

GOPHER TORTOISE MANAGEMENT PLAN

Gopherus polyphemus

September 2012



FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION
620 South Meridian Street
Tallahassee, FL 32399-1600

GOPHER TORTOISE MANAGEMENT PLAN TEAM

Sponsor: Eric Sutton, Director
Division of Habitat and Species Conservation

Sponsor
Representatives: Dr. Thomas Eason, Deputy Division Director
Division of Habitat and Species Conservation

Dr. Brad Gruver, Section Leader
Species Conservation Planning Section
Division of Habitat and Species Conservation

Team Leader: Deborah Burr, Gopher Tortoise Management Plan Coordinator
Division of Habitat and Species Conservation

Team Members: Joan Berish, Fish and Wildlife Research Institute
Greg Kaufmann, Division of Recreation and Parks, Florida
Department of Environmental Protection
Tom Ostertag, Division of Habitat and Species Conservation
Kristen Sommers, Division of Habitat and Species Conservation
Dan Sullivan, Division of Habitat and Species Conservation

Team Resources:

Facilitators:	David Arnold, Laura Jerome
Document Management:	Paul McCall
Stakeholder Coordination:	Deborah Burr
Permitting:	Rick McCann, Eric Seckinger, Heather Rigney, Samantha Dupree, Daphne McCann
Monitoring, Online Permitting:	Kristen Sommers
Local Governments, Waifs:	Allie Perryman
Incentives:	Brian Branciforte, Kris Cathey, Joe Prenger, Tom Ostertag, Jenna Walker (Intern)
Best Management Practices:	Scott Sanders, Joe Prenger
Mapping:	Brian Beneke, Sean Singletary, Beth Stys, William Wade (Intern)
Habitat Protection and Acquisition:	Gary Cochran, Tom Houston
Legal:	Michael Yaun
Education and Outreach:	Judy Gillan
Community Relations:	Diane Hirth
Economic Impact:	Dr. David Harding, Dr. Michael Thomas

Law Enforcement:	Captain Carol Keyser, Major Mark Warren
Commensals:	Dave Almquist (FNAI), Terry Doonan, Kevin Enge, Anna Farmer, Tom Ostertag, Sean Singletary, Clinton Smith, Melissa Tucker, Bill Turner
Policy:	Dennis David, Thomas Eason, Brad Gruver, Greg Holder, Scott Sanders, Eric Sutton, Major Mark Warren
State and Federal Coordination:	Dr. Elsa Haubold

EXECUTIVE SUMMARY

The Florida Fish and Wildlife Conservation Commission (FWC) published its first gopher tortoise (*Gopherus polyphemus*) management plan in 2007, and the gopher tortoise was reclassified from a Species of Special Concern to Threatened (68A-27 F.A.C.). This document is a revision of the 2007 Gopher Tortoise Management Plan, and is intended to guide the continued recovery of the gopher tortoise in Florida through 2022. Conservation objectives and actions from the original plan that have been completed or achieved in the first five years of implementation are included in Chapter 6 of this document. The listing history of the gopher tortoise in Florida also provides a good background and is included in Appendix 1.

Significant conservation and economic events have influenced revisions to this management plan. As a result, the revised goal and objectives shift the focus away from the regulation and permitting of gopher tortoises that was implemented under the 2007 draft of the plan, to additional conservation actions emphasizing a non-regulatory approach to conserving this species. The Gopher Tortoise Management Plan approved in 2007 included an extensive framework for new permitting guidelines to transition away from the now former incidental take and standard relocation permits. Working closely with stakeholders, FWC staff created detailed relocation guidelines based on the framework in the 2007 management plan; these high-priority permitting guidelines were approved by the Commissioners and were fully implemented in 2009. Additionally, it is important to note that the economy of Florida was much different when the first plan was drafted in 2006-2007. The plan was approved and implementation began at the start of a major recession. Although considerable progress was made, and many of the objectives were achieved, much of the foundation of the plan was based on a robust economy and booming development industry. Finally, the status of the gopher tortoise has also changed. In July 2011, the U.S. Fish and Wildlife Service (USFWS) completed the 12-month status review for the gopher tortoise and found that the species is warranted for federal listing as Threatened under the Endangered Species Act (ESA), but precluded due to proactive implementation of beneficial conservation measures now to prevent it from becoming federally-listed in the future. Numerous other factors affecting the conservation of gopher tortoises have also played a role in revisions to the management plan; however, FWC staff and stakeholders have thoroughly considered these 3 significant events during the extensive revision of this plan.

The gopher tortoise is a moderate-sized, terrestrial turtle, averaging 23-28 cm (9-11 in) long. The species is identified by its stumpy, elephantine hind feet and flattened, shovel-like forelimbs adapted for digging. The shell is oblong and generally tan, brown, or gray. The gopher tortoise occurs in the southeastern Coastal Plain from southeastern South Carolina to extreme southeastern Louisiana (Auffenberg and Franz 1982). The gopher tortoise is endemic to the United States, and Florida represents the largest portion of the total global range of the species. Gopher tortoises remain widely distributed in Florida, occurring

in parts of all 67 counties. The burrows of the tortoise also provide refuge for more than 350 other species * e c n n g f " ð , including some species that are currently state and federally listed in Florida.

The current cause of imperilment of the gopher tortoise, as identified by the final Biological Status Report (Enge *et al.* 2006a), is the rate of population decline, inferred from loss of habitat. The new Gopher Tortoise Permitting Guidelines (approved April 2008, as amended) ensure the humane and responsible relocation of all gopher tortoises from development sites. Furthermore, FWC no longer issues incidental take permits that allow entombment of tortoises. As a result of this new permitting program, the rate of decline of the species can no longer be evaluated solely by habitat loss. Therefore, the overarching objective for this management plan is to incur no net loss of gopher tortoises from the time of plan approval in 2012 through 2022. The ultimate goal for gopher tortoise conservation is to restore and maintain secure, viable populations of gopher tortoises throughout Florida so the species no longer warrants state listing. The plan establishes the measurable overarching objective that works towards decreasing the rate of population decline of the gopher tortoise because it is necessary to immediately decrease the rate of decline so that the ultimate conservation goal can be achieved (*i.e.*, < 30% over 3 generations to evaluate the Threatened designation and potentially delist the species if it does not meet any of the criteria for listing outlined in 68A-27 F.A.C.).

For this 10-year plan, the overarching objective of no net loss of gopher tortoises will be accomplished by meeting all of the following objectives:

- (1) Minimize the loss of gopher tortoises by 2022 by ensuring humane and responsible relocation of all gopher tortoises from lands proposed for development, minimizing illegal harvest of tortoises, creating best management practices (BMPs) for agricultural and silvicultural lands, implementing methods to reduce juvenile mortality, reducing loss of tortoises to disease, and reducing vehicle-related mortality through education and exclusion measures.
- (2) Increase and improve gopher tortoise habitat by 2022. This will require ongoing coordination with public agencies on the management of gopher tortoise habitat on protected lands in addition to restoring degraded lands with potential gopher tortoise habitat. Both public and private land acquisition averaging 57,000 acres per year will help to conserve the species distribution and maintain wildlife corridors between undeveloped lands. Identifying addition incentives to encourage habitat management and conservation easements on private lands is instrumental to increasing the acres of managed and protected habitat.
- (3) Enhance and restore gopher tortoise populations where the species no longer occurs or has been severely depleted on protected, suitable lands by 2022. This will require an evaluation of protected lands to determine where gopher tortoise populations are depleted and the condition of the habitat. Implementation of a range-wide population monitoring protocol to help evaluate the status of the species throughout Florida will help to determine where gopher tortoise populations need to be restored.

- (4) O c k p v c k p " v j g " i q r j g t " v q t v o b k 2022 by addressing e v k q p " c u specific management needs and creating guidelines for relocation of priority commensal species from development sites as appropriate. Best management practices for priority commensal species on agricultural and silvicultural lands will also be created, and land managers and the general public will be targeted with information about the broader role of the gopher tortoise as a keystone species.

The plan presents a suite of conservation strategies and actions that serve to achieve the conservation objectives. These strategies and actions are best accomplished by applying an adaptive management approach that allows for easy adjustments to policies, guidelines, and techniques based on observed conservation benefits/detriments and sound science. The actions are organized into the following broad sections: regulations, permitting, local government coordination, law enforcement, habitat protection, habitat management, population management, disease management, incentives, monitoring, education and outreach, and research. A new chapter addressing the conservation of commensals is included and contains a suite of actions that help to conserve priority commensals and more than 350 other animal species documented to use gopher tortoise burrows.

Conservation and recovery of the gopher tortoise through the implementation of this plan will require the cooperation of local governments; regional, state, and federal agencies; non-governmental organizations; business interests; and the public. Although this plan was developed by FWC in collaboration with the stakeholders, it cannot be successfully implemented without significant direct involvement of these agencies and non-governmental organizations.

Public comment and outside review were formally solicited and incorporated at several junctures during the revision of this management plan. A stakeholder core assistance group provided initial input on many of the revisions as they were completed. Additionally, 3 public stakeholder meetings provided an opportunity for the public to provide both verbal and written input on the revisions to the plan. V j g u g " o g g v k p i u " y g t g " p q v k e g gopher tortoise listserv that reaches more than 230 members of the public. An additional public comment period was noticed in the Florida Administrative Weekly to solicit input on draft revisions of the management plan. In addition to soliciting input from the public, FWC reached out to its partners in Georgia, Alabama, and South Carolina; the U.S. Department of Defense; and the U.S. Fish and Wildlife Service to obtain their input on the revisions to the plan. Lastly, input from subject matter experts on gopher tortoises and associated conservation actions was obtained throughout the management plan revision process.

TABLE OF CONTENTS

GOPHER TORTOISE MANAGEMENT PLAN TEAM..... ii

EXECUTIVE SUMMARY iv

TABLE OF CONTENTS..... vii

LIST OF TABLES x

LIST OF FIGURES xi

LIST OF ACRONYMS xii

GLOSSARY xiii

CHAPTER 1: BIOLOGICAL BACKGROUND 1

 Taxonomic Classification 1

 Life History and Habitat 1

 Distribution and Population Status 2

 Historic and Ongoing Conservation Efforts 3

CHAPTER 2: THREAT ASSESSMENT..... 5

 Reason for Listing..... 5

 Present and Anticipated Threats 5

CHAPTER 3: CONSERVATION GOAL AND OBJECTIVES..... 8

 Conservation Goal 8

 Conservation Objectives 9

CHAPTER 4: CONSERVATION ACTIONS..... 16

 Regulations 16

 Permitting 17

Guidelines..... 17

Online Permitting System..... 18

Agricultural, Silvicultural, and Wildlife Management Activities 18

Management of Gopher Tortoises on U.S. Military Installations..... 19

Waif Tortoises..... 20

 Local Government Coordination 24

 Law Enforcement..... 28

 Habitat Protection 30

Conservation Easements 32

H Y E ø u " Q r v k o c n " E q p u g t x c v . k . q . p . " R . n . c . p . p . k . p . i 3 3 ' D q w p f c..... 33

Military Buffering..... 34

Habitat Conservation Plan Land Acquisition (HCPLA) Grants..... 34

Conservation Banks..... 35

Critical Lands and Waters Identification Project 35

H n q t k f c A a t i o n P l a n n . f . n . k . h . g 35

Florida Wildlife Conservation Guide..... 36

 Habitat Management..... 37

Managing the Habitat 40

Management Tools 43

 Incentives 47

Permit-Based Incentives..... 48

Candidate Conservation Agreement 49

Candidate Conservation Agreement with Assurances 49

<i>Habitat Conservation Plans</i>	50
<i>Conservation Banking</i>	50
<i>Cooperative Conservation Blueprint</i>	51
<i>Landowner Assistance Programs</i>	51
<i>Safe Harbor Agreement</i>	52
<i>Tax-based Incentives</i>	52
<i>Additional Conservation-based Incentive Programs</i>	52
Population Management	53
Disease Management	56
Monitoring	59
Acquisition of Public Lands	60
Protected Gopher Tortoise Habitat on Private Lands.....	60
Habitat Management Actions.....	61
Gopher Tortoise Relocation Activities.....	61
Recipient Sites.....	62
Gopher Tortoise Population Status and Habitat Loss	62
Gopher Tortoise Permits	63
Commensal Species.....	64
Overall Success of the Gopher Tortoise Management Plan.....	64
Education and Outreach.....	66
Research	69
<i>Long-term Population Dynamics, Habitat Use, and Movements</i>	70
<i>Minimum Patch Size and Population Size Needed to Maintain a Functional Population</i>	70
<i>Juvenile Tortoise Needs and Survival</i>	71
<i>Relocation and Methods to Enhance Site Fidelity on Recipient Sites</i>	71
<i>Impacts of Herbicides on Tortoises</i>	72
<i>Impacts of Exotic Wildlife on Tortoises</i>	72
<i>Long-term Effects of URTD on Tortoise Populations</i>	72
<i>Effectiveness of Retaining or Relocating Tortoises on Sites Undergoing Development</i>	72
<i>Best Burn Regimes for Various Habitats and Best Alternative Management Methods Where Fire is Precluded</i>	73
<i>Habitat Use and Movements in Relatively Poorly-Drained Soils, especially in South Florida</i>	73
CHAPTER 5: GOPHER TORTOISE COMMENSAL SPECIES.....	75
State and Federally Listed Priority Commensal Species	76
Non-listed Priority Commensal Species	86
Invertebrate Commensal Species.....	88
Nonnative Species that use Gopher Tortoise Burrows	94
Interim FWC Policy on the Relocation of Priority Commensals	94
Limited Relocation Guidance.....	95
CHAPTER 6: IMPLEMENTATION STRATEGY.....	98
Timeframe for Completing Actions.....	99
Significant Gopher Tortoise Management Plan Achievements to Date.....	99
CHAPTER 7: ECONOMIC, SOCIAL, AND ECOLOGICAL IMPACTS.....	104
Potentially Affected Parties	104

Social Impacts	105
Economic Effects	105
Ecological Impacts.....	106
Potentially Positive Impacts	106
Potentially Negative Impacts.....	107
LITERATURE CITED	108
APPENDICES	124
APPENDIX 1. History of Gopher Tortoise Regulations in Florida	124
APPENDIX 2. Gopher Tortoise Enforcement Policy.....	125
APPENDIX 3. FWC Regional Map and Contact Information	127
APPENDIX 4. Gopher Tortoise Priority Habitat by FWC Region	128
APPENDIX 5. Gopher Tortoise Priority Commensal Species County Distribution Maps	135
APPENDIX 6. Invertebrates Associated with Gopher Tortoises	140
<i>Select Invertebrate Distribution Maps</i>	154
APPENDIX 7. Conservation-based Incentive Opportunities	168
APPENDIX 8. Stakeholders	171
APPENDIX 9. An Economic Analysis of the Gopher Tortoise Management Plan (September 2007, Revised September 2012).....	175
ENDNOTES: Internet URLs Hyperlinked in this Document.....	224

LIST OF TABLES

Table 1. Proposed timeline for implementing permitting actions..... 23

Table 4. Florida Forever Funded Acquisitions 32

Table 5. Proposed timeline for implementing habitat protection actions. 37

Table 6. General characteristics for plant communities commonly used by the gopher
tortoise including associated fire frequency, and parameters and related values
w u g f " v q " f g h k p g " q r v k o w o " i q r j g t " v q t v q k u g " j
Guide to Natural Communities). 42

Table 7. Proposed timeline for implementing habitat management actions. 47

Table 8. Proposed timeline for implementing incentives actions. 53

Table 9. Proposed timeline for implementing population management actions..... 56

Table 10. Proposed timeline for implementing disease management actions. 59

Table 11. Proposed timeline for implementing monitoring actions. 64

Table 12. Proposed timeline for implementing education and outreach actions. 67

Table 13. Proposed timeline for implementing research actions. 73

Table 14. Interim guidance for limited relocation of commensals based on post-
development site characteristics and species identity. 96

Table 16. Completed and Ongoing Conservation Activities 99

V c d n g " 3 9 0 " " E c v g i q t k g u " q h " u v c m g j q n f g t u ø " k p v g t
conservation. 104

LIST OF FIGURES

Figure 1. Distribution of the gopher tortoise in the southeastern United States. 3
Figure 2. Gopher Tortoise Complaints Received by FWC Law Enforcement (2009-2011)
..... 29

LIST OF ACRONYMS

ARC	Acquisition and Restoration Council
ASPCA	American Society for the Prevention of Cruelty to Animals
BSR	Biological Status Report
CCA	Candidate Conservation Agreement
CCAA	Candidate Conservation Agreement with Assurances
CFR	Code of Federal Regulation
DEP	Florida Department of Environmental Protection
DOT	Florida Department of Transportation
ESA	Endangered Species Act
F.A.C.	Florida Administrative Code
FAQ	frequently asked question
FNAI	Florida Natural Areas Inventory
F.S.	Florida Statutes
FTE	full time equivalent
FWC	Florida Fish and Wildlife Conservation Commission
FWRI	Fish and Wildlife Research Institute, FWC
FY	Fiscal Year
GIS	geographic information system
GPS	global positioning system
GTTAG	Gopher Tortoise Technical Assistance Group
HSC	FWC Division of Habitat and Species Conservation
INRMP	Integrated Natural Resource Management Plan
IUCN	International Union for Conservation of Nature
LE	FWC Division of Law Enforcement
NGO	non-governmental organization
OCO	operating capital outlay
NRCS	Natural Resources Conservation Service
SHA	Safe Harbor Agreement
TNC	The Nature Conservancy
URTD	upper respiratory tract disease
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

GLOSSARY

anthropogenic - of human origins; human-related; caused by humans.

asters - plants in the sunflower family.

basal area - the cross-section area of a tree stem in square ft, usually measured at breast height (4.5 ft). The basal area of a forest stand is calculated by adding the basal area of all the trees and dividing by the acreage of land (expressed as square ft per acre).

best management practices (wildlife) - practical, cost-effective actions that agricultural and silvicultural producers can undertake to reduce the potential for take of state-listed species.

biodiversity - the variety of all forms of life. Gopher tortoises contribute to plant and animal diversity through their burrowing habits.

biomass - the total weight of living organisms in a given area.

burrow occupancy rate - also known as a correction factor, this is the percentage of gopher tortoise burrows on a particular site that are occupied at a given time (tortoises generally use more than 1 burrow over time).

canopy cover - layer of vegetation extending above head height, usually composed of tree branches.

carrying capacity - the maximum number of individuals of a species that an area can support, given the amount and quality of food, water, and cover.

clutch - all the eggs produced by 1 bird or reptile at a single time.

commensal - living in a relationship in which 1 animal derives food, refuge, or other benefits from another animal without hurting or helping the other animal. The term commensal in this document excludes exotic species and species rarely found in tortoise burrows. A species is considered a priority commensal species for this document due to its listed status, dependence on the gopher tortoise burrow community, or identification as such by stakeholders and biologists.

connectivity (habitat) - the desirable linking or joining of isolated small areas of similar habitat to create larger interconnected blocks to potentially reduce the effects of fragmentation.

conservation easement - a voluntary legal agreement between a landowner and a land trust or government agency that limits the type or amount of development on the private ownership.

degradation (habitat) - a lowering in quality of habitat for gopher tortoises, often related to lack of prescribed fire or other management.

donor site - the property, usually a development, from which tortoises are removed during relocations.

dorsal - situated on or toward the upper side of the body.

ecological niche - where an organism lives and what it does (*i.e.*, how it fits into its profession, biologically speaking).

endemic - exclusively native to a particular geographic area.

epidemiological - referring to the study of causes and distribution of disease in populations.

epizootic - an outbreak of disease affecting a large number of animals at 1 time within a particular region or geographic area.

fecundity - potential capacity of an organism or population to reproduce. In gopher tortoises, a low number of eggs and slow growth to sexual maturity translate to low fecundity.

flatwoods - common upland habitat characterized by flat terrain, moderately to poorly drained soils, scattered pine trees, saw palmetto, and various other shrubs, forbs, and grasses. Gopher tortoises tend to burrow in the better drained portions of this habitat.

forage - plant material, such as grasses, legumes, and other flowering plants, eaten by grazing animals.

forb - a flowering plant with a non-woody stem that is not a grass.

fossorial - refers to an animal adapted to digging and living underground.

founder effect - the reduced genetic diversity when a population is descended from a small population of colonizing ancestors.

fragmentation (habitat) - a process of environmental change, usually caused by human-related land clearing, where once connected habitats are now in (often scattered) pieces.

genotypic assemblage - gopher tortoise populations that have a similar genetic (hereditary) make-up and that occur in a certain area.

GIS - geographic information system: a computer-based system used for storage, retrieval, mapping, and analysis of geographic data. GIS is used for mapping potential gopher tortoise habitat in Florida.

gopher tortoise (*Gopherus polyphemus*) - a moderate-sized, terrestrial turtle, with stumpy, elephantine hind feet and flattened, shovel-like forelimbs adapted for digging.

ground cover - herbaceous plants and the lowest shrubs occupying an area: a generic term used to describe the mat of plants found on the forest floor.

ground truth - checking GIS or other computer-generated information by going to specific locations and performing observations and measurements to determine the accuracy of computer-based habitat mapping.

habitat - the place where a gopher tortoise lives that provides all its needs for food and shelter.

herbaceous - refers to non-woody plants, generally green and leafy in appearance and texture.

herpesvirus - an infectious agent that has been associated with respiratory disease and infections of the mouth and nasal passages.

human predation - the taking or harvest of gopher tortoises for food (now illegal).

incidental take - any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. As related to gopher tortoises, potential gopher tortoise mortality, direct (*e.g.*, heavy machinery) or indirect (*e.g.*, entombment), that could occur during land development.

invasive species - plants or animals that are not native to a region, which when introduced accidentally or intentionally out-compete native species for available resources, reproduce prolifically, and dominate regions or ecosystems.

invertebrate - an animal that lacks a backbone, *e.g.*, an insect.

iridovirus - an infectious agent that has been associated with respiratory disease and infections of the mouth and nasal passages.

keystone species - a plant or animal that increases or decreases the diversity of an ecosystem, depending on its abundance or rarity. The gopher tortoise is a keystone species in upland habitats in Florida.

legumes - plants in the bean family.

mark-recapture - method used in wildlife research that involves capturing animals, marking them, releasing them, then recapturing some of the same individuals during 1 or more recapture periods.

mesic (habitat) - having a moderate or well-balanced supply of moisture.

midstory - the middle layer, generally 3-9 ft in height, of trees and shrubs (in a multi-layered forest) shaded by taller trees.

minimum convex polygon - a method of determining the home range of an individual or group of animals by connecting the outermost known location data points for a particular period of time.

mitigation contribution - compensation, usually either in the form of monetary contributions or protected habitat donated, to offset the ill effects of human-related land change (*e.g.*, development) on gopher tortoise populations.

mitigation parks - select lands with gopher tortoise populations that have been acquired, permanently protected, and managed using mitigation funds. Such preserves help to offset the loss of habitat from urbanization.

mutualist - refers to a relationship between species where both derive benefits.

mycoplasma - an infectious agent (bacterium) that has been associated with upper respiratory tract disease in gopher tortoises.

obligate - a species confined to a narrow range of conditions; in this case, an obligate species would be dependent on gopher tortoise burrows.

on-site (relocation) - an area that is located within the same boundaries (as defined in the legal description or as identified by the county parcel identification number) of the development area from which tortoises or commensals are to be removed and which is under the same ownership as the development area.

parasite - an organism that lives in or on another (the host), from which it obtains food, shelter, or other requirements at the expense of the host.

plantar tubercles - small pads on the feet of Florida mice, used to distinguish them from other similar species.

population - a group of individuals of the same species that occur in a defined area at the same time and regularly interact or interbreed.

population augmentation - to enlarge or increase a population, in this case by adding individuals to a population not currently from that population.

potential gopher tortoise habitat - those land cover types and soil associations that are known to support the life history requirements of the gopher tortoise. These habitats include, but are not limited to, sandhill, scrub, scrubby flatwoods, pine flatwoods, dry prairie, coastal strand, xeric hammock, mixed pine-hardwoods, and disturbed habitats on suitably drained soils. Designation of an area as potential gopher tortoise habitat does not indicate that the area is currently inhabited by gopher tortoises.

predation - hunting and killing another animal for food.

prescribed fire (controlled burning) - a planned fire applied within a particular land area under the right weather conditions to accomplish specific, well-defined management objectives.

protected lands (habitat) - Public or private lands that provide significant conservation and protection for imperiled wildlife, in this case the gopher tortoise, and are protected from imminent development or alteration, thereby ensuring present and future important wildlife resources. Habitat protection can be accomplished through fee simple ownership, acquisition of less-than-fee interests, or other agreements associated with landowner incentive programs.

radio-instrumentation (telemetry) - attaching a small radio transmitter to a gopher signals that are detected using a hand-held antenna and receiver.

recipient site - the property where relocated tortoises are released. Different types of recipient sites are based on the habitat protection provided. The types of recipient sites include public or private lands with long-term protection, short-term protection, or no protection as defined in the Gopher Tortoise Permitting Guidelines.

refugia - areas in which organisms can survive during periods of unfavorable conditions.

relocation - deliberately moving wild gopher tortoises or commensal species.

rescue relocation - deliberately moving individuals or groups of tortoises to areas that are typically unprotected, and may be relatively small, disturbed, or inadequately managed to support long-term population viability. Rescue relocation is conducted primarily to remove wild gopher tortoises from human-caused harm.

responsible relocation - deliberately moving wild gopher tortoises into protected, managed, suitable habitat where their future survival and long-term population viability are very likely.

restocking - deliberately moving wild gopher tortoises into protected, managed, suitable survival and long-term population viability are very likely.

restocking site - an area of protected, managed, suitable habitat where gopher tortoise populations have been severely depleted or eliminated.

roller-chopping - a forestry method for preparing sites for planting pine trees; also used as a land management tool to reduce the height and density of understory vegetation. A bulldozer pulls a heavy cylindrical drum with cutting blades that chop vegetation.

sandhill - upland habitat on gently rolling terrain that has deep, sandy soils; longleaf pine; xeric-adapted oaks; and wiregrass.

scrub - upland xeric shrub habitat with or without sand pines, that has deep, sandy soils; evergreen oaks; and scattered bare patches of sand.

seronegative - negative blood test indicating no immune response to the bacteria that cause upper respiratory tract disease in gopher tortoises.

seropositive - positive blood test indicating an immune response (exposure) to the bacteria that cause upper respiratory tract disease in gopher tortoises.

seroprevalence - rate of occurrence of seropositive status in a population or sample; used as a criterion of comparison between populations or samples.

shrub - a woody plant (height variable) that has several stems arising from the base and lacks a single trunk.

silviculture - the art and science of establishing and growing healthy, high quality forests to meet human needs.

site fidelity - remaining within a particular area.

soft release (relocation) - those releases where relocated animals are contained in an enclosure at the recipient site for some period of time before being allowed to roam freely; this differs from hard releases where animals are turned loose without any period to acclimate to their new surroundings.

stewardship - taking good care of natural resources.

succession (habitat) - predictable and orderly changes in plant composition or structure over time.

take - to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in such conduct. **take** means an act which actually kills or injures fish or wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering (Chapter [68A-27 F.A.C.](#)¹).

terrestrial - living on land.

understory - the lowest vegetative layer in a forest, consisting of woody and herbaceous growth less than 3 ft in height.

univoltine - refers to organisms having 1 brood per year.

upland (habitat) - high, generally dry, lands that are not wetlands (water).

upper respiratory tract disease - a disease that occurs in gopher tortoises, where infected individuals may show a discharge from the nasal passages or eyes, swelling of the eyelids or area around the eyes, or reddened third eyelid. These so-called clinical signs (*i.e.*, symptoms) come and go over time.

ventral - situated on or close to the abdomen or lower surface of the body.

viable population - a stable, self-sustaining population with a high likelihood (*e.g.*, more than 95%) of surviving for a long-term period (*e.g.*, 100 years).

waif tortoise - a gopher tortoise that has been removed from the wild but is not associated with a permitted relocation effort and is generally from an unknown location.

xeric (habitat) - very dry, in this case due to soil characteristics.

CHAPTER 1: BIOLOGICAL BACKGROUND

This chapter provides a brief summary of information on selected aspects of the biology and life history of the gopher tortoise. For more detailed reviews and information on the biology and conservation of this species, the reader may reference the Biological Status Report (BSR) for the Gopher Tortoise (Enge et al. 2006a), Mushinsky et al. 2006, or Ashton and Ashton 2008.

Taxonomic Classification

Gopher tortoises are members of the Class Reptilia, Order Testudines, and Family Testudinidae. Of five North American tortoise species (genus *Gopherus*), the gopher tortoise (*G. polyphemus*) is the only one that occurs east of the Mississippi River.

Life History and Habitat

The gopher tortoise is a moderate-sized, terrestrial turtle, averaging 23-28 cm (9-11 in) long. The species is identified by its stumpy, elephantine hind feet and flattened, shovel-like forelimbs adapted for digging. The shell is oblong and generally tan, brown, or gray; hatchlings are yellowish-orange.

The gopher tortoise typically inhabits uplands, especially those with relatively well-drained, sandy soils. The gopher tortoise is generally associated with longleaf pine (*Pinus palustris*) and xeric oak (*Quercus* spp.) sandhills but also occurs in scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, mixed hardwood-pine communities, and a variety of disturbed habitats (Auffenberg and Franz 1982; Kushlan and Mazzotti 1984; Diemer 1986, 1987, 1992b; Breininger *et al.* 1994; Ashton and Ashton 2008). Gopher tortoises dig burrows that average 4.5 m (14.8 ft) long and 2 m (6.6 ft) in depth (Hansen 1963). Ashton and Ashton (2008) recorded their longest burrow as 20.5 m (67 ft). These burrows, which provide protection from temperature extremes, moisture loss, and predators, serve as a refuge for 350-400 other species, including listed commensal species such as the gopher frog (*Lithobates capito*), eastern indigo snake (*Drymarchon couperi*), Florida pine snake (*Pituophis melanoleucus mugitus*), and Florida mouse (*Peromyscus floridanus*) (Cox *et al.* 1987, Jackson and Milstrey 1989, Witz *et al.* 1991, Kent *et al.* 1997).

The gopher tortoise is slow to reach sexual maturity, has low fecundity, and has a long life span (Landers 1980). Females reach sexual maturity at 9-21 years of age, depending on local resource abundance and latitude; males mature at a slightly younger age

The gopher tortoise is slow to reach sexual maturity, has low fecundity, and has a long life span.

(Landers *et al.* 1980, Diemer and Moore 1994, Mushinsky *et al.* 1994, Aresco and Guyer 1999). The breeding season is generally March - October (Johnson *et al.* 2007). Nests are excavated (often in burrow mounds) from mid-May to mid-June, and only 1 clutch is produced annually (Landers *et al.* 1980). Clutch size is usually 5 to 9 eggs, with an average of 6 (Diemer and Moore 1994, Butler and Hull 1996; see summary in Ashton *et al.* 2007). Incubation period is approximately 80-100 days, depending on latitude

(Iverson 1980, Landers *et al.* 1980). Predation on nests and hatchlings is heavy (Alford 1980, Landers *et al.* 1980, Butler and Sowell 1996, Smith 1997, Pike and Seigel 2006).

Gopher tortoises feed primarily on broadleaf grasses, wiregrass, grass-like asters, legumes, and fruits (Garner and Landers 1981, Macdonald and Mushinsky 1988), but they are known to eat >400 species of plants (Ashton and Ashton 2008). Tortoise densities and movements are affected by the amount of herbaceous ground cover (Auffenberg and Iverson 1979). Generally, feeding activity is confined to within 50 m (164 ft) of the burrow (Auffenberg and Franz 1982), but a tortoise may travel ≥ 100 m (328 ft) from its burrow for specific forage requirements (Ashton and Ashton 2008). Home range size varies with habitat type, season, and sex of the tortoise; moreover, considerable individual variation has been found (Diemer 1992b). Reported average home ranges for males have varied from 0.5 to 1.9 ha (1.2 to 4.7 ac). Females generally have smaller home ranges, with reported averages ranging from 0.1 to 0.6 ha (0.2 to 1.6 ac) (McRae *et al.* 1981, Diemer 1992b, Smith *et al.* 1997, Eubanks *et al.* 2003; see summary in Pike 2006). Each tortoise typically uses several burrows (McRae *et al.* 1981, Auffenberg and Franz 1982, Diemer 1992b), which complicates estimates of population density (McCoy and Mushinsky 1992b).

Gopher tortoise densities and movements are affected by the amount of herbaceous ground cover.

Distribution and Population Status

The gopher tortoise occurs in the southeastern Coastal Plain from southeastern South Carolina to extreme southeastern Louisiana (Auffenberg and Franz 1982); Figure 1. The gopher tortoise is endemic to the United States, and Florida represents the largest portion of the total global range of the species. Gopher tortoises remain widely distributed in Florida, occurring in parts of all 67 counties; however, their current range in south Florida is limited because of unsuitable habitat and increased urbanization (Diemer 1987, Mushinsky *et al.* 1992). Gopher tortoises are found on both the east and west coasts (Auffenberg and Franz 1982, Kushlan and Mazzotti 1984).

Population estimates for the gopher tortoise in Florida are based on 2003 geographic information system (GIS) data indicating that the current extent of gopher tortoise habitat is approximately 3.3 million acres (Enge *et al.* 2006a). Using density information from McCoy *et al.* 2002 and population ratios of adult to immature tortoises from Diemer 1992a, the estimated number of adult tortoises approximately 785,000 (see Enge *et al.* 2006a for more detailed explanations of acreage and population estimates).

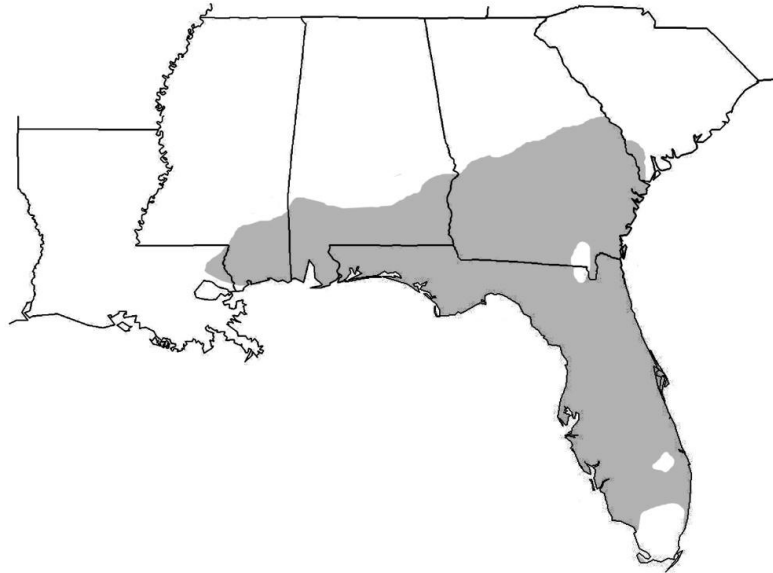


Figure 1. Distribution of the gopher tortoise in the southeastern United States.

Historic and Ongoing Conservation Efforts

Harvest of gopher tortoises has been regulated in Florida since 1972, and the species was fully protected in 1988 (Appendix 1). The introduction of toxic substances into burrows (e.g., gassing to force rattlesnakes from their retreats) was prohibited in 1978, and the racing of gopher tortoises for charity purposes was ended in 1989. By the mid-1980s, impacts from development necessitated increasing regulatory focus. From 1984 to 2011, various policies, protocols, guidelines, and rules have addressed the impacts from urbanization on this imperiled species. In June 2006, the Florida Fish and Wildlife Conservation Commission (FWC) amended its rules to clearly provide protection to the burrows of gopher tortoises.

Originally state-listed as Threatened in 1975, the gopher tortoise was reclassified as a Species of Special Concern in 1993. In 2007, the gopher tortoise was reclassified as Threatened in Florida. Associated with the Biological Status Report (BSR) published in 2006 (Enge *et al.* 2006a) and the approval of the original management plan, the gopher tortoise was reclassified as Threatened in 2007.

The gopher tortoise is currently listed by the U.S. Fish and Wildlife Service (USFWS) as Threatened in accordance with the federal Endangered Species Act (ESA) for populations occurring west of the Mobile and Tombigbee Rivers in Alabama, Mississippi, and Louisiana (50 CFR §17.11). The status of the gopher tortoise in its eastern range was evaluated by the USFWS in 2010-2011. The 12-month status review was published in the Federal Register (76(144):45130-45162) in July 2011 and included the finding that the species is warranted for federal listing under the ESA as Threatened, but precluded from

listing due to higher priority listing activities (U.S. Fish and Wildlife Service 2011). As such, it is currently considered as a Candidate species under the ESA. Candidate species are not subjected to federal regulations under the ESA, and current conservation actions can potentially help preclude the need for future federal listing in the eastern portion of the range. To foster an increased level of collaboration to actively conserve gopher tortoises, the Department of Defense, U.S. Forest Service, USFWS, FWC, Georgia Department of Natural Resources, South Carolina Department of Natural Resources, Alabama Division of Wildlife and Freshwater Fisheries, tribal organizations, and several non-governmental organizations (NGOs) entered into a Candidate Conservation Agreement (CCA) for the gopher tortoise in 2008 (as revised). The purpose of this voluntary agreement is to implement proactive and coordinated conservation activities that can, in turn, help preclude the need to list the gopher tortoise under the ESA.

Habitat protection is a key component of the conservation strategy for this species. Past land acquisition efforts by FWC and other state agencies have focused on securing high quality natural communities because of the values these habitats provide to tortoises, burrow commensals, and other wildlife species. However, acquisition of conservation lands under Florida Forever has significantly decreased since the Gopher Tortoise Management Plan was approved in 2007. This is a result of the current economic downturn that has affected all of Florida (and most of the United States). Therefore, the revision of this plan includes a new approach to habitat protection through incentives and partnerships, more so than outright acquisition by FWC and other public agencies. Protection of quality native habitats will continue to be a priority, but restoration of potential habitat for gopher tortoises on public and private lands will also take priority when these activities contribute toward recovery of the gopher tortoise.

Many local governments have also made significant contributions to the conservation of gopher tortoises, primarily by preserving and managing habitat through various conservation programs, screening development activities to determine the need for a permit from FWC, and directly limiting impacts on tortoises. The FWC has coordinated with a number of counties regarding gopher tortoise mitigation and conservation since the 1980s and, under the plan, has organized annual workshops for local governments to enhance coordination and disseminate information critical to local conservation efforts.

CHAPTER 2: THREAT ASSESSMENT

Reason for Listing

In May 2002, Florida Fish and Wildlife Conservation Commission (FWC) staff introduced a petition (Gruver 2002) to reclassify the gopher tortoise from a Species of Special Concern (68A-27.005, H 0 C 0 E T j t g q v p e c e s (68A-27.004, F.A.C.). A team of scientists completed the [Biological Status Report](#)² (Enge *et al.* 2006a), and FWC Commissioners agreed that reclassification of the gopher tortoise was warranted. The status review found that the species meets Criterion A (population size reduction-inferred from loss of habitat) for classification as a Threatened species. The gopher tortoise was reclassified as Threatened in September 2007 following the management plan approval by the FWC Commission.

Present and Anticipated Threats

The primary threat to gopher tortoises in Florida is habitat destruction, fragmentation, and degradation, particularly from urbanization and development, agriculture, and phosphate/heavy metals mining (Diemer 1986, 1987; Berish [Diemer] 1991; McCoy and Mushinsky 1995; Berish 2001; Smith *et al.* 2006). Tortoise populations in the Florida Panhandle have been severely depleted by human predation and from habitat degradation resulting from fire suppression and planting dense stands of sand pine (*Pinus clausa*) in sandhill habitat (Auffenberg and Franz 1982; Diemer 1986, 1987; Berish 2001). Formerly large tortoise populations in the northern peninsula have been depleted by agriculture, human predation, and increasing development (Taylor 1982, Diemer 1987). In central Florida, urban growth and development, phosphate mining, and citrus production are the primary threats (Auffenberg and Franz 1982; Diemer 1986, 1987). In south Florida, tortoise habitat has been destroyed or degraded by urbanization, intensive agriculture, and invasive exotic plant species (Berish [Diemer] 1991, Berish 2001). Habitat fragmentation of rural areas by roads and increased vehicular traffic due to development result in increased road mortality of gopher tortoises, which are often drawn to roadsides because of available forage (Franz and Auffenberg 1978; Landers and Buckner 1981; Landers and Garner 1981; Lohofener 1982; Diemer 1986, 1987; Berish 2001; Mushinsky *et al.* 2006).

The primary threat to gopher tortoises in Florida is habitat destruction, fragmentation, and degradation.

Degradation of tortoise habitat on silvicultural lands occurs when the canopy of pine plantations becomes closed and little or no understory forage is available to tortoises (Landers and Buckner 1981; Landers and Garner 1981; Auffenberg and Franz 1982; Diemer 1986, 1987; Berish 2001). Site preparation associated with pine silviculture reduces native ground cover, and the sparse cover of legume and non-legume forbs provides poor forage, resulting in slower tortoise growth rates and delayed sexual maturity (Aresco and Guyer 1999). Lack of prescribed fire or suppression of natural fires also results in canopy closure and reduced tortoise forage plants (Landers and Speake 1980; Landers and Garner 1981; Auffenberg and Franz 1982; Diemer 1986, 1987; Berish 2001). Local isolated populations of

gopher tortoises may persist for decades in overgrown habitat, but recruitment of young into these populations declines as the canopy increases and habitat quality decreases (McCoy and Mushinsky 1992a, Mushinsky and McCoy 1994).

Lack of prescribed fire or suppression of natural fires results in canopy closure and reduced tortoise forage plants.

The spread of exotic plant species such as Brazilian pepper (*Schinus terebinthifolius*), Australian pine (*Casuarina equisetifolia*), cogongrass (*Imperata cylindrica*), and hairy indigo (*Indigofera hirsuta*) also degrades tortoise habitat (Berish [Diemer] 1991, Hicklin 1994, Berish 2001, Basiotis *et al.* 2005, Smith *et al.* 2006). Cogongrass from Asia can quickly form a tall, dense ground cover that is unsuitable for the gopher tortoise, particularly on rangelands, pastures, roadsides, and reclaimed phosphate mines (Shilling *et al.* 1997, Mushinsky *et al.* 2006).

Gopher tortoise eggs and hatchlings are preyed upon by mammals, birds, and snakes (Douglass and Winegarner 1977, Fitzpatrick and Woolfenden 1978, Landers *et al.* 1980, Butler and Sowell 1996, Smith 1997, Pike and Seigel 2006). Approximately 80-90% of nests are typically depredated, primarily by predators such as the raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), gray fox (*Urocyon cinereoargenteus*), and opossum (*Didelphis virginiana*) (Hallinan 1923, Ernst and Barbour 1972, Douglass and Winegarner 1977, Landers *et al.* 1980). More than 90% of hatchlings may not survive their first year (Witz *et al.* 1992, Butler and Sowell 1996, Epperson and Heise 2003, Pike and Seigel 2006). Adults are usually immune to predation, but some are killed by dogs (*Canis familiaris*) and coyotes (*C. latrans*) (Douglass and Winegarner 1977, Causey and Cude 1978, Hawkins and Burke 1989, Mushinsky *et al.* 2006). Gopher tortoise populations can typically sustain themselves despite natural predation pressure, with only 1 to 3 of every 100 eggs probably producing a breeding adult (Landers 1980). However, predator populations, such as raccoons and crows (*Corvus* spp.), can be artificially high in some habitats because of anthropogenic factors (Smith and Engeman 2002). Also, new tortoise predators have invaded Florida via human transport or habitat alteration: nine-banded armadillo (*Dasypus novemcinctus*), coyote, monitor lizards (*Varanus* spp.), and red imported fire ant (*Solenopsis invicta*) (Douglass and Winegarner 1977, Auffenberg and Iverson 1979, Main *et al.* 2000, Epperson and Heise 2003, Enge *et al.* 2004, Owens *et al.* 2005). Recently, Argentine tegu lizards (*Tupinambis meriana*) have been found using gopher tortoise burrows near Tampa; their impact on tortoises is currently unknown (Enge *et al.* 2006b).

Heavy human predation on the gopher tortoise occurred in the past in Florida, especially in the Panhandle and northern peninsula (Harcourt 1889, Fisher 1917, Anderson 1949, Alberson 1953, Hutt 1967, Matthews 1979, Auffenberg and Franz 1982, Taylor 1982, Diemer 1986, Mickler 1986, Diemer 1987, Berish 2001). Prior to the closure of tortoise harvest in the late 1980s, a community in Okaloosa County held an annual tortoise cookout. Although tortoise protection and decreased tortoise populations have reduced human consumption rates, some tortoise populations may still be depleted by continued human predation (Mushinsky *et al.* 2006). Road development facilitates human access into remote areas and may lead to exploitation of additional gopher tortoise populations. Evidence of sporadic, localized harvest of tortoises still exists (T. Thomas, pers. comm.).

Beginning in the 1990s, upper respiratory tract disease (URTD) was identified as a potential threat to the gopher tortoise (Brown *et al.* 2002), and relatively large die-offs (100-300+ shells) that might be linked to URTD were documented on several public lands in Florida (McLaughlin 1997; Smith *et al.* 1998; Brown *et al.* 1999; Diemer Berish *et al.* 2000, 2010; Gates *et al.* 2002; Rabatsky and Blihovde 2002; Siegel *et al.* 2003). At least 2 *Mycoplasma* (bacteria) species have been shown to cause URTD in gopher tortoises (Brown *et al.* 1995, 2004; Brown *et al.* 1999), and other pathogens, including herpesvirus and iridovirus, may cause similar disease (Origgi *et al.* 2004, Johnson *et al.* 2010). Pathogens may be partially responsible for declines in some gopher tortoise populations. However, URTD may have a long evolutionary history as a gopher tortoise disease (McCoy *et al.* 2007). There are several possibilities why URTD has only been discovered relatively recently: (1) increased research on gopher tortoises, (2) increased stress on gopher tortoise populations from habitat fragmentation and degradation has lowered their resistance to pathogens, (3) a more virulent form of the pathogen has evolved, or (4) URTD was introduced by humans via exposure to infected captive tortoises (Brown *et al.* 1999, Mushinsky *et al.* 2006).

Epidemiological studies to date have not clarified impacts from URTD. Throughout social behavior is believed to play a critical role in the spread of mycoplasma in wild populations, with immature tortoises having minimal direct interactions with adults, thereby limiting their exposure to the pathogen (Wendland *et al.* 2010b). On Sanibel Island, 87% of gopher tortoises tested were seropositive for exposure to the pathogen, and at least 1 population on the island appears to have experienced a 25-50% reduction in breeding age adults (McLaughlin 1997, McLaughlin *et al.* 2000). In a follow-up survey of selected public lands, however, McCoy *et al.* (2007) reported that gopher tortoise declines did not appear to be related to the presence of *M. agassizii* in the specific populations studied. Using mark-recapture data collected over a 4-year period, Ozgul *et al.* (2009) reported that apparent survival of seropositive (exposed) tortoises was higher (0.99) than that of seronegative tortoises (0.88); however, another plausible model suggested that susceptible (seronegative) tortoises in high seroprevalence ($\geq 25\%$ seropositive) sites had lower apparent survival rates than did susceptible tortoises in low seroprevalence ($< 25\%$ seropositive) sites, indicating a possible acute effect of infection. This same study reported that the number of tortoise carcasses detected during annual surveys increased significantly with increasing site seroprevalence, from approximately one to approximately five shell remains per 100 individuals. Perez-Heydrich *et al.* (2011) found that even relatively URTD-free tortoise populations showed decline, with no evidence to indicate that URTD was the sole or primary cause of gopher tortoise population decline. The models also indicated that the impact of disease on host populations depended primarily on how often a population underwent an epizootic state, rather than how long the epizootic persisted in the exposed population. Thus, impacts of mycoplasmal URTD are not clear at this time. In the case of a chronic disease in a long-lived species, actually quantifying the impacts may require decades of data to document long-term, small-scale impacts.

CHAPTER 3: CONSERVATION GOAL AND OBJECTIVES

Conservation Goal

The ultimate conservation goal for the gopher tortoise is to restore and maintain secure, viable populations of gopher tortoises throughout Florida so the species no longer warrants listing. Achieving this goal will also assist in securing populations of the many commensal

The Goal: Restore and maintain secure, viable populations throughout Florida so the species no longer warrants listing.

species dependent on the burrows and habitat of the gopher tortoise, and may prevent these species from becoming more imperiled in the future. The current cause of imperilment of the gopher tortoise is the rate of population decline, inferred from loss of habitat. Accomplishing this ultimate goal will require reducing the rate of gopher tortoise population decline and maintaining or increasing populations on protected habitat until the species qualifies

for delisting. The new Gopher Tortoise Permitting Guidelines (approved April 2008, as amended) ensure the humane and responsible relocation of all gopher tortoises from development sites. Furthermore, FWC no longer issues incidental take permits that allow entombment of tortoises. As a result of this new permitting program, the rate of decline of the species can no longer be evaluated solely by habitat loss. The desirable end state for this goal is:

- Viable gopher tortoise populations remain present in every county in Florida.
- Total tortoise population stabilizes at carrying capacity of protected habitat (public and private).
- Genetic diversity and integrity of total population and subpopulations are retained.
- Protected locations of sufficient area and population size to be perpetually stable.

Realizing this goal will take many years, in part because of the magnitude of the challenges facing this species, and in part due to the inherent biology of these slow growing, long-lived animals. Progress toward this ultimate goal must therefore be incremental, step by step, strategically and practically directed to optimize the use of available resources. Therefore, the overarching objective for this management plan is to incur no net loss of gopher tortoises from the time of plan approval in 2012 through 2022. The plan establishes the measurable overarching objective that works towards decreasing the rate of population decline of the gopher tortoise because it is necessary to immediately decrease the rate of decline so that the ultimate conservation goal can be achieved (*i.e.*, < 30% over 3 generations to evaluate the Threatened designation and potentially delist the species if it does not meet any of the criteria for listing outlined in 68A-27 F.A.C.).

Conservation Objectives

Conservation objectives and strategies provide bench marks to measure progress towards achieving the management plan goal. The objectives will be met through the implementation of the series of conservation actions that serve to achieve the conservation objectives and strategies. This plan proposes the following objectives that will be monitored over the plan period.

The conservation objectives involve minimizing the loss of gopher tortoises, managing and protecting habitat, restoring gopher tortoises, and maintaining the tortoise as a keystone species.

Objective 1: Minimize the Loss of Gopher Tortoises

Strategy 1.1 - Ensure responsible relocation of all gopher tortoises from development sites through the implemented permitting guidelines. (p. 17)

Action 1.1.1: Accommodate additional gopher tortoises displaced by development on other lands to address specific conservation, educational, or humane needs. (p. 19)

Strategy 1.2 - Improve permitting compliance and enforcement effectiveness through partnerships with local governments in all counties by 2017. (p. 28)

Strategy 1.3 - By 2014, develop best management practices (BMPs) to avoid and minimize incidental take of gopher tortoises on agricultural and silvicultural lands. (p. 18)

Action 1.3.1: Y q t m " y k v j " H Y E ø u " E q p u g t x æ v i k n q p " R n c p p k
private agricultural and silvicultural interests, and stakeholder groups to develop BMPs that will avoid and minimize incidental take of gopher tortoises and/or burrows. (p. 18)

Strategy 1.4 - Reduce hatchling predation on sites, as appropriate, where population viability and persistence have been compromised. (p. 53)

Action 1.4.1: In extreme cases where hatchling success is documented to be unusually low or where sustained juvenile mortality is occurring, consider implementing predator exclusion, head-start programs, or both, where juveniles are protected until large enough to minimize the predation risk. (p. 53)

Strategy 1.5 - Reduce the anthropogenic transmission of tortoise diseases.

Action 1.5.1: Establish an educational campaign to warn the public of the risks to gopher tortoise populations from transmission of infectious agents when gopher tortoises are moved illegally. (p. 56)

Action 1.5.2: Provide disinfection and sanitation protocols for those persons conducting permitted relocations or tortoise research. (p. 56)

Action 1.5.3: Provide protocol for accommodating clinically ill tortoises during permitted relocations. (p. 56)

Strategy 1.6 - Increase knowledge of disease impacts on tortoise populations. (p. 56)

Action 1.6.1: Establish a procedure for carcass recovery and pathological investigation of sick and dead tortoises in instances of large-scale mortality events (*e.g.*, more than 20 dead tortoises in a relatively restricted geographical area and time period). (p. 56)

Action 1.6.2: Create a gopher tortoise mortality event database and coordinate with other agencies and local governments to document incidences of unusual or large-scale die-offs. (p. 56)

Action 1.6.3: Participate in range-wide gopher tortoise health working group to facilitate exchange of information and issues on tortoise health evaluation and disease monitoring. (p. 56)

Action 1.6.4: Conduct periodic follow-up assessments (*e.g.*, serology; nasal flushes) of tortoise populations known to have high incidence of disease to determine impacts over time. (p. 56)

Action 1.6.5: Conduct study to sample serology of tortoises on select recipient sites following multiple relocations to determine exposure status to mycoplasma and, if possible, iridovirus. (p. 56)

Action 1.6.6: Provide link on FWC website to *Handbook on Gopher Tortoise (Gopherus polyphemus) Health Evaluation Procedures for Use by Land Managers and Researchers* to assist with determination of tortoise health and illness. (p. 56)

Strategy 1.7 - Gather the necessary information to effectively manage resident and relocated tortoise populations over the long-term. (p. 69)

Action 1.7.1: Conduct follow-up studies of marked populations to determine dynamics, immigration, and emigration over 1 or more decades. (p. 70)

Action 1.7.2: Evaluate forage and nutritional needs that affect movements and habitat use. (p. 70)

Action 1.7.3: Identify and implement marking technique for juvenile tortoises that will persist over time. (p. 69)

Action 1.7.4: Find improved method to more accurately determine tortoise age. (p. 70)

Action 1.7.5: Evaluate usefulness of satellite telemetry for intensive monitoring of tortoise movements. (p. 69)

Action 1.7.6: Conduct baseline and follow-up studies of fragmented or insular populations to provide insights on minimum patch size/viable population. (p. 70)

Action 1.7.7: Evaluate survival of older juvenile and subadult size classes to help alleviate detection problem associated with hatchling tortoise burrows. (p. 69)

Action 1.7.8: Evaluate best methods to detect hatchling and juvenile burrows, *e.g.*, post-burn surveys; use of canines to locate burrows. (p. 69)

Action 1.7.9: Gather additional data on opportunistic sheltering, use of microhabitats, and dispersal by juvenile tortoises. (p. 69)

Action 1.7.10: Determine if winter burns contribute to calcium depletion in juvenile tortoises. (p. 69)

Action 1.7.11: Evaluate the impacts of herbicides on tortoises. (p. 72)

Action 1.7.12: Identify impacts of exotic wildlife on tortoise populations. (p. 72)

Action 1.7.13: Conduct follow-up surveys of tortoises inhabiting burrows on sites undergoing development and of tortoises retained in on-site preserves. (p. 72)

Action 1.7.14: Conduct follow-up studies of tortoises moved under temporary exclusion permits to determine response to temporary displacement along linear, disturbed habitats. (p. 69)

Action 1.7.15: Determine habitat use and movements of tortoises in relatively poorly-drained soils, especially in South Florida. (p. 73)

Strategy 1.8 - Reduce the decline of gopher tortoises through targeted education and outreach to specific audiences. (pp. 66-67)

Action 1.8.1: Create various outreach products to increase the awareness of motorists on the issue of road mortality. (p. 67)

Action 1.8.2: Develop a tortoise-wise community program to educate residents on the v q t v q k u g ø u " t q n g " c u " c " m g { u v q p g " u r g e k g u . " t c tortoises by pets, and compatible yard planting that provide forage for gopher tortoises. (p. 67)

Objective 2: Increase and Improve Gopher Tortoise Habitat

Strategy 2.1 - Increase the amount of protected, potential habitat from recent estimates (2003 data; Enge *et al.* 2006a) of 1,340,000 acres to 1,955,000 acres. This will include an

additional 615,000 acres by both acquisition of new public lands and permanently protecting private lands with conservation easements. (p. 30)

Action 2.1.1: Continue public acquisition of potential habitat by all sources at an average of 41,000 acres per year through 2022. (p. 30)

Strategy 2.2 - Increase protection of potential habitat on private lands (*e.g.*, through conservation easements) to an average of 16,000 acres per year through 2022. This is approximately 12% of the 1.98 million acres of potential tortoise habitat currently in private ownership. (p. 30)

Action 2.2.1: Mechanisms for achieving this objective include FWC recipient site permits, state and local government partnerships, and private land stewardship programs. (p. 30)

Strategy 2.3 - Manage vegetation to optimize gopher tortoise forage and shelter needs on public and private lands. (p. 37)

Action 2.3.1: Manage habitat to meet management parameters in Table 6. (p. 42)

Action 2.3.2: Target the percent of canopy cover on protected, occupied, or potential habitat to be less than 60% to promote an increase of herbaceous forage. (p. 42)

Strategy 2.4 - Develop cooperative agreements, outreach capacity, technical assistance, and cooperation with other local, state, and federal land management agencies to encourage them to manage available tortoise habitat. (p. 28)

Strategy 2.5 - Provide incentives and assistance for appropriate habitat management on private lands. (p. 47)

Action 2.5.1: Work with Landowner Assistance Program (LAP) to educate private landowners regarding identification of and proper land management in gopher tortoise habitats. (p. 51)

Action 2.5.2: K p " e q q r g t c v k q p " y k v j " N C R " c p f " H Y E ø u " E q o Blueprint, develop new incentives and payment for ecosystem services programs to encourage proper gopher tortoise habitat management. (p. 51)

Action 2.5.3: Participate in or organize workshops and other outreach to educate private landowners and the general public on appropriate habitat management. (p. **Error! Bookmark not defined.**)

Strategy 2.6 - Promote the use of Habitat Conservation Plans (HCPs), conservation banking, and Candidate Conservation Agreements with Assurances (CCAA) to interested public and private landowners. (p. 50)

Action 2.6.1: Coordinate with FWC and USFWS staff and evaluate these incentive tools as a means to provide a conservation benefit for gopher tortoises, and provide incentives to the landowner for the added conservation benefit. (p. 47)

Strategy 2.7 - Monitor the amount and condition of habitat over time to determine if populations are declining, stable, or increasing. (p. 59)

Action 2.7.1: Develop ways to monitor or assess gopher tortoise habitat at the landscape scale using remote sensing or other means. (p. 59)

Strategy 2.8 - Work with private partners and other agencies to seek funding to restore habitat and increase gopher tortoise carrying capacity and review the application of FWC land acquisition funds for this purpose. (p. 30)

Strategy 2.9 - Investigate initial and subsequent response of tortoises to various fire frequencies and seasons. (p. 73)

Action 2.9.1: Identify best practices for areas where fire is prohibited or limited. (p. 73)

Objective 3: Enhance and Restore Gopher Tortoise Populations

Strategy 3.1 - Enhance gopher tortoise populations in degraded habitats and restore gopher tortoises on suitable public conservation lands where populations have been severely depleted or eliminated. (p. 53)

Action 3.1.1: Coordinate with public land management agencies to identify sites that could benefit from either facilitated or directed population restoration. (p. 53)

Action 3.1.2: Determine best sources of gopher tortoises for population restoration on select publicly owned conservation lands. (p. 53)

Strategy 3.2 - Continue to work with willing private landowners to determine if either facilitated or directed population restoration would benefit their tortoise populations. (p. 53)

Strategy 3.3 - Gather the necessary information to effectively manage resident and relocated tortoise populations over the long-term. (p. 69)

Action 3.3.1: Determine which factors enhance site fidelity and overall relocation success, e.g., source, number, and size/sex of tortoises; habitat type; season of relocation. (p. 71)

Strategy 3.4 - Monitor population status of gopher tortoises using the range-wide monitoring protocol. (p. 59)

Action 3.4.1: In cooperation with LAP, FDACS, or other entities involved in monitoring voluntary BMP compliance, gather and analyze data from observations of gopher tortoises and burrows on participating lands. (p. 18)

Objective 4: Maintain the Gopher Tortoise and its Associated Species in the Upland Ecosystem

Strategy 4.1 - Create guidelines for relocation of priority commensal species from development sites as appropriate. (p. 75)

Action 4.1.1: Develop interim recommendations for relocation of commensals when relocating gopher tortoises. (p. 75)

Action 4.1.2: Determine the necessary habitat and population conditions on recipient sites to accommodate for the relocation of commensals. (p. 75)

Action 4.1.3: Identify appropriate recipient sites for each priority commensal species. (p. 75)

Action 4.1.4: As appropriate, develop procedures for relocation that will maximize survival of the individuals and conservation of the species. (p. 75)

Strategy 4.2 - Develop guidelines for specific management needs of priority commensal species. (p. 75)

Action 4.2.1: Coordinate with the FWC Florida mouse management plan team to incorporate management recommendations. (p. 76)

Action 4.2.2: Coordinate with the FWC Florida pine snake management plan team to incorporate management recommendations. (p. 76)

Action 4.2.3: Coordinate with the FWC gopher frog management plan team to incorporate management recommendations. (p. 76)

Action 4.2.4: Coordinate with USFWS staff to incorporate appropriate recommendations from the eastern indigo snake recovery plan. (p. 76)

Strategy 4.3 - By 2014, develop BMPs for select priority commensal species on agricultural and silvicultural lands. (p. 18)

Strategy 4.4 - For the duration of this management plan, continue to educate land managers and the general public about the broader role of gopher tortoises in maintaining biodiversity of upland ecosystems. (p. 37)

Strategy 4.5 - By 2017, identify data gaps with regard to management and conservation of priority commensal species from development sites. (p. 75)

Action 4.5.1: Perform a literature review to identify data needs regarding the impacts of agricultural practices on commensal species and their use of gopher tortoise burrows. (p. 75)

Action 4.5.2: Develop effective relocation strategies and guidelines for each species as appropriate. (p. 75)

Action 4.5.3: Conduct surveys of genetic variation to determine subpopulations and the level of gene flow among subpopulations. (p. 75)

Action 4.5.4: Identify habitat characteristics that influence home range sizes, habitat utilization, and species densities in scrub and sandhill habitats. (p.75)

Action 4.5.5: Determine and implement effective methods for surveying priority commensal populations on areas where gopher tortoises occur. (p. 75)

Action 4.5.6: Develop monitoring protocols for priority commensals that are relocated to collect data and inform future management. (p. 75)

Action 4.5.7: Monitor relocated priority commensals to assess the survivorship and behavior of those individuals and impacts on recipient populations. (p. 75)

Action 4.5.8: Identify and prioritize appropriate recipient sites for commensal species when relocated. (p. 75)

Action 4.5.9: Evaluate disease susceptibility and transmission in advance of relocating priority commensals. (p.75)

Action 4.5.10: Conduct surveys for invertebrate commensals to determine distribution and habitat; and collate species specimens and data for analyses. (p. 75)

Action 4.5.11: Determine best protocols for releasing commensals at recipient sites that increase their chance for survival. (p. 75)

CHAPTER 4: CONSERVATION ACTIONS

This chapter presents conservation actions which serve to achieve the conservation objectives and strategies outlined in Chapter 3. These actions are best accomplished by applying an adaptive management approach that allows for easy adjustments to policies, guidelines, and techniques based on observed conservation benefits or detriments, and sound science. Although science serves as the basis for management actions, there are instances where the Florida Fish and Wildlife Conservation Commission (FWC) and its partners must project beyond available m p q y n g f i g " v q " j g n r " t g f w e g " v j g " t c v g " q h " v j k u " u r g available, it will be incorporated into ongoing gopher tortoise conservation.

The actions are organized into the following broad sections: regulations, permitting, local government coordination, law enforcement, habitat protection, habitat management, incentives, population management, disease management, monitoring, education and outreach, and research. Each section contains specific management actions and timelines for implementation.

Regulations

The FWC amended agency rules (Chapter 68A-27, F.A.C.) in 2007 to reclassify the gopher tortoise from a Species of Special Concern to Threatened, and to implement protections necessary to achieve the objectives of this plan. In 2011, FWC revised the rules relating to endangered and threatened species. The 2011 revision of rule 68A-27, however, did not alter the protections provided for gopher tortoises. A history of the regulation of gopher tortoises is included in Appendix 1. Sub-paragraph 68A-27.003(2)(d)3 , F.A.C. states:

The Gopher tortoise is hereby declared to be State-designated Threatened Species and shall be afforded the protective provisions specified in this subparagraph. No person shall take, attempt to take, pursue, hunt, harass, capture, possess, sell or transport any gopher tortoise or parts thereof or their eggs, or molest, damage, or destroy gopher tortoise burrows, except as authorized by Commission permit or when complying with Commission approved guidelines for specific actions which may impact gopher tortoises and their burrows. A gopher tortoise burrow is a tunnel with a cross-section that closely approximates the shape of a gopher tortoise. Permits will be issued based upon whether issuance would further management plan goals and objectives.

In 2007, when the Gopher Tortoise Management Plan was first approved by FWC, a new permitting framework was outlined and included as a high priority implementation item of the plan. The Gopher Tortoise Permitting Guidelines (April 2008, as amended) were developed and approved by FWC and remain in effect for specific actions which may impact gopher tortoises and their burrows. Permits are issued based upon whether issuance would further management plan goals and objectives [68A-27.003(2)(d)3, F.A.C.].

Rule 68A-27.007 F.A.C. also provides some exceptions to the permitting requirement for actions that are consistent with FWC-approved species management plans or for emergency purposes as described in the rule.

Permitting

The gopher tortoise has been protected in Florida for over 30 years, since 1979 as a Species of Special Concern, and since 2007 as a Threatened species. Historically, gopher tortoise permits have been issued for impacts incidental to carrying out an otherwise lawful activity such as relocation prior to land clearing and development commencing. The new permitting system implemented under the 2007 management plan was restructured to ensure that all gopher tortoise relocation projects benefit to the species.

The Species Conservation Planning Section at FWC issues permits for protected species including development related permits, scientific research, education, and other specific purposes for gopher tortoises. Issuance of these permits is intended to authorize and facilitate land management, scientific collection, and educational activities under conditions that provide safeguards and conservation benefits to protected species. Most scientific and educational use permits require approved research proposals or educational outreach plans. Additional information is located on the MyFWC.com website under the Protected Wildlife Permitting [webpage](#).³

Guidelines

Following approval of the Gopher Tortoise Management Plan in 2007, FWC worked with stakeholders to develop the highest priority implementation item in the plan. The Gopher Tortoise Permitting Guidelines were approved by the Commission in 2008 and fully implemented in 2009. Subsequent revisions have been made, with input from stakeholders, which have improved the permitting process and provided additional permitting options specific to types of impacts. All permitted activities for the gopher tortoise also help to ensure that all activities while providing a conservation benefit to the species. The guidelines specify prohibited actions that impact gopher tortoises and their burrows. Information about gopher tortoise permitting, including the Gopher Tortoise Permitting Guidelines, can be accessed online at MyFWC.com/GopherTortoise.⁴

New options and requirements for relocating gopher tortoises are detailed in the Gopher Tortoise Permitting Guidelines. These options further assist in achieving conservation objectives by directing entities developing properties where gopher tortoises would be impacted by such activities, obtain a gopher tortoise relocation permit and contribute to the conservation of the species. Permit-based incentives encourage permitted entities to relocate tortoises to long-term protected and managed recipient sites that provide the greatest assurance for long-term conservation of the species.

The Gopher Tortoise Permitting Guidelines are adaptive in nature. Working closely with stakeholders, FWC has revised and improved the guidelines multiple times since initial approval in 2008. As more information becomes available, FWC will continue to work with stakeholders to update and improve the guidelines that help achieve the conservation objectives for the species.

Online Permitting System

Since April 2009, most permits can be applied for and obtained electronically at MyFWC.com/GopherTortoise. The FWC online permitting system was created to better track the relocation of tortoises from development sites to permitted recipient areas, thus contributing to minimizing the loss of tortoises. Once registered, applicants can complete and submit permit applications and associated mitigation. The system also provides a means to send and receive official communications between FWC and applicants, and to issue and retrieve permits online. Although paper applications remain available, applications submitted online help to expedite the review process and ensure the information entered is consistent. The online permitting system also provides the capability for the general public to search for and view all permit applications

Since April 2009, most permits can be applied for and obtained electronically at MyFWC.com/GopherTortoise.

and issued permits related to gopher tortoises. In addition to the online permitting system, the MyFWC.com/GopherTortoise website includes an enhanced mapping tool allowing any user to find authorized agents, relocation permits, and recipient sites by geographic location.

The online permitting system is supported by powerful database management technology that allows sophisticated retrieval and analysis of information from this complex dataset. This database also provides permit reporting services that allow FWC staff to easily access important data collected from the online permitting system. This information is useful to FWC for determining progress toward achieving the objectives of this plan, through tracking, verifying, and monitoring permitted activities throughout the state. Future enhancements to the online system will include the electronic submission of the monitoring reports from permitted recipient sites, and the capability to record the management activities conducted on these protected lands.

The online permitting system helps track the progress made towards meeting the overall goal and objectives of the Gopher Tortoise Management Plan. Additional enhancements to the system in the future will help ensure sufficient capacity is available at recipient sites and track habitat management activities on those sites. Furthermore, the online system allows for the submission of data on commensal species encountered and relocated during the relocation of gopher tortoises. Assessment of burrow use by other species and documenting the relocation of these other species helps FWC ensure the continued function of gopher tortoises as a keystone species.

Agricultural, Silvicultural, and Wildlife Management Activities

Approximately 61 million acres of agricultural and silvicultural land use (National Agricultural Statistics Service 2007, U.S. Forest Service 2007).

listed species, occur on lands utilized for agriculture. The FWC has long recognized that agriculture provides a valuable benefit to the conservation and management of fish and wildlife in Florida, including species designated under Rule 68A-27.003, F.A.C. On March 6, 2008, the FWC Executive Director issued a General Policy Statement on the application of the FWC permitting requirements for Agricultural, Silvicultural and Wildlife Management Activities as they relate to gopher tortoises. The Policy Statement is included in Appendix 2 of this plan and in the Gopher Tortoise Permitting Guidelines (April 2008, as amended). The policy provides in part:

This policy is for the purpose of enforcement of Chapter 68A-27 relating to gopher tortoises with respect to agricultural and silvicultural activities or activities intended to improve native wildlife habitat. The adoption of the Gopher Tortoise Burrow rule does not expand pre-existing gopher tortoise regulatory prohibitions or change existing policy or practice with respect to agricultural and silvicultural activities. I q r j g t " v q t v q burrow permits are not required to conduct agricultural activities, silvicultural activities, or activities intended to improve native wildlife habitat. Such activities include, but are not limited to: tilling, planting, mowing, harvesting, prescribed burning, mowing, disking, roller-chopping and tree-cutting.

In November 2011, the FWC amended its rules relating to Endangered or Threatened Species, Chapter 68A-27 F.A.C. Once again, recognizing the importance of agriculture to wildlife conservation and management, Rule 68A-27.007(2)(d), F.A.C., provides that agriculture conducted in accordance with best management practices (BMPs) adopted by the Department of Agriculture and Consumer Service does not require an incidental take permit from the FWC. In accordance with this Rule, FWC will work with the Florida Department of Agriculture and Consumer Services, landowners, and other stakeholders to legislatively authorize, develop, and adopt BMPs to protect wildlife species. Until such time that the BMPs are developed, refined and adopted, the General Policy Statement attached in Appendix 2 will remain in effect. It is anticipated that as agriculture opts into the adopted BMP program, the General Policy Statement will be phased out of both the Gopher Tortoise Management Plan and the Gopher Tortoise Permitting Guidelines.

Management of Gopher Tortoises on U.S. Military Installations

The FWC acknowledges federal law prohibits the U.S. military from paying for mitigation and that the State of Florida cannot compel the U.S. military to obtain a State permit unless a waiver to this stipulation is granted by Congress; all military actions on its installations are exempt from state authorizations typically required for impacts to gopher tortoises. The U.S. Department of Defense (DoD) military service branches provide vital national security. The U.S. military and Florida National Guard bases and installations serve the DoD to successfully achieve its goals and mission to protect Americans and the security of the United States of America. Due to this, FWC categorically excludes Florida National Guard Camp Blanding Military Reservation from state authorizations otherwise required for impacts to gopher tortoises.

This categorical exclusion for the National Guard and the following paragraph apply to on-installation activities and as a part of the Integrated Natural Resource Management Plan (INRMP).

The FWC recognizes that military installations in Florida provide significant conservation benefits for gopher tortoises. Along with the State of Florida, DoD is a party to the Gopher Tortoise Candidate Conservation Agreement (CCA) of 2008, and has committed to implementing proactive gopher tortoise conservation measures across the specified geographic area. While the EEC "k u " x q n w p v c t { . " H Y E " w p f g t u v c p f u " v j g " F q F compliance therewith, to include a commitment to submit data to FWC reflecting completed relocation activities within a reasonable timeframe. Additionally, Federal law, the Sikes Act Improvement Act (SAIA), 16 U.S.C. §670 *et. seq.*, requires military installations conduct a program that provides for the conservation and rehabilitation of natural resources, including k o r g t k n g f " y k n f n k h g " u r g e k g u . " Wildlife related k p i " v q " g c e j conservation activities may include, but are not limited to, habitat management (especially prescribed fire), habitat restoration k q p . " c p f " y k n f n k h g " u w t x g a t y u " c p f " o q installations comprise 737,315 acres (Florida Natural Areas Inventory 2012). Habitat management activities conducted on installations benefit a vast array of wildlife. Therefore, FWC will continue to work with military partners in Florida (*i.e.*, Air Force, Navy, Army, and Marines) to ensure INRMPs provide for mission requirements and conservation measures that benefit species on military installations, including but not limited to the gopher tortoise.

Waif Tortoises

Despite their documented decline over the last century, one of the many special qualities of gopher tortoises is that they remain a widely-distributed species, occurring in parts of all counties in Florida. They are also quite adaptable to their environments and are habitat generalists that can survive in a variety of dry, grassy landscapes. Because of these characteristics, gopher tortoises are known to co-exist with humans in suburban areas where remnant patches of habitat may still exist in utility corridors or in yards and neighborhoods. Although gopher tortoises spend most of their time in their burrows, they nevertheless are often observed basking on their burrow mounds or foraging along roadsides. Unless an individual tortoise is noticeably injured, the best option for gopher tortoises is to leave them where they are found. It is also illegal to possess gopher tortoises for any reason without authorization from FWC.

Unless an individual tortoise is noticeably injured, the best option for gopher tortoises is to leave them where they are found.

However, if a gopher tortoise is found in a metropolitan, urban area where virtually no wildlife alert hotline (toll free: 1-888-404-3922) to receive guidance. In many cases, once a tortoise is removed from an area and cannot be returned, the outcome for the tortoise is living out v j g " t g o c k p f g t " q h " k v u " n q p i " n k h g " k p " e c r v k x k v { = " or if there are health concerns. These individuals are referred to by FWC as waif gopher tortoises. In other cases, waif tortoises can be released into specially designated areas (see below). The FWC strives to keep wild gopher tortoises in the wild, and to prevent displaced

tortoises from being indiscriminately released into wild areas where they may disrupt resident tortoise populations or transmit diseases.

Conservation efforts involving educating the public and locating permanent placement sites for waif tortoises are not new to FWC. Educational brochures have been created and are available to the public at MyFWC.com/GopherTortoise or from FWC regional offices. Therefore, it is important to include these efforts as part of an integrated approach for conserving the species to help minimize the number of waif tortoises throughout Florida. A major part of the conservation efforts focused on waif tortoises is education of the general public. It is important for all residents and visitors of Florida to know the laws protecting native wildlife.

Survival can be an incredible conservation asset, but sometimes the actions of well-intentioned people can result in a negative impact on an individual animal or to wildlife populations. Some include but are not limited to: removing a tortoise from an undeveloped natural area, retrieving a tortoise from a suburban area where remnant grassy areas still exist, and placing a tortoise in a vehicle to rescue it from a roadway. In many cases, it may be possible to return temporarily (if local information is available (e.g. GPS location or mileage to a notable landmark), thereby reducing the number of waifs.

Permitting Guidelines for Accommodating Waif Tortoises

Over the last decade, FWC staff has contended with how to best accommodate waif gopher tortoises and find appropriate placement of these individual animals. Nonetheless, finding permanent resources, including FWC permitting staff, gopher tortoise biologists, wildlife rehabilitators, local governments, educational facilities, and the general public. Establishing standardized guidelines for their accommodation will greatly increase efficiency while providing opportunities for conservation through education and repatriation. Detailed permitting guidelines for accommodating waif tortoises will be developed and included in the Gopher Tortoise Permitting Guidelines at the next revision opportunity.

Releasable and Non-Releasable Waif Tortoises

Once a displaced tortoise is identified by FWC and classified as a waif gopher tortoise, the animal can no longer be released back into the wild where natural wild populations of gopher tortoises occur. It is important when a tortoise is identified as a waif to further determine whether it is a releasable waif gopher tortoise or a non-releasable waif gopher tortoise.

Releasable waif gopher tortoises may be eligible for release on an FWC-designated waif tortoise recipient site. A waif tortoise recipient site is a natural area that does not have an existing gopher tortoise population, or where the resident population has been severely depleted. Fewer criteria and restrictions will apply for these sites than those required for long-term protected recipient sites permitted by FWC. Conversely, there may be special requirements such as permanent fencing, or special enclosures for the release of juveniles. To be classified as releasable, tortoises should show no visible signs of illness, need no medical care (tortoises may have received previous medical attention), not require human intervention for continued survival,

and have been exposed to no diseased tortoises while in captivity. Juvenile tortoises hatched in captivity may be considered for release into the wild in some cases.

Non-releasable waif tortoises are not candidates for release into wild, natural areas due to conditions associated with that particular tortoise. These conditions may include one or more of the following: exhibit signs of illness; require ongoing medical care; are sufficiently disabled to preclude successful burrowing or foraging; have been exposed to diseased tortoises while in captivity; or require human intervention for continued survival.

Options for Accommodating Waif Tortoises

To ensure their safety and survival, and to contribute to the overall conservation of gopher tortoises, it is imperative that adequate options be available for the placement of waif tortoises. The FWC provides a no-cost permit option for individuals or facilities seeking permission to possess a waif gopher tortoise. After obtaining a permit, education facilities, schools, and zoos can use non-releasable waif tortoises to help educate local residents about the importance of this species.

The FWC is also working with public and private landowners to identify and establish recipient sites for releasable waif tortoises to receive individuals or groups of waifs that can be accommodated in natural areas. Sites for releasable waif tortoises must be suitable set-aside areas that are undisturbed by construction activities and that provide a safe environment. Waif recipient sites are generally established on smaller properties that may not meet the criteria for establishing a recipient site as outlined in the Gopher Tortoise Permitting Guidelines. Landowners interested in establishing a waif recipient site should understand that receiving waif tortoises may not provide the economic benefits normally associated with the relocation of tortoises displaced from development sites.

Providing a variety of placement options for waif tortoises is important to help reduce unauthorized releases that could adversely impact wild populations. Guidelines for accommodating waif tortoises will be provided in greater detail in the Gopher Tortoise Permitting Guidelines at the next revision opportunity.

Use of Waifs to Assist Other States in Population Restoration

Assisting with population restoration efforts in other states is another option for waif tortoise placement under appropriate circumstances. Such placements may occur when groups of waif tortoises are in need of placement at one time; this is the most difficult type of waif placement, encumbering significant FWC resources. One option currently being explored is assisting other states with population restoration efforts using waifs on protected lands where gopher tortoise densities have been severely depleted. The FWC, in partnership with the South Carolina Department of Natural Resources and the Savannah River Ecology Lab, will implement a pilot project of restoring gopher tortoise populations to the 1,500-acre Aiken Gopher Tortoise Preserve. Details for such interstate collaborations will be specified in Memorandums of Understanding (MOUs) and could include periodic post-relocation burrow surveys, and, preferably, initial intensive follow-up using mark-recapture or radio-telemetry.

Table 1. Proposed timeline for implementing permitting actions.

Permitting Actions	2013	2014	2015	2016	2017
Revise permitting guidelines for consistency with the changes in the management plan, and thereafter as necessary.					
Distribute revised guidelines to Authorized Agents and permittees. Coordinate with Authorized Agent training providers to ensure that curricula content is updated and accurate.					
Review FWC staffing strategy (as necessary) to accommodate changes in permitting volume.					
Modify the online permit system as needed to be consistent with permitting guideline revisions.					
Analyze 2011 user survey results on the website and permit system and make necessary changes to improve ease of use.					
Create summary reports as needed for monitoring gopher tortoise permitting activity.					
Enhance the online permitting system to collect better documentation on relocation of commensal species.					
Develop BMPs for gopher tortoises.					
Work with military partners on INRMPs to accommodate on-base activities that impact gopher tortoises					
Develop a "what to do with tortoises if encountered" through effective messaging on what to do with tortoises if encountered.					
Distribute the waif tortoise fact sheet.					
Coordinate with other states to restore tortoise populations throughout the range using waifs.					
Work with landowners to establish releasable waif tortoise recipient sites.					
Encourage environmental educators to accept waifs to use for education purposes.					
Distribute Captive Tortoise Care guidelines to waif permit holders and licensed wildlife rehabilitators.					
Develop a program to develop guidance on the proper release of rehabilitated tortoises.					

Local Government Coordination

Florida's growth management law places significant responsibility for land and water use decisions on local governments. Achieving Florida's conservation goals requires local government land and water use plans and regulations that recognize important state fish and wildlife resources, including habitat, and provide adequate provision for their conservation. The FWC will collaborate with and provide information to local governments regarding species management plans, permitting guidelines, and assistance programs that are available to landowners, as well as the general public.

Part II of Chapter 163 Florida Statutes requires that county comprehensive growth management plans include a conservation element. The conservation element must include the identification of areas within the county where important fish, wildlife, or habitat resources, including state-listed species, are located. This element must contain principles, guidelines, and standards for conservation that restrict activities known to adversely affect the survival of these species. Through the state commenting clearinghouse and FWC staff reviews and provides input on county growth management plans and plan amendments to ensure important state fish, wildlife, and habitat resources are adequately considered. Further, land development regulations require conditions on land or water use specifying how those uses will be administered consistent with the conservation element of the county growth management plan.

The Florida Constitution gives FWC the regulatory and executive powers of the state with respect to wildlife, including gopher tortoises. Accordingly, county growth management plans and land development regulations provide the avenue by which FWC, through its agency commenting process, can inform and influence land and water uses relevant to the conservation of state-listed species. This management plan identifies specific areas known, or having potential, to harbor gopher tortoises. The plan also identifies the threats to the gopher tortoise that warrants its Threatened status, and FWC has implemented permitting guidelines providing means for affected parties to avoid, minimize, or mitigate the threats to the gopher tortoise associated with development activities. The FWC provides technical assistance to local governments during growth management plan development, plan amendments, associated development proposals, and with the development of habitat management plans on public lands under their jurisdiction. Therefore, coordination between FWC and local governments in implementing components of this plan is essential to the conservation and management of this species.

Local governments, and regional or state agencies (*e.g.*, water management districts), often are the first to conduct site inspections of properties where clearing or building permits are being sought. These on-site inspections typically occur early in the permit process and provide the opportunity to confirm the presence or absence of gopher tortoises, and to inform landowners and builders about required FWC permits and authorizations. This action by local governments or other agencies provides a mechanism to assure that necessary FWC permits can be issued earlier in the permit approval process, prior to local government land clearing or building permits being issued. Coordination with local governments will improve FWC efforts to minimize the loss of gopher tortoises.

Local governments and other agencies also play a substantial role in gopher tortoise conservation and management by providing protected and managed areas for gopher tortoises (*i.e.*, by maintaining habitat for existing gopher tortoise populations, making suitable habitat available as gopher tortoise recipient sites, and restoring lands with potential gopher tortoise habitat to act as future recipient sites). A number of local governments have created habitat acquisition programs. These programs can provide important assistance for achievement of this management of gopher tortoise habitat. Despite important successes by some local governments, most still lack sufficient funds to restore and manage (through mechanical means and prescribed fire) the vast majority of their lands as conservation areas for gopher tortoises and other wildlife. As a result, lands protected by local governments can become unsuitable for gopher tortoises, burrow commensals, and other upland wildlife over time. Since 2009, FWC has offered financial assistance to local governments to promote and assist in gopher tortoise habitat management. Appropriately managing gopher tortoise habitat at a local level is essential for FWC to achieve its objective of increasing and improving gopher tortoise habitat. Assistance will continue to be available based on funding.

Additionally, local governments may lack the information necessary to make important decisions regarding gopher tortoise conservation including: what lands under their protection have suitable habitat for displaced gopher tortoises; what lands are in need of restocking; and what levels of habitat management or restoration are needed to maintain resident gopher tortoise populations or make lands suitable for gopher tortoise restocking. The FWC offers technical assistance to local governments to help improve their gopher tortoise conservation efforts.

Coordination between local governments and FWC will be crucial in efforts to increase funding for habitat acquisition and management. The FWC will encourage local governments to support FWC efforts to assure adequate funding within the Florida Forever successor program for the acquisition and management of listed species habitat, including management of existing publicly owned or controlled land. The FWC will coordinate with local governments to help ensure that local acquisition programs, and their implementing ordinances and policies, are: (1) consistent with the goal and objectives of this gopher tortoise management plan; and (2) focus on core acquisition priorities for gopher tortoises, listed burrow commensals, and other important wildlife species.

The FWC will also partner with other Florida land-managing agencies and programs in the development of a common habitat management tracking system to help prioritize local government lands in need of management assistance. Local government lands will be represented in a GIS model to identify gopher tortoise priority habitat. Priority habitat listed in this database will receive management assistance funding as available from FWC and will be referred to The Nature Conservancy Resource Management Support Team within the region (Chapter 4, Habitat Management). These strike teams provide technical assistance and support for both mechanical management and fire management of upland habitats. For a list of habitat management and prescribed fire resources, refer to the Habitat Management section.

Effective cooperation and communication between FWC and local governments can streamline the FWC permit review process, improve regulatory compliance, and improve management of county and city-owned or controlled lands for gopher tortoises and other upland wildlife.

FWC will assist and encourage local governments to:

- Stay current with FWC regulations related to gopher tortoises and other listed species. Staff involved with all aspects of development review and planning should be familiar with these regulations.
- Include a question on clearing and building permit applications as to what listed species surveys have been conducted on the property.
- Inspect parcels undergoing development review for the presence or absence of gopher tortoises and, when gopher tortoise burrows are present (as confirmed through site visits by trained county staff, FWC staff, or environmental consultant reports/data), require listed species surveys before issuance of clearing or building permits. Or, at a minimum, notify FWC staff of sites where burrows have been documented to help insure compliance with FWC gopher tortoise rules and guidelines.
- Consider assisting FWC with verification of gopher tortoise surveys on proposed development sites to ensure compliance with FWC guidelines for such surveys.
- Draft a standard permit condition for locally-issued development permits (*i.e.*, clearing or building permits) to ensure FWC gopher tortoise permits are obtained prior to commencing development activities in areas known to support gopher tortoises.
- Notify FWC of wildlife complaints regarding potential FWC rule violations through FYE ø u " y k n f n k h g " c n g t v " p w o d g t 0 " " E q q t f k p c v g " y l supporting information for FWC law enforcement investigations.
- Identify, protect, manage, and restore important gopher tortoise habitat on lands owned or controlled by local governments and state agencies, and monitor resident tortoise populations on these protected lands.
- Establish recipient sites for relocation of gopher tortoises, thereby providing a local option for county projects that can help retain regional populations and reduce relocation costs.
- Establish, within land development codes, incentives that will enhance local i q x g t p o g p v u ø " c d k n k v { " v q " c e s w k t g " i q r j g t " v q t control.
- Establish local ordinances to protect gopher tortoise habitat.

- Use Memorandums of Understanding (MOU) or other agreements with FWC to implement any of the above actions.

FWC will:

- Promote technical assistance and incentives available to landowners by providing information to local governments regarding species management plans, permitting options, and incentive programs available to applicants, developers, and landowners, as well as the general public.
- Develop conservation measures and best management practices (BMPs) to address the gopher tortoise and its habitat needs, and provide them to local governments for incorporation into their local land development regulations.
- Disseminate outreach materials for local governments, landowners, and the general public to foster better understanding and compliance with this plan, FWC regulations, and incentives for landowners.
- Develop additional outreach materials as needed based on need or demand.
- Create partnerships with non-profit organizations and other public entities to assist with management of gopher tortoise habitat on lands protected through local government acquisition programs that lack sufficient staff to conduct burns or other habitat management on their own.
- Assist local governments in obtaining recipient site permits (*e.g.*, conduct a pre-application site visit) on lands they own and manage which are potential gopher tortoise recipient sites.
- Through a future multi-agency habitat management tracking system, identify incentives for habitat management on publicly owned or controlled lands located within priority gopher tortoise habitat.
- Consider opportunities within the gopher tortoise permitting system to provide incentives to local governments to set aside conservation lands as potential restocking or otherwise responsible relocation sites for gopher tortoises.
- Assist local governments in establishing local ordinances and incentives in land development codes to better restore and manage publicly owned or controlled land to provide habitat for gopher tortoises and other upland wildlife.
- Schedule workshops with local governments. Such workshops will involve in-depth dialogue on key gopher tortoise conservation issues such as current topics, highlights of new information, and other FWC programs.

Table 2. Proposed timeline for implementing local government coordination actions.

Proposed Local Government Coordination Actions	2013	2014	2015	2016	2017
Disseminate educational materials for local governments, homeowners, landowners, etc.					
Coordinate with local governments and state agencies in requesting funding for habitat management, acquisition, and restoration through the Florida Forever successor program.					
Conduct workshops with local governments to enhance gopher tortoise conservation at the local level.					
Partner with The Nature Conservancy Resource Management Support Team program to assist local governments with habitat management activities.					
Assist local governments with drafting of permit conditions, Memorandums of Understanding, and ordinances.					
Provide gopher tortoise habitat assistance funding for habitat management activities on county/city owned conservation lands (annual funding dependant).					
Explore incentives for local government staff to obtain training necessary to qualify for an Authorized Gopher Tortoise Agent permit.					

Law Enforcement

The FWC Division of Law Enforcement (LE) helps ensure that all entities developing property within gopher tortoise habitat comply with the Gopher Tortoise Permitting Guidelines (2008, as revised), and abide by the Florida Statutes and FWC rules, policies, guidelines, and permits which protect the species. The FWC developed and implemented a training manual, *Law Enforcement Nongame Wildlife Training Manual* (November 2010), for training new FWC law enforcement recruits. The manual outlines appropriate steps for conducting investigations, and includes a protocol for officer response to gopher tortoise complaints. Since 2010, training for new recruits on gopher tortoise rules and regulations has been incorporated as standard curriculum at the LE training academy. The Gopher Tortoise Enforcement Policy (Appendix 2) also assists officers with enforcement of existing rules.

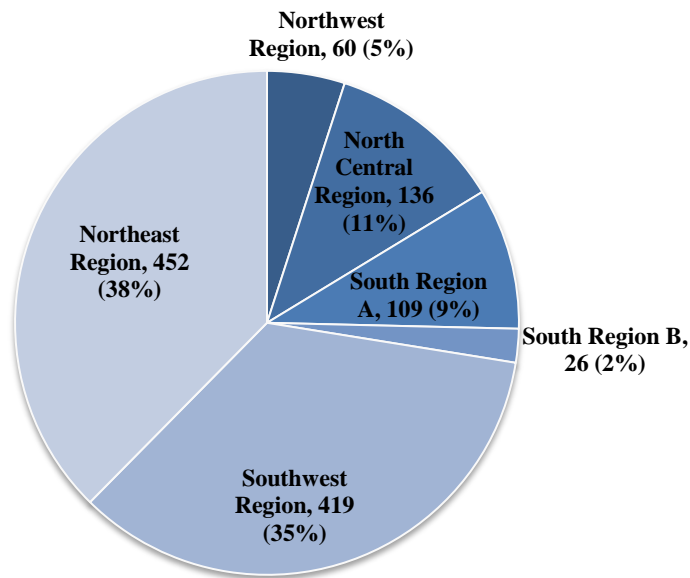
Training of existing field personnel will be prioritized by geographic area based upon analysis of dispatch call data for complaints regarding gopher tortoises. The chart below (Figure 2) displays call volume by FWC region related to gopher tortoise complaints over the most recent 3 years for which data are available. Based in part upon analysis of the underlying data summarized in this chart, FWC LE expects to begin incorporating gopher tortoise enforcement as

work plans in the Brooksville Ridge area (e.g., Citrus, Sumter, Hernando, and Pasco counties) by 2013. As such, this activity will be routinely tracked, analyzed, and evaluated for effectiveness.

Officers will continue responding to complaints and conducting proactive patrols to investigate gopher tortoise violations.

The Division of Law Enforcement will assist the FWC Species Conservation Planning Section with coordination and partnerships with counties and local government agencies related to gopher tortoise enforcement, permitting, and complaint response. The FWC LE will have primary enforcement responsibility in cooperative endeavors with local government agencies.

Figure 2. Gopher Tortoise Complaints Received by FWC Law Enforcement (2009-2011)



Officers will continue responding to complaints and conducting proactive patrols to investigate gopher tortoise violations. Officers will determine whether violations have occurred using the gopher tortoise enforcement protocol. At the conclusion of investigations, officers will appropriate charges are prepared and appropriate mitigation imposed.

Additionally, LE will continue working to ensure that those in possession of valid tortoise permits adhere to, and abide by, the specific terms and conditions of the permit and FWC guidelines. Violators may be issued a written warning or citation and may face suspension, revocation, or non-renewal of their current permit(s) as well as loss of future permit privileges.

Table 3. Proposed timeline for implementing law enforcement actions.

Proposed Law Enforcement Actions	2013	2014	2015	2016	2017
Develop training on gopher tortoises and associated burrow commensals for state attorneys offices.					
Update LE training manual to reflect changes in rule and permitting guidelines.					
Conduct training sessions for LE field officers.					
Continue training sessions at LE recruit academy.					
Implement gopher tortoise enforcement component into n c y " g p h q t e g o g p v " q h h k e g t Ridge area.					
Create a fact sheet for LE dispatch personnel to assist with complainant calls.					
Conduct proactive patrols and efficient response to complaints regarding gopher tortoises and development.					
Evaluate calls for service and complaints to prioritize law enforcement efforts and investigate which calls resulted in enforcement action.					
Develop a self study guide to be posted on the LE web page to assist officers with gopher tortoise enforcement methods.					

Habitat Protection

The objective to increase the acres of protected gopher tortoise habitat by an additional 615,000 acres sets the bar high for habitat acquisition and other forms of permanent protection. Since the Gopher Tortoise Management Plan was approved in 2007, the state has acquired 32,120 acres (5% of 615,000 acres) of upland habitat under the public lands acquisition program, Florida Forever. Acquisition of these lands in fee simple is only one way to achieve the goal, and this plan encourages the use of less-than-fee interests, and other habitat protection measures such as partnerships between governmental agencies and private landowners. Such partnerships may include those that advance the restoration, enhancement, management, or repopulation of imperiled species habitat on state lands. Conservations easements, land protection agreements, and non-state funded tools such as rural land stewardship areas, sector planning, and mitigation should be used, where appropriate, to bring environmentally sensitive tracts under an acceptable level of protection at a lower financial cost to the public. These approaches provide private landowners with the opportunity to enjoy and benefit from their property at the same time.

Accomplishing this objective will require close partnerships among regional, state, and federal agencies; local governments; and non-governmental organizations (NGOs). For these alternative options to work effectively, viable economic landowner incentives will need to be realized, particularly related to the relocating of tortoises on privately owned lands. Approaches to protecting wildlife habitat, particularly gopher tortoise habitat, through means other than fee

simple ownership are being explored, developed, or implemented in Florida. Some of the

History of Public Lands Protection in Florida

Prior to 1964, the federal government was responsible for the establishment of the majority of public conservation lands in Florida, including the national forests and Everglades National Park. In addition, the federal government donated to Florida its first state parks including Highlands Hammock, Okefenokee, and Torreya, and sold it the lands that eventually became the Withlacoochee and Blackwater River state forests. By 1964, the state had accumulated approximately 530,000 acres of forests, parks, wildlife management areas, and water management areas, in addition to the federal land holdings.

Significant Florida legislative actions to address the high rate of loss of native habitats and recreationally important lands essentially began in 1964 with the establishment of a \$20 million bond program to acquire outdoor recreation lands. This was followed by a variety of land conservation programs over the intervening years, including most recently the \$3 billion Florida Forever Program, established in 1999 and funded through 2010. These programs provided more than \$6.5 billion in funding for purchase of environmentally sensitive and outdoor recreation lands. Through these programs, Florida has conserved approximately 2.5 million acres of land for conservation.

Although FWC received limited legislative appropriations for land acquisition prior to 1990, the advent of the Preservation 2000 and Florida Forever programs, each of which directed a portion of total funding to FWC, provided the agency with a significant, long-term source of funds for acquisition of additions and inholdings to lands managed by the Commission. This funding stream was created in recognition that the agencies responsible for the management of lands acquired through the larger acquisition programs, such as Florida Forever, are in a better position to identify those parcels necessary to protect resources, complete the resource boundary of the project, and to aid in their management and use.

In addition to the state land purchase programs, other agencies have implemented their own land conservation acquisition programs. These programs, along with private land trusts and non-profit organizations, have acquired a significant amount of conservation lands. Not all of the lands acquired under these various programs contained habitat suitable for gopher tortoises; nevertheless, these programs have been the primary factor in conserving wildlife habitat including gopher tortoise habitat.

Since the recession that began in 2007, public funding for land conservation acquisition programs has, understandably, been dramatically reduced or eliminated altogether. Although more than \$6 billion were appropriated by the State on land conservation acquisition in the P-2000 and Florida Forever programs through 2008, only \$15 million have been appropriated since 2008. Since fiscal year (FY) 2006-07, the State, including the water management districts, acquired approximately 238,000 acres of land (both fee and less-than-fee conservation easements) statewide for conservation. The bulk of that acreage was acquired in FY2006-07 and FY2007-08, totaling approximately 169,000 acres. Since the start of FY2008-09, approximately

69,000 acres have been acquired by the State and its water management districts. Although this is a significant amount of conservation land, it represents a continuing decline in public land acquisition at the state level.

As Table 4 illustrates, Florida Forever funded acquisitions resulted in approximately 526,950 acres of upland conservation lands since 2001 (both fee and less-than-fee conservation easements). The bulk of those lands were acquired prior to 2007, as economic conditions after that date substantially reduced the funding for public land acquisition programs in Florida.

Table 4. Florida Forever Funded Acquisitions

Year of Closing	Total Acres	Upland Acres	% Upland
2001	6,284	4,470	71.1%
2002	145,887	94,060	64.5%
2003	129,028	78,515	60.9%
2004	57,657	47,061	81.6%
2005	105,031	82,004	78.1%
2006	113,367	98,775	87.1%
2007	66,404	53,105	80.0%
2008	32,595	28,009	85.9%
2009	18,325	13,789	75.2%
2010	22,372	18,110	80.9%
2011	11,341	9,053	79.8%
2001 - 2011	**708,291	*526,950	74.4%
2007 - 2011	151,036	*122,065	80.8%

*Approximate upland ratio from macro GIS analysis ** County, City and Private acq. not shown

Private Lands Protection Mechanisms in Florida

As economic conditions have reduced funding for public land acquisition, the importance of private lands for conservation has grown. Consequently, creation of conservation initiatives and mechanisms that function as alternatives to traditional conservation land acquisition programs to conserve wildlife habitat are increasingly important. Although many of these initiatives began prior to completion of the 2007 Gopher Tortoise Management Plan, economic conditions have accelerated their emphasis and growth. Among these are a substantial increase in new alternative conservation mechanisms and initiatives that have begun in Florida. Major programs are discussed below, and additional detail is provided in the Incentives section of this chapter.

Conservation Easements

Conservation easements involve the acquisition through purchase or donation of a portion of the rights associated with the land to provide some degree of protection to natural resources on

the land. There are several advantages of this approach as the land in most instances stays on the tax rolls and the private landowner maintains responsibility for managing the property while still retaining some level of continued use. Although the cost could be as low as 50 percent of the cost of fee simple, the price depends on many factors, such as the number of rights purchased, the degree to which the land is used, and the value of the land. Federal, state, and regional agencies all use this tool to protect lands.

Some new federal and state initiatives have been enacted recently to make conservation easements more attractive to private landowners. The Wetlands Reserve Enhancement Program (WREP) and Reserved Rights Pilot Program, a new program in the Federal 2008 Farm Bill, provide the added incentive to the private landowner to participate in the WREP because the landowner may reserve grazing rights if the reservation is compatible with restoration goals.

Article VI, Section 22 of the Florida Constitution, (FL Const. art. XII, § 28) providing an opportunity for private landowners to receive ad valorem or real property tax reductions or exemptions in return for the designation of either short-term or perpetual conservation easements on their lands. The Florida Legislature approved legislation to implement the new conservation easement plan during the 2009 legislative session. Private landowners seeking to apply for the new conservation easement/tax exemption must apply to the Acquisition and Restoration Council, depending upon the amount of acreage involved. The constitutional amendment encourages increased conservation efforts by private landowners to protect their lands.

Along with other conservation agencies and organizations within Florida, FWC is working with landowners to inform and assist them on the availability of this new conservation incentive. The agency is developing internal guidelines regarding acceptance of conservation easement donations. Additionally, the Acquisition and Restoration Council (ARC) has developed guidelines to determine eligibility for tax exemptions on conservation easements 40 acres or less in size.

The State of Florida holds conservation easements and land protection agreements over 176,181 acres. According to the Florida Natural Areas Inventory, there were 655,873 acres protected statewide by conservation easements held by the State of Florida, the federal government, five water management districts, local governments, and private entities as of February 2012. This program of conservation easements continues to be well-received by landowners with whom the state holds easements or land protection agreements. Compliance with terms and conditions of easements and land protection agreements remains good.

HYE 0 u " Q r v k o c n " E q p u g t x c v k q p " R n c p p k p i " D q w p f c

The Optimal Conservation Planning Boundary Tool was developed by FWC to help designate optimal planning boundaries, a required element of the U v c v g 0 u " e q p u g t x c v k q management plans. The Optimal Conservation Planning Boundary Tool is designed to aid in implementing a comprehensive and proactive approach to long-term conservation planning and actions in and around protected lands. Advantages of this tiered approach include:

- Closes conservation planning gaps with a resource-based approach.
- Aids in development of habitat conservation and restoration opportunities.
- Promotes proactive, long-term conservation planning, acquisition, and management.
- Provides comprehensive agency-wide and stakeholder input.
- Enhances consistency with the Florida Forever and ARC recommendations.
- Eliminates gaps between qualifying Florida Forever criteria and timely acquisitions.
- Aides in identifying and conserving other important natural and cultural resources not previously identified.
- Results in the creation of a Conservation Action Strategy unique to each conservation area.

Although the Optimal Conservation Planning Boundary Tool was developed primarily for use in H Y E ø u " e q p u g t x c v k q p " r n c p p k p i " c p f " o c p c i g o g p v " w p used in a wide variety of conservation and land use planning settings.

Military Buffering

Increasingly, the Department of Defense thru the Readiness and Environmental Protection Initiative (REPI), and the State of Florida have emphasized the importance of d w h h g t k p i " H n q t through conservation acquisition programs from development that would impede their mission. These win-win partnerships acquire easements or other interests in land from willing sellers to preserve compatible land uses and sustain wildlife habitat near installations and ranges where the military operates, tests, and trains.

Some of the military buffering initiatives, such as the Northwest Florida Greenway which is designed to conserve a corridor of lands stretching from the Apalachicola National Forest to Eglin Air Force Base, have the potential to conserve a considerable amount of wildlife habitat. There are also several Florida Forever projects located within the boundary of the greenway, such as Seven Runs Creek (Nokuse Plantation), which contain large tracts of potential gopher tortoise habitat.

To date, these partnerships have led to the fee and less-than-fee acquisition of over 24,000 acres around six different installations in the state. Included in these acquisitions is 17,137 acres around Camp Blanding Joint Training Center in located Clay County. Those acquired as fee simple will be managed by the State of Florida for the conservation of rare and imperiled species.

Habitat Conservation Plan Land Acquisition (HCPLA) Grants

This federal grant program awards funds to promote the recovery of threatened and endangered species via habitat protection of areas adjacent to established Habitat Conservation Plans (HCP). These land acquisitions are meant to complement, rather than replace, private mitigation responsibilities required by the HCP (see Incentives section below). In addition to listed species, these acquisition grants can have important benefits for ecosystems that support proposed and Candidate species. The FWC currently works with local governments to apply for

and obtain Habitat Conservation Plan Land Acquisition grants and will expand these efforts to include gopher tortoises where appropriate. Additional information about Habitat Conservation Plan Land Acquisition grants is available on the USFWS [website](#).⁵

Conservation Banks

The creation and establishment of conservation and wetland mitigation banks to offset the impacts of development have also provided potential alternative mechanisms that may result in a net increase in the amount of wildlife habitat, including gopher tortoise habitat, being conserved in Florida. Additional information on conservation banking is included in the Incentives section below.

Other Conservation Planning Initiatives

Critical Lands and Waters Identification Project

The Florida Natural Areas Inventory (FNAI) collaborated with the University of

H n q t k f c ø u " I g q R n c p " E g p v g t " c p f " H Y E " q p " c " E t k v k e c h q t " v j g " u v c v g ø u " E g p v w t { " E ~~The CLIP is a scientifically-based~~ *U w u v u v c v g y k f g " n c p f u e c r g " v q q n " v j c v " k f g p v k h k g u " H n q t* The goal of CLIP is to provide the best available planning tool to assist citizens and decision-makers to envision and ensure a sustainable future. Further information about CLIP is available on the FNAI [website](#).⁶

H n q t k f c ø u " Y k n f n k h g " C e v k q p " R n c p

The H Y E " *k u " v j g " n g c f " g p v k v { " h q t " v j g " f g x g n q r o g* plan uses a habitat- *d c u g f " c r r t q c e j " v q " k f g p v k h { " v j t g c v u " v q c e v k q p u " p g g f g f " v q " c f f t g u u " v j g o 0 " " V q " u w r r q t v " v* Legacy Initiative in 2004. Major statewide conservation issues identified in the FWC Strategy include:

- Habitat loss and fragmentation.
- Degradation of water resources.
- Incompatible fire management.
- Invasive plants and animals.
- Management of the physical environment (*i.e.*, dredging and shoreline hardening activities, etc.).

V j g " K p k v k c v k x g ø u " r t k q t k v k g u " c n u q " k p e n w f g " v statewide geographic information and decision support system for long-term land use planning.

V j g " D n w g r t k p v " y k n n " k f g p v k h { " H n q t k f c ø u " n c p f " v e u g p 0' " d " g O' ÷ t q g v " p k f p " h q p t' d h n v k t k p f " c ø u " Y k n f citizens, agencies, landowners, and businesses to create a common 50 to 100 year vision for [section](#)⁷ at MyFWC.com.

Florida Wildlife Conservation Guide

The Florida Wildlife Conservation Guide, which was published online in 2009, is a partnership project between FWC, USFWS, and FNAI. The guide is intended to enhance the technical assistance capabilities of these agencies, in a passive sense, by providing basic project planning information specific to the needs of fish and wildlife, at an easy-to-find-and-use location.

The guide is designed to assist the user in identifying those landscape elements that support many common species of wildlife and identifying important natural history details, survey protocols, management considerations, and population monitoring guidelines for rare or imperiled fish and wildlife species. Finally, the guide provides information on regulatory requirements where they exist with suggestions for land use planning alternatives. The FWC solicited input from all levels of government as well as landowners, researchers, developers, and non-profit organizations to ensure that the guide would be user friendly. The Florida Wildlife Conservation [Guide](#)⁸ is available from MyFWC.com.

Summary

Collectively, these alternative conservation mechanisms and initiatives, along with the traditional publicly funded conservation acquisition programs, despite their current limitations, provide a strong framework to promote the conservation of wildlife habitat and gopher tortoise habitat in particular. Reliance primarily on public acquisition programs since 2007 resulted in acquisition of approximately 5% of the overall gopher tortoise habitat protection objective. Each of the above listed mechanisms aids in increasing the opportunities for conserving wildlife habitat, including gopher tortoise habitat, thereby increasing the potential to double the gains of the past five years and to realize 20% of the habitat preservation objective within the next ten years if current trends continue. Actions that address this objective include:

- E q p v k p w g " v q " g o r j c u k | g " u w r r q t v " q h " e q p u g t x c v as a principal on the Acquisition and Restoration Council (ARC) to promote state land acquisition projects that acquire and/or protect upland communities important to listed wildlife such as the gopher tortoise and associated commensals.
- Emphasize acquisition of severely imperiled upland habitats such as sandhill, scrub, and coastal dunes, as well as other gopher tortoise habitats (particularly those with viable populations), by coordinating with the following:
 - Department of Environmental Protection
 - Water Management Districts
 - County environmental offices
 - Florida Natural Areas Inventory
 - The Nature Conservancy and Trust for Public Land
 - F g r c t v o g p v " q h " F g h g p u g " c p f " H n q t k f c ø u " O k n

- Continue to acquire suitable upland habitats that are in need of restoration, restore the necessary ecological components for that habitat type, and restock tortoises if populations c t g " u g x g t g n { " f g r n g v g f " * d c u g f " q p " v j g " j (capacity).
- Continue to emphasize habitat connectivity by acquiring and/or protecting upland habitats that are adjacent to other preserved lands or that serve as corridors to link preserves.
- Highlight acquisition projects, and whenever possible, acquire uplands with adjoining or integrated wetland communities to provide habitat for burrow commensals.
- Support continued funding of the Florida Forever program to allocate sufficient funds necessary to acquire and manage suitable or potentially suitable habitat for imperiled species, including the gopher tortoise, to meet the habitat and land acquisition objective of this and other Commission management plans over the next 10 years.
- Create economic incentives for private landowners to place their properties under conservation easements (see Incentives below).

Table 5. Proposed timeline for implementing habitat protection actions.

Proposed Habitat Protection Actions	2013	2014	2015	2016	2017
Continue to collaborate with the ARC to promote state land acquisition projects that acquire and/or protect upland communities important to listed wildlife such as the gopher tortoise.					
Continue working with local governments and NGOs to emphasize acquisition of severely imperiled upland habitats such as sandhill, scrub, and coastal dunes.					
Continue to encourage land acquisition of suitable upland habitats in need of restoration.					
Continue efforts to increase habitat connectivity by acquiring and/or protecting upland habitats adjacent to other preserved lands.					

Habitat Management

This plan places great importance on the ability of protected lands to support gopher tortoise populations at levels that will ensure the long-term security of the species. Appropriate habitat management, including protecting and managing existing high quality habitat as well as

improving and restoring degraded habitat, is critical to ensuring that gopher tortoise populations continue to persist in Florida. Active habitat management programs that benefit gopher tortoises must occur on both public and private lands in order to achieve the goal and objectives outlined in this plan.

The Role of Public Conservation Lands

Currently, the 1.34 million acres of potential gopher tortoise habitat in public ownership represents 40% of the estimated 3.32 million acres of gopher tortoise habitat remaining in the state. With such an important portion of existing gopher tortoise habitat falling under public ownership, public agencies bear a significant responsibility for undertaking appropriate habitat management.

statutory requirements and provisions for long-term management funding. Consequently, this plan advocates increased management focus and intensity on public lands capable of supporting the habitat and life history requirements of the gopher tortoise. There is concern, however, that current land management funding levels are insufficient to achieve desired levels of upland habitat management on publicly owned lands. Successful implementation of this plan may require a legislative commitment to supply management agencies with the necessary personnel, equipment, and funding to undertake required management actions.

Many public conservation lands are required to have a management plan approved by the Acquisition and Restoration Council (ARC) or their governing board. Specifically, s. 253.034(5) of the Florida Statutes (F.S.) says in part, all land management plans shall include an analysis of the property to determine if significant natural resources including listed species occur on the property. If significant natural resources occur, the plan shall contain management strategies to protect the resources. The Florida Forever Act (s. 259.105 F.S.) adds that all state lands that have imperiled species habitat shall include as a consideration in the management plan restoration, enhancement, management, and repopulation of such habitats. For lands identified by the lead management agency as having gopher tortoise populations or the potential to support gopher tortoise populations, FWC will be consulted as statutorily required, and the lead management agency is encouraged to include FWC as part of the management plan advisory group. During consultation and when appropriate, FWC staff will ensure that short-term and long-term management objectives outlined in each plan are compatible with and help advance the goal and objectives of the Gopher Tortoise Management Plan.

To assist in management plan development consistent with requirements of s. 253.034 F.S. and s. 259.105 F.S., FWC staff recommends that managers consider using the following text in an c t g c ø u " o c p c i g o gopher tortoise has been identified as a significant natural resource on the property:

- Xeric uplands and natural communities that support the gopher tortoise will be managed to achieve/maintain vegetative parameters comparable to those found in comparable reference sites. Frequent prescribed fire is the preferred tool, but other treatments will be used when necessary. Maintaining these communities in a manner that replicates their

natural form and function helps ensure they meet the needs of the gopher tortoise and the other species dependent on these communities.

Guidance on drafting Measurable Objectives within Management Plans: ARC-approved management plans are now required to have measurable objectives. The FWC is not dictating that any specific property plan should have a gopher tortoise measurable objective; however, should an agency choose to include a species-specific objective for the gopher tortoise, the following is guidance on a possible objective:

- Once an area has quantified the acres of potential habitat, the first bullet above could be the duration of this plan, use appropriate management to maintain XX acres of xeric upland habitat with vegetative parameters u " e q o r c t c d n g " v q " v j q u g " q h " t areas in which habitat restoration is required, a reasonable short or long-term measurable q d l g e v k x initiate efforts to restore XX acres of xeric upland habitat so vegetative parameters are similar v q " v j q u g " h q t " t g h g t g p e g " u k v g u C is required, a short or long-term measu t c d n g " q d l g e v k x g " e q w n f " d g " õ u c r r t q r t k c v g " j c d k v c v " v q " c r r t q r t k c v g " f g p u k v k

The Role of Private Lands

The remaining 2,167,453 (62%) acres of potential gopher tortoise habitat not in public ownership in Florida is held by private landowners. With the decline in availability of funding for public land acquisition associated with recent economic circumstances, it is increasingly clear that privately held land will have an important role in ensuring protection of appropriate gopher tortoise habitat. According to the 2012 Florida Natural Areas Inventory, 193,214 acres of these privately held potential gopher tortoise habitat lands are under some form of conservation protection. The various forms of protection for private lands in existence or being proposed are discussed in detail in the Habitat Protection and Incentives sections of this chapter, and the Incentives section outlines mechanisms available to attract more landowners to place some form of formal protective measures on their land. Even without such formal measures, however, many private landowners are interested in managing their lands for the benefit of wildlife. The following techniques and management tools are appropriate for all land managers regardless of the ownership structure or protection status of the land being managed.

Setting Land Management Strategies

Faced with limited resources, it becomes important to establish priorities. The FWC recommends that the highest priority for managing gopher tortoise habitat is to maintain habitat already in maintenance condition to prevent degradation. The second priority is to improve degraded habitat, starting with patches adjacent to patches in maintenance condition or that have a good concentration of gopher tortoises. The third priority is to restore habitat on areas that have been so severely altered that they no longer function as a natural community and require significant attention to return to the historic condition. Again, the preference is to start with patches adjacent to or near good concentrations of gopher tortoises to allow for population expansion.

Prioritization of habitat patches for management to benefit gopher tortoises (1= highest)

1. Habitat in maintenance condition and inhabited by good concentrations of gopher tortoises.
2. Habitat in maintenance condition, regardless of gopher tortoise densities.
3. Slightly degraded habitat (that will be moved towards maintenance condition with treatment) adjacent to a patch in maintenance condition or has a good concentration of gopher tortoises.
4. Slightly degraded habitat regardless of location.
5. Severely altered habitat (needing complete restoration) adjacent to maintenance condition habitat or adjacent to good densities of gopher tortoises.
6. Severely altered habitat (needing complete restoration) regardless of location.

Managing the Habitat

Gopher tortoises will occupy most upland plant communities that contain relatively well-drained soils for burrowing, and sufficient herbs and grasses for forage (Ashton and Ashton 2008). Historically, the recurrence of lightning-ignited fire was pivotal in influencing vegetative u w e e g u u k q p " c p f " u j c r k p i " u r g e k g u " e q o r q u k v k q p " c p The frequency and periodicity of these fires provided a competitive advantage to fire-tolerant vegetation, resulting in open pine stands and lush ground cover, conditions well-suited to the life history needs of the gopher tortoise (Myers and Ewel 1990).

The regular application of prescribed burning is critical for the maintenance of habitat conditions preferred by the gopher tortoise. Prescribed burning reduces shrub and hardwood encroachment, and stimulates growth of tortoise forage plants such as grasses, forbs, and legumes. This allows greater sunlight penetration to reach ground level, which promotes establishment of understory species used by the tortoise as forage. Fire also promotes conditions necessary for gopher tortoise egg incubation. Early growing season fires (April óJune) cause a more pronounced vegetative response when compared to burning during the period of plant dormancy. These early growing season burns stimulate flowering in many warm season grasses, increase species composition among understory plants, and result in higher understory biomass production (See Prescribed Fire sub-section below).

Increased urbanization and societal intolerance of prescribed burning represent serious threats to gopher tortoise populations and their habitat. Consequently, maintaining habitat conditions preferred by gopher tortoises requires a commitment by resource managers to plan and initiate vegetation management practices.

Setting Desired Future Conditions

Land managers across Florida may have differing ideas on what constitutes good natural community conditions for gopher tortoises. Therefore, FWC provides the following guidance on effective management actions and the desired future conditions of various natural communities to support healthy gopher tortoise populations. In general, FNAI ø [Guide to the Natural](#)

[Communities of Florida 2010 Edition](#)⁹ is an excellent source of information on each associated management consideration.

Reference natural communities¹⁰ where the ecological condition of the community is high quality. These reference natural communities provide examples of what conservation managers might strive to accomplish in managing the natural communities under their care. The FNAI provides an [interactive map](#)¹¹ to assist land managers in identifying nearby reference natural communities. For each reference natural community, FNAI provides a document describing the area, including the recommended range of values for a number of vegetative parameters for that natural community, and the average value for each parameter at that reference site. Familiarity with these values can help guide managers in determining appropriate vegetative parameter values for their property. When using this guide, it is important to understand the [Reference Area Sampling Station Design](#)¹² and [vegetative parameter definitions](#)¹³ prior to using the reference site values to create area-specific desired vegetative parameter values. The use of different techniques to measure parameter values will result in parameter values that may not be comparable. For instance, using 2 techniques to estimate a value at 1 location may generate 2 different values, even though the condition is the same.

In the documentation for some reference sites, FNAI provides a *Notable Species Management Considerations* section that will inform the reader if the reference site is within recommended guidelines for specific imperiled species. A table of the recommended range of vegetative parameter values by natural community is included in Table 6. For scrub management, FWC worked with FNAI to develop the [Scrub Management Guidelines for Peninsular Florida](#).¹⁴

Although FWC encourages management that strives to achieve the FNAI recommended range of vegetative parameter values for a natural community, meeting gopher tortoise objectives may necessitate using a range that differs from the FNAI recommendation, or that favors one end of the range of possible values for some attributes. For instance, a manager striving to create optimal gopher tortoise habitat may be consistently in the lower range of values for basal area and in the higher range of values for percent ground cover.

Reference site values can provide insight into setting area-specific values. Familiarity with the conditions of the reference site, the average values of the reference site, and the species supported by the reference site provides the basis for making an informed decision in setting area-specific desired values. Managers should always consider the habitat needs of other wildlife, especially those considered imperiled, during the decision making process for setting desired future conditions.

Table 6. General characteristics for plant communities commonly used by the gopher tortoise including associated fire frequency, and parameters and related values used to define optimum gopher tortoise habitat in Florida * c f c r v g f " *Guidelines to Natural Resource Management (Communities)*.

	mesic flatwoods (northern FL)	mesic flatwoods (peninsular FL)	upland pine	sandhill	scrubby flatwoods	scrub	dry prairie
Basal Area of Pine (sq ft per acre)	20-80	10-50	20-80	20-60	20-60	0-20	0.0
Maximum Canopy Cover (%)	60	60	50	50	40	40	10
Bare Ground (%)	<5	<10	<5	1-10	10-20	10-40	1-10
Herb Cover (%)	>25	>25	>50	>25	1-10	<5	>10
Wiry Grasses Cover (%)	>10	>10	>25	>10	1-10	<5	>10
Average Maximum Palmetto Height (ft)	<3	<3	<3	<3	<3	<3	<1.5
Palmetto Cover (%)	10-25	10-25	<5	<5	5-15	0-10	5-20
Average Maximum Shrub Height (ft)	<2	<2	<2	<3	<3	<5	<2
Shrub Cover (%)	<25	<25	<10	10-20	10-40	20-40	10-40
Fire return interval (years) ¹	1-3	1-3	1-3	1-3	3-8	variable	1-2

Note: Some of these habitat characteristics may not support higher gopher tortoise densities.

¹ These fire return intervals will help maintain desired conditions; however, degraded habitats may need more than the application of fire to restore an area to maintenance condition.

Management Tools

Proactive habitat management on both public and private lands requires application of land management activities to enhance conditions for gopher tortoise foraging (diverse herbaceous ground cover) and reproduction (open, sunlit sites for nesting). Land managers have a number of tools they can use to enhance the condition of the natural community in ways that benefit the gopher tortoise. Prescribed fire and timber thinning are two of the most beneficial of these tools, and often the most cost-effective. Habitat in maintenance condition usually can be maintained using only prescribed fire. However, in cases where past management has allowed for alteration or degradation of the habitat, the application of other management tools may be necessary to facilitate the effective use of prescribed fire. The following land management practices are effective for improving habitat quality and could be incorporated into the management framework for public and private conservation lands. The measures below are meant to serve as general guidance rather than a specific prescription to manage habitat. Land managers should research appropriate land management tools specific to their areas and conditions of their site to choose what management tool is most appropriate.

Prescribed Fire: Managers can use prescribed fire to maintain habitat already in maintenance condition, or use it in conjunction with other tools to restore degraded natural communities to a more natural form and function. The preference is for gopher tortoise habitat to receive prescribed fire at the interval recommended in Table 6. Although growing season fire is favored in most instances, in order for managers to meet the recommended fire return intervals, managers on most properties will need to apply fire throughout the year making use of as many good burn days as possible. Further, if a patch is due for a burn and conditions are not suitable during the growing season, it may be better to maintain the frequency of the fire return interval by applying a dormant season burn rather than waiting for the following growing season. Diversity in the application of fire benefits the habitat and the gopher tortoise. Additionally, the frequent application of fire is a major contributing factor to high species richness (Glitzenstein *et al.* 2012). In any 12-year period, a habitat patch in a natural community that has a 1-3 year preferred fire return interval should experience some burns at a 12-18 month interval, some at an 18-30 month interval, and some at a 30-36 month interval, with some fires occurring during the growing season and some during the dormant season.

The existing fire strike teams can be used to enhance the number of acres burned or otherwise treated for the benefit of the gopher tortoise. Strike teams are available primarily to assist in increasing the amount of prescribed fire implemented on the ground, and are accessible to both public and private landowners. However, these teams are also able to conduct site preparation activities (such as preparing fire lines and roller chopping) and invasive exotic control in addition to applying prescribed fire. Over the long-term, the technical assistance provided by the strike teams should enable many landowners to create their own self-sustaining habitat management programs. One important focus of the teams is application of prescribed fire near the wildland-urban interface.

The management tools are meant to serve as guidance rather than a specific prescription to manage habitat.

To minimize potential negative impacts to gopher tortoises associated with a prescribed fire program, it is important to ensure that tortoises are not killed when disking or using other equipment to prepare safe lines. Fortunately, tortoises are readily visible, and this is easily accomplished. When practical, prescribed fire should be avoided in September and October. This is a period when hatchlings are more numerous and vulnerable (Ashton and Ashton 2008).

Prescribed Fire Resources: Prescribed fire in Florida is governed by Chapter 590, Florida Statutes, and Chapter 51-2, Florida Administrative Code. Information on becoming a certified burner can be accessed online from the [Florida Forest Service](#).¹⁵ The University of Florida School of Forest Resources and Conservation [Fire in Florida](#)¹⁶ program provides information and resources for land managers, homeowners, educators, and extension agents on prescribed fire. [The Nature Conservancy Resource Management Support Team](#)¹⁷ provides 'on the ground' technical assistance. The goal is to improve targeted uplands by assisting with prescribed fire and invasive species control. The National Interagency [Prescribed Fire Training Center](#)¹⁸ (PFTC) teams assist with or conduct prescribed burns; contact The Nature Conservancy at (407) 682-3664, or the PFTC at (850) 523-8630 for more information. Other resources are available to assist land managers and owners with prescribed fire, k p e n w f k p [Prescribed Fire Councils](#)¹⁹ and the Southern Fire Exchange. The Councils bring together the collective knowledge and skills of these groups, providing a forum for information sharing. The [Southern Fire Exchange](#)²⁰ (SFE) Resource Center consolidates southern fire information, and provides access to fire data, documents, projects, tools, and websites related to fire and natural resource management via the [Southern Fire Portal](#)²¹ (SFP).

Heavy Equipment: Many of the treatments in this list require the use of heavy equipment. Although the effect of the treatment on the habitat is beneficial, there can be negative effects if minimization measures are not implemented to avoid direct mortality of tortoises and to minimize burrow collapse. Rather than repeating this mitigation measure in each treatment, it is provided here, for use in all treatments that require use of heavy equipment.

Equipment operators should be made aware of tortoises and instructed to avoid them. Marking the location of burrows (often done with flagging) in advance of the treatment helps equipment operators avoid collapsing burrows and is encouraged whenever feasible. When practical, minimize use of heavy equipment during September and October since hatchlings are more numerous and vulnerable at this time, and it is difficult for individuals operating equipment to see hatchlings (Ashton and Ashton 2008). As tortoises tend to be most active during coolest times in the warm months, and the warmest time during the cool months, adjusting the times when heavy equipment is used may reduce the risk to gopher tortoises.

Timber Thinning: Timber thinning can be an important tool in maintaining or enhancing habitat for the gopher tortoise. For areas in maintenance condition, once basal area approaches the upper value for the natural community (Table 6), applying a timber harvest can help move the condition to the lower range in the value, benefiting gopher tortoises. As basal area increases, the canopy becomes denser and less sunlight reaches the forest floor,

which influences the ground cover. Timber thinning also may be a necessary tool to enhance slightly degraded stands. Thinning will open the canopy and create conditions more suitable to the safe application of prescribed fire. Further, the equipment used for timber thinning typically knocks down excessive shrubs and hardwoods in the stand. Thus, thinning can have multiple positive effects on the stand. Areas converted to sand pine (*Pinus clausa*) may require a clear cut before initiating natural community restoration.

potential negative effects to gopher tortoises that might be associated with a timber harvest, and help avoid direct mortality of tortoises and minimize burrow collapse. Areas of more intense activity associated with the harvest, such as slash piles, logging decks, and skid trails should be placed in areas without burrows. Planning for regeneration while simultaneously accommodating the needs of the gopher tortoise includes avoiding overstocking the stand, using less intensive site prep (to minimize impacts to the soil and ground cover), and planting longleaf pine where appropriate.

Whole Tree Removal: Although not an option everywhere, there are some portions of the State that contain biofuel plants or other facilities that are willing to purchase hardwoods, or have citizens willing to cut and remove hardwoods for firewood. When the stand under management has an excessive hardwood component, whole tree removal is the preferred method of stand enhancement. Unlike other hardwood reduction techniques, whole tree removal does not result in excessive debris covering the forest floor post-treatment. Excessive debris on the forest floor can inhibit ground cover growth, with negative effects on gopher tortoises. Whole tree removal can be affected via firewood sales, or sales to harvesters who use typical forest thinning equipment to harvest and remove the hardwoods. The minimization measures for timber thinning and heavy equipment (above) may be appropriate for this treatment.

Chopping: Roller chopping may be an appropriate tool in stands with excessive shrub or palmetto cover. Typically, single drum chopping is preferred. It is important to prescribe the right equipment to reduce the shrubs and palmetto with minimal soil disturbance. Chopping reduces the shrub and palmetto in a way that enhances safe application of prescribed fire. Further, chopping may be preferred over mulching or shredding, as mulching and shredding leave a dense matt of mulch that may hamper ground cover response. However, it is important to follow chopping with prescribed fire (Menges and Gordon 2008). Chopping without follow-up prescribed fire has minimal benefits to the gopher tortoise.

To minimize potential negative effects to gopher tortoises associated with roller chopping, follow the heavy equipment minimization techniques suggested above. When practical, apply roller chopping during cooler periods or periods of reduced gopher tortoise activity. However, it is important to apply the treatment so as to achieve the intended management objective, while allowing for follow-up prescribed fire at an appropriate time.

Mulching or Shredding: Mulching or shredding is an additional management tool to reduce excessive shrubs, palmetto, or young hardwoods. As these treatments usually result in a thick layer of mulch-like material being deposited on the ground, it is critically important that these treatments be followed with prescribed fire to remove this layer and allow for ground

cover response. These tools may be especially useful as a pre-treatment to areas prior to ground cover restoration plantings. Typically, there is little chance of negative impacts on gopher tortoises from these applications in such stands as these stands tend to have no tortoises and little intact ground cover.

To minimize potential negative effects to gopher tortoises associated with mulching or shredding, follow the heavy equipment minimization techniques suggested above. To minimize the amount of mulch material on the ground post treatment, use the equipment to drop vegetation, without necessarily grinding or mulching all of the plant material. It is better to leave larger trees intact on the ground rather than completely mulching them. When practical, apply these treatments during cooler periods or periods of reduced gopher tortoise activity. However, it is important to apply the treatment so as to achieve the intended management objectives, while allowing for follow-up prescribed fire at an appropriate time.

Mowing: Mowing is a useful tool for maintaining open grass-dominated stands, pastures, or roadside conditions. Mowing used in conjunction with disked fire lines can increase fire line effectiveness during the prescribed burn. Keep mower blades or cutters at least 18 inches above the ground to avoid injury to tortoises when mowing natural areas known to contain tortoises. See the minimization approach suggested in Heavy Equipment (above).

Herbicides: Herbicides can be effective for controlling infestations of invasive exotic plants. Left untreated, invasive exotic plants can reduce native plant species composition or interfere with the application of habitat management practices such as mowing and prescribed burning. Herbicides may also be useful in reducing excessive shrub and hardwood densities. When using herbicides for this purpose, select an herbicide and appropriate application that has the desired effect on the shrubs and hardwoods, but that does not have a significant negative effect on native, herbaceous ground cover.

Ground Cover Restoration: Ground cover restoration techniques should be applied on degraded and agriculturally disturbed sites to restore natural plant community functions and create suitable habitat for use by gopher tortoises and associated commensal species. In many cases, it is best to restore the ground cover first, and then restore the pine component after the ground cover has successfully regenerated and has carried prescribed fire.

Table 7. Proposed timeline for implementing habitat management actions.

Proposed Habitat Management Actions	2013	2014	2015	2016	2017
Implement appropriate habitat management practices on upland natural plant communities to restore community dynamics and functions on lands managed by FWC.					
Implement ground cover restoration techniques on degraded and agriculturally disturbed sites to restore natural plant community functions and create suitable habitat for use by gopher tortoises and associated commensal species.					
Recommend to the ARC that Land Management Reviews of state-managed lands include a separate assessment to determine if upland habitat management is consistent with the goal and objectives of gopher tortoise conservation.					
Coordinate with partner organizations to identify and prioritize local government and state lands in need of assistance with management activities.					
Continue to support existing prescribed fire strike teams to enhance the number of gopher tortoise habitat acres burned or otherwise treated.					
Engage the H Y E Assistance Program and partner agencies to provide support and technical assistance to private landowners for managing gopher tortoise habitat.					

Incentives

As discussed in the previous sections on habitat protection and management, private lands will play an increasingly important role in achieving the goal and objectives for gopher tortoise conservation in Florida. Public lands alone are inadequate to recover the species; it will also take the collaboration of private property owners. The challenge faced in this regard is to find ways to attract and engage more private landowners in conservation activities that benefit wildlife. Through ongoing habitat management practices and prescribed fire, private landowners can have a profound impact on the conservation of gopher tortoises and the habitat on which they, and more than 350 commensal species, depend on private landowners. Private landowners also play a significant role in increasing protection of habitat and conservation efforts for the gopher tortoise, thereby helping to reduce the

threats that the gopher tortoise faces. However, it can be challenging at times for private landowners to continue beneficial land practices due to changes in economic conditions.

Conservation-based incentives typically provide financial payments, regulatory assurance, or both, and help further the goals and objectives of ~~u r g e n t~~ conservation plans. Conservation-based incentives can assist landowners to continue the good work they are already doing that benefits wildlife, and can help to increase the landowner base conserving gopher tortoises in Florida. Private lands comprise more than 60% of all potential gopher tortoise habitat in Florida. Collectively, private landowners throughout the eastern range of the tortoise have the ability to help preclude federal listing of the species. The plan is structured to provide incentives to partners encouraging their action and participation. These incentives are intended to promote an increase in the acreage of protected and managed tortoise habitat (Chapter 3, Objective 2), and focus FWC permitting efforts on activities providing the best long-term conservation benefits to the species. The FWC will continue to work with partners and stakeholders to identify and develop new incentive-based conservation opportunities in addition to those included in the Gopher Tortoise Management Plan.

Implementation of this management plan will further require the cooperation of many agencies and partners outside FWC. The FWC will continue to work with other state and federal agencies to develop incentives for active conservation measures on publicly owned lands such as state lands and military installations and bases. Available incentives can be categorized as either being associated with the revised permit system or with state and federally administered landowner assistance programs.

Permit-Based Incentives

Permit-based incentives can be divided into 3 categories, those that: (1) waive permit requirements for activities specifically intended to improve habitat for native wildlife (*e.g.*, prescribed burning); (2) authorize increased stocking densities on approved recipient sites exceeding minimum habitat quality criteria; and (3) require smaller mitigation contributions for responsible relocations.

Gopher tortoise permit requirements will continue to be waived on public or private lands for activities specifically intended to improve habitat for native wildlife. These activities generally include prescribed burning, mowing, roller-chopping, and tree stand thinning. However, permits are required when these activities are conducted as a precursor to property development.

Higher stocking densities are allowed on recipient sites that exhibit desirable tortoise habitat attributes, such as those containing well-drained soils, open or sparse tree canopy, or a healthy ground cover of herbaceous plants. Habitat criteria necessary for higher stocking densities are outlined in the Gopher Tortoise Permitting Guidelines.

The permit system requires smaller mitigation contributions from permittees that responsibly relocate tortoises to permanently protected private or publicly owned lands. This

economic incentive helps guide developers towards mitigation that provides the maximum long-term conservation benefit.

Candidate Conservation Agreement

Candidate Conservation Agreements (CCAs) are voluntary conservation agreements between the USFWS and one or more public or private parties. The USFWS works with its partners to identify threats to candidate species, plan the measures needed to address the threats and conserve these species, identify willing landowners, develop agreements, design and implement conservation measures, and monitor their effectiveness.

In 2006, the USFWS received a petition to federally list the gopher tortoise throughout its non-listed range, which includes Florida, Georgia, and parts of Alabama and South Carolina. As a response to this listing petition, stakeholders representing the four profit organizations drafted and executed a Candidate Conservation Agreement (CCA). The purpose of the CCA is to address species management and conservation throughout its non-federal-listed range. In November 2008, the CCA was fully signed and implementation began. New partners signed on to the agreement in 2009 and, currently, additional state, federal, and non-profit organizations are also considering entering into this partnership agreement. The CCA provides incentives for future regulatory relief should the conservation activities conducted by the parties help to preclude the need to federally list the gopher tortoise. A copy of the CCA for the gopher tortoise can be downloaded from the USFWS [website](#).²²

Candidate Conservation Agreement with Assurances

Candidate Conservation Agreement with Assurances (CCAA) are proactive, voluntary agreements between the USFWS and a private party that provides significant conservation benefits for Candidate species on non-federal lands, while providing regulatory assurances to the landowner should the species become federally listed under the Endangered Species Act (ESA). A CCAA allows a property owner to voluntarily implement conservation measures on lands that benefit and provide conservation lift for species covered by the agreement. In exchange, the property owner receives a permit from the USFWS which provides assurances that further conservation actions or additional land use restrictions will not be required if the species becomes listed in the future, provided the CCAA is in good standing. The assurances obtained under the agreement provide regulatory certainty to landowners regarding their activities on lands included in the agreement.

The USFWS works with interested landowners to develop CCAAs. These voluntary agreements allow landowners to manage their property in ways that benefit Candidate species. These agreements also can be developed to provide regulatory certainty for landowners should the species become listed under the ESA. The FWC will work cooperatively with landowners and the USFWS to develop CCAAs for the gopher tortoise in Florida. For further information on CCAAs, visit the Candidate Conservation section of the USFWS [website](#).²³

Habitat Conservation Plans

Habitat Conservation Plans (HCP) are planning documents originally developed as an element of the application for issuance of an incidental take permit for federally listed species. HCP planning grants are available to assist with the development of a HCP. These plans outline the effects of anticipated future impact and proposed actions to be undertaken to minimize and mitigate such impacts. HCPs can include listed species, non-listed species, and Candidate species. This planning approach allows for conservation efforts to be taken before providing early benefits and broader conservation options, and may preclude the need for federal listing under the ESA. As HCPs are developed for large scale projects, multiple incidental take permits are allowed under one HCP, making it a planning effort to address species and habitat conservation on a landscape-level while still meeting regulatory requirements. HCPs include the following: information assessing potential future impacts to listed species; measures to monitor, minimize, or mitigate those impacts; funding available to support the plan; alternative actions available to avoid impacts; and justification for the chosen alternative. HCPs are approved on the basis that the take is incidental to a lawfully permitted activity that impacts will be minimized and mitigated to the extent practicable, that adequate funding is identified and committed to implement the HCP, and that take of the species will not noticeably reduce the likelihood of survival and recovery of the species.

Several HCPs currently being developed in Florida include gopher tortoises in their plans. The FWC does not allow entombment of gopher tortoises, and current permitting requirements for gopher tortoises apply under all HCPs in Florida. The gopher tortoise program and FWC the gopher tortoise is included where appropriate in all future HCP planning efforts. Additional information regarding HCPs is available on the USFWS [website](#).²⁴

Conservation Banking

Conservation banks are another program available to private landowners for lands that are permanently protected through the use of perpetual conservation easements. The owner of such lands agrees to place the property under an easement and to manage for any listed species, Candidate species, or any other at-risk species. In exchange for these conservation measures, the bank owner is awarded conservation credits which may be sold to individuals or developers needing to mitigate adverse impacts of their projects on affected species. Conservation banking may have broad utility for numerous landowners through preservation, enhancement, restoration, or establishment of habitat for listed species. Through proper habitat management, lands used for ranching, farming, or silviculture may qualify for the program.

Establishing a conservation bank requires the following actions be taken: a banking agreement must be established between the landowner, FWC, and USFWS; an easement granted to a third party, precluding future development and outlining appropriate land uses; a long-term management plan created for the site; and provision made for long-term management and monitoring of the easement through a non-wasting endowed trust. Once

these criteria are met, the owner receives and is able to sell conservation credits to offset development impacts within a defined service area.

The FWC does not issue permits for the incidental take of tortoises; however, conservation banks may provide an opportunity for the use of credits based on ecosystem services or for habitat credits. This would provide a financial incentive for landowners who have quality tortoise habitat which is already at optimal carrying capacity. The FWC has a strong partnership with the USFWS in establishing conservation banks for federally listed species and has included tortoise recipient sites under the conservation easement. The FWC will continue to examine the full range of utility that banking may provide. For further information on conservation banking, visit the USFWS [website](#).²⁵

Cooperative Conservation Blueprint

One approach to encourage the participation of private landowners to conserve wildlife habitat identified in the Cooperative Conservation Blueprint is to develop a Payment for Ecosystem Services (PES) program. The USDA Natural Resources Conservation Service provides funding for the development of PES and other market-based conservation tools through their Conservation Innovation Grants. The FWC is currently working with multiple partners to develop a proposal for a PES program that would incorporate some form of compensation to landowners who provide critical habitat for the Florida panther, gopher tortoise, and/or aquatic species that would expand on similar programs targeting water quality or quantity.

Landowner Assistance Programs

V j g " H Y E ø u " N c p f q y p g t " C u u k u v c p e g " R t q i t c o " * N
agencies with the application of several landowner incentive programs for meeting wildlife conservation goals. Among these are the Forest Stewardship Program, Wildlife Habitat Incentives Program, Environmental Quality Incentives Program, Partners for Fish and Wildlife Program, Common Species Common, and the Wetland Reserve Program (Appendix 7). These programs are voluntary and some may provide financial incentives, depending on annual appropriation, for wildlife conservation and habitat management on private lands.

The LAP provides technical guidance and review to focus and approve the distribution of these cost share funds for specified wildlife management activities. The FWC will coordinate internally with its landowner assistance program to enhance the application of these programs on appropriate privately owned uplands for gopher tortoise conservation. This program includes technical advice and outreach to landowners on opportunities for establishment of conservation easements, revenue generation as gopher tortoise recipient sites, technical and financial assistance with habitat management (*e.g.*, prescribed burning, vegetation management), and development of written management plans. The FWC is currently creating improved outreach and evaluation of landowner needs and preferences to increase the effectiveness of this program. The gopher tortoise conservation goal and objectives will be integrated into this program.

Safe Harbor Agreement

The Safe Harbor Agreement (SHA) has the potential to increase the value of landowner incentives, although its application to gopher tortoise conservation in Florida is not compatible at this time. Should SHAs become a viable incentive for landowners in Florida, FWC will explore the application of the SHA in the context of the management plan actions. Additional information regarding Safe Harbor Agreements can be accessed on the USFWS [website](#).²⁶

In principle, an SHA allows an agency to assure a landowner that successful land management conservation will not subject the landowner to increased regulatory burden if the landowner agrees to perform specific activities that enhance the habitat. The voluntary agreement is a contract between the USFWS and landowner, specifying an agreed baseline level of regulated wildlife that the landowner will not be able to impact without obtaining a permit. Further, the agency agrees not to penalize landowners should changes in their land use practices result in an increase in the regulated species numbers above the agreed baseline level. This gives landowners certainty about future regulatory responsibilities, thereby assuring landowners that their management activities which encourage wildlife will not cause an increased future regulatory burden. A potential drawback of creating an SHA is that conservation benefits created under the agreement can be reversed if the landowner chooses to change land use. However, widespread application of the SHA suggests this occurs in only a small number of cases, and the freedom from fear of future regulatory jeopardy fosters cooperative wildlife management in many examples. The SHA has been notably successful in supporting private conservation areas for the federally protected red-cockaded woodpecker (*Picoides borealis*) in Florida.

Tax-based Incentives

Florida provides tax incentives including property tax exemptions for landowners that put a perpetual conservation easement on their land. This allows landowners interested in maintaining their current conservation or agricultural practices into the future to receive a break from property taxes for excluding additional development on their property. These tax reduction incentives encourage greater conservation of gopher tortoise habitat. In Florida, voters approved an amendment to the state Constitution to allow for property tax exemption and classification and assessment of land dedicated in perpetuity and used for conservation purposes (FL Const. art. XII, [§ 28](#)²⁷). Written management plans developed through the H Y E o u " Landowner Assistance Program can provide documentation to support applications for these tax incentives. Additional information regarding property tax incentives is available on the Florida Forest Stewardship [website](#).²⁸

Additional Conservation-based Incentive Programs

There are many other conservation-based incentive opportunities for landowners who want to help conserve imperiled wildlife and specifically the gopher tortoise. A comprehensive list of federal and state programs is included in Appendix 7.

Table 8. Proposed timeline for implementing incentives actions.

Proposed Incentives Actions	2013	2014	2015	2016	2017
Assess the effectiveness of permit-based incentives toward achievement of the management plan conservation objectives.					
Coordinate internally with FWC staff that provide technical assistance and outreach to private landowners to identify cost share opportunities for landowners who manage gopher tortoise habitat on private lands.					
Coordinate with FWC and USFWS staff and evaluate Habitat Conservation Plans (HCPs), conservation banking, and Candidate Conservation Agreements with Assurances (CCAA) as means to provide a conservation benefit for gopher tortoises, and provide incentives to the landowner.					
Implement as appropriate Habitat Conservation Plans (HCPs), conservation banking, and Candidate Conservation Agreements with Assurances (CCAA) to benefit the conservation of gopher tortoises with interested landowners.					
Identify practices and land use changes that result in a positive habitat value for gopher tortoises on agriculture and silviculture lands.					
Develop Payment for Ecosystem Services pilot incentive program for landowners.					

Population Management

Preserving, managing, and restoring gopher tortoise habitats are key components in achieving the conservation goal; however, addressing the needs of tortoise populations also plays a role in the success of a long-term species conservation plan. In general, resource managers undertake activities to enhance the required burrowing, foraging, and nesting habitat, with the understanding that tortoise individuals and populations will benefit through improved nutrition, increased fecundity, and positive effects on growth rates and age to sexual maturity. However, as populations become increasingly fragmented and impacted by anthropogenic factors, managers will need to take a more direct, hands-on, approach to conserving this Threatened species. In addition to maintaining viable gopher tortoise populations where they exist, the strategies related to population management are: to enhance gopher tortoise populations in degraded habitats; to restore gopher tortoises on public conservation lands where populations have been severely depleted or eliminated; and,

where necessary, to reduce hatchling predation on select sites where population viability and persistence have been compromised.

Population Restoration

There are two primary approaches to population restoration. ***Facilitated population restoration*** is used in areas with severely altered or degraded habitat that also has some habitat patches supporting tortoises. By undertaking specific land management actions to restore the altered or degraded habitat, the manager increases the amount of suitable habitat and facilitates the natural growth of the existing population over time. Gopher tortoise populations on a number of conservation lands around the state could be enhanced by this approach. Moreover, although restoring populations takes time for this long-lived, slow-growing species, such natural increases can help overcome some of the past decline and contribute positively to overall tortoise population growth in Florida. ***Directed population restoration*** is the deliberate and planned restocking of wild gopher tortoises on public conservation lands where survival and long-term population viability are very likely. This approach can be used in a variety of circumstances, including areas where habitat has been restored or created but lacks a local source of tortoises to repopulate the restored habitat. For example, select portions of the Florida Panhandle may qualify for restocking where past harvest has severely depleted or eliminated the local tortoise resource over vast acreages. Additionally, reclaimed mining sites in northern and central Florida have been restocked in the past, and new sites may serve a similar function in the future.

Facilitated restoration of depleted tortoise populations through habitat improvement and natural population growth is a preferred population management tool, just as prescribed fire is a premier habitat management tool. An initial step will be determination of which public lands might best benefit from either of the two approaches to population restoration. Restocking will be considered in situations where the habitat has either been restored or is already in good condition, but where no available surrounding tortoises exist to rebuild the population naturally, or where the population is so severely depleted that viability is compromised. Guyer *et al.* (in press) found that at densities below 0.4/ha, tortoises alter movements in ways that might affect population viability because of changes in social structure. If restocking is necessary, sources of tortoises will be carefully considered to enhance the success of the population restoration. Insights from genetic studies (*e.g.*, Osentoski and Lamb 1995; Schwartz and Karl 2006; Sinclair-Winters *et al.*, in prep.) will be factored into restocking decisions. During 2011, other Florida land management agencies worked with FWC to create detailed guidelines for restocking tortoise populations on publicly owned conservation lands (Appendix 12, Gopher Tortoise Permitting Guidelines). The focus of such restocking efforts is to establish viable populations on protected, well-managed lands.

Head-start Programs and Predator Exclusion

Head-starting of juvenile tortoises has been undertaken (C. Powell, M. Hinderliter, pers. comm.). Eggs are retrieved from the wild and incubated in a laboratory, and the resulting

