Gopher tortoise

Biology, Conservation, and Regulation

Gopher tortoise (*Gopherus polyphemus*)

- State threatened species
- Lifespan 40 to 60 years
- Reproductive maturity at 9 to 21 years
- Low reproductive rate (1 clutch per year)
- Only native land turtle in Florida

Identification

Stumpy back legs

Shovel like front feet

Broad head with non-projecting snout

Adult gopher tortoises

Juvenile gopher tortoises

Behavior

- Active in warmer months
- Mate and nest in spring/summer
- Spend 80% of life in burrow
- Bask in sun to increase body temperature

Reproduction

Diet

- Herbivores
  - Soft stem plants
- Opportunistic
- Travel <160 ft for food

Habitat

Habitat

The burrow

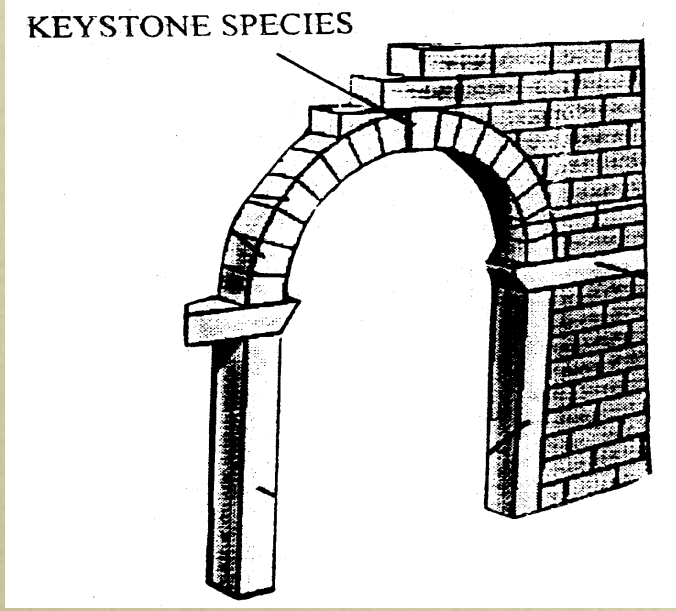
- Average around 7 feet deep and can reach more than 15 feet long
- A tortoise can have more than one burrow within its home range
- The mouth of a gopher tortoise burrow is distinctly half-moon shaped
  - The size of the opening is proportional to the size of the tortoise

Burrow classification

- Potentially occupied burrow
  - Active
  - Inactive
- Abandoned

Burrows are protected too!

- Gopher tortoises are called “keystone species”
- More than 350 wildlife species (commensals) seek refuge or live in the burrows
- Many of these species are also protected



Commensals

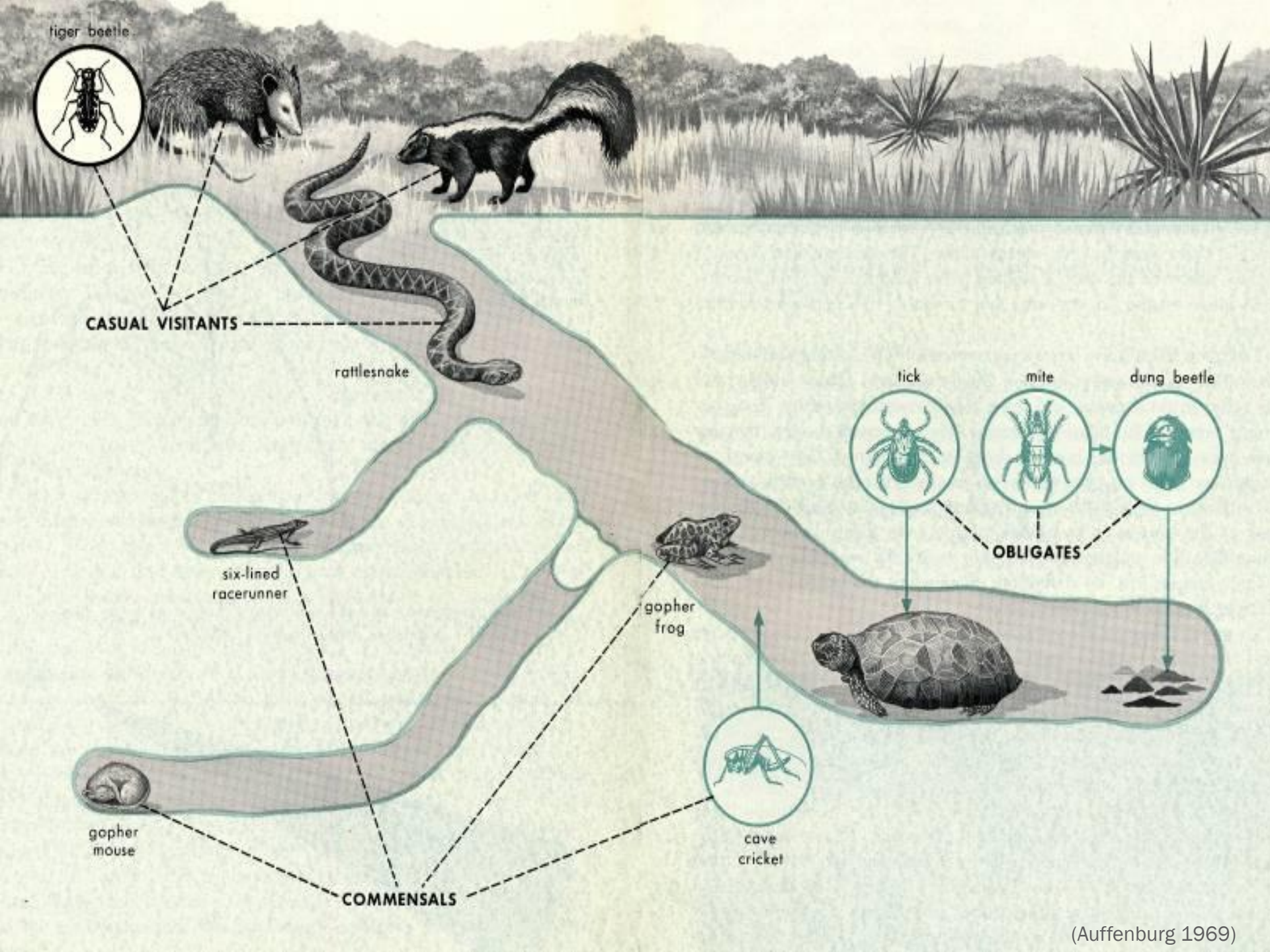
Indigo snake

Gopher frog

Diamondback rattlesnake

Florida pine snake

Florida mouse



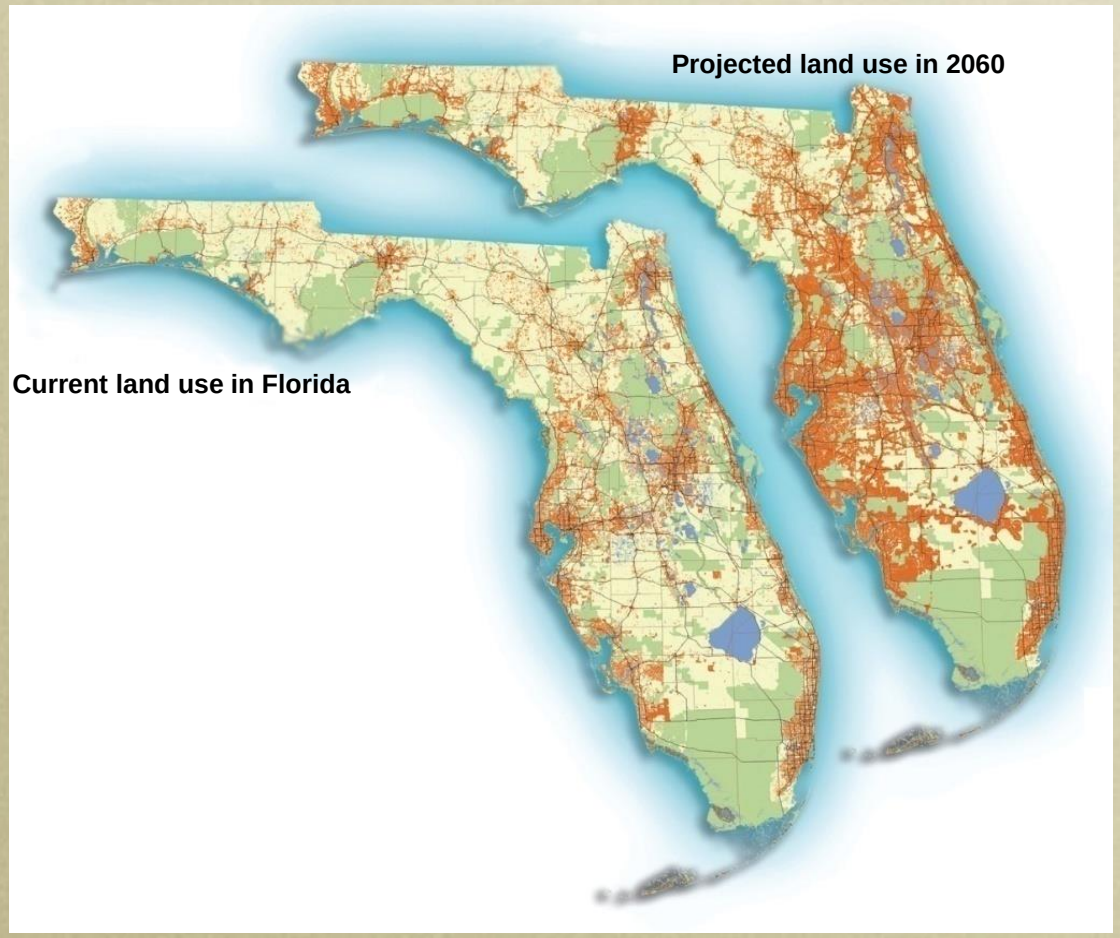
(Auffenburg 1969)

History of Legal Status

- Listed as Threatened in 1975
- Changed to Species of Special Concern in 1979
- Harvest prohibited since 1988
- Listed as Threatened in 2007

Why are populations declining?

- Habitat loss
- Fragmentation
- Degradation
- Disease
- Illegal harvest



These maps show Florida as it is today and how it could look in 2060, if its population doubles.

Management Plan (approved 2012)

- Goal - *To restore and maintain secure, viable populations throughout Florida so the species no longer warrants listing*
- 4 objectives include minimize loss of tortoises, increase and improve habitat, restoring populations where they are depleted, and maintaining the tortoise as a keystone species
- Suite of conservation strategies and actions including regulation, permitting, and law enforcement

Stakeholder involvement

- Six years of intensive work by FWC Commissioners, staff, and stakeholders
- The Gopher Tortoise Technical Assistance Group (GTTAG) was formed in 2005
  - Comprised of 30 individuals representing 10 interest groups (e.g., primary industry, conservation interests, local government)

Laws protecting gopher tortoises

- **F.A.C. 68A-27.003** (2)(d)3- 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. Permits will be issued based upon whether issuance would further management plan goals and objectives.

Examples of violations

- Non-development related violations
  - Human consumption
  - Harassment, mutilation, and poisoning
  - Gassing burrows
  - Possessing a tortoise without a permit
  - Filling in burrows
- Development related violations
  - Activities not in compliance with the permitting guidelines or permit conditions
  - Site clearing where burrows occur

Mandatory relocation

- As of June 2007, FWC required that all gopher tortoises must be relocated out of harm's way before any land clearing or development takes place, and property owners must obtain permits from the FWC *before* they move them
- New permitting guidelines developed and approved in 2008

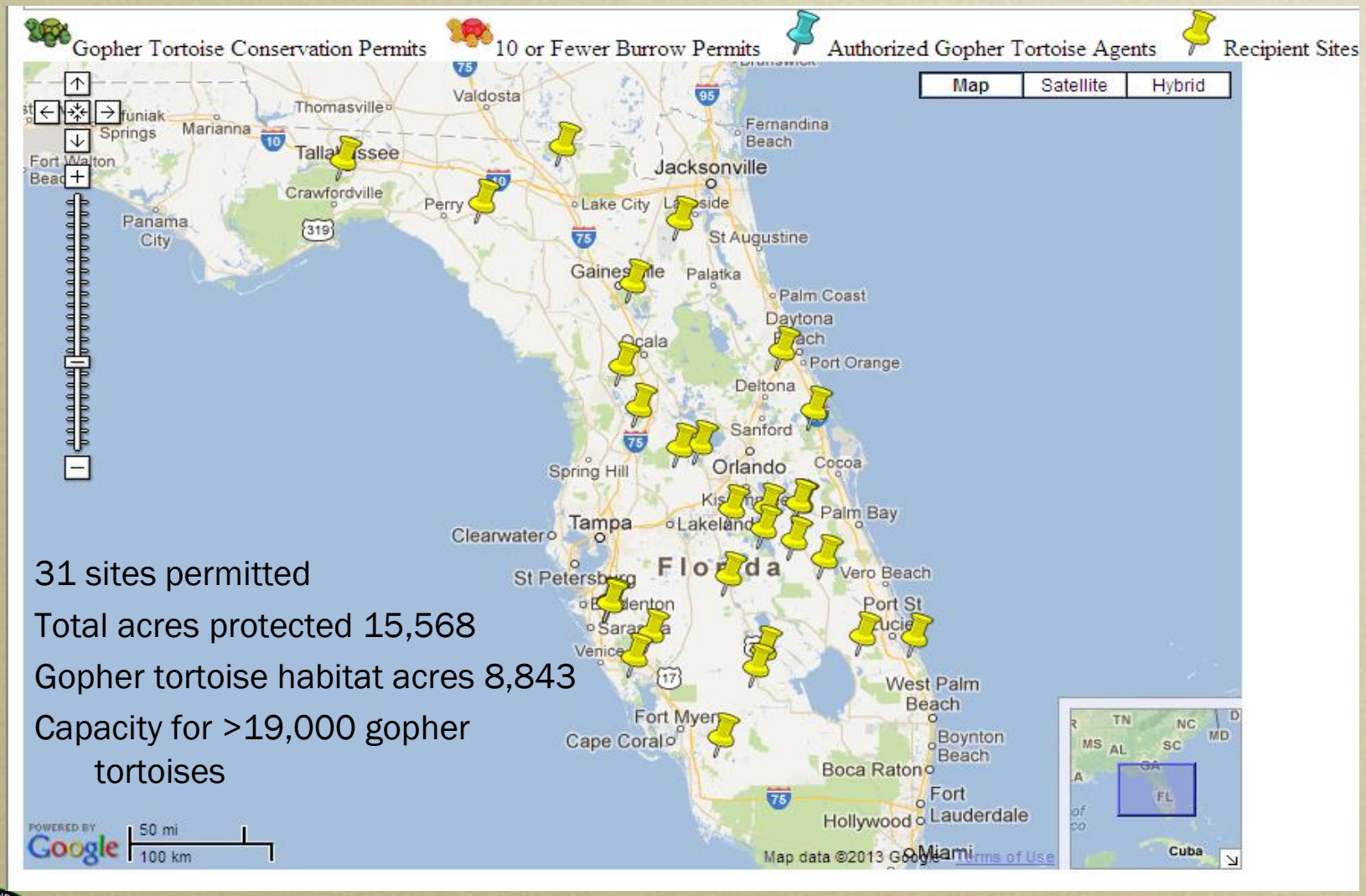
Permit types

- Authorized Gopher Tortoise Agent
- Relocation
  - Burrow and Structure Safety
  - 10 or Fewer Burrows
  - Conservation
- Recipient Site
  - Long-term protected
  - Short-term or unprotected
  - Research
- Temporary Exclusion
- Emergency Take
- Disturbed site
- Scientific Collection

Recipient sites

- Long-term, short-term, unprotected, and public conservation lands
- Designed to provide financial incentives and advantages to landowners who establish long-term protected sites
  - Provides the highest conservation value for the gopher tortoise and its habitat
  - Most cost effective to relocate tortoises to long-term sites
  - Tortoise stocking density “bonuses” for the best habitat

Recipient sites



31 sites permitted

Total acres protected 15,568

Gopher tortoise habitat acres 8,843

Capacity for >19,000 gopher tortoises

Habitat management

- Proactive management requires application of management activities to enhance conditions for gopher tortoise foraging
  - Prescribed fire
  - Mechanical treatment
  - Herbicide application
  - Timber thinning

Benefits of prescribed fire

- Reduces risk of wildfires
- Ensures ecosystem health
- Restore degraded natural communities

Financial and technical assistance

- The Nature Conservancy fire strike team (50,000 acres annually)
- Financial assistance for local governments (1,100 ac. 2012)
- Cost-share incentives for private landowners (21,500 acres 2012-13)
- Habitat management plans for public lands

Conservation actions

- Local government coordination
  - Workshops
- Permitting and regulation
- Law enforcement training
- Habitat Protection
  - Military lands buffering

Photo by Lee Woods

Conservation actions

- Habitat management
- Incentives
  - Payment for ecosystem services
- Population management
- Disease management
- Monitoring
  - Population status and relocation activities

Conservation actions

- Education and outreach
  - Educational materials
  - Citizen science portal (app)
- Research
  - Minimum population size
- Commensals
  - Website
  - Eastern indigo snake

What can we do to protect this important species?

Research

Conserve habitat

If there is a tortoise on your property…

- Avoid development altogether
- Develop at least 25 feet from the burrow
- Relocate the tortoise on your property, with a permit
- Obtain a permit to relocate the tortoise to an off-site recipient site

Become tortoise-wise

- Become active in conservation organizations that promote habitat protection and management
- Write to elected officials about issues that affect tortoises and their habitat
- Support public and private land conservation efforts
- Educate your community on the importance of wildlife and laws protecting them

Become tortoise-wise

- Landscape with native plant species
- Keep dogs away from burrows and tortoises
- Don’t pick up the tortoise

Gopher tortoise conservation depends on the participation of public <u>and</u> private lands

Help tortoises across roadways

- Move it to the other side in same direction
- DO NOT take it home or put it in your vehicle
- If tortoise is injured, contact your local FWC office

For more information

- Visit our website to access information and download educational materials: http://MyFWC.com/GopherTortoise
- Call FWC at 850-921-1030
- Report wildlife violations at MyFWC.com/law/Alert

Slide 1

No notes

Slide 2

The gopher tortoise is a state threatened species. Their range spreads throughout all 67 counties in Florida as well as to the southern parts of Mississippi, Alabama and Georgia along with the southernmost point of South Carolina. The bulk of its range is throughout Florida. It is endemic to the United States and the only native species of tortoise to be found east of the Mississippi River. They are a long-lived, slow-growing species with a low reproductive rate. Because of this, the replacement rate of tortoises is low and the species is vulnerable to a rapid decline.

Slide 3

Gopher tortoises have flat, shovel like front feet with claws for digging as opposed to webbed feet for swimming like turtles. They have stumpy, elephantine back legs which they use to brace themselves while digging. They have a broad head with non-projecting snout.

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Adult tortoises have a gray/brown color and can weigh up to 15 pounds. They average from 9 to 11 inches long, but some grow to be about 15 inches in length. Females grow to be larger than males and have a flat plastron, while males have a slight concavity in their plastron for reproductive purposes. Males also have more prominent gulars at the front of their plastrons for fighting in competition for mates or territory.

Slide 5

Juveniles are less than 5 inches long. Their shells are soft until the age of 7 and they have a yellow/orange color. Adults do not care for their young after they are hatched. This combined with the fact that their shells are soft for 7 years makes them quite vulnerable to their environment and predation. Juveniles may use an existing burrow or dig their own for shelter.

Slide 6

Gopher tortoises are ectothermic. They can not regulate their own body temperature, thus they rely on their environment to keep them at healthy temperatures. They often bask in the sun to warm themselves and their burrows keep their temperatures regulated inside it throughout all seasons. The climate affects their biology and activity level. Tortoises living in warmer climates will grow and mature faster than those in colder climates. The spring and summer months provoke mating and nesting. They also will go dormant in the winter, not leaving their burrows if it is too cold outside. This is similar to hibernation, but is referred to as aestivation.

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Gopher tortoises reach sexual maturity slowly. Females generally mature anywhere from 9-21 years of age, and males mature slightly sooner. Breeding season is from March to October. Nests are built from mid-May to mid-June in the apron of the burrow, which is a mound of dirt near its opening. Only one clutch of about 5 to 9 eggs is produced annually. Eggs incubate for 80-100 days, and predation on nests is heavy.

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Tortoises are herbivores, eating mostly grasses and low growing vegetation, including fruits and legumes. Some of their favorites include blueberries, wiregrass, stinging nettle, and prickly pear. They have been known to eat things like insects and small crabs during times of desperation, but in general they prefer plants. Tortoises tend to look for specific species of plants during different stages in their life - pregnancy or maturation, for example – depending on their specific nutritional needs.

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Gopher tortoises prefer high, dry, sandy places such as longleaf pine and xeric oak sandhills. They also live in scrub, xeric hammock, pine flatwoods, dry prairie, coastal grasslands and dunes, mixed hardwood-pine communities, and a variety of disturbed habitats, such as pasture lands. The biggest threat to their long-term survival is loss of habitat.

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Due to loss of habitat, particularly in highly urbanized areas of south Florida, they are often found living in anthropogenic habitats. They are seen in many backyards, school playgrounds or fields, and along roadsides.

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The gopher tortoise burrow is an important addition to the ecosystem within which gopher tortoises live. It provides mild temperatures and humidity all year. Burrows average about 6 or 7 feet deep and about 15 feet long, but there are plenty that might exceed these measurements. A burrow entrance will resemble the shape of a gopher tortoise, usually a small, half-moon shape.

Slide 12

Burrows can be classified as either potentially occupied or abandoned. Abandoned burrows will appear to be unused or dilapidated. The entrance will be partially or completely collapsed or filled in, not appearing to be caused by recent rains or livestock activity. Impact on an abandoned burrow does not require a permit. Burrows classified as potentially occupied (burrows that appear to be intact a possibly have inhabitants) are protected by law. They will also be classified as either active or inactive. Active burrows are in good repair, with their half-moon shaped entrance still intact. The soil is loose and the entrance is clear of vegetation. There may be tortoise tracks visible around it. An inactive burrow might appear to be in good repair with its entrance still half-moon shaped, but there may be leaves at the mouth and the soil is hard-packed. Tortoises can stay in their burrow for an extended amount of time. So in the winter especially the burrow could look like it isn't being used but in actuality there may be a tortoise inside. This is still considered a potentially occupied burrow and is still protected.

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The gopher tortoise is a "keystone species". The term "keystone" is a metaphor derived from the structure of an arch. The "keystone" refers to the center stone in the arch, removal of which will eliminate support for the remaining stones and likely collapse the entire structure. The gopher tortoises burrow is home to over 350 commensal species who utilize it for shelter. If the tortoise is removed, the burrows are removed, and some or many of these species' populations would decline in correlation with the tortoise's. So removal of the tortoise could be detrimental to the entire ecosystem.

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Some examples of commensal species are the gopher frog, eastern indigo snake, Florida pine snake, the Florida mouse, the Diamondback rattlesnake, burrowing owl, and hundreds of invertebrates, such as the gopher cricket and scarab beetle. Again, there are over 350 species who utilize these burrows. These are just a few.

Slide 15

The temperature in the burrow is naturally regulated. During winter it keeps its inhabitants warm and provides refuge during hot summer afternoons. Burrows also provide a safe refuge for tortoises and commensals to escape fires (natural or prescribed) and storms.

Slide 16

Sale, export, and possession of more than 10 tortoises were banned by 1973. They were originally listed as Threatened by 1975, and the year after the possession limit dropped to 5. In 1978 the introduction of toxic substances into burrows was banned, and then in 1979 the listing was revised to “Species of Special Concern” . In 1984 there was a ban on bucket traps and snares and a relocation policy statement was issued. The next year the possession limit dropped to 2, the interim relocation protocol was issued and harvest began to be prohibited. In 1988 statewide harvest was prohibited. In 2006 rules protecting burrows passed, and in 2007 they were relisted as Threatened and the Gopher Tortoise Management Plan was approved.

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The biggest problem gopher tortoises face is habitat loss from human population growth and continuous development of natural lands. Another problem is habitat degradation from a reduction of fire. Prescribed burning is extremely important for tortoises as they are a fire dependent species. Fire opens up the forest canopy and allows growth of vegetation, and their habitat will become unsuitable if burning is not frequent enough.

Slide 18

The current management plan is a revised edition of the one that was originally approved in 2007. The ultimate goal is to restore and maintain secure, viable populations of tortoises throughout Florida so the species no longer warrants listing. The plan includes 4 main objectives: 1) Minimize the Loss of Gopher Tortoises; 2) Increase and Improve Gopher Tortoise Habitat; 3) Enhance and Restore Gopher Tortoise Populations; and 4) Maintain the Gopher Tortoise's Function as a Keystone Species. Each objective has a variety of strategies and actions, including regulation, permitting, law enforcement, public education/involvement, etc., associated with it that will assist in the accomplishment of the final goal and fulfill all of the objectives.

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The stakeholders of the Gopher Tortoise Management Plan constitute a large abundance and variety of people; from the local governments to the private landowners and public residents in areas that might be classified as suitable gopher tortoise habitat. Since the implementation of the original plan, the FWC has made collaboration, cooperation and coordination with other stakeholders an integral part of strategies for helping to reach conservation goals. One of the biggest group of stakeholders is The Gopher Tortoise Technical Assistance Group, or the GTTAG. Formed in 2005, this group is comprised of 30 individuals representing 10 different interest groups. Groups like these help to get the stakeholders involved and let a variety of perspectives and opinions be shared. Because of this, decision makers can make decisions that will best serve the people as a whole, keeping every perspective in mind.

Slide 20

The law states that no person shall take, attempt to take, pursue, hunt, harass, capture, possess, sell or transport and gopher tortoise or parts of their eggs, or molest, damage or destroy gopher tortoise burrows, except as authorized by Commission permit or when complying with Commission approved guidelines. . 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.

Slide 21

Some examples of non-development related violations of this law include human consumption; harassment, mutilation, and poisoning of a tortoise or their burrow, including gassing the burrow; possessing a tortoise without a permit; and destroying and/or filling in tortoise burrows without FWC permission. Some development related violations include beginning development on a tortoise inhabited site without a permit; activities on project/work sites that are not in compliance with the permitting guidelines or permit conditions; and site clearing where burrows occur.

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If there are any on-site gopher tortoise burrows located within 25 feet of construction activity, all tortoises in the vicinity must be relocated and a relocation permit must be obtained before any clearing or constructing. The FWC issues permits that authorizes these relocations, and it is important that they be consulted immediately when relocation is needed.

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The permitting guidelines include new permitting options. They include:
•**Authorized Gopher Tortoise Agent:** This permit authorizes qualified persons to capture, handle, and transport gopher tortoises to certified recipient sites. FWC is in the process of evaluating various training proposals that will help provide the necessary training required to become an authorized agent.
•**10 or Fewer Burrows Permit:** This type of permit is available for individuals who are not authorized gopher tortoise agents when 10 or fewer burrows (and the number of tortoises occupying those burrows) will be impacted on a development site. This permit allows a registered landowner to relocate the tortoises themselves on-site providing a way to keep the tortoises from returning (such as installing a silt fence). If off-site relocation is preferred, an authorized agent must do the relocating.
•**Conservation Permit:** This permit is applied for when there are more than 10 burrows in the vicinity. It allows for relocation of gopher tortoises either off-site or on-site to recipient areas with different levels and durations of protection. The preferred conservation actions, such as the preservation of quality habitat on-site, and restocking or otherwise responsibly relocating tortoises to long-term protected lands (public or private) will require a lower mitigation contribution than the alternatives.
•**Recipient Site Permit:** To receive a FWC recipient site permit, candidate properties must meet site suitability criteria for size, soil, and habitat, which varies according to the level of conservation value provided by the potential site. This permitting option allows for landowners to become certified recipient site owners, to which donor sites will be able to relocate tortoises. The level and duration of protection can vary among sites.
•**Temporary Exclusion Permit:** This type of permit is specifically reserved for the installation or maintenance of major utility transmission lines. It allows tortoises to be temporarily relocated via exclusion from the site where the utility and right-of-way maintenance is to be completed to an approved on-site enclosure. Once the work has been completed, the tortoises will be allowed to re-enter the right-of-way at will.

•**Emergency Take Permit:** This permit will be issued only under specific circumstances, in cases where there is an immediate danger to the public's health and/or safety or in direct response to an official declaration of a state of emergency by the Governor of Florida of a local government entity. The process may be handled after the fact or act least after construction activities have already started.
•**Disturbed Site Permit:** This permit refers to the relocation of tortoises from a disturbed site and may be required when premature disturbance to the vegetation or ground has occurred before the tortoise burrow surveys are complete or before gopher tortoise capture and relocation activities have been completed. It provides an option for mitigation and relocation of tortoises within disturbed portions of the project area.
•**Scientific Collecting**: This permit authorizes approved research activities on specified areas.

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There are 4 different levels of conservation on recipient sites. The different sites include Long-term Protected Recipient Sites, Recipient Sites for Restocking Public Conservation Lands, Short-term Protected Recipient Sites, and Unprotected Recipient Sites. Long-term sites are privately or publicly owned lands that must be protected by a perpetual conservation easement that conforms to the standard format available from FWC. Public conservation lands are publicly owned and currently managed for conservation. They must provide suitable habitat and must be actively managed under an approved habitat management plan. Short-term protected sites have some enforceable protection commitment, but they do not meet the definition of "long-term". Unprotected sites provide relocated gopher tortoises protection for at least two years but generally do not have any further state or federal commitments.

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Recipient sites can be either publicly or privately owned. Currently there are about 40 recipient sites set up around the state. Private lands comprise more than 60% of all potential gopher tortoise habitat in Florida, thus it is not possible to reach the goal of the management plan without the help of these landowners. There are a variety of reasons that someone may be interested in having a permitted recipient site. Some may just be interested in the protection of an endemic species, but it is likely that the most popular reason might be financial incentives that are associated with taking the relocated tortoises. As a recipient site owner, one can charge for relocated tortoises almost as if it were a free market. Long-term recipient sites that put a perpetual conservation easement on their land are also provided with some property tax exemptions. From a county perspective, a county-owned long-term recipient site would serve as a cost effective way to relocate tortoises.

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The Gopher Tortoise Management Plan places great importance on the ability of protected lands, both privately and publicly owned, to support gopher tortoise populations at levels that will ensure the long-term security of the species. Habitat management is very important. Strategies might include mechanical treatment, such as mowing or roller chopping, herbicide application for invasive species control, and timber thinning. All of these actions help to move towards the restoration, enhancement, repopulation, etc. of affected lands in need of improvement. The preference is to start with the patches adjacent to or near good concentrations of gopher tortoises to allow for population expansion. One of the most effective and important management tools that can be used on gopher tortoise habitat is prescribed fire.

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The gopher tortoise along with many others is a fire adapted species. Historically, the recurrence of lightning-ignited fire was pivotal in influencing vegetative succession and shaping species composition and structure of Florida's upland pant communities. The fires opened up the canopy and promoted the continued growth of low-growing vegetation. They resulted in open pine stands and lush ground cover, a habitat well-suited for the needs of a gopher tortoise. Today, periodic prescribed fire provides the same benefits for the habitat. Prescribed burning helps to ensure the health of the ecosystem, reduces the risk of wildfires, and helps to restore degraded ecosystems. It is a safe way to provide a natural process to promote the continued success of the environment.

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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. They are also able to conduct site preparation activities and the technical assistance they provide should enable many landowners to create their own self-sustaining habitat management programs. The Nature Conservancy fire strike team provides ground-level technical assistance and contributes to the burning of about 50,000 acres annually.

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The Gopher Tortoise Management Plan has a variety of strategies for action on conserving the species. Recognizing that the goal and objectives cannot be reached by the FWC alone,

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Other general conservation actions in the management plan include habitat management and incentives, which have already been discussed in this presentation, along with population management, disease management, and monitoring. As gopher tortoise populations become increasingly fragmented and impacted by anthropogenic factors, it has been recognized that managers need to take a direct, hands-on approach to conserving the populations of tortoises. In addition to maintaining viable gopher tortoise populations where they exist now, strategies related to population management are: to enhance their populations and degraded habitats; to restore gopher tortoises on public conservation lands where populations have been severely depleted or eliminated; and to reduce hatchling predation on select sites where population viability and persistence have been compromised. Disease can greatly impact the health and population demographics of wildlife, so this is another area that land managers must be consistently aware of and focused on.

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Education and outreach activities outlined in the Gopher Tortoise Management Plan have been implemented. Utilizing staff and student interns. Since the publication of the original Gopher Tortoise Management Plan in 2007, a number of the research needs outlined in the plan have been addressed, such as tortoise population changes over time, genetic comparisons of tortoise populations in the panhandle and peninsula, insights regarding minimum preserve size, effects of URTD, and tortoise response to prescribed fire and habitat restoration. There are still plenty of facets about gopher tortoises and their lives that have yet to be understood, and so research will continue as long as there is still valuable information to be grasped. Research continues to be done on commensal species' populations as well, since they are also likely to be in decline with those of the tortoises.

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What more can be done to protect this keystone species?

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Research yields very valuable information about species and their habitats to us. It helps us to discover proper methods for improving habitat conditions because it give insight to the biology and ecology of gopher tortoises and their habitats. If we want to understand how we can make the best possible improvements for them, we need to continue research programs and get as much information as we can.

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The number one threat to gopher tortoise populations at present is habitat loss. We need to work together to conserve land for them and learn to reduce our sprawling ecological footprint so we can save the environment around us, for ourselves and for all the species who share our land with us.

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If there is a tortoise on your property, the best thing to do for it would be to avoid developing your property altogether. If you must develop, we advise that it be at least 25 ft from any burrows. If the project warrant relocating the tortoises, get a proper permit and relocate it lawfully, whether it be on-site or off-site relocation, before any activity is begun.

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We should all strive to make our communities tortoise-wise. Individuals or groups of individuals should become active in conservation organizations that promote habitat protection and responsible management. We encourage you to write to your elected officials with your concerns about issues that affect tortoises and their habitat. Support the conservation efforts of public and private lands instead of fighting it or being indifferent. One of the most important things you could do for the cause is to educate your community on the importance of wildlife and the laws protecting them.

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Simpler actions community residents can take include landscaping their yards with native plants instead of exotic or invasive plants, keeping pets like dogs away from burrows and tortoises, and leaving tortoises to live their lives in nature undisturbed. If you see a tortoise, do not pick it up and bring it home. Possession without a permit is illegal. Leave tortoises in the natural environment where you find them.

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If you see a tortoise in a particularly dangerous spot, we do encourage you to assist it out of danger and then leave it be. For instance, if there is a tortoise on the side of the road trying to cross the street and you decide that you should help it before something tragic occurs, move it to the other side of the road - in the direction it was already going. Again, do not take it home or put it in your vehicle. If you see an injured tortoise, please contact your local FWC office immediately with accurate information on where the tortoise was observed.

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For more information you can visit our website where you can access information and download education materials; call FWC at 850-921-1030 with any inquiries if you find a badly wounded tortoise in need of help; and report wildlife violations and alerts at MyFWC.com/law/Alert.