

The Back-Yard Pocket Gopher: Lifecycle & Management

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Based loosely on a talk by

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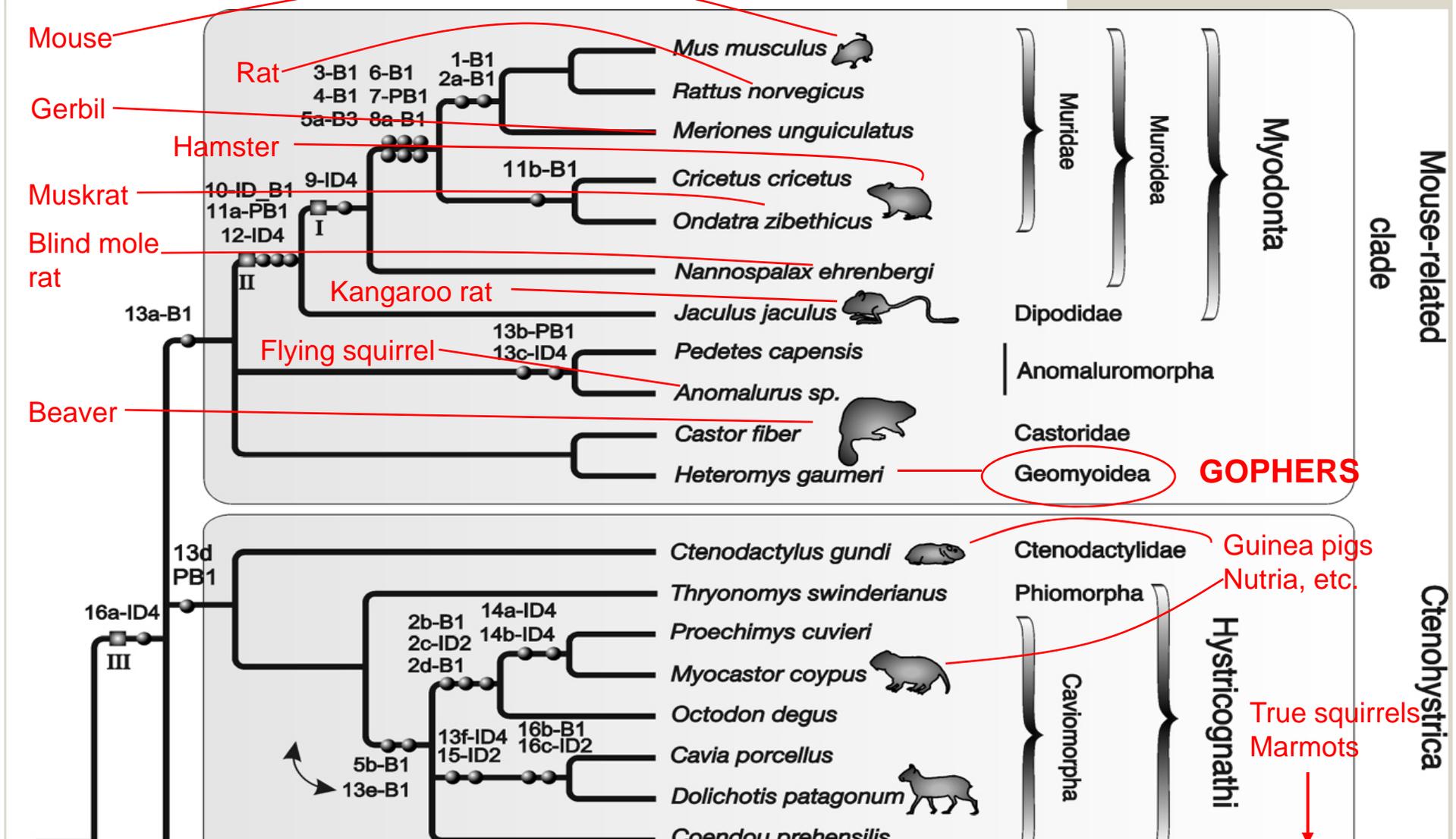
Gophers are rodents

- Large incisors always exposed
 - Lips close behind front teeth
- Small eyes and ears
 - Not great vision
- Sensitive whiskers
 - Hairs on tail for backing up
 - Guided by “feel”
- Clawed front feet
 - For digging
- Pocket gopher name comes from fur lined cheek pouches for food storage
- About 35 species
 - Ours: *Thomomys bottae*



Gophers are rodents

Image: Farwick, et al., 1995



Voles

- “Meadow mice”
 - Not true mice
 - Shorter tails, different ecology
- Shallow burrows
 - Connected by sheltered trails
- Shy surface feeders
 - Prefer shelter
 - Damage above ground
- Control with mouse traps



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Moles

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- Feed on insects
- Shallow subsurface tunnels
 - “Volcano” shaped mounds
 - Plug in center
- Damage limited to root disturbance
- Trap to control
 - Macabee
 - Small Gophinator
 - Small cinch



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Biology/Ecology

- Understanding the biology of vertebrate pests and ecological systems will guide management decisions
- Examples:
 - Soil moisture for mounding
 - What to look for
 - Reproductive cycles
 - When to trap

That under-ground lifestyle

- Prefer loamy soils
 - Good drainage
 - Good gas diffusion
- Active day & night
- Most active between 4-8PM
- Eat in 3 ways
 - Eat roots, tubers from below
 - Venture onto surface to clip leaves
 - Pull plants down into burrow
- Agricultural losses of 25-30% typical in forage



That under-ground lifestyle

- Territorial
 - Territories as small as 100 square meters
- Reproduction
 - Normally 1x/year in rainy season
 - In spring, young gophers are kicked out
 - Inexperienced
 - Pioneers
 - Good trapping
 - Can be continuous if area is:
 - Irrigated year-round
 - Rich in food sources
 - e.g.: alfalfa field
 - Don't let this happen!





Statewide IPM Project
UC Regents, University of California



Gopher ID

- Burrowing rodent 6-8 inches long
- Gopher mounds are usually plugged, often fan-shaped
- Fresh mounds typically have dark, moist soil
- ID mounds and damage
 - Gophers rarely seen



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Gopher damage

- Feed on roots, weakening or killing plants
- Can girdle trees & vines below ground
- Mounds can serve as weed seed beds
- Burrow systems designed to conduct water
 - Irrigation loss
 - Levee damage
 - Erosion





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Gopher benefits

- Increased soil fertility
 - buried vegetation
 - fecal wastes
- Increased soil aeration and decreased soil compaction
 - This may be a problem in a levee
- Increased water infiltration
 - decreased runoff
 - This may be a problem in a levee
- Increased rate of soil formation
 - bringing subsoil material to the surface

A photograph of a field with dry grass, soil, and some green weeds. The ground is uneven, with patches of dirt and small rocks. There are several small holes or depressions in the soil, possibly from insect activity. The overall scene suggests a natural, somewhat disturbed environment.

Management strategy

1. Identify pest species

Management Strategy

1. Identify pest species
2. Assess options for this species
3. Implement control
4. Monitor for effectiveness and reinfestation





Assessing options

- How bad is the infestation?
- Is it severe enough to warrant control?
- Is control realistic given the tools at your disposal?

Assessing options

- Time of year
- Relative costs

| Modify Habitat | Exclude | Bio-control | Trap | Gas Explosive Device | Bait | Repel | Fumigate | Shoot |
|----------------|---------|-------------|------|----------------------|------|-------|----------|-------|
| X | X | X | X | X | X | | | |

| Baiting | Gas Explosive Device | Trapping |
|------------|----------------------|------------|
| \$420/acre | \$396/acre | \$252/acre |



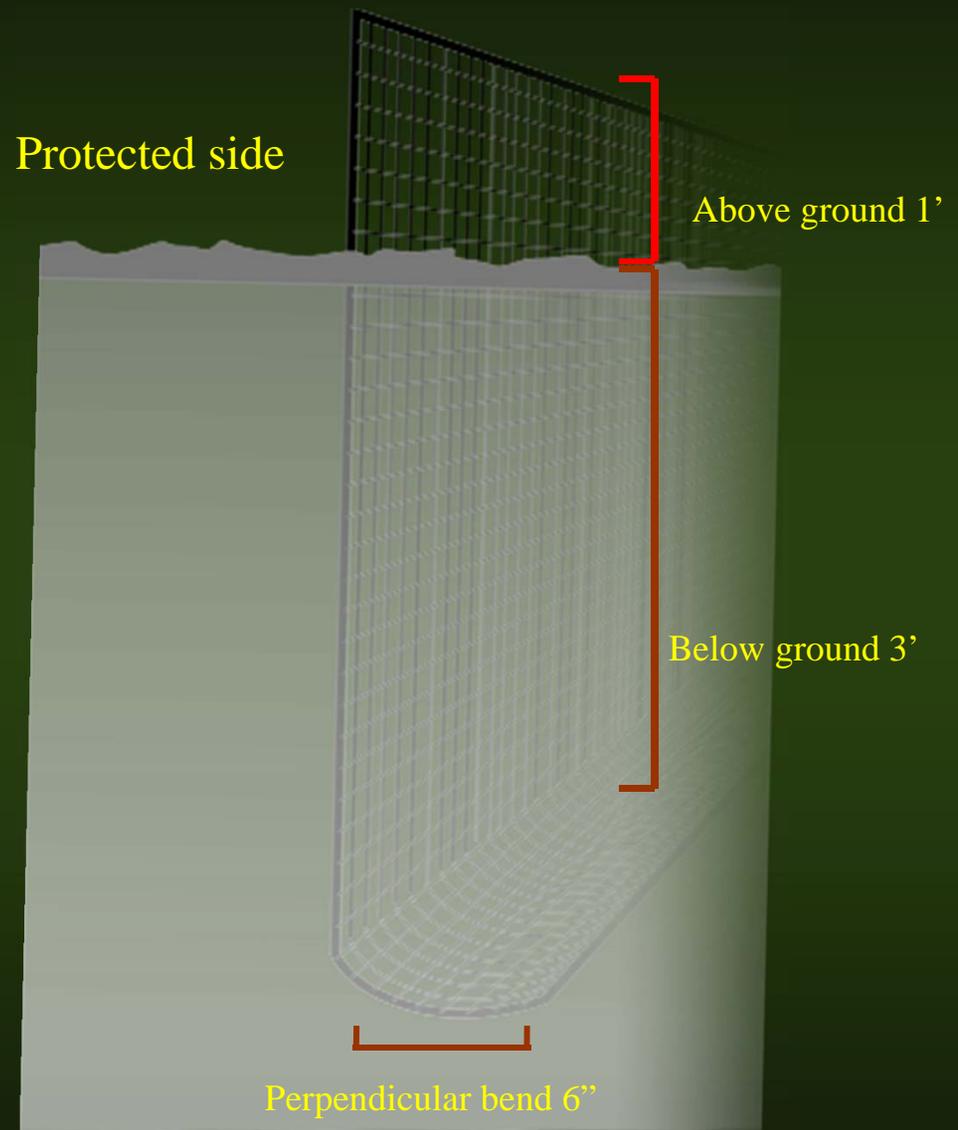
Options: Modify Habitat

- Reduce desirability of environment to gophers
- Ensure compost bins are gopher proof
 - $\frac{3}{4}$ inch mesh galvanized wire under bins
- Control weeds to remove alternate food sources



Exclusion

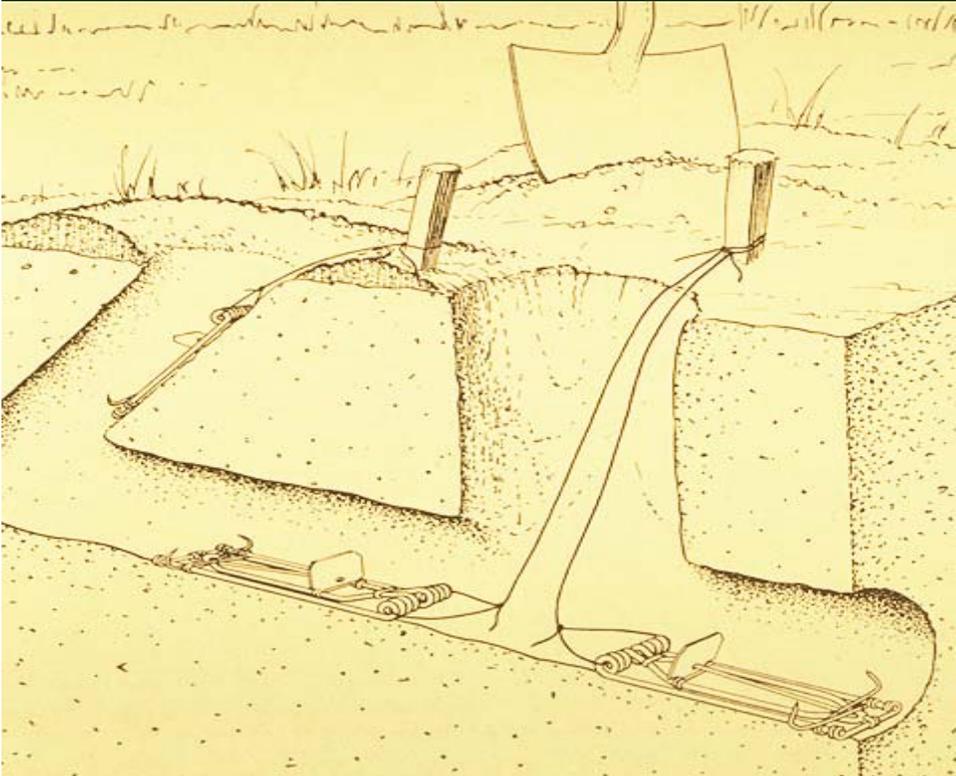
- Want to grow things gophers love?
 - Legumes
 - Figs
- Fencing
 - $\frac{3}{4}$ inch mesh galvanized wire
 - About 3 feet deep
 - Depending on soil
 - About 1 foot above ground
- Build a raised bed
 - $\frac{3}{4}$ inch mesh galvanized wire bottom
 - Must be > 1 foot high at lowest point
- Not always practical for larger areas



Options: Biocontrol

- Owl boxes: Owl efficacy highly dependent on site specifics. Most sites only achieve moderate control.
- Gopher snakes kill a few, but are unlikely to control populations
- Weasels
- Badgers
- Foxes





Options: Trapping

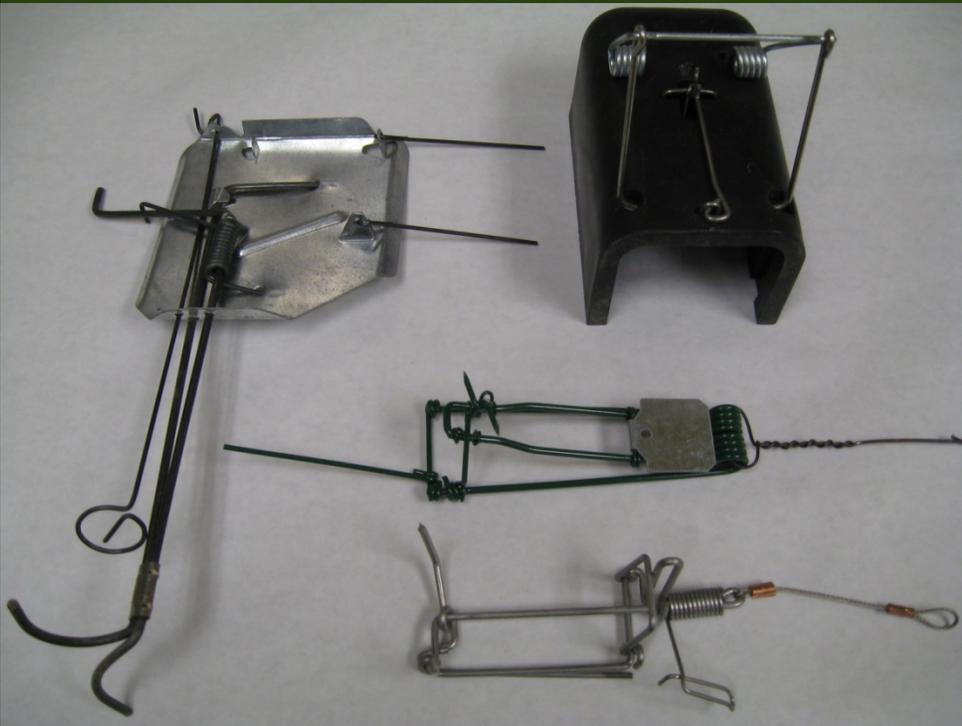
- Advantages:
 - Quantifiable results
 - No toxins involved
 - As organic as you can get
 - Efficient and economical (with proficiency)

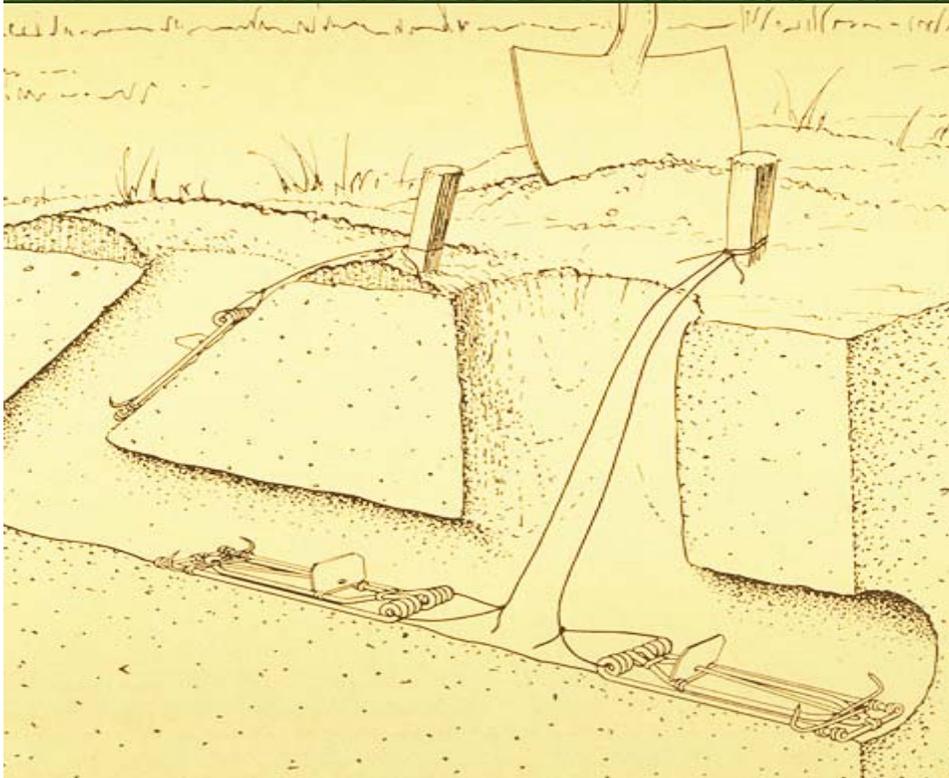
Efficiency: capture % per # of traps

Rate: novice / expert trappers

Options: Trapping

- Two basic types:
 - pincers
 - squeeze-type box
- Common examples:
 - Black Box
 - Cinch
 - Macabee
 - Gophinator





Options: Trapping

- Find a fresh burrow
- Probe to locate main tunnel
- Dig down to main tunnel
- Place traps
- Stake traps
- Cover hole (optional)
- Check traps in a few hours
- Move traps in 1-2 days if nothing is caught

Options: Baiting

- There are *restricted use* and *non-restricted use* baits (poisons) but most are now restricted use, with some exceptions for homeowner use.

| | Anticoagulants | Zinc phosphide | Strychnine |
|----------------|----------------|----------------|------------|
| Pocket gophers | X | X | X |

Options: Baiting

- Strychnine works best
- Use probe to find tunnel
- Dispense bait in tunnel (underground)





Options: Repellents

- Chemical repellents
 - Objectionable odors
 - Unpleasant tastes
- Sonic stakes
 - Ground vibrations
- University research does NOT support efficacy



Options: Other Strategies

- Gas explosive device
 - Combusts propane and air
 - Kills gophers via concussive force
 - Collapses burrows
 - May not be overly effective and has potential hazards

Options: Other Strategies

- Carbon Monoxide



Monitoring

- Regularly check for signs of gophers
- Follow up control efforts can be used to eliminate gophers you missed the first time ...
 - ... and there will be more.



Photo: Aroid, via Flickr



Questions?



References

- Astrid Farwick, Ursula Jordan, Georg Fuellen, Dorothee Huchon, François Catzeflis, Jürgen Brosius, and Jürgen Schmitz (2006) Automated Scanning for Phylogenetically Informative Transposed Elements in Rodents, *Systematic Biology*, *Syst Biol* (2006) 55 (6): 936-948. doi: 10.1080/10635150601064806
- This slideshow is a loose adaptation of Dr. Roger Baldwin's 2011 presentation *Integrated Approach to Controlling Pocket Gophers*. Dr. Baldwin is the IPM Wildlife Pest Control Advisor based at the Kearney Research and Extension Center in Parlier, California. Any errors contained herein are mine.
- Some of Dr. Baldwin's as yet unpublished research graphs have been removed from this presentation so that it may be posted on-line. The modified version can be found at:
<http://ucanr.org/svgopher>