Keeping Your Woods Healthy Through the Years Ahead

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Climate Affects Everyone

Climate – What you expect.

Weather – What you get!

Brenda Cataldo via bolton.govoffice.com

Variable weather

Water changes

Species changes

Threat multiplier

Increased disturbance from extreme events

- Heavy precipitation
- Flooding
- Ice storms
- Heat waves/droughts
- Wind storms
- Hurricanes

"Events" are very difficult to predict

Dan Turner, Cambridge Fire Dept.

VTRANS/VT ANR

NY DEC

NOAA

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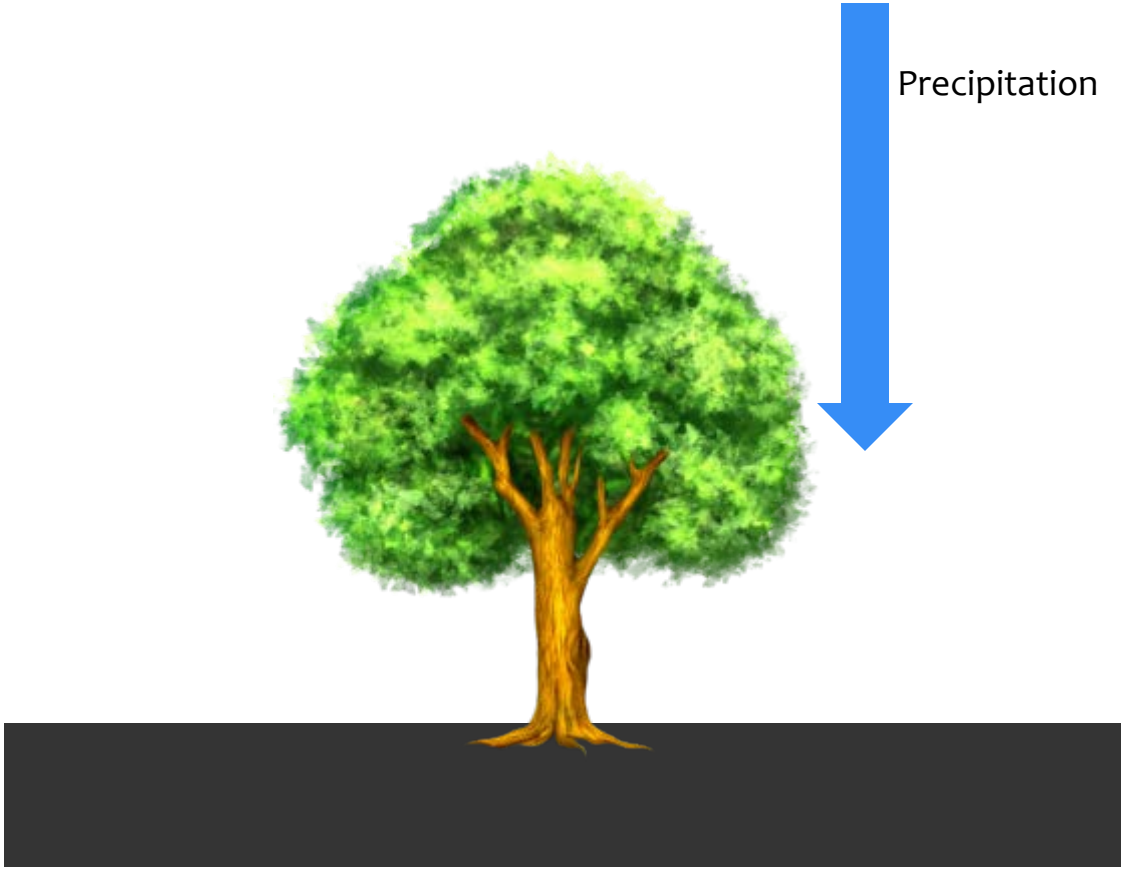
Future predictions of summer precipitation are mixed.

Rain during the growing season may not change a lot.



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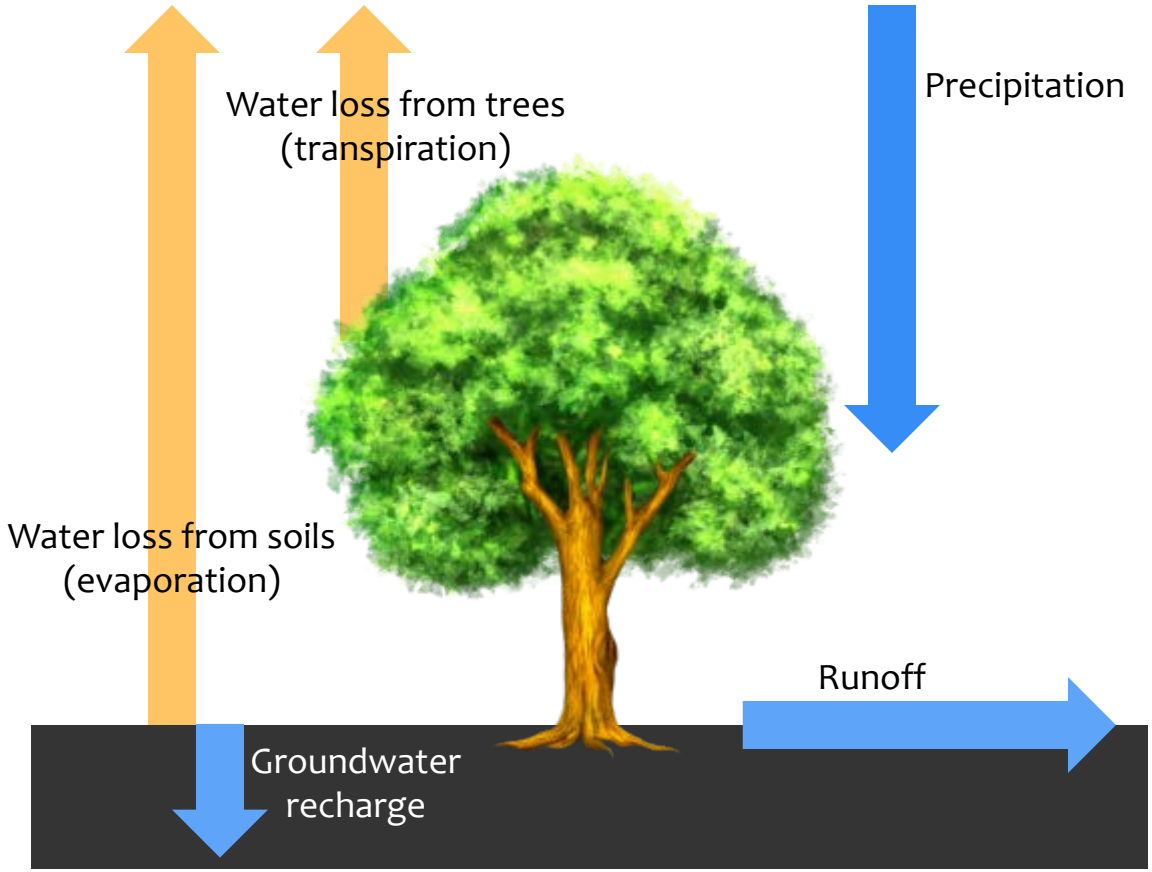

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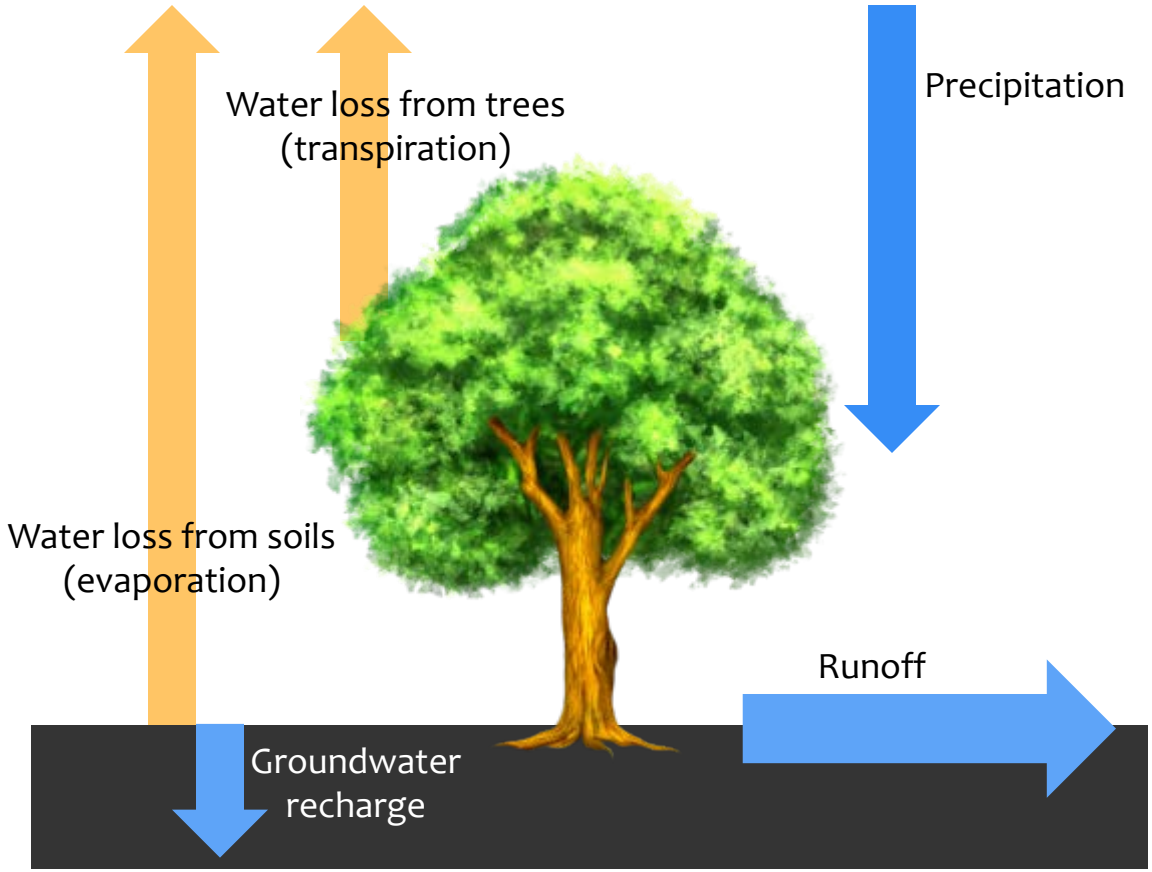

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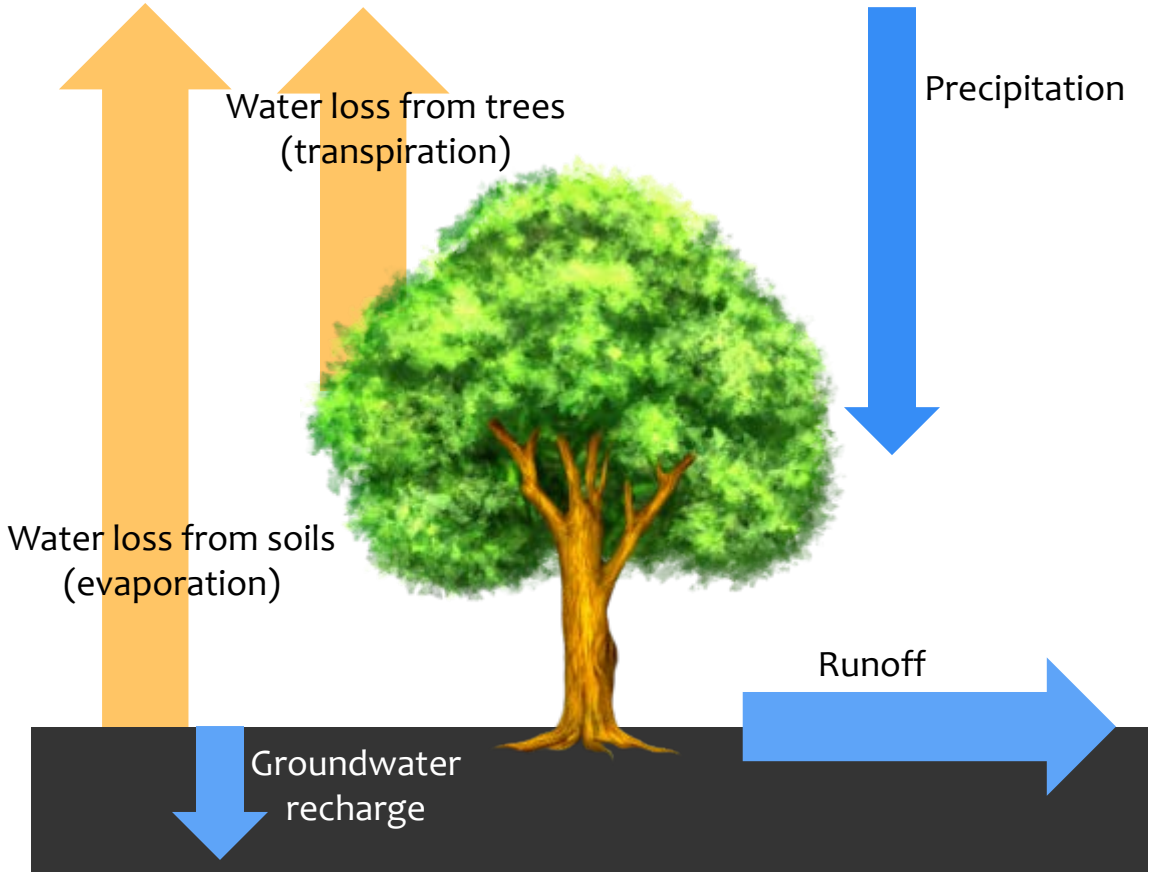
Future predictions of summer precipitation are mixed.

Rain during the growing season may not change a lot.

- Extreme events increase runoff
- Warmer temperatures dry air & soils

Result: Risk of moisture stress & drought



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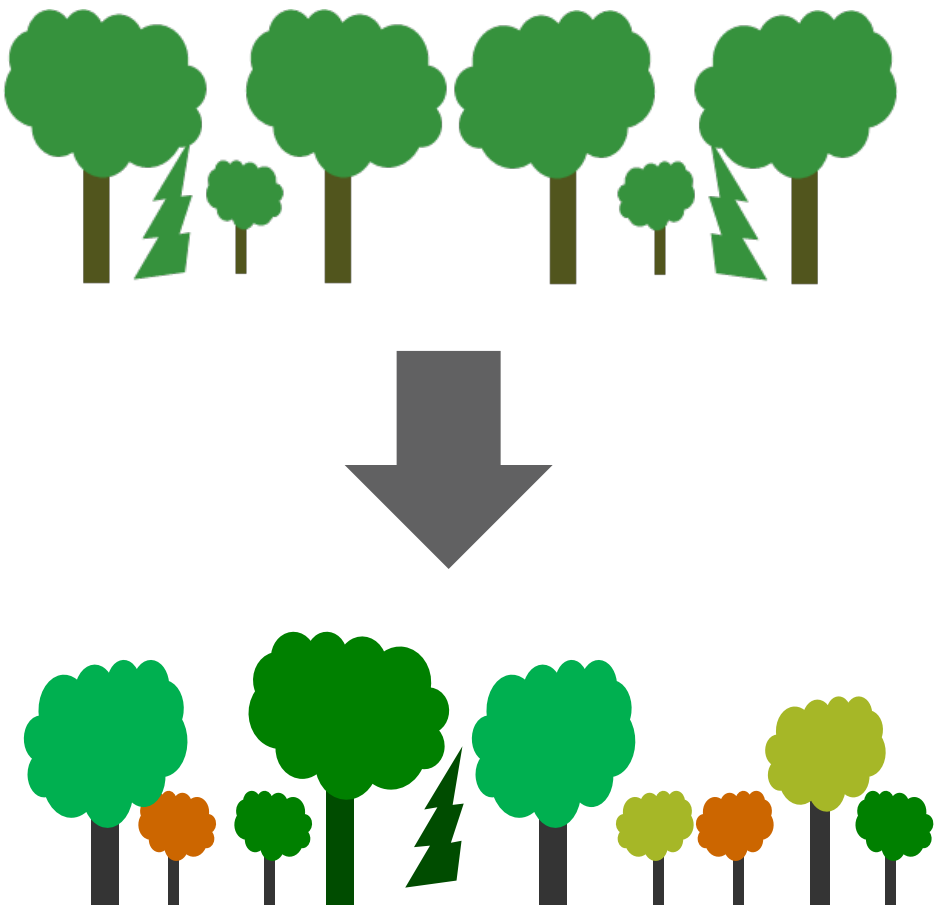
Plant and animal species will respond to changes in climate.

What really matters:

- **Competition**
- **Management**
- **Disturbance**



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Interactions make all the difference.

- Chronic stress
- Disturbances
- Invasive species
- Insect pests
- Forest diseases

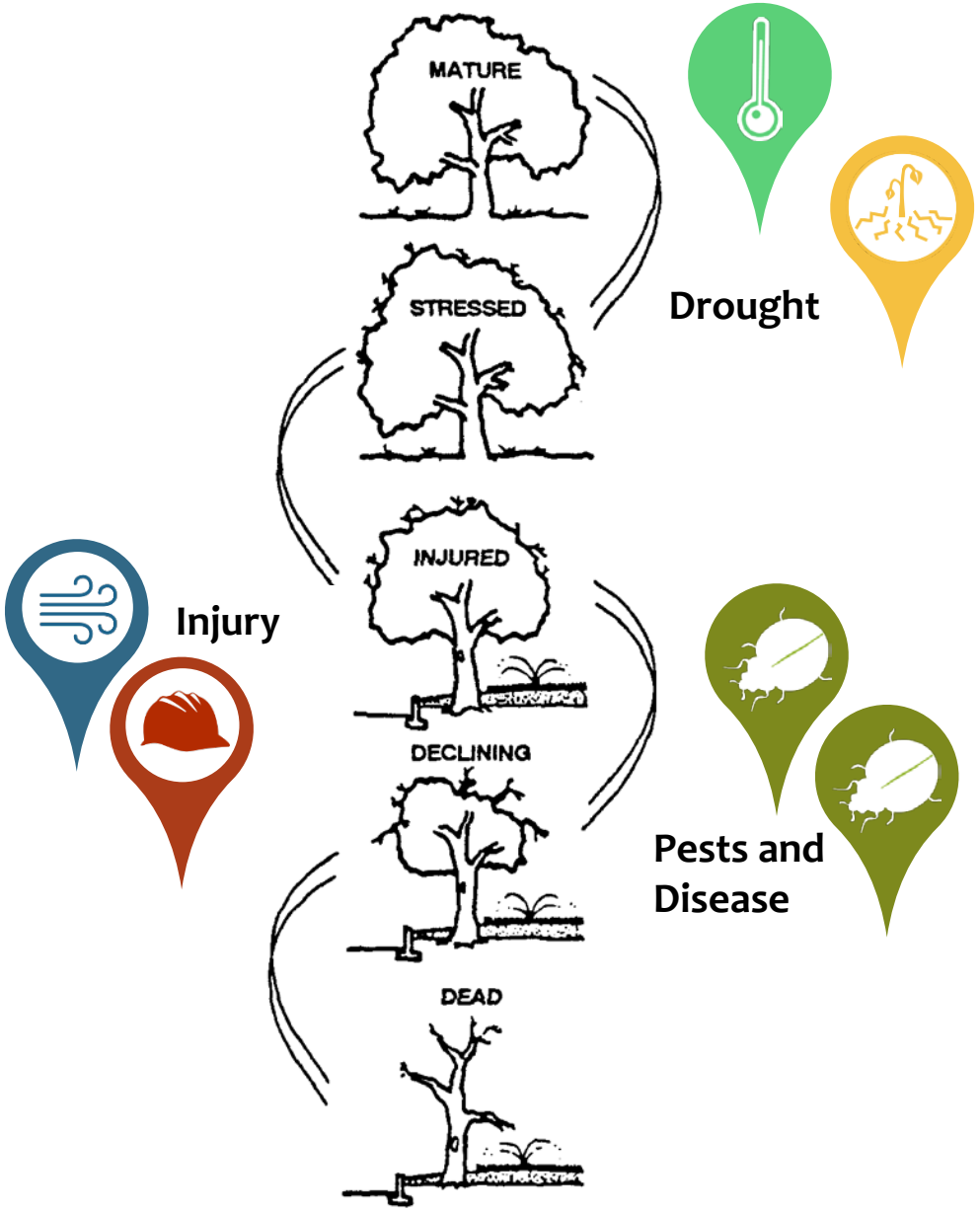


Image: Bartlett Tree Experts

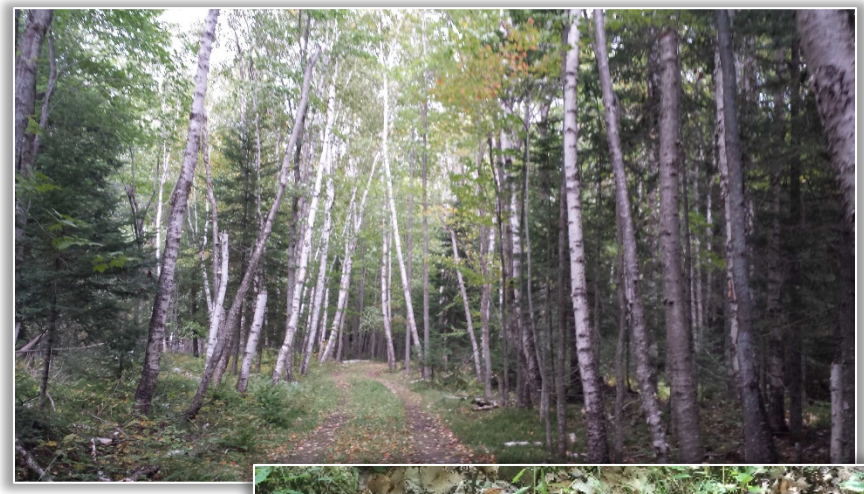

What can you do for your woods?

Improve your wood's defenses against unwanted change.

Protect water and soils on your land.

Good road and trail systems

- Improve access
- Concentrate impacts to designated locations



Stream crossings

- Ensure culverts and bridges can withstand extreme events
- Protects habitat for fish and aquatic organisms
- Protects water quality

Improve your woods' defenses against unwanted change.

Prevent and control non-native plants and weeds.

Early detection and action

- Stress or disturbance from other causes can allow plants to establish or expand
- Become familiar with our local offenders!

Images: Invasives Plants Atlas of New England (www.eddmaps.org)

Improve your woods' defenses against unwanted change.

Improve ability of your trees to resist bugs and disease.

Early detection and action – again!

- Promote healthy and vigorous trees
- Remove unhealthy trees
- Stress or disturbance from other causes can increase risk from pests or diseases
- Specific treatments for different insects and diseases

Images: USFS Northeastern Area, Mass Audubon

Improve your woods' defenses against unwanted change.

Protect rare or sensitive plant and animal communities.

Consider what is special or sensitive in your woods

- Rare plants or plant communities
- Rare animals or unique habitat features
- Streams, creeks, seeps, and other water features
- Wetlands, including seasonal pools

Promote diversity in your woods.

Promote a diversity of tree species and sizes.

Tree species diversity

- Different tree species in case one performs poorly
- Species that are more tolerant of hotter and drier conditions

Tree size diversity reduces risk

- More sizes generally means a variety of ages, including young trees
- Can increase resistance to strong winds

Promote diversity in your woods.

Promote a diversity of tree species and sizes.

Forest management

- Unhealthy trees targeted for removal (worst first)
- Keep trees of less common species
- Keep trees that may do well in future
- Retain good habitat

Promote diversity in your woods.

Promote a diversity of tree species and sizes.

Forest management practices = Thinning

- Removes some trees, providing more space to the remainder

Promote diversity in your woods.

Promote a diversity of tree species and sizes.

Forest management practices = Patch or group selection

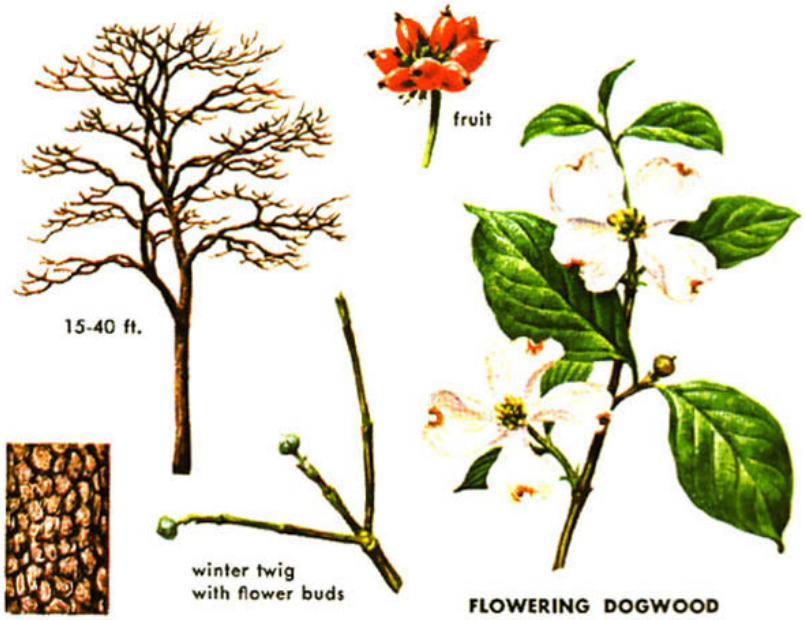
- Removes trees in a more concentrated area to promote small and baby trees

Be pro-active to adapt your woods to changing conditions.

Consider which tree species you might want to promote.

Trees adapted to future conditions

- Match trees to site
- Trees that can take a wide range of conditions
- Trees that can handle hotter and drier conditions



Be pro-active to adapt your woods to changing conditions.

Manage damage to young trees from excessive deer browsing.

Deer look cute but threaten baby trees

- Deterrence – *shoo, deer!*
- Avoidance – less palatable species
- Protection – fenced exclosures, fencing individual trees, tree shelters, piled tree tops
- Repellents – sprays, etc.

Be pro-active to adapt your woods to changing conditions.

Monitor your woods and the effect of different management tactics.

Be observant to changes in your woods

- Look for changes and "weird things"
- Early spring – many invasives green up first
- After big rains – soil erosion, sedimentation, ponding, etc.

- If nothing else: take photos!

Be pro-active to adapt your woods to changing conditions.

Get advice from professionals.

Take advantage of specific expertise

- Consulting foresters
- Wildlife biologists, ecologists
- Agencies – NRCS, state agency
- Land trusts
- University Extension programs
- Lawyers, legal professionals

www.rhodeislandwoods.uri.edu

www.rifco.org

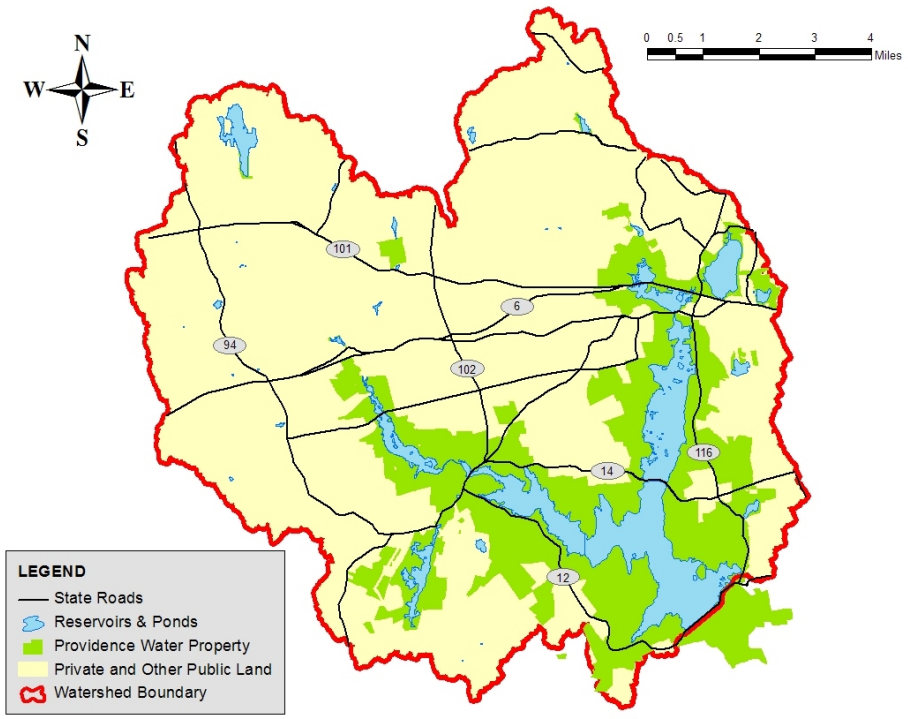
LOCAL EXAMPLE:
PROVIDENCE WATER'S FOREST CLIMATE ADAPTATION PROJECT

Overarching goal of management is to maintain a forest that is adaptive to change and resilient to disturbances that could impact water quality

HOW DID WE COME TO PURSUE THIS PROJECT?

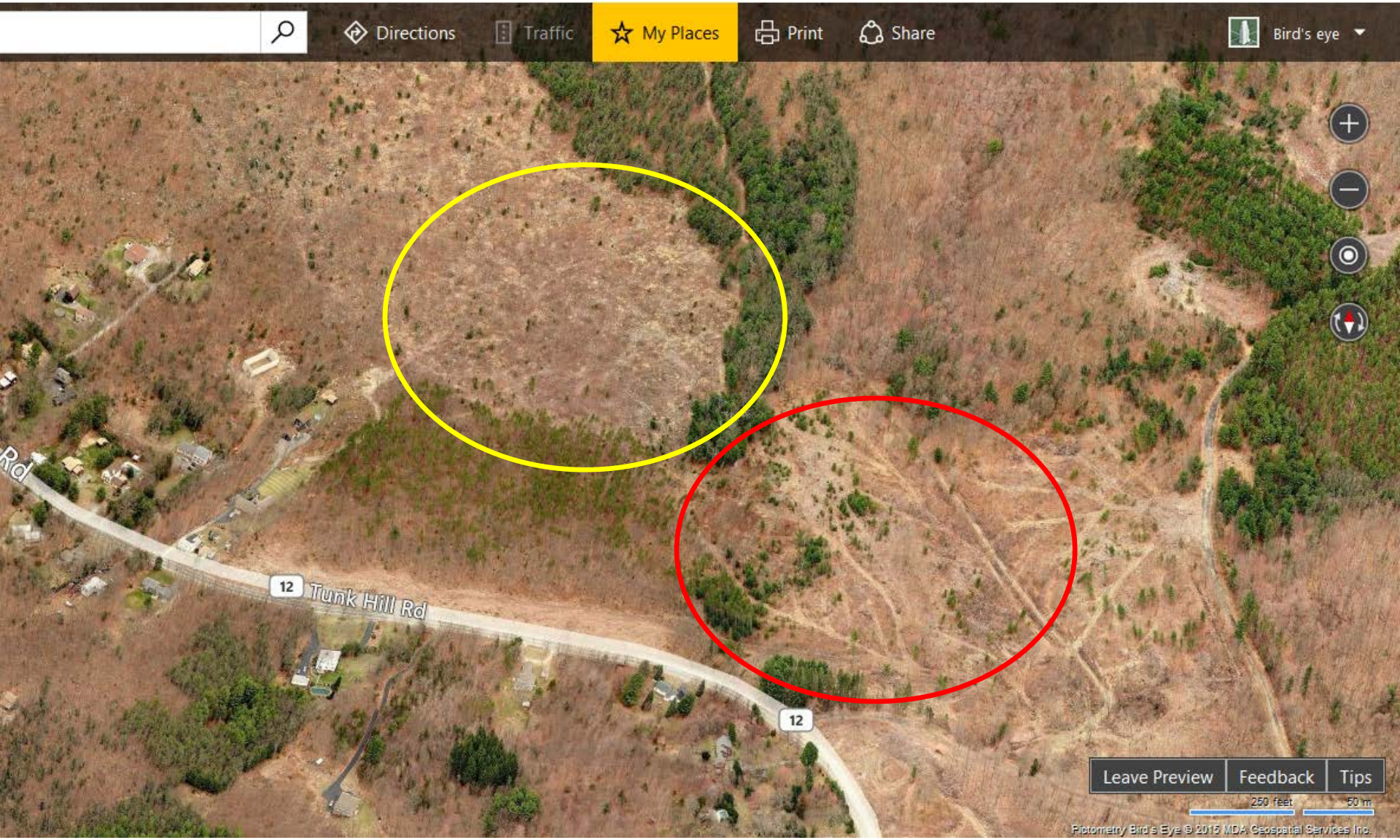
CLIMATE VULNERABILITIES

- Climate change not directly addressed in current forest stewardship plan
- Forest health and regeneration
- Invasive species
- Internal road system (severe storm effects)



HOW DID WE COME TO PURSUE THIS PROJECT?

- Poor upland oak growing site with some young pines
- Following salvage harvest, remaining trees died and regeneration failed to develop
- Drought, defoliation, deer
- What to do with this site?
- Opportunity to experiment with “proactive” strategy



Winter "Bird's Eye" view from a decade ago (Bing Maps)

2015 PLANTING: MIX OF SPECIES DIVIDED DIVIDED EQUALLY BETWEEN TWO SITES

CONIFERS (250 each)

- Eastern red cedar
- Loblolly pine
- Pitch pine
- Shortleaf pine

Native species

Non-native with limited presence

Not currently present

HARDWOODS (100 each)

- Black locust
- Black oak
- Persimmon
- Pin oak
- Sassafras
- Sweetgum
- White oak

Planting: Early May

Watering: Next Day

MONITORING AND RESULTS SO FAR

- Different species planted in an irregular but varied pattern
- Significant seedling mortality from drought immediately following planting
- Survivors are doing OK
- Monitoring height growth of 10 tagged seedlings of each species in both areas
- Annual height measurements planned for at least 5 years
- **Results indicate deer browse is having a major impact**


Tunk Hill Rd
Google
Recent summer aerial view (Google Maps)
Imagery ©2017 Google, Map data ©2017 Google
Terms

CHALLENGES & OPPORTUNITIES

- Deer may take a toll on seedling survival
- Important factors:
  - seedling availability
  - following best practices for planting
  - planting season weather
- Untested and not yet viable from a purely economic perspective
- Some skeptics

- Relatively modest cost
- Example of a proactive on-the-ground action you can take on your land
- Opportunity to engage others on climate change
- Possible benefits from participating in a network of landowners & professionals

QUESTIONS?

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