

Biodiversity and Ecology

(including deer and ticks)

Deer and Tick-Borne Disease Committee

Town of Bethlehem

Oct. 6, 2014

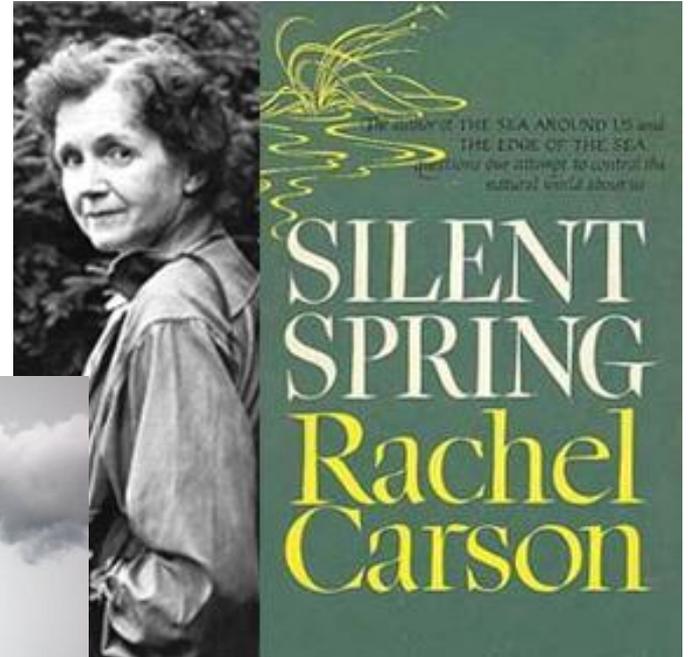
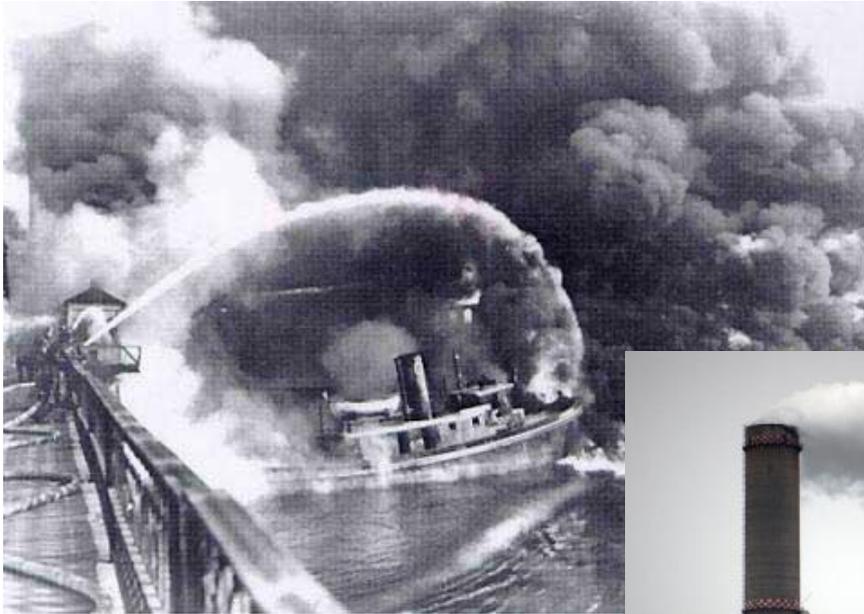
The Old View:

“Nature” is rather savage and we need to tame it



“Wild Animals of New Netherlands”

The Newer View: “Nature” was just great before we wrecked it



The Evolving View: People are a fundamental part of “nature”



Ecology

“Ecology is the study of the relationships between living organisms, including humans, and their physical environment; it seeks to understand the vital connections between plants and animals and the world around them. Ecology also provides information about the benefits of ecosystems and how we can use Earth's resources in ways that leave the environment healthy for future generations...”

-Ecological Society of America (emphasis added)

Ecology provides for an increasingly comprehensive approach to understanding:

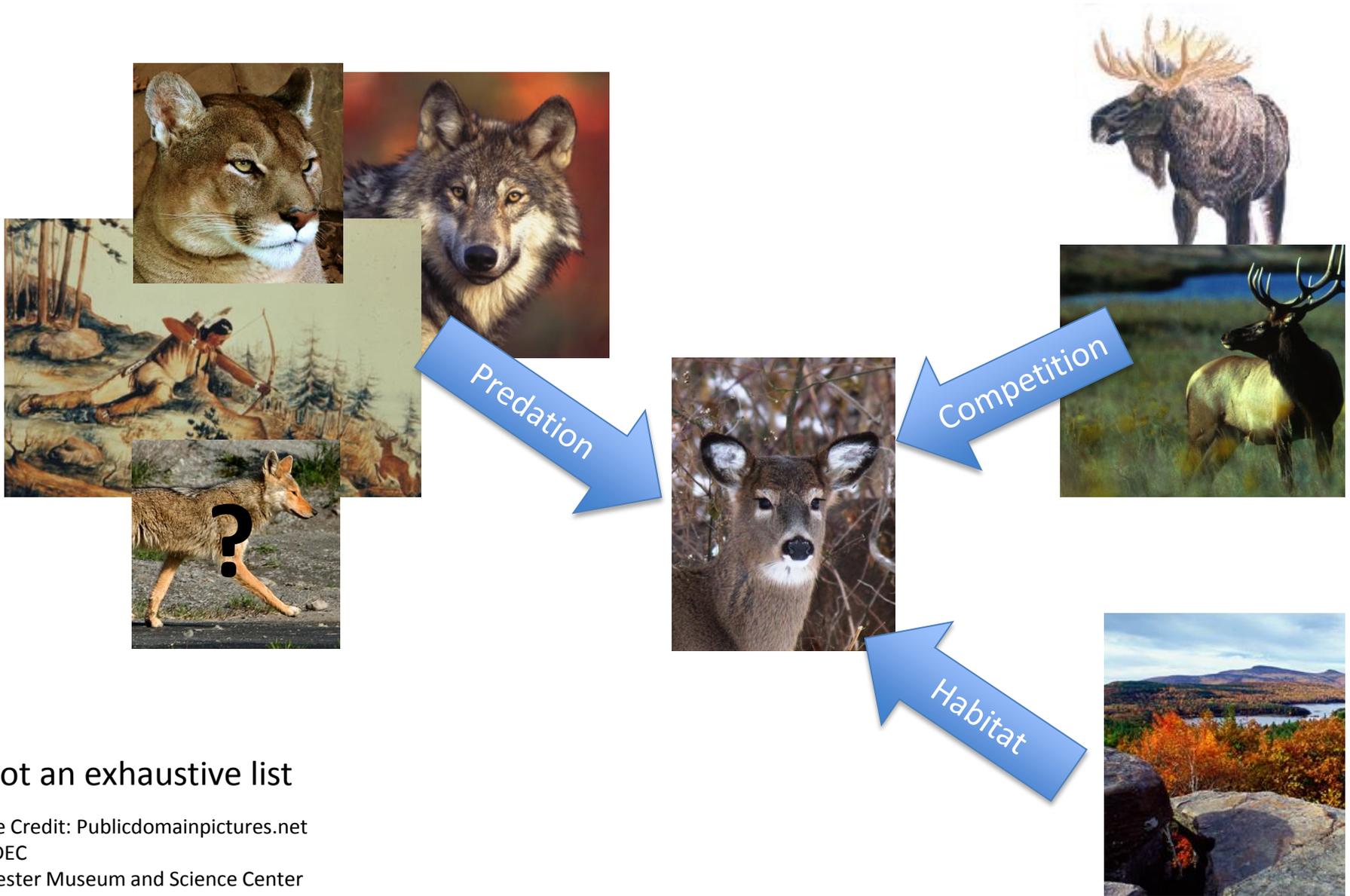
- Population dynamics
- Function of an ecosystem, e.g., ecosystem services
- The true impact of people’s actions (roles and values)

Biodiversity

- Biodiversity is a concept within ecology
- Encompasses the range of variation among living organisms
- How an ecosystem functions depends, in part, on biodiversity
- As a general observation, biodiversity is decreasing...but also changing
- *Among other things, biodiversity partly reflects human values*



Prior Deer Population Control in Bethlehem*

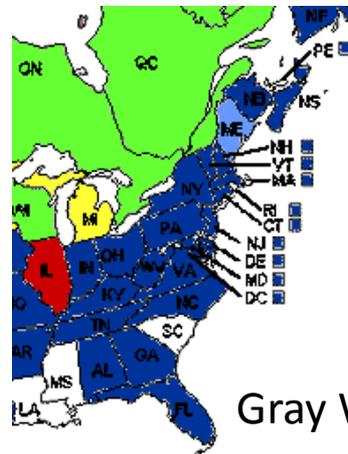


* Not an exhaustive list

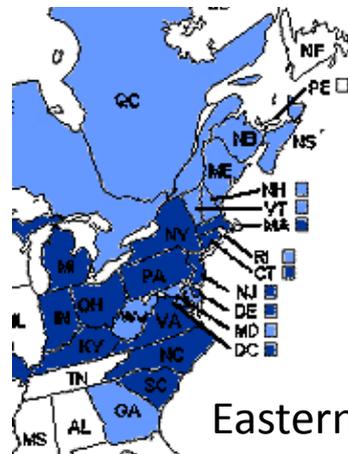
Image Credit: Publicdomainpictures.net
NYS DEC
Rochester Museum and Science Center
USFWS

Predation has decreased

- Most top predators extirpated
- Combination of factors
 - Targeted hunting
 - Habitat loss
- *This reflects human values*



Gray Wolf



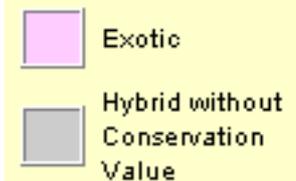
Eastern Cougar

State/Province Conservation Status



Conservation Status

Not Applicable (SNA)

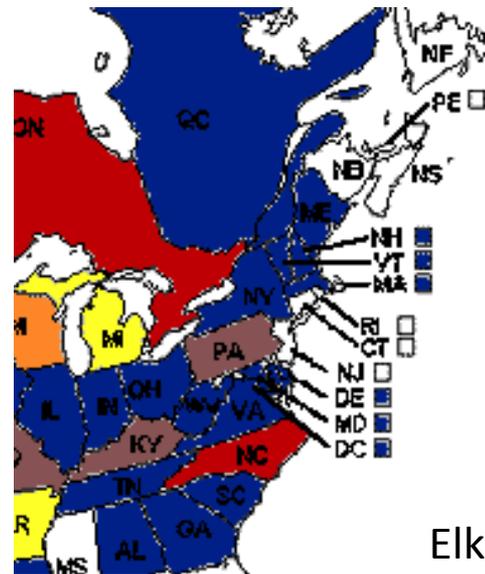


New mortality ('Predation') introduced



Competition has decreased

- Most large competitors extirpated
- Combination of factors
 - Targeted hunting
 - Habitat loss
- *This reflects human values*

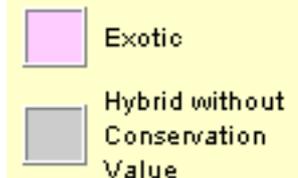


State/Province Conservation Status



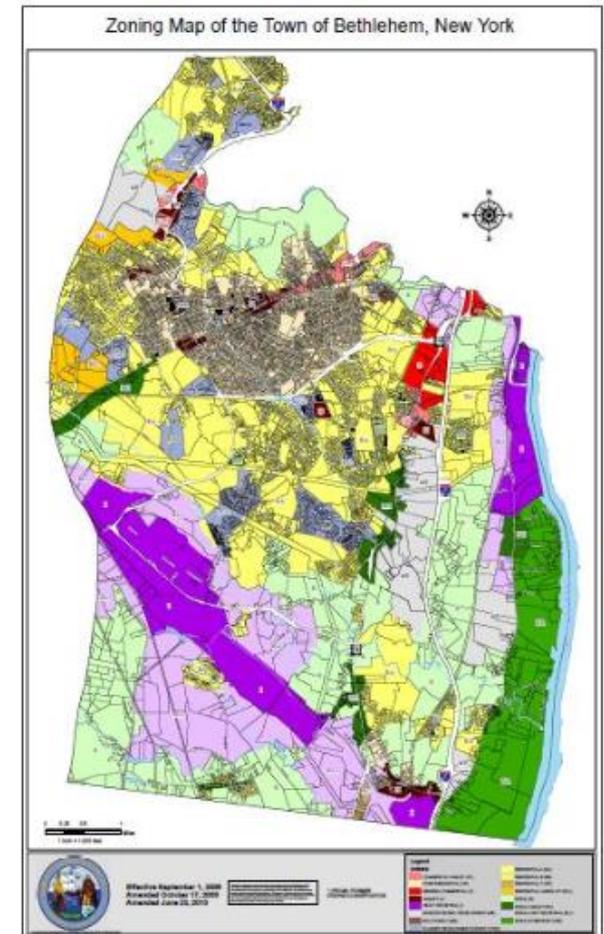
Conservation Status

Not Applicable (SNA)

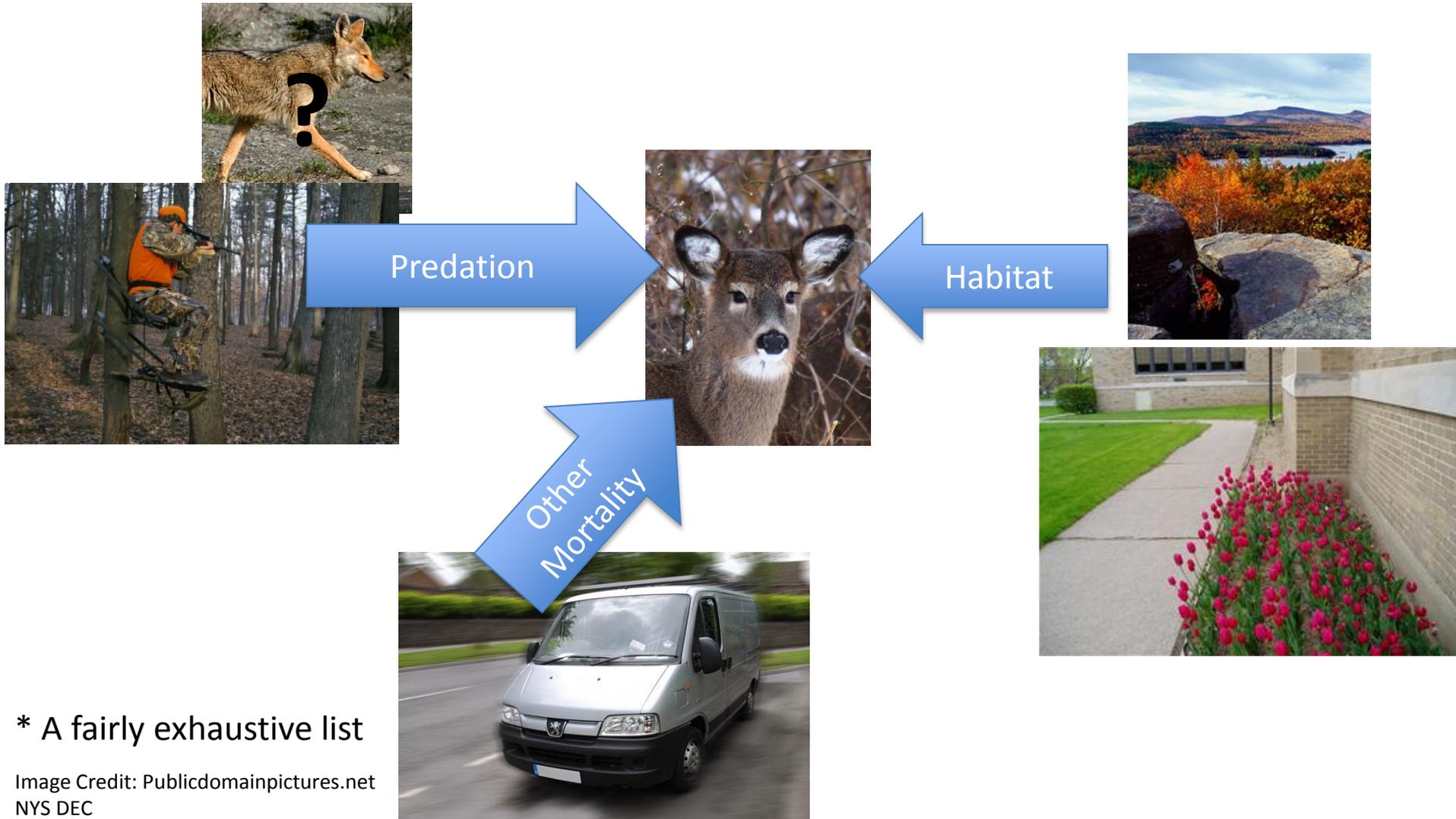


Deer habitat has increased

- Much of the former forest has been converted to agriculture, housing, other uses
- *This reflects human values*



Current Deer Population Control in Bethlehem*



* A fairly exhaustive list

Image Credit: Publicdomainpictures.net

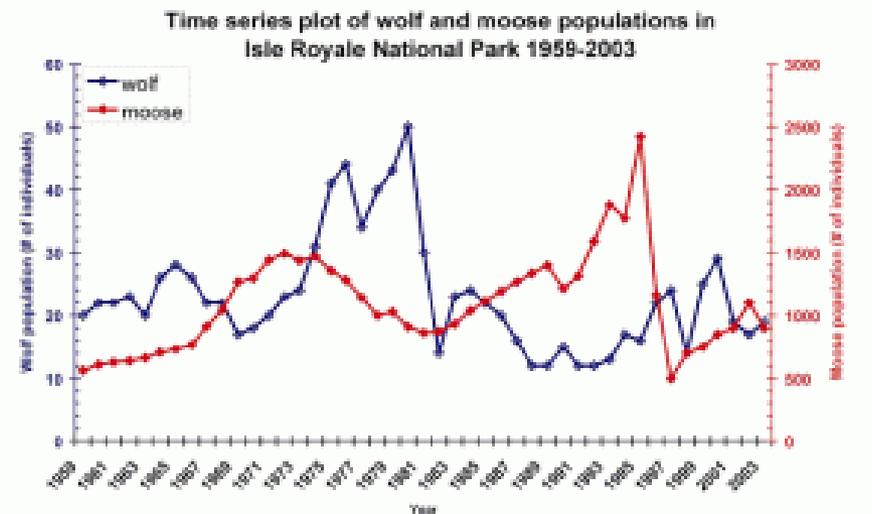
NYS DEC

USFWS

Town of Bethlehem, NY

Practical Considerations

- Population dynamics:
Nothing happens overnight, or as expected
 - Populations usually take time to respond, and they rebound
 - Systems are complex and responding to factors we haven't thought of yet
 - Populations are dynamic – sometimes they adapt!



Frontiers of Science. Based on data from D. W. Smith, R. O. Peterson, and D. B. Houston, "Yellow Stone After Wolves," *BioScience* 53, no. 4 (2003): 330-41; and from McLaren, B. E., and R. O. Peterson, "Wolves, Moose, and Tree Rings on Isle Royale," *Science* 266, no. 5190 (1994): 1555-58. © 2007 The Trustees of Columbia University.

Practical Considerations

- Ecosystem function and the law of unintended consequences
 - What new challenges will be created by our solutions?
 - Where are we working at cross-purposes?



Conventional Subdivision



Conservation Subdivision

Thanks for the habitat!



Practical Considerations

- Human roles and values: We still need to live....work....play....and grow!
 - What are our primary values?
 - How do we as a town view nature and our role in it?

