www.climateconservation.org

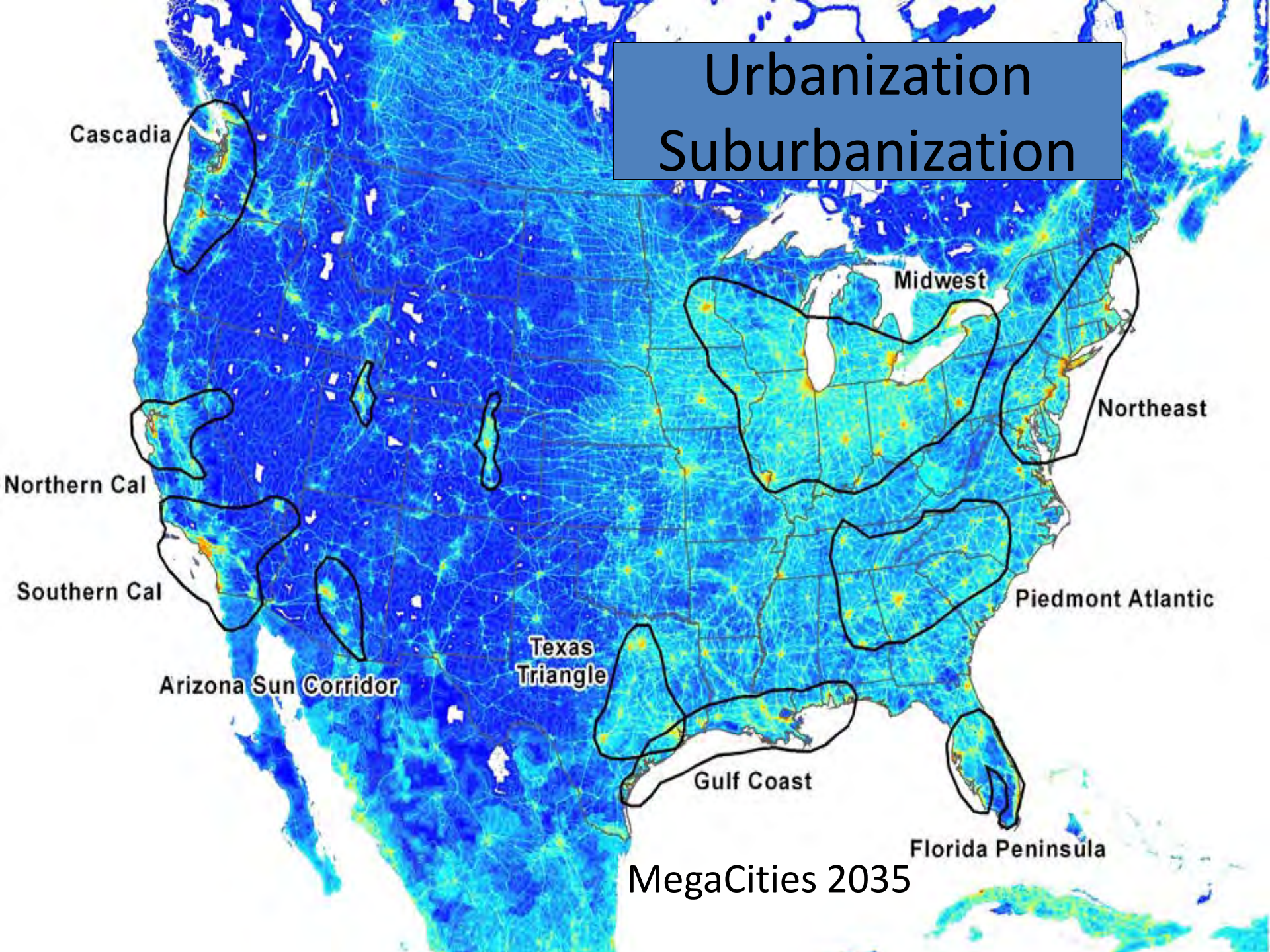

# Large Landscape Conservation: a Local and Global Imperative

## 2013 RCP Network Gathering

## Nashua, New Hampshire

Gary M. Tabor VMD MES
gary@climateconservation.org


MIDTOWN
CHELSEA
GREENWICH VILLAGE
ALPHABET CITY
SOHO
CHINATOWN
TRIBECA
FINANCIAL DISTRICT


Urbanization
Suburbanization
Cascadia
Midwest
Northeast
Northern Cal
Southern Cal
Piedmont Atlantic
Texas
Triangle
Arizona Sun Corridor
Gulf Coast
Florida Peninsula
MegaCities 2035

# NORTHERN FOREST LANDS STUDY

USDA FOREST SERVICE AND
GOVERNORS' TASK FORCE ON
NORTHERN FOREST LANDS

APRIL 1990

Northern
Forest
Alliance

# Northern Forest Lands Council

# Northern Forest Center Networks & Programs

Northern Forest Center

The Center advocates for the Northern Forest region and helps its communities benefit from forest-based economic and conservation initiatives.

The Center delivers on its mission by collaborating with a wide range of public and private partners across the region. Together we are creating a new generation of conservation tools that can provide economic incentives for good long-term forest stewardship while simultaneously reinvigorating the region's economy.

This map tells the story of the work we do—with our many partners—and where it is delivering benefits to the people and communities of the Northern Forest. The legend categorizes the people we work with and ongoing projects into 7 types of work. Every star on the map represents a partner or participant in a significant project; every circle represents a workshop; every triangle represents a project. Five large geographic areas are outlined to show where significant programs are focused.

## The Center's Programs:

**Generate Returns** for communities, businesses, and landowners using the forested landscape sustainably for:
- Wood Products
- Renewable Energy from Biomass
- Ecosystem Services
- Tourism

**Build Capacity** across the region through:
- Coordinated Public Policy
- Targeted public and private investment
- Strong, collaborative networks

**Demonstrate Success** through specific place-based projects that integrate multiple strategies:
- Community Forests
- Androscoggin Valley–Mahoosuc Region Pilot

CANADA

MAINE

NEW YORK

VERMONT

NEW HAMPSHIRE

Caribou
Ashland
Mt. Katahdin
Millinocket
Piscataquis County
Greenville
Monson
Springfield
Dover-Foxcroft
Calais
Grand Lake Stream
Washington County
Machias
Stratton
Carrabassett Valley
Rangeley
Hartland
Orono
Bangor
New Vineyard
Farmington
Franklin County
Rumford
Errol
Berlin
Newry
Gorham
Bethel
Fayette
Livermore
AUGUSTA
Belfast
Searsmont
Appleton
Jefferson
Buckfield
Turner
Norway
West Gardiner
Auburn
Lewiston
Lisbon Falls
Wiscasset
Nobleboro
Warren
Brunswick
Bath
Harpswell
Yarmouth
Portland
Massena
Highgate
Richford
Newport
Coaticook
Craftsbury Common
Lyndon
St. Johnsbury
Danville
Colchester
Winooski
Burlington
Essex Jct.
Stowe
Waterbury
Willsboro
Shelburne
Westport
Elizabethtown
Paul Smiths
Saranac Lake
Ray Brook
Lake Placid
Tupper Lake
Watertown
Mineville
Bristol
New Haven
Waitsfield
MONTPELIER
Northfield Falls
Northfield
Warren
Bethlehem
Lisbon
North Haverhill
Middlebury
Corinth
Randolph
Thetford Center
Fairlee
Lyme
South Royalton
Lincoln
Center Conway
Fryeburg
Wonalancet
Ashland
Plymouth
Hanover
Rutland
Lowville
Blue Mtn Lake
Inlet
Old Forge
Boonville
Utica
Dolgeville
Frankfort
Lake George
Glens Falls
Fort Edward
Granville
Danby
Ludlow
Rockingham
Greenwich
Danbury
New London
CONCORD
Chichester
Rollinsford
Bow
Northwood
Durham
Manchester

## Legend

### The People We Work With & Serve—
Partners, Collaborators & Participants

- Ecosystem Services
- Biomass
- Policy
- Sustainable Forestry & Innovation
- Investment
- Tourism
- Community Forests

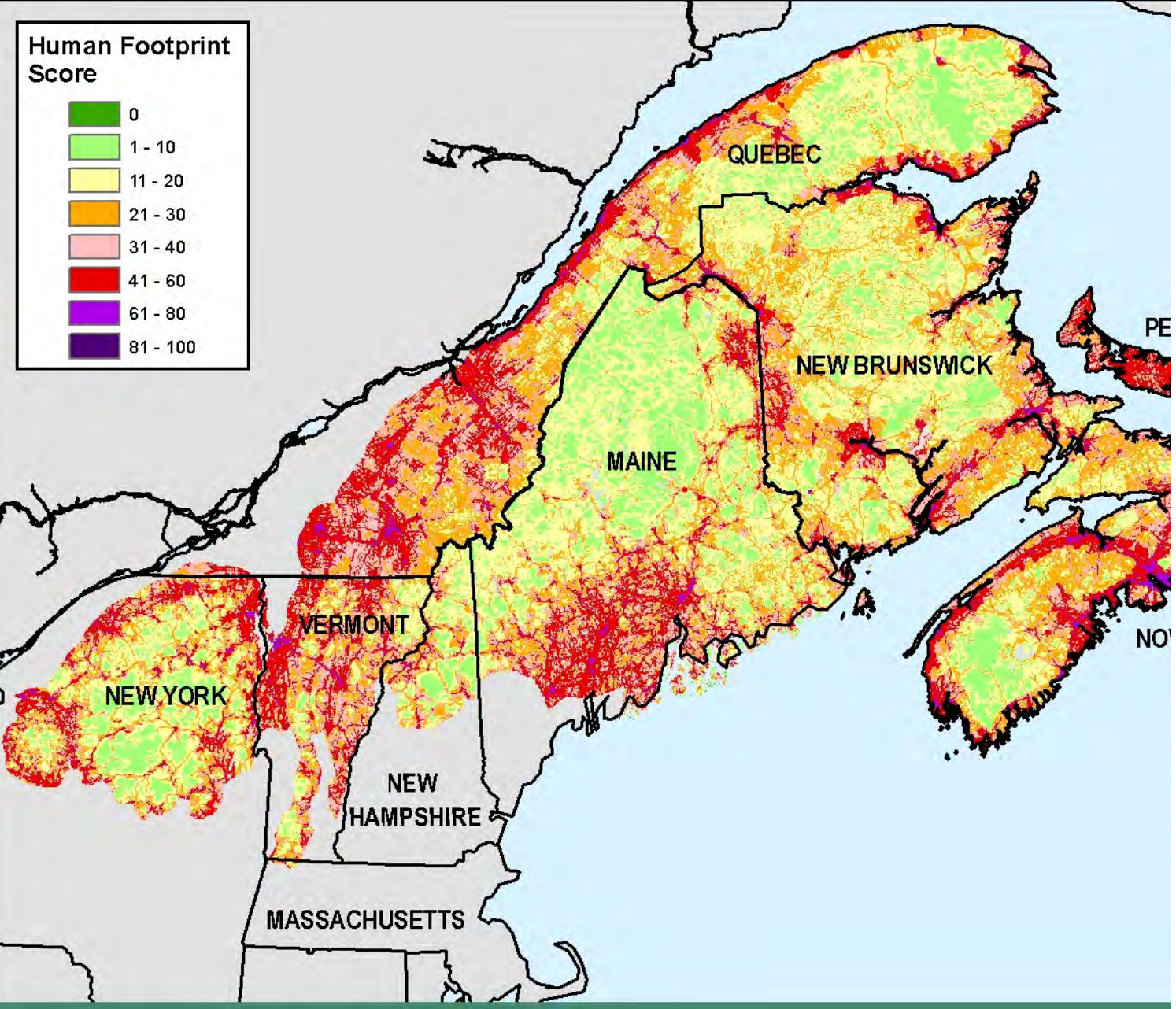
### The Places We Work

- Communities The Center has helped with Biomass Energy
- Workshops on Innovations in Wood Product Manufacturing
- Workshop Trainings for Tourism Businesses
- Locations of Community Forest Projects
- Workshops about Community Forests
- Communities visited by Ways of the Woods

*Projects serving or taking place across large geographic areas are outlined and numbered, as follows:*

1. Upper Connecticut River Watershed, N.H. & Vermont

Community GIS




Two Countries One Forest

Deux Pays Une Forêt

reinventing conservation for the 21st century

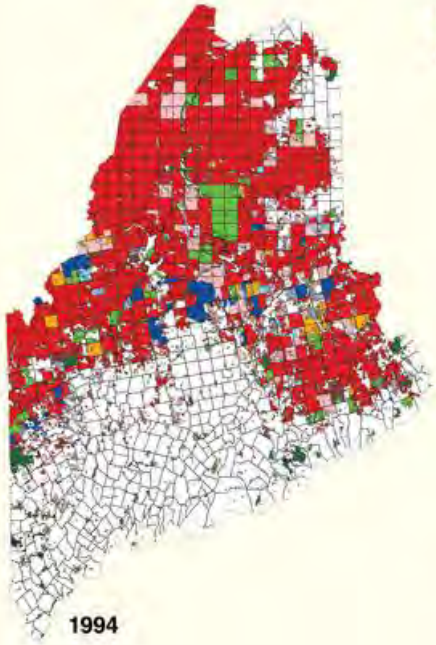
WILDLIFE CONSERVATION SOCIETY

# NORTHERN APPALACHIANS HUMAN FOOTPRINT

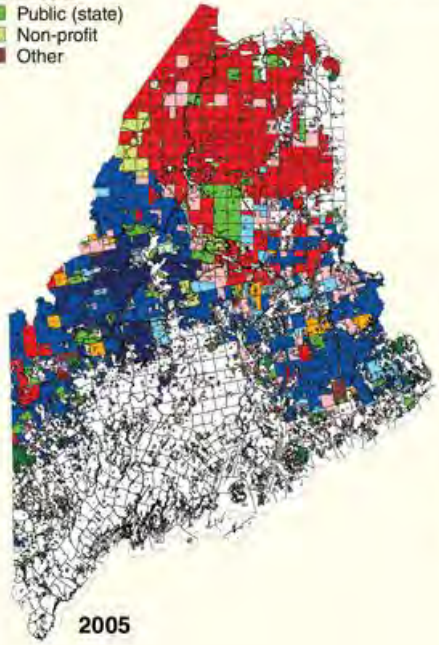
## Changes in Forest Ownership in Northern Maine

**Traditional ownership types**
- Industry
- Old-line family
- Individual/family
- Tribal
- Federal
- Public (state)
- Non-profit
- Other

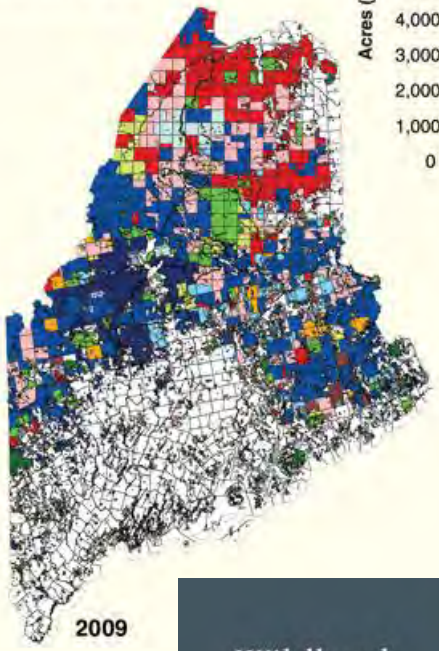
**Emerging ownership types**
- REIT
- Financial investor
- Developer
- Contractor/new timber baron



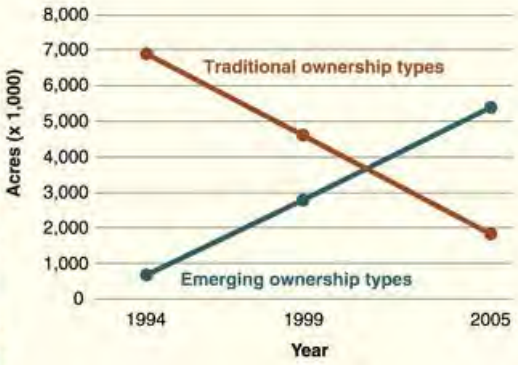
1994

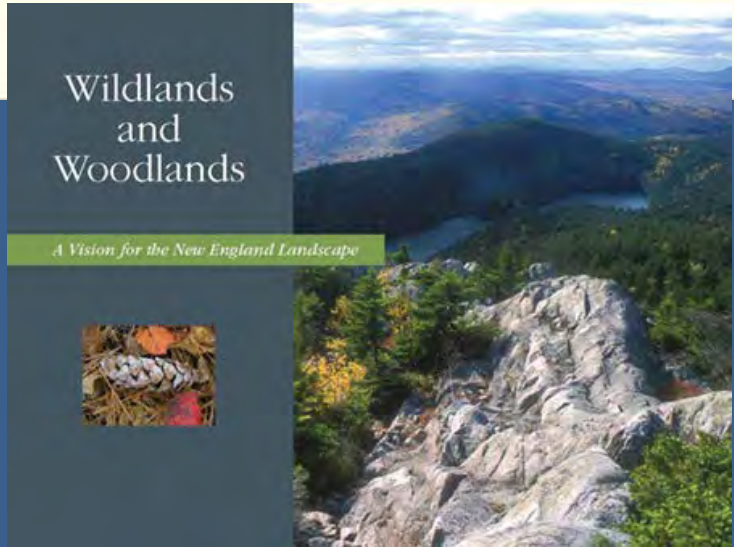


2005



2009



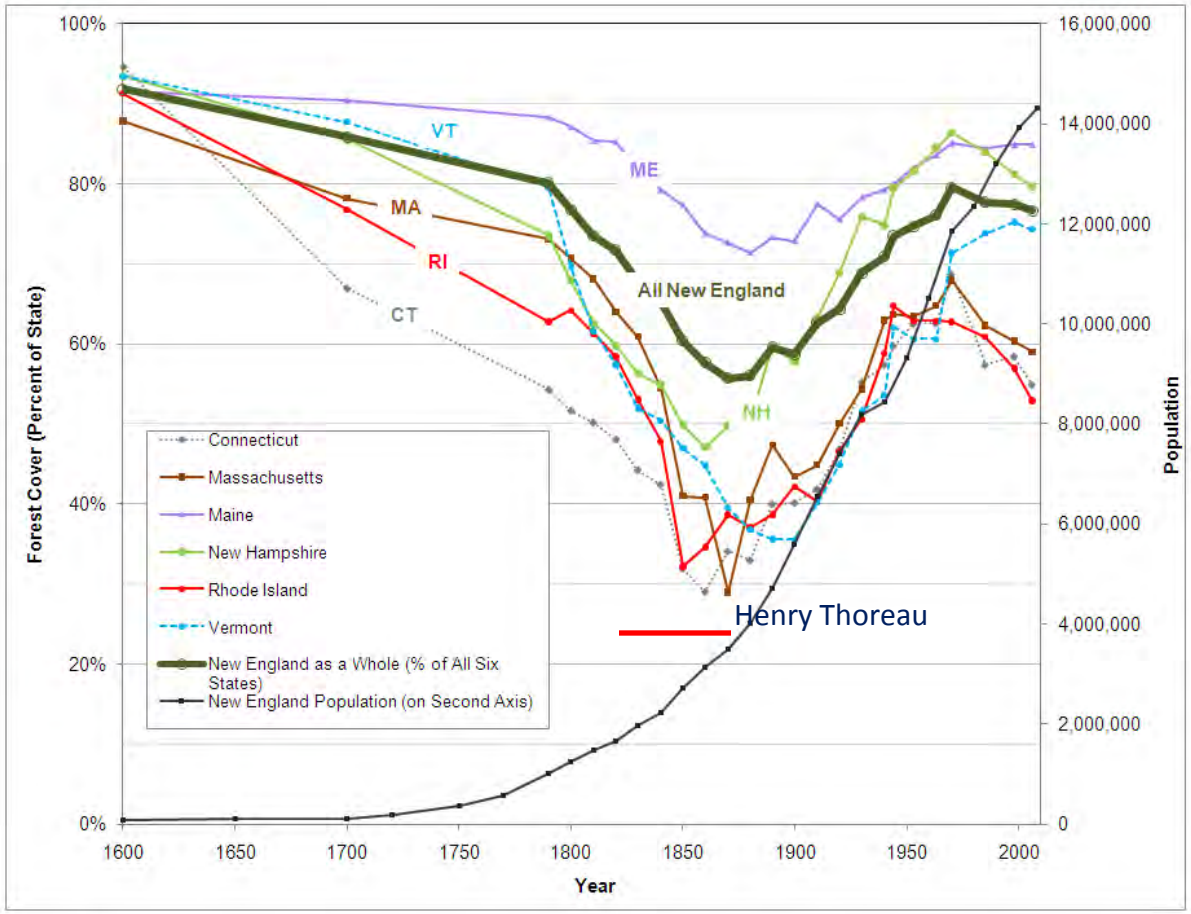
# New England Forests:
# A Second Deforestation is Underway

**1880** – Agriculture dominated

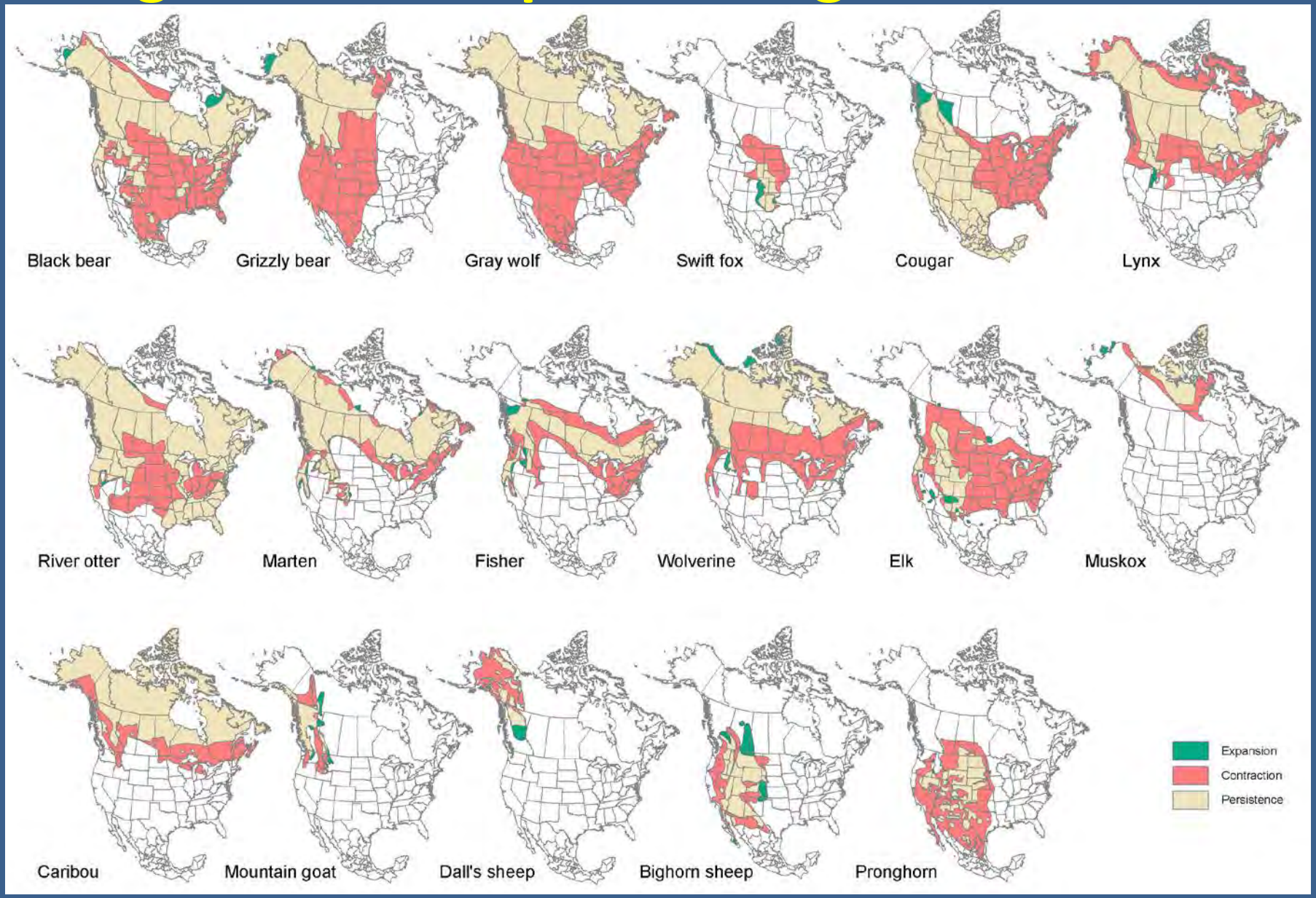
**2010** – Forest dominated

**2060** – ???

## Forest Cover and Population Trends in New England



# Large mammal species range contractions




Source: Laliberte and Ripple 2004


HISTORIC RANGE
1922 RANGE IN U.S. ONLY
CURRENT RANGE


CALIFORNIA REPUBLIC

REVIEW

doi:10.1038/nature11018

# Approaching a state shift in Earth's biosphere

Anthony D. Barnosky[1,2,3], Elizabeth A. Hadly[4], Jordi Bascompte[5], Eric L. Berlow[6], James H. Brown[7], Mikael Fortelius[8], Wayne M. Getz[9], John Harte[9,10], Alan Hastings[11], Pablo A. Marquet[12,13,14,15], Neo D. Martinez[16], Arne Mooers[17], Peter Roopnarine[18], Geerat Vermeij[19], John W. Williams[20], Rosemary Gillespie[9], Justin Kitzes[9], Charles Marshall[1,2], Nicholas Matzke[1], David P. Mindell[21], Eloy Revilla[22] & Adam B. Smith[23]

**Localized ecological systems are known to shift abruptly and irreversibly from one state to another when they are forced across critical thresholds. Here we review evidence that the global ecosystem as a whole can react in the same way and is approaching a planetary-scale critical transition as a result of human influence. The plausibility of a planetary-scale 'tipping point' highlights the need to improve biological forecasting by detecting early warning signs of critical transitions on global as well as local scales, and by detecting feedbacks that promote such transitions. It is also necessary to address root causes of how humans are forcing biological changes.**

BBC News Sport Weather Capital Culture Autos

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26 September 2013 Last updated at 15:35 ET

Share

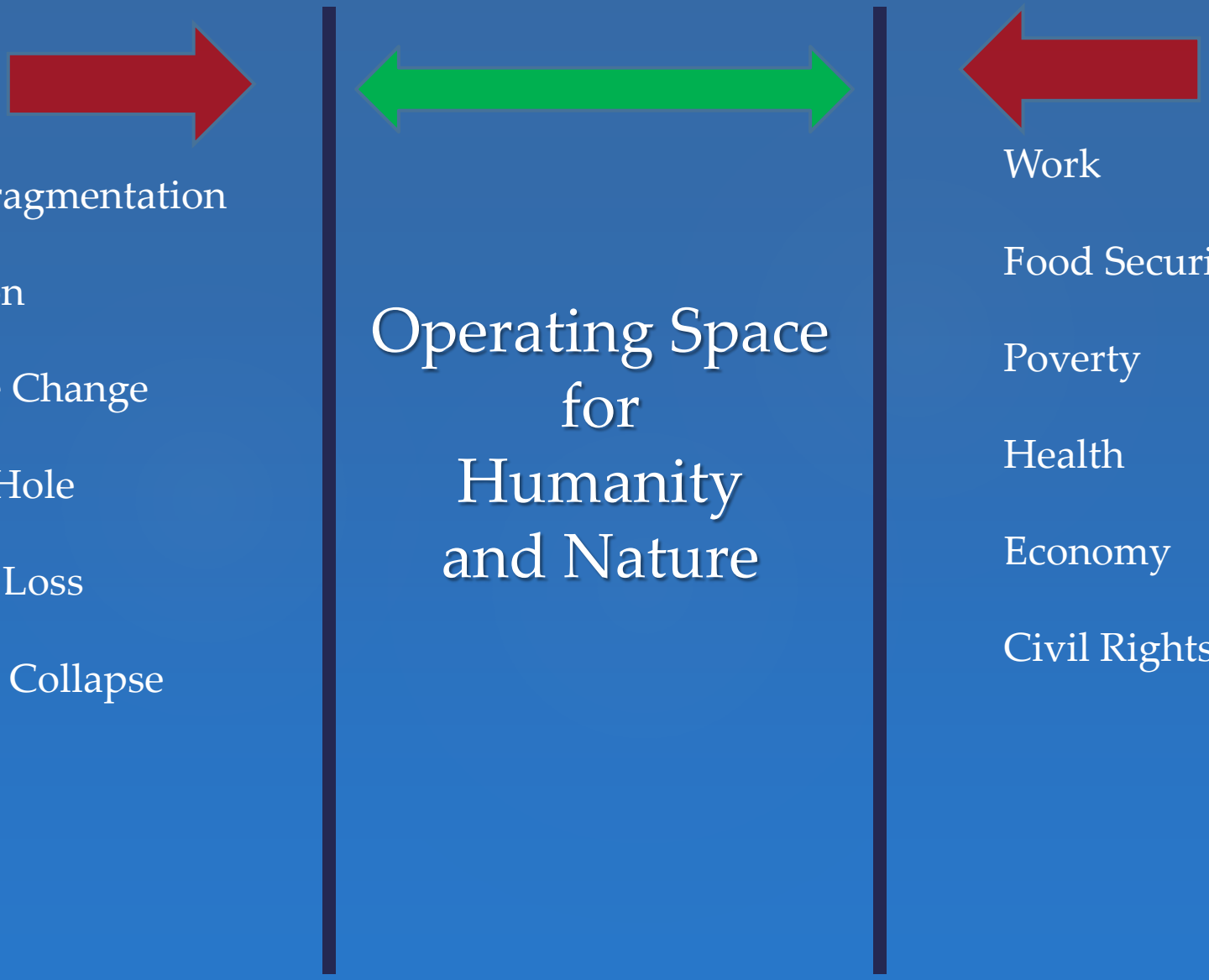
# Forest fragmentation triggers 'ecological Armageddon'

# Near-Complete Extinction of Native Small Mammal Fauna 25 Years After Forest Fragmentation

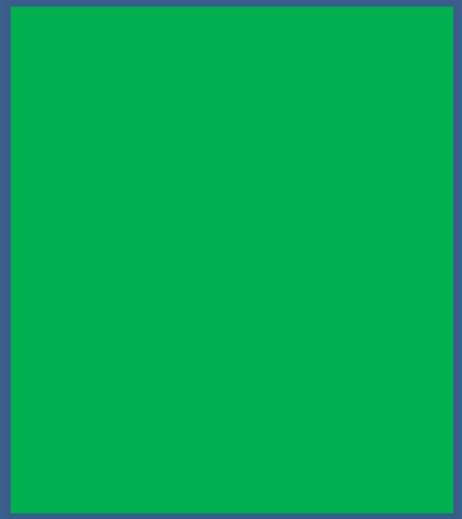
Luke Gibson,[1*] Antony J. Lynam,[2] Corey J. A. Bradshaw,[3] Fangliang He,[4,5*] David P. Bickford,[1*] David S. Woodruff,[6] Sara Bumrungsri,[7] William F. Laurance[8]

Tropical forests continue to be felled and fragmented around the world. A key question is how rapidly species disappear from forest fragments and how quickly humans must restore forest connectivity to minimize extinctions. We surveyed small mammals on forest islands in Chiew Larn Reservoir in Thailand 5 to 7 and 25 to 26 years after isolation and observed the near-total loss of native small mammals within 5 years from <10-hectare (ha) fragments and within 25 years from 10- to 56-ha fragments. Based on our results, we developed an island biogeographic model and estimated mean extinction half-life (50% of resident species disappearing) to be 13.9 years. These catastrophic extinctions were probably partly driven by an invasive rat species; such biotic invasions are becoming increasingly common in human-modified landscapes. Our results are thus particularly relevant to other fragmented forest landscapes and suggest that small fragments are potentially even more vulnerable to biodiversity loss than previously thought.

27 SEPTEMBER 2013 VOL 341 SCIENCE www.sciencemag.org




Adapted from Rockstrom et al. 2009



# Thinking Out of the Box:

1872 Solution

Yellowstone Postage Stamp

# Yellowstone National Park
# Targhee National Forest Boundary

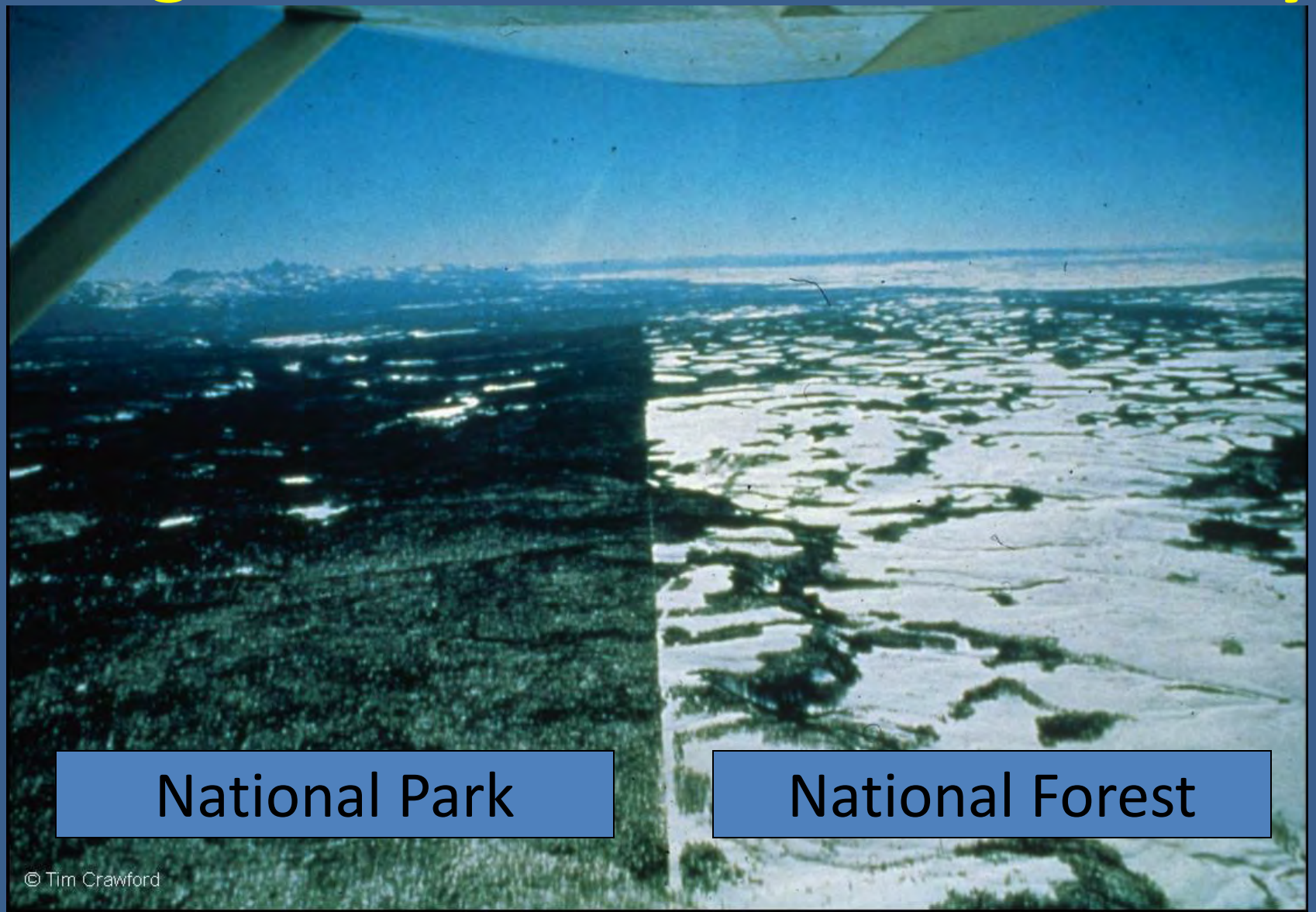
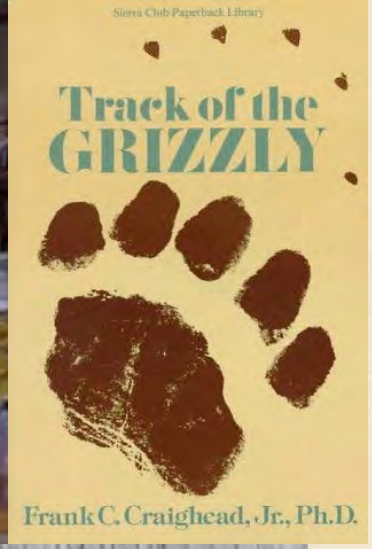
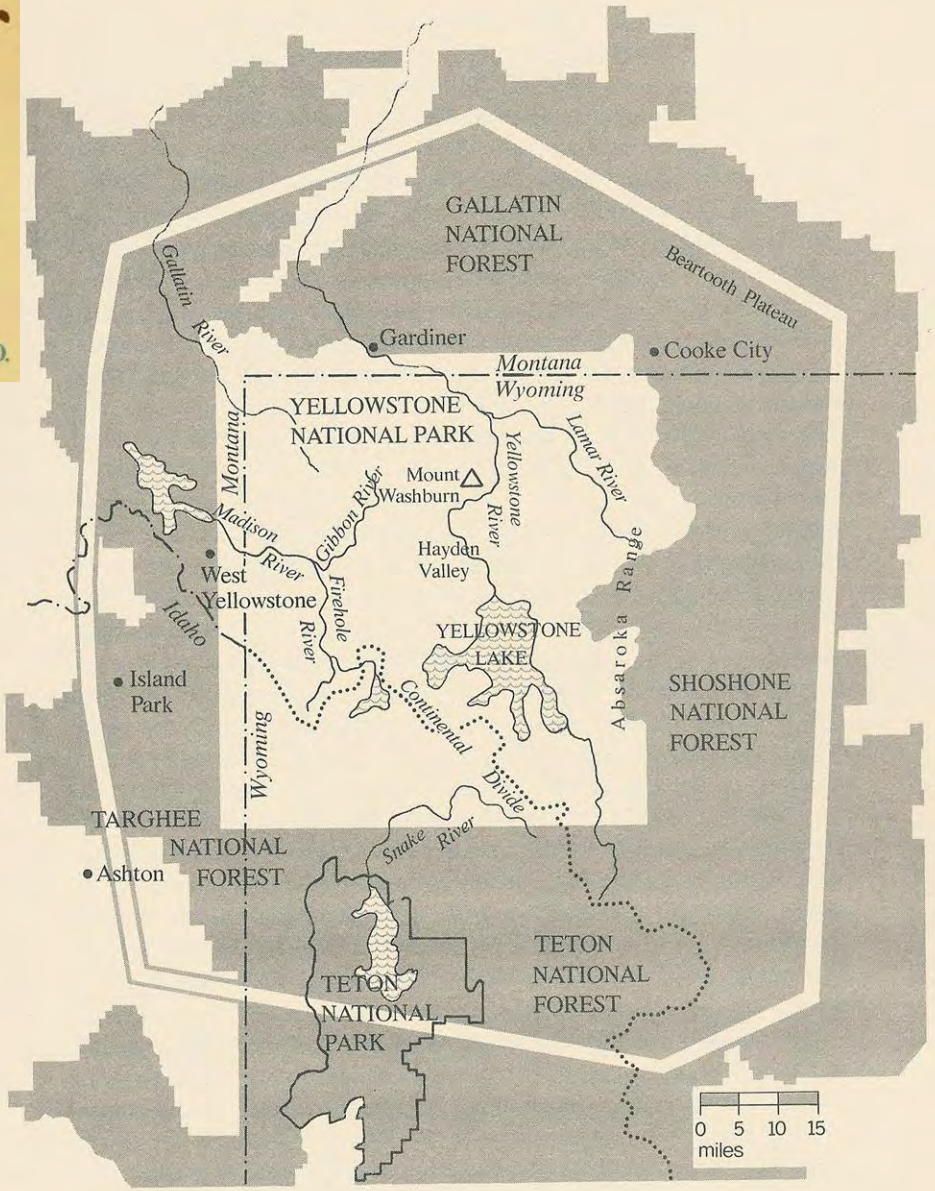
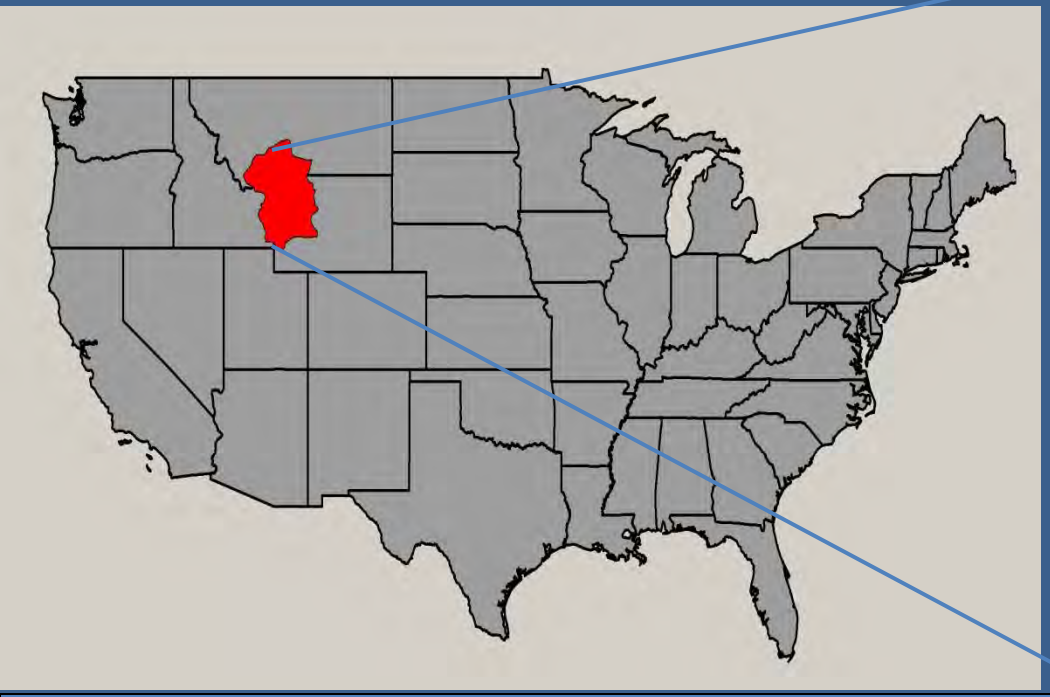


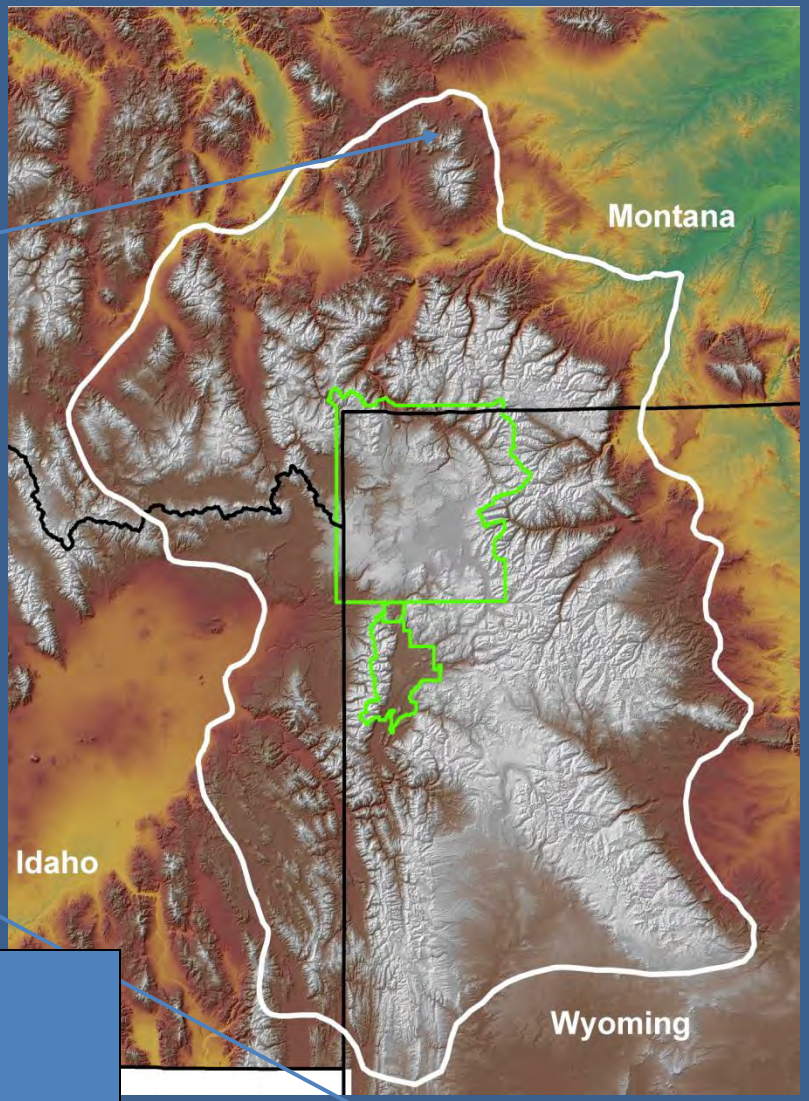
Photo:
Gary Tabor


Sierra Club Paperback Library
Track of the
GRIZZLY
Frank C. Craighead, Jr., Ph.D.

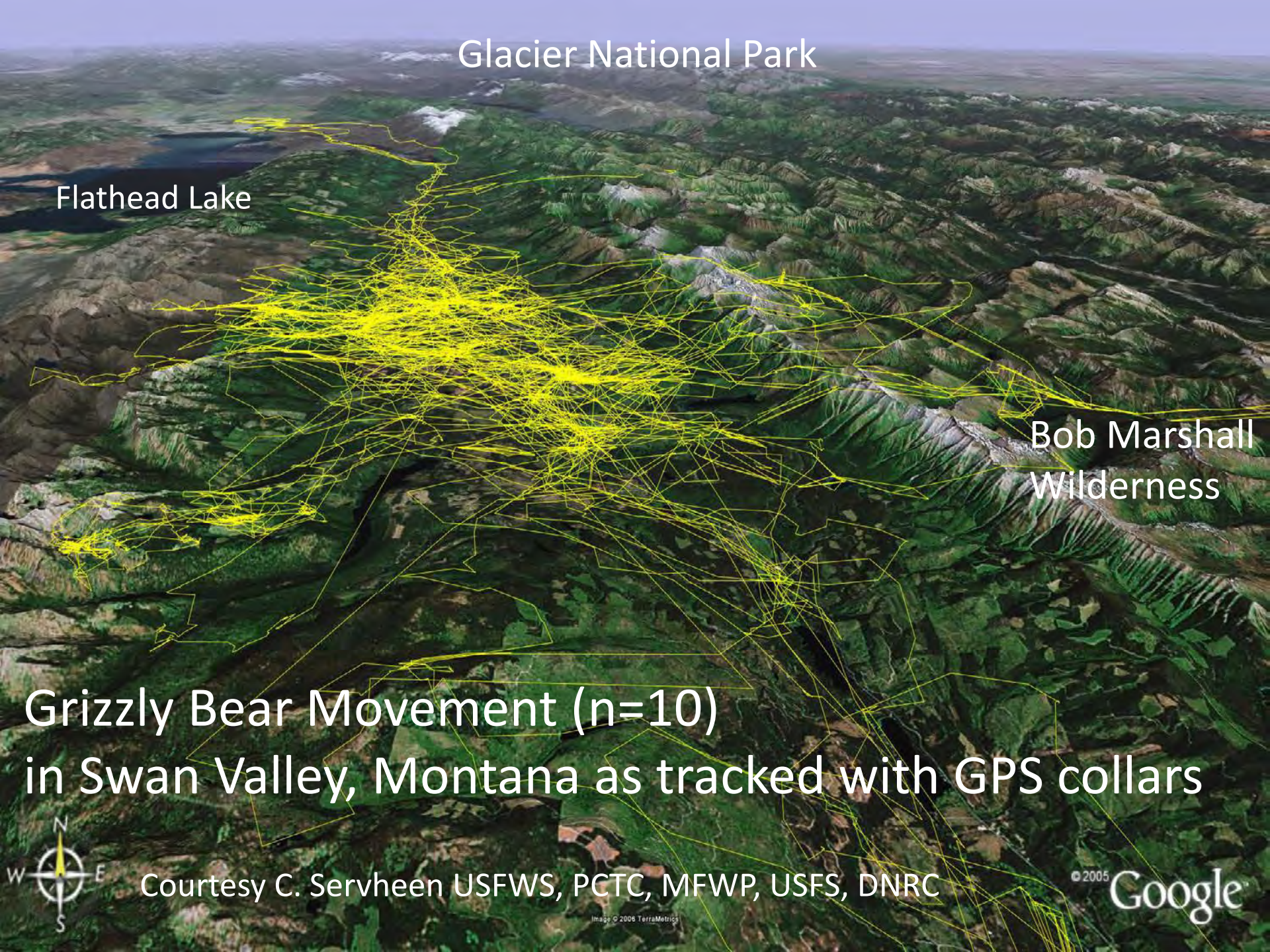

GALLATIN
NATIONAL
FOREST
Beartooth Plateau
Gallatin River
Gardiner
Cooke City
Montana
Wyoming
YELLOWSTONE
NATIONAL PARK
Montana
Yellowstone River
Lamar River
Mount
Washburn
Gibbon River
Madison River
Hayden
Valley
West
Yellowstone
Firehole River
Idaho
YELLOWSTONE
LAKE
Absaroka Range
Island
Park
Continental Divide
SHOSHONE
NATIONAL
FOREST
Wyoming
TARGHEE
NATIONAL
FOREST
Ashton
Snake River
TETON
NATIONAL
PARK
TETON
NATIONAL
FOREST
0 5 10 15
miles

# The Greater Yellowstone Ecosystem

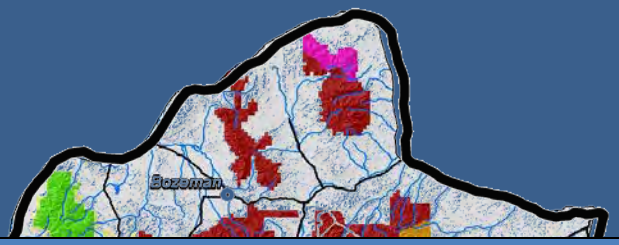




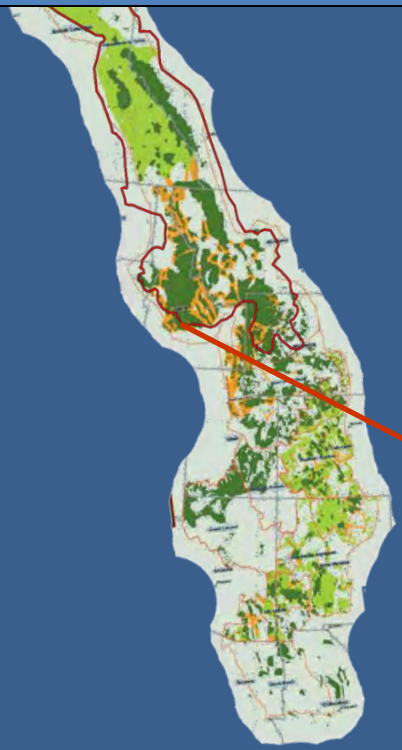

Pattern: Square to Polygon

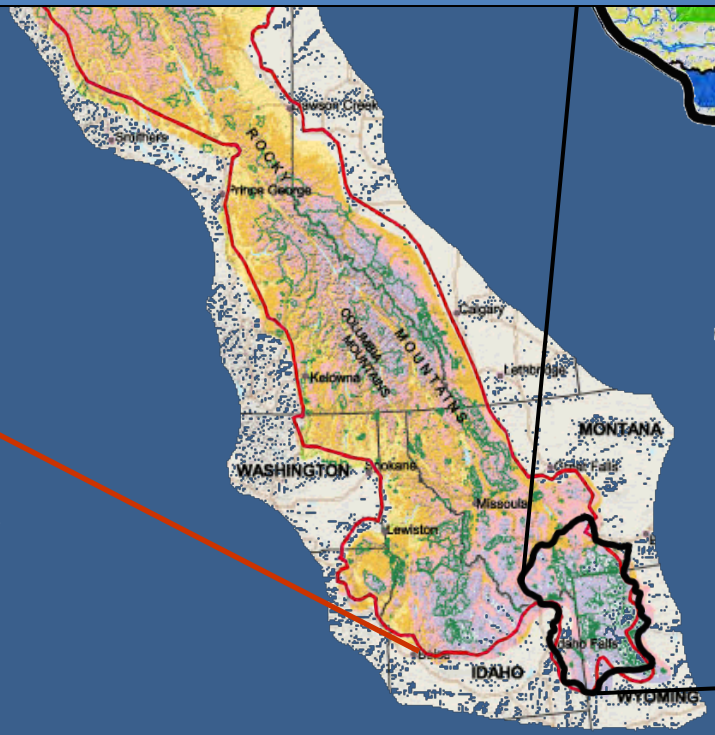

Glacier National Park
Flathead Lake
Bob Marshall Wilderness
Grizzly Bear Movement (n=10)
in Swan Valley, Montana as tracked with GPS collars
N
W
E
S
Courtesy C. Servheen USFWS, PCTC, MFWP, USFS, DNRC
Image © 2006 TerraMetrics
© 2005 Google

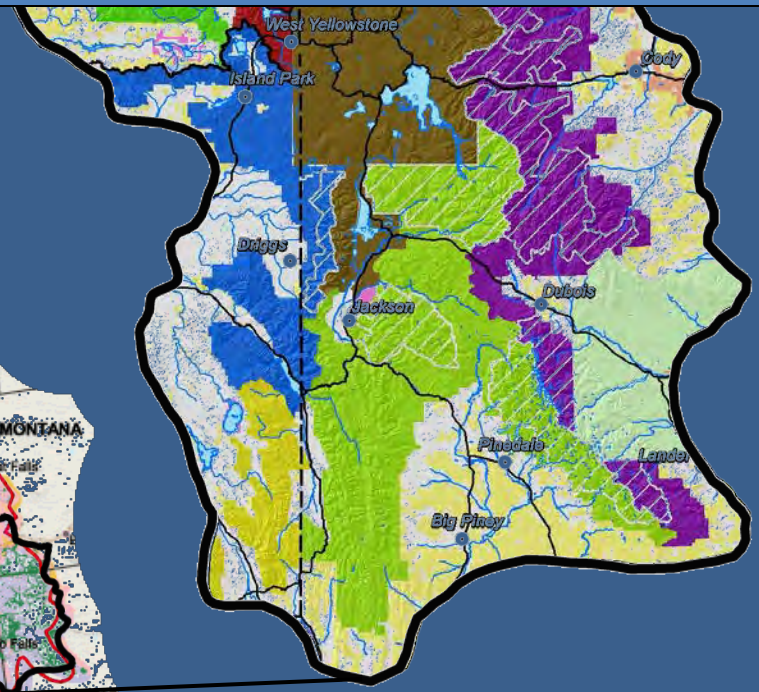
# Scale


## What scale can ecological processes be maintained?






**Spine of the Continent** **Yellowstone to Yukon** **Greater Yellowstone**

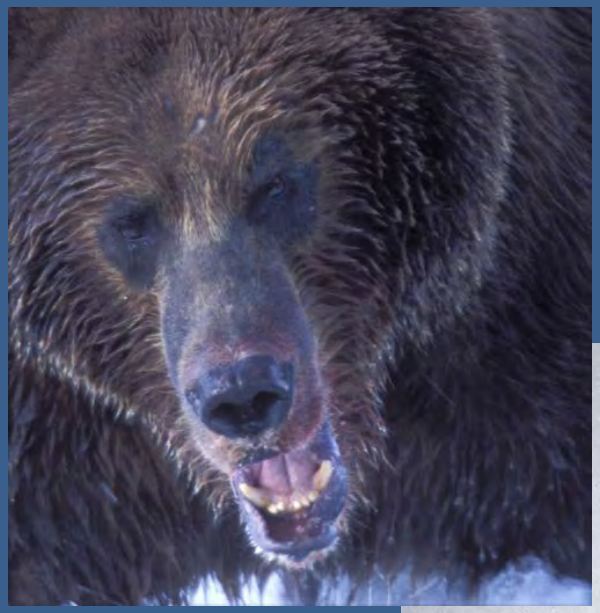
# Processes

CENTER FOR LARGE LANDSCAPE CONSERVATION

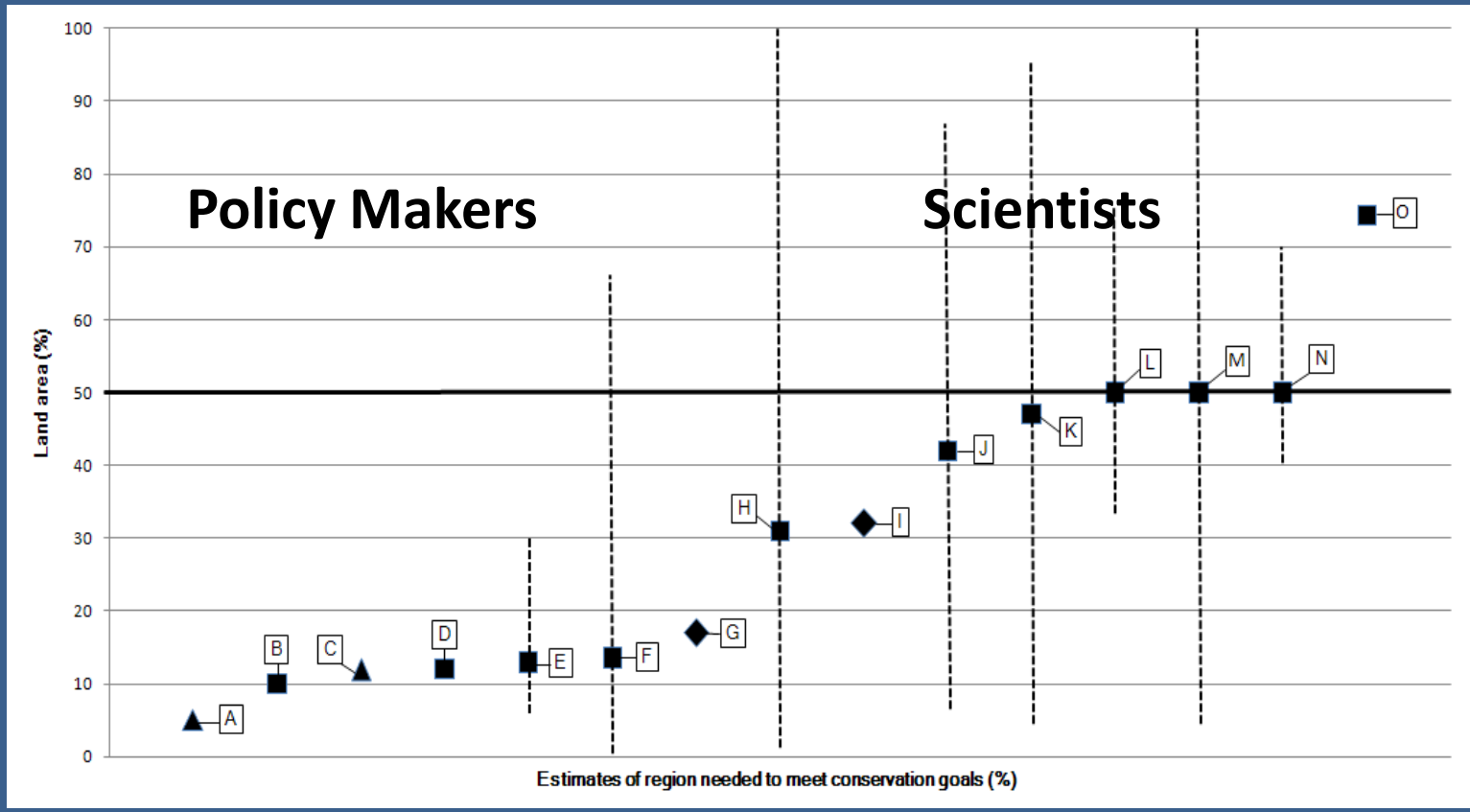
Ecological Connectivity
Natural Disturbance Regimes
Fire Ecology
Hydrology
Water Catchment
Migration
Dispersal
Pollination
Resilience

**Natural Capital and Ecological Services**

# Roam Wild and Free



Photos: Collopy, Tabor, Paquet

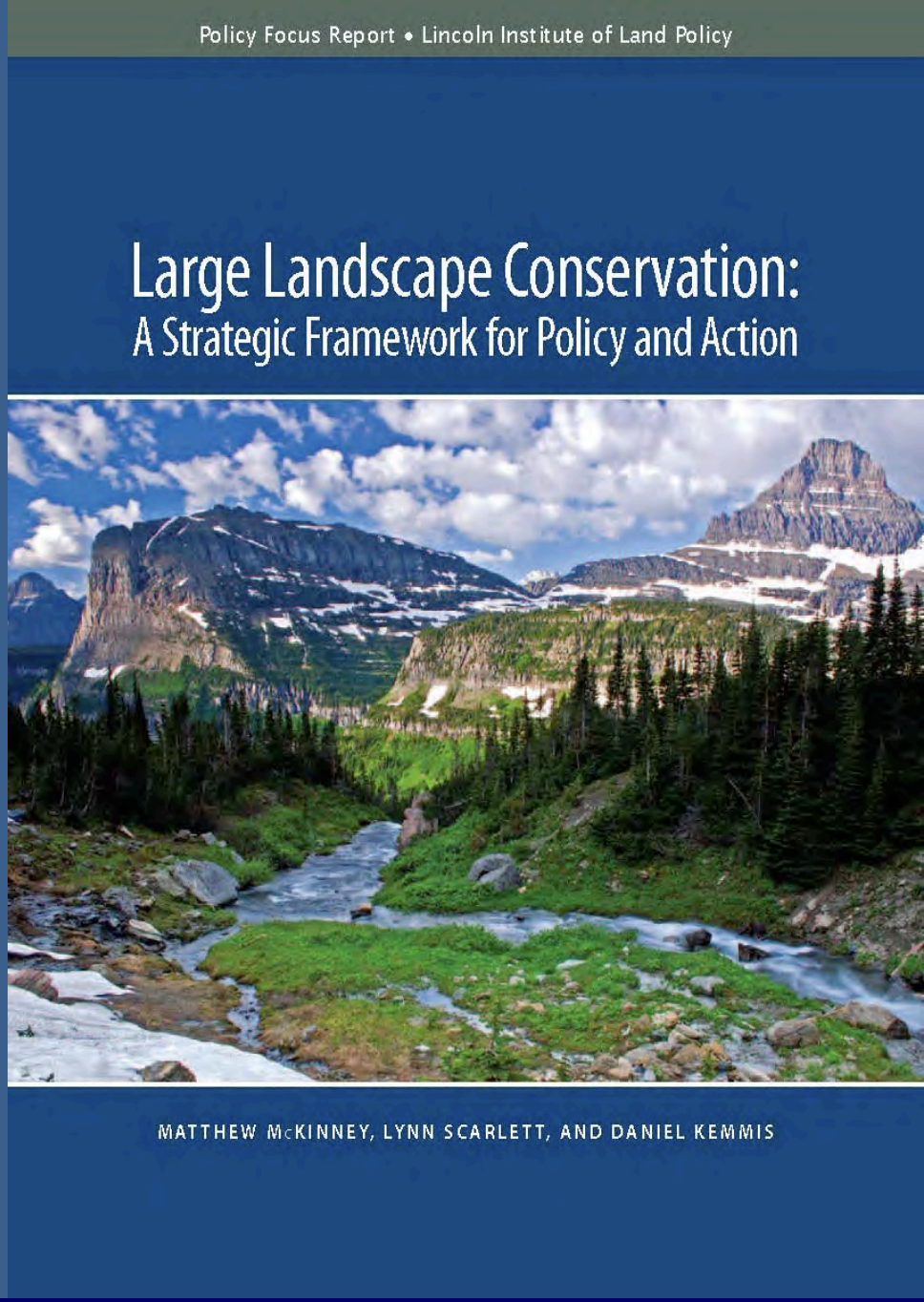



How much is enough? Estimates of percentage of land required for conserving biodiversity. Current protected areas and policy-driven estimates tend to be smaller (left portion of graph) than science-based estimates (right portion of graph).

C.Davis and G.Tabor in Noss et al. J. Cons Bio. 2012.

The University of Montana
Center for Natural Resources and Environmental Policy

# Taking Conservation to Scale:
## The Challenge of Working Across Boundaries



# Tee Shirt Size Chart of Landscapes

| Size | Acres | Hectares | Landscape Example |
|---|---|---|---|
| Small | 100,000+ | 45,000+ | Ted Turner's Ranch Montana |
| Medium | 500,000+ | 225,000+ | Great Smokey Mountain NP |
| Large | 1,000,000+ | 450,000+ | Yellowstone National Park US |
| XLarge | 10,000,000+ | 4,500,000+ | Greater Yellowstone Ecosystem US |
| XXLarge | 50,000,000+ | 22,500,000+ | NZ or all of US National Parks |
| XXXLarge | 100,000,000+ | 45,000,000+ | Yellowstone to Yukon US CA |