

Separate Last Chapter  
Conclusion Chapter

**Insights from a Natural and Cultural Landscape**

**V. Insights from Time and the Land**

**Pre-History Section Ecology and conservation lessons**

- Template for spatial variation – gradual boundaries driven by landscape variation – soils, moisture; significant island-wide variation.
- Natural processes dominate; change is slow with few notable exceptions
- Vegetation structure and species missing from present. Old growth – pine, hardwoods, and mixed forest. Forest dynamics structure – old trees, CWD, damaged trees, uproots. More beech, beetlebung and hickory; very little open land or successional habitat.
- People with an abundance of natural resources; highly adaptable.

Accommodate growth and humans; preserve, sustain nature intact.

Real distinction: passive vs active management; wildland vs woodland. All is cultural but humans can make real difference in decisions. Viable alternative is to allow natural processes to shape and reassert themselves. E.g., cordwood and timber versus old-growth; salvage or no; fire versus sheep versus succession; coastal pond - natural breach vs excavator.

**Topics**

Inertia – what happens today is very dependent on the past, may be contingent on our expectation for the future. What we do, what natural forces operate on, are conditions handed to us from history; but the entire system is in motion-erosion of features created in the past; plants and animals recovering from historical changes. Even if we do nothing much will change. Without future changes in the system – i.e. environmental change. If change occurs; inertia will condition the response – e.g. coastal erosion, shift in species. To keep things the way they are – is impossible – but even to approximate, requires huge effort. World without us, 19<sup>th</sup> C New England. Entropy.

Human/subjective/emotions – strong and important driver of conservation and management. Wilderness movement. Science informs – generally not the primary driver and motivator; never provides an ultimate on answer. History and aesthetics – strong motivators.

Science and history change – both as knowledge base changes, technology and information improve, and as attitudes, opinions, social context change.

Lengthy history – dominated by biophysical prolonged phase of extensive domination by human recovery and wild to give a mixture of cultural and natural. As this occurs – shredded by new wave of human. Permanent, driven ironically by love of human and natural.

Modern conservation – accommodates growth and humans – sustains nature and work with history.

Could use any landscape to illustrate these points: Yellowstone where tectonic geology, fire predominate; Yucatan where limestone geology and ancient people shaped the land.

Martha's Vineyard – special case of New England and eastern U.S. Transformed landscape. Simultaneously wilder as shredded by new human activity. Land where the physical template so clearly tied to history and one easily grasped and understood. Wide range of other processes. Cultural processes long-standing, intense in relative terms (e.g. Indians – most focused on coast; colonial – agrarian and maritime intense; development intense). Biological response diverse but striking and understandable. Biodiversity – quintessential like – landforms, history and people.

### **Conservation - Guiding Principles**

Manage with understanding of the past and informed by ecology. Use past and ecology to interpret present and forecast future; understanding how the environment may change and species respond – anticipate the future.

- Neither history nor science provides the answers; never absolute answer. Science and history both change (as do human behaviors). No right answer. No obvious benchmarks. Real decisions and options. Subjective and emotional is strong driver of human action, not the rationale and scientific. Don't hold conservation up to a different standard than other major decisions. We don't make our major investments – cars, entertainment, houses, charities for rational reasons.

**Hubris** – human limitations.

Doing nothing – often a highly viable option. Doing nothing for a long time is easy for nature, difficult for people. Real distinction – active and passive management.

Mixture of cultural and natural landscapes; highly desirable – conservation, aesthetics, human nature. Cultural in nature is ok. Develop/No; harvest versus OG; salvage/no; fire versus sheep; cultural versus natural; state forest natural (?); plant; duck pond. Grasslands and Cultural Landscapes. What do we do with landscapes and features derived from past cultural practices? Reality – many cherished landscape and features derived by/from human activities or singular events. Persistent but transient. Motivation to keep them – aesthetic, romantic,

historical biodiversity, science. Cannot preserve many, can restore and recreate some or at least mimic. Approach – determine historical process that created these.

\* → Subjective and emotional is the strongest driver of human action, not the rationale and scientific. Shouldn't hold conservation up to a different standard than other major decisions.

Inertia – huge effort to maintain status quo – impossible actually, but semblance is huge effort.

Can do bold things, advance major conservation goals because they excite, intrigue, fascinate.

Great if these are reinforced by economics – tourism, environmental sustainability, economic rationale – infrastructure.

No need for more research and study – not that more insights won't be useful. Continued study synthesis, updating thoughts. Reality – small, confined area – some of most thoroughly studied, evaluated and planted landscapes in U.S. Great diversity of organizations, collaborating with research and planning. MV Commission. Island Plan.

No right answer. No obvious benchmarks. Real decisions and options.

Protect large blocks and critical connections – (include underdevelopment) for nature and people so includes access. Need for intact blocks, less management. No mystery what these parcels are, but many priorities – trails, beech access, habitat and much overlap; specific management concerns and objectives.

Develop/No; harvest versus OG; salvage/no; fire versus sheep; coastal (??) (??) versus natural; state forest natural (??); plant; duck pond.

Coordination needed among NGOs – competition healthy and some obvious niches – scale and focus, etc. Share information, contacts and resources. Plan and coordinate attack – contact with landowners, maintain regular contacts. Coordinate efforts. Commission is leading in getting out island-wide goals.

### **Ecological Issues and Lessons – Spread these across the chapters**

Importance of location

- Exposure – prevailing winds, Nor'easters, hurricanes. Modifying influence of vegetation
- Processes – fire
- Physiography – topography, soils, water
- Climate – moderating influence of the sea.

## EXPLORING THE LAND AND ITS HISTORY

### **Conservation Landscapes**

*State Forest-Greenfields-Pohogonot.Great Plain.* Liberate and reveal the natural patterns. Eliminate plantations – young and old. Bottoms – cut; very occasionally burn? Open through where possible; recreate; liberate. Oak and pine forest – grow up. Observation Tower.

*Seven Gates-Woods-Polly Hill-Waskosims.*

*Chappaquiddick*

*Nomans*

*Squibnocket – Menemsha – Aquinnah*

***Major lessons in ecology, history and conservation emerge from the text, photos and figures.***

*At the broadest level:*

- Ecology is an inherently historical science that explores the way that intertwined natural and cultural processes shape modern environments and condition future dynamics. Every landscape is embedded with historical legacies and inertia that interact with current and emerging processes to control future conditions.
- All efforts to forecast and anticipate future conditions and manage for conservation need to be strongly guided by ecological history. The past allows us to anticipate the future and offers sound guidance towards sustainable management.
- Despite our appropriate focus on global climate change today, the direct impacts of humans remain (and will remain) the major driver of landscape dynamics in most regions and should be a preeminent concern for society. Land-use change remains the single greatest threat to natural environments and biodiversity; the interaction between these direct impacts and global change will determine the future of landscapes and the earth.

*For New England:*

- Despite much popular and scholarly literature to the contrary the region's pre-history was dominated by natural processes and expansive ancient forests that were shaped on millennial time scales by climate change and episodic natural disturbance. This pre-history conflicts with well-established historical interpretations such as Bill Cronon's *Changes in the*

*Land* and require a rethinking of established cultural, ecological, and conservation paradigms.

- The infrequent occurrence of abrupt ecological transformations during pre-history and with European settlement provide insights into potential directions and magnitudes of change that may transpire as rapid climate and human-induced disturbances occur in the future. On the other hand, cultural adaptations by native peoples to ecological dynamics (sea level rise, abrupt climate change and the catastrophic mortality of dominant tree species) may provide some guidance for modern society confronting global change.
- The most rapid period of change and most dramatic ecological transformation of the region occurred in the past four centuries when forests were substantially reduced in extent, size and stature and then, equally rapidly began to recover along with many ecological processes and native plant and animal populations.
- The historical interplay of natural and cultural processes in the region yields major opportunity and challenge: a second chance to protect forests and to enhance natural patterns and processes; a largely unaddressed ethical and management dilemma concerning what to do with landscapes and species that depend upon historical practices and conditions for their persistence; a challenge of retaining both natural and cultural landscapes in the face of expansive human conversion of both to buildings, lawns and pavement; and the looming complexity of climate change.
- From a reading of history emerges an approach to conservation that recognizes the opportunity and need to advance simultaneously: natural processes, cultural landscapes, and human enterprise. Lengthy periods in pre-history characterized by slow change, the predominance of forest cover and natural processes encourage the establishment of large wildland tracts. Meanwhile, the need for resources, the interest in local production and the productivity of New England forests and farms motivate extensive management of the land. Fortunately, there is a way forward that involves intensive management and large nature reserves that will support diverse cultural and natural landscapes and their species.

For the Vineyard:

- The integrated role of natural and cultural processes in shaping Vineyard landscapes necessitates land protection and conservation management that are grounded in ecological history.
- The volume builds on and complements the robust and innovative conservation planning process that the Vineyard has been engaged in for the past decade—the Island Plan.

- The strong local movement toward locally grown (vegetables, flowers, beef, lamb, chicken, pork, etc.) provides the opportunity to advance agriculture as a conservation tool. The Vineyard could become a leader in a historically and ecologically robust and sustainable approach to conservation that would replace less effective and most costly approaches including prescribed fire, clear-cutting and brush-hogging, and herbicides.

### Features to lose

- Entire landscapes to sea level + distinctive features  
Lucy Vineyard, Swan Pond
- Landscape features - old field cedars, Menemsha/Quawsoo trees

### New Species + Habitats

WP forests, spruce in woods

Novel assemblages

Invasives - Autumn olive, bittersweet, garlic mustard

# Historical Insights into the Ecology and Conservation of Martha's Vineyard

David Foster and Brian Hall

Harvard Forest, Harvard University

Petersham, Massachusetts

*Our woodlots have a history, and we may often recover it for a hundred years back, though we do not.... yet if we attended more to the history of our lots we should manage them more wisely.*

- Henry David Thoreau, Oct. 1860

Martha's Vineyard is loved for its remarkable natural beauty and diversity and its iconic cultural landscapes which have been created by fascinating interactions between geology, climate, ocean processes, plants, animals, and of course, people.

We are studying the ecology and

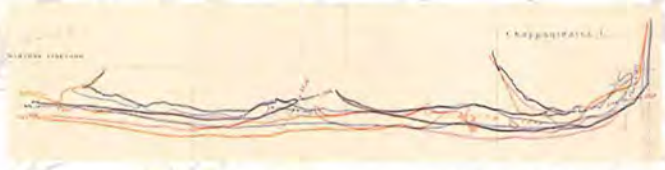
history of the Island in order to better understand the processes that have shaped the landscape in the past and how ongoing processes such as development, climate change, and a range of natural disturbances may change it in the future. We plan to share this information and insights broadly so that collectively we can

apply Thoreau's advice and manage the Island wisely.

Below are a few of the insights we have learned from this project to date:

## Sea-Level Change and Coastal Erosion

Sea-level rise since the end of the last ice age. (meters below modern sea level)



Scientists and mariners have long been interested in how ocean waves, tides, and storms modify the island's shoreline. Henry Whiting, a resident of West Tisbury, made this map in 1846 and amended it in 1856, 1871, and 1886 as breaches in Norton Point Beach were formed and migrated and as the coastline eroded (see dates on left side).

Martha's Vineyard was not an island until around XXX years ago, when water from melting glaciers caused sea level to rise to ~10 meters below modern sea level, removing the land connection to the continental shelf and mainland Massachusetts.



The 2007 breach of Norton Point Beach caused dramatic erosion along the Wasque shore, affecting natural landscapes and human infrastructure and causing much philosophical discussions about appropriate responses to natural disturbances. However if we take a historical view these changes were not unprecedented as shown by the shoreline change in the Whiting map.

## Changing Land Use



Since the peak of farming around 1850, there have been dramatic changes in the Martha's Vineyard landscape. In 1850 50% of the island was open farmland and 39% was woodland; today only 11% is actively used for farming, while 60% is forested. These changes present challenges for on-island food production and conservation of once-common open landscapes and habitats for uncommon species.



Much of the island has remain wooded through all of the known historical period ("ancient woodlands" - photos on left). These sites look very different from forests that have grown in on land that was formerly cleared and used for farming ("secondary forests" - photo above). Having so many acres of ancient woodlands is unusual in the northeastern United States; these lands are worthy of much more conservation interest.



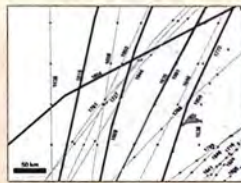
Conversely, many of the areas that were once intensively used for farming—possibly even overgrazed—are important to conservationists because they are home to uncommon species and are considered beautiful by islanders and visitors.



Island-based farming can not only boost the economy and provide locally grown food, it can also preserve once-common landscapes and provide habitat for wildlife that needs open areas.

## Hurricanes

*The Indians here had a tradition that away back in the ante-historical days there was a flood which rose so high that it destroyed the entire human population of New England... It is said, and with much truth, that New England has more tornadoes and cyclones in proportion to its area than any other part of the United States.* Sidney Perley 1891. The Historic Storms of New England



Hurricanes and nor'easters have long been a part of life in New England and Martha's Vineyard as shown in this map of historic hurricane tracks.

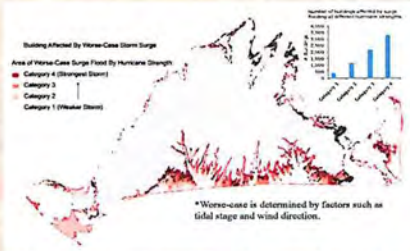


Hurricane Irene (8/2011) at Stonewall Beach.



While most storms have a relatively mild impact on the island some, such as the 1938 hurricane, can cause widespread destruction of property and dramatic changes in the landscape as shown in these photographs from Menemsha (courtesy of the Vineyard Gazette).

## Hurricane Surge Flooding in a Worst-Case\* Scenario



\*Worst-case is determined by factors such as tidal stage and wind direction.

Climatologists predict an increase in the number and strength of storms in the near future due to global climatic change. These storms are expected to cause increased flooding on the island in low-elevation areas directly along the coast. These same areas are often considered the most desirable for home building due to their ocean views. Building locations (2005) and storm-surge flooding data are courtesy of the Martha's Vineyard Commission.

We greatly appreciate help from: Martha's Vineyard Commission, Martha's Vineyard Land Bank Commission, Massachusetts Audubon Society, Pampunonasa Farm, Polly Hill Arboretum, Shantia Meadow Foundation, The Nature Conservancy, The Trustees of Reservations, Vineyard Conservation Society, Dave Orwig, Jonathan Thompson, Tom Dunlap, Eric and Bob Pomeroy, Allen Keith, Steve Youngberg, John Floridon, Chris Kennedy, JoAnn Taylor, Mark London, Chris Sordal, Max Ditt, Tom Chase, Bradinda O'Neil, Matt Perkins, Bob Woodruff, Matt Eddy, Alan Henth, Charles Jones, Tim Boland, Tom Clark, Kate and Ted Stealey, Kaho Hyde, Mary Cote, Rebecca Gilbert, Randy Beth David, Missa Pease, The Woods Family, Dana Street, Nik Soren, Katie Scott, Lucia Haganan, Jenny Hobson, Conrad Noyes, John Wisniewski, Bart Poulter, Tim Simons, Paul Gaudin, Glenn Matlack, Peter Dromedaris, Kristen Pacheco, Julie Russell, John Vaccarella, Lily Walker, Jeremy Perkins, Audrey Buckler Perkins, Sarah McKay, Steve Bernier, Albee Keith, Jeremy Hinson, Tim Milone, Megan Sargent, Ben Raver, Fritz Knight, Ava Pomeroy, Erik Sorenson, Emory Brown, Paul Ellis, Jim Adams, Lar Helwig, and many others.

## Conservation + Ecology

MV - microcosm of great issues to study and interpret

- Indians - continuity, flexibility of lifestyle in the face of uncertainty, climate change, veg dynamics, hurricanes + oceans - adaptable
- Beech/oak abrupt transition; climate dynamic; threshold; future analog
- loss of grasslands, shrub habitats, early successional
- sprawl, <sup>and monstrous houses</sup> growth, development; water contamination
- connectivity
- sea-level rise
- cultural vs natural

Case study for dealing w/ issues - Conservation roundtable; Land Bank; MV Commission; diverse orgs; Welkman Ctr; Island Plan Leadership - HBL; Local production; merge farming + conservation

### Challenges

- some spp lost, New organisms, New habitats support novel spp, assembl.
- no stationarity - 500 yrs, Change a constant but not constant
- Episodic, slow, abrupt
- Processes - some lost (Indian, Colonial); some persist, legacies, some new
- Can only go forward, tweaking what is here + there
- Major change come
- Conflicts - wildland x workings; fire x mow; interior forest x ag

Pragmatic approach - science and history - guides; human needs

### Solution

Priorities - land protection; greatest security - options, flexibility; buffer trails; spp. habitat and connectivity; financial hedge; water



Solution cont.

~~Central forest - Protect 1st~~

~~Central 1st priority - can always change most  
etc.~~

~~Best future options~~

~~Best security - if we want - resources, reserves,  
trails + access.~~

~~Land always more expensive~~

~~Best protection - spp, against change, for #2D~~

Part + parcel with smart growth. Complements and reinforces the zoning + effort to be more efficient in construction, energy use and transportation. As move forward with focused development and other zones e.g. of commercial, industrial and residential areas advance conservation to reinforce these patterns + make them secure.

Pragmatic - CRs, work w/ landowners + their interests take advantage of their history, experience, knowledge + ability to work local land. Compensate for value. Fee purchase as necessary and useful - landowner interest, specific mgmt objective, focused public use + benefits - e.g. trails.

Manage as little as necessary and in focused way.

- allow old forest to develop, C to be stored and spp to sort out according to natural process/permissions

conditions. Retard change - major concern over change and yet most ↑ pace of change. Interaction of disturbance and changed environment will generate the most rapid change.

Persistent existing elements - most spp not killed by climate change - so will live a long time even in unfavorable climate - e.g. bivalves.

- Prevention + mitigation - v. little evidence of success. Much uncertainty in how things will happen or what factors will change, how spp will respond so success given
- Offshore generate more impact than onshore to correct or prevent. Impact accelerates change + opens side to new spp.
- Esp true of salvage logging - value offshore low + impact offshore great; danger offshore overblown and other caution at less expense more warranted  
Fire, bugs,

→ Nature is fine w/o us. Hubris  
No ecosystem change

Impact offshore much greater + unintended consequences  
Any further impact accelerates, augments add.

Human need to respond, to do something - issue of leadership, esp true of managers, agencies organizations - want to show are doing something taking charge + control of situation

Incredible value to unmanaged - control, legacy, research, destination

Natural part of landscape - v. little in NE

examples - Pisgah, Naushon, Woods Property

Much

→ value to mgmt; great recreation - get products from land. Myth of Preservation

Wildlands - core, large - reduce, natural process, spp; recreation science, mgmt; coordinated adjoining ownerships - bigger Wildland

Working lands  
Cultural lands

Woodlands

Grazing - diversity w/ different regimes - diff animals on diff lands & over time - chickens, pigs, sheep, goats, horses, beef

Replace burning w/ grazing - cost but effective, historical, engaging - recreation, production; cost effective  
Intense cult - greenhouses, fields,

Can cover a much greater area; lots of practitioners, educational. Eliminate fuel - low fuel

With mowing regime as needed.

No health issues, little safety concern

12-18-12

## Conservation Insights

Can't go back

- Conditions will never repeat
- Legacies + inertia in system
- Losses - Hltw, Indians ; Addition
- Cultural context different - so responses will differ

Remarkable opportunity with forests

- more AW than ~~seen~~ anyone would expect
- old forests maturing - ancient processes,
- some sizable intact areas
- recognition that forest was originally abundant + old  
so can manage for those

Openland extremely valuable

Will lose things

## Management + Conservation

Real distinction - active versus passive; allowing natural to shape is very different than managing

No right answer, no benchmark but real decisions to make  
real options + values are important

Timber vs old-growth; sheep vs fire, salvage vs no; barbed vs open

Change is constant, not necessarily rapid

Long stasis

Shoreline as metaphor for the changing environment

good of the land, to support the diversity of life. If we want to maintain the diversity that surrounds us we need to be active, not passive managers of the land.

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Even the smallest islands were forested—or heavily wooded. Cuttyhunk, Gosnold description, Penikese. Size of trees in pine floorboards and wainscoting 2-3" wide. Oak 16" by 48".

Balance of Nature issue - Need people to manage, vegetation in balance at landscape scale with people - want completely out of balance with loss of Inds - diversity + abundance (Coron), particular spp (Man +

Almost no regard for physical processes -

disturbances or biotic processes - insects pests

or climate change - only slight focus on LIA impact

on Ag or shift to warm dry + Mast forest

~~the~~ focus almost exclusively on cultural processes - dominant

both in controlling social developments across

regions and within region + landscape + in

shaping vegetation.

Provocative PNAS paper - cultural changes tied to major climatic periods. DRF reviewer - injects balance into discussion.

Need to envision important role of other processes in shaping the vegetation. Especially true if

# The Primeval Myth

*There is a persistent myth that the landscape which greeted the first European explorers and settlers in the New World consisted of a great forest of massive trees stretching unbroken from the Atlantic to the Mississippi. That myth—the classical primeval forest—is now questioned. In fact, if one looks carefully into the records of early visits to the continent, one finds a number of allusions to open spaces, meadows, blow downs and young forests.*

*In 1927, Harvard University acquired a tract of land in Winchester, New Hampshire, known as the Pisgah Tract, in which there were sections of forest that had been untouched since a hurricane and fire swept through the area in the 1600s. Forest biologists, in keeping with the concepts that were current at that time, figured they had on their hands a small portion of ancient America. To their dismay however, the 1938 hurricane destroyed what they thought to be the last of the great forest.*

*It is a curious twist of fate that the hurricane struck so violently in Winchester. After the debris had been cleared and the turmoil had settled, the Harvard biologists began to reconsider the nature of the pre-colonial landscape. After all, if it had happened once,*

*couldn't it have happened before? By the mid-forties, thanks primarily to the work of Earl Stevens and Hugh Raup, a new theory emerged.*

*According to this theory, there were indeed stands of ancient trees in swamps and other sheltered areas. But the greater portion of the landscape consisted of clearings, wet meadows and young emergent forest. These areas owed their existence primarily to the altering influences of storms, fire, insects and the work of beavers, although ironically man already had an important influence on the land even before the appearance of the Europeans. The Indians cleared large tracts for gardens, and there is even evidence that they burned sections to encourage brush areas for deer—certainly an early example of game management in this country.*

*The photographs on the following pages show both the myth and the reality. The first three show the Pisgah Tract before the 1938 hurricane, the others attempt to depict some of the typical habitats that greeted the first explorers. It is a curious irony that these examples of pre-colonial America are still around today—as close to us as the nearest marsh.*

# Sandplain Conf

12-8-04

Benchmarks

Expts

Barriers to mgt + strategies

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Steinauer

↓ spp richness as ↑ shrub cover  
forbs key to diversity

Summer burn or mow much more effective than spring

But may ↑ # stems

Fires constrained to dormant season

Brushcut shrub land - Heavier Perturbation

similar to burn - shrub went from SO to Myrica

little grass + forb response

↑ woody plant w/ dormant burn or mow in grass/heath  
↑ forbs

Fire + mowing - good maintenance - NOT clear, if  
will restore

Need to manipulate soils, add seed



Chris Neill

Job's Neck

Ed Grass ↓ Wauvoit Bay from N loading

Clearing + Seeding (from Katama)

Fire <sup>vs</sup> w/o seed

*Festuca filiformis*

No rare spp.

Native ruderal, native ruderal, exotic, native forest

Burn - no impact on diversity

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M. Jordan

Montauk - heavily grazed for 100s of years - barren  
not deeply plowed; hilltops - most open, dryly.  
heavily grazed areas (interpreted as cause for)  
lower diversity; many non-native grasses, presumably  
in w/ cattle

thinking of goats, sheep, cattle

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Lloyd Raleigh

Grassland spp ↓

feed on grass + forbs

Forested spp ↑

50% of listed heps occur on MV



Wildland Trust of SE Mass

WAP

1983 - Ram Pasture April

Lloyd

MV, Eliz Is, ACK - low DDT; low Compsilura

Wasque = Way skwee

Lunch w/ Paul Elias

Grant in this winter for April meeting = funding in summer. Less interested in forest, more interested in surrounding openland; background for sheep mgt.

Sheep + Farm Records for Island

Photos from Dunwiddie - Wigglesworth

Bruce may have access to records

Nashawend - good success at maintenance, less at restoration. Don't focus the cattle much

Rassmann

\$800K on fire lanes

60-80ac of frost bottom restoration - WS + PP removal

~ 400 ac. plantation left

- allow those w/ native flora to fall apart
- harvest others

- Keep oak stands
- thin SP stands

→  
Joel Carlson

TNE NE + NY - ~ 500-600 ac annually  
900 ac max last yr

←  
Landfire - wildland fire + fuel assessment mapping  
for entire US

  
Kendra Buresch

## Mgt Objectives



Heterogeneity • Biodiversity • Rare Spp mgt

↳ RSM

Scale issues

Historical Accuracy - Yes + No

Objectives - Grassland # Ac; max spp



Landscape pattern + process

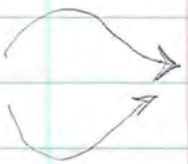
Ag Practices

Fire Effects Database



Cultural Landscapes

Planned carelessness



Aesthetics

## Regional Approach to Conservation

another rationale for Regional Study

- what is unique
- what is important regionally

Compsilauve - limbed spp. outside of MV  
to barrens - MV also in forests

500-1000 ac burned annually

5000 ac. max possible

D. Murray

Nantucket

Arctostaphylos - definitive heath plant

orig. thought as N fibers

Scottish heaths - grassy w/ Nardus

late bud, fire stimulated

Calluna, Erica cinerea, Arctostaphylos, V. myrtillus, V. v. i.

Arctostaphylos - rel. non-flammable so doesn't burn in U.S. where

exists in pure stands; does in Europe where in stands

~~1746~~ massive w/ Calluna

1746 massive intro. of sheep in Scotland; including fire

grouse hunting ~ 1800

heath prob. started w/ Indians - fire + agric.

Nantucket - 16,000 sheep by 1840 → grassy heath

1743 - wood scarce - most imported

1860 Whaling decd pop'n 10,000 → 3,000; ↑ sports hunting

burning esp. along ponds

~1900 - abandonment → Quercus, Myrica pen,

controlled burning, mowing

Ultimate problem - housing development; avc. cost \$350,000

P. Denwoodie 3 time scales

① yearly  
B. Zaremba - perm. plots 1982 →

② 100 yrs - photographs 80-100

heathland succession (spp) appears to change E → W on island  
E Pine + Oak  
Arctostaphylos; ~~W~~ N+ ~~W~~ Vitis + Myrica in A

Wigwam Pd area 1906, 1955, 1985 photos - spectacular

③ Pollen

Taupawshas ~~1000~~ 12,000 BP

11,000 → spruce, JP, grass - open spruce + pine

E + W differences - 2 lobes of ice  
over island - textural differences

sig. diff in flora + succ.

date 8500 → WP + PP, oak WP suggests protected locations (from salt spray)  
argues that Oak = tree oak (Q. velutina)

$\pm 1000$   
5000 - became an island - based on erosion rate + sea level rise  
rapid loss of area of island - esp. w/ area  
tremendous effect on salt spray

date 3500 - missing sediment so rate + sequence of forest disappearance occurred  
prob. ↑ Indian agric, ↓ island size, ↑ salt spray

PP - native but also introduced  
heathlands - minor component for long time

heyday prob. last few hundred yrs  
w/ grazing

Bob Zarombka

Maritime heath = 75000 ericad, low tree cover, acid (4.1-4.5 pH), coarse soils  
3-4 mi. of ocean

E Cape Cod → E. LI esp. Nantucket, Truro, Chap., Mittenk pt  
Bay + Ocean sides

not Block Island

↑  
areas 4-5 acres in size

~400 acres Cape Cod

10-12,000 Nantucket ~30 ac. on LI

Invasion - spp. diversity remains high until canopy closure - so  
removal should work

Maritime grasslands - esp. on finer soils, w/ clay lenses

Erica + Calluna - planted but doesn't naturalize vs. W coast Calif  
+ Nfld where Erica spreads well

Biogeography P. Müller Harper & Row

W. Patterson

Lightning - not imp. in coastal heaths

but high charcoal = anthro. origins

Gaylussacia burns vigorously in growing season

scorching occurs up to 5x fire lit.



## Questions for the conservation biologists

What are the important ~~species~~ plant and animal species and assemblages? ~~What~~ Do they share particular traits, life history attributes, affinities for particular vegetation and habitats? Where do they occur? What are the major conservation objectives?

How does the coastal region emerge as a distinctive focus for ~~uncommon~~ the conservation of uncommon taxa and assemblages. What regions does it share affinities to? (Other sandplain areas; ridgetops? ~~Europe~~ - Parts of Europe, from a cultural management perspective?)

What has been the history of land protection?  
Motivation, organizations, <sup>spatial + temporal</sup> patterns.

What has been the history of conservation management?  
Protection, reforestation and forestry, prescribed fire, ~~and~~ tree and brush-cutting, diverse approaches.

What have been the conservation threats?  
Hunting and exploitation.  
Development and land conversion, Wetland ditching and draining, DDT, Collecting. Other human activity - automobiles, recreation.

~~Jon C.~~

MV

3-30-10

## Conservation

Map - Conservation over time; type of conservation

Discuss types of protection, mgmt, ownership

Discuss individual properties what they show

State Forest

MAS - Felix Neck

PHA + Woods

Memomsha

Long Point

Wasque

Seven Gates

## Different Town Centers

Sites to see physiography

Gay Head - look South

Pd at Long Point - Chikmat to see moraine

MCSF - Pit, view of moraine

L.S. side blocked drain

M

Coast + moraine

### Conservation Examples

#### Conservation landscapes assembled

- i. State Forest - Greenfield - Pohogonot - Parrywise - Long Pond  
 Sepicassa - then up to Vlt through Stony Hill <sup>+ Thimble Farm</sup> and to  
 S Woodlands towards Oak Bluffs - Felix Nest - Tut Hill -  
 Morro Glog + Kotam

#### ii Chappy Trail

- iii Western Moraine - Phillips - Ripley's - <sup>Blackwater -</sup> Norton  
 [Seven Gates] to Central Moraine area

- iv. Coastal Ponds - Chilmark, TGP [Quansoo], Long  
 Pond + Homer's, EGP (Turkeyland), Poche Pond  
 Cape Poge

#### Lost Opportunity

West Chop  
 Foster's Farm - State Road via <sup>Norton's to</sup> Ice House Pond  
 State Forest Development

Allen R Keith 1969. The Mammals of Martha's Vineyard  
The Dukes Count Intelligencer. 11-98.

Original forest Newsham is remnant - RM, B+Y Birch, hickory, beech,  
W, Scarlet, R Oak, Pitch + WP - Chamberlain

MV - heavy forest cover - mid 1700s - almost all gone

Shaker 1888 - 33,000 ac - C+E - unkillable due to plowing + fires

1750-1900 - little habitat for large mammals incl. deer

Fox, skunk, raccoon - trapped/poisoned by shepherds

Lafimer 1925

Indian forest - scrub oak - covered C+E - ↓ by 1925

Since - increasing spread of SO

1916 fire > 11,000 ac.

Climate - intermediate ACE + mainland

Spring foliage - 2 wks later

E Cottontail - assoc. w/ Extinction of NE Cottontail

11 spp introduced - Brown Hare, Snowshoe, Blacktailed Jackrabbit, Fallow

deer - r - died out. Fallow - small pop's

<sup>- here w/ few</sup>  
Opposum + Chipmunk - recult - not yet imported

House mouse, Norway + Black Rat + Cat reintro - 1877 but extirp. growing

4 exterminated + reintroduced - Raccoon ~ 1920, Mink ~ 1890, Skunk ~ 1920

Red fox - reintro then extirpated again

Woodchuck + S Flying Squirrel - should be here - arrived foolish?

Otter - largest carnivore - every large water body + just offshore

# NE Food Vision

Donahue et al.

Food Solutions New E  
system

network dialogue/learn regional food

Brian Donahue

At least half of its own food

<del>12%</del> 5% today	< 2 m	14.5 15 m inhabitat	12% food
15% land	6 m	17 m	50% :

Now 1/2 vegs ; 1/4 fruit; > 1/2 dairy fish ~ 100% 5% beef

half of fruit, some grain + dry beans; all its dairy, beef + animal products

50 years

Could produce 2/3

balance foods reasonably produced here + those best brought in from outside

Neither are predictions, prescriptions or plans. Explore what could happen if society were to commit to conservation, healthy lifestyle sustainable food P

Takes 1/2 acre

Compatible w/ WxW 50% SNE 80% N

Develop 10 → 1200 Compact / smart growth clustering, redevelop

What do we conserve in dynamic landscapes + how?

How should we value cultural landscapes esp. those where LV discont.

How to integrate human development, natural resource extraction, conservation?

What are regional + global consequences

Many dynamic processes - climate, human, LU, pests + pathogens

Kaleidoscope - individ. elements little fixed, come together in combination

constant change + novel assembly, structures, patterns

Species decline + new arrivals

Past → Present  $\xrightarrow{\text{Lessons}}$

Regional → Global - C Seg; resource use + recycling; Illusion <sup>good can generally</sup> <sub>had</sub>

##

Foster et al. MV 2002

Brian, Sylvia, Susan + Tim

2000 yrs

Good background description

Moraine; outwash over moraine; outwash - 3 geomorph units

Underlain - >100m Quat + coastal plain sediments

11 stratigraphies  
W Mor. Coastal OP Central Out  
Mesic Hdws; O-P-Hdws; P-O - highest charcoal NE

No evidence - NA altered forest cover; climate - comp + fire; Eur-forest ext

Varied cons objectives - moraine - little changed - extensive forest + flora;

outwash plain - broken by plantations; mosaic S, O, P - maintain w/

fire + cutting; S shore - Ag - sustainable, traditional LU

Landscape patterns - veg, soil disturbance relationships  $\Delta$  thru time

What are patterns, drivers, approaches to conservation - how  $\Delta$  over time?

Archaeo - well to extensive drained w/in 75m coast

Major conc - Lagoon, Teshmoa, Sengekontadit; Squiranockit + Menemehag

TGP, Oyster, EGP; Katama + Choppo: Few on S shore - isolated

by barrier islands - so fewer shell fish

Maize - uncommon; deer v. common 1500 to 3500 pop'n @ contact

Stone, wooden, ditch fences 1775-1815 20K sheep; 3500 cattle; 400 horses;

800 pigs; 1683 E'town ordinance; 1762 - described as max sustainable <sup>popn</sup>

1788 - peat for firewood; 1848 - restricted woodland

1840-50  $\uparrow$  forest (40-50%) - initially on W Mor; 1880 - new forest - lots of PP,

esp to N + NW; <sup>late</sup> Mid 19<sup>th</sup> - Hdws cut; P-Hdws N+NW; PP - new woods

1950 - Forest 70%; 20<sup>th</sup> C -  $\downarrow$  55%

Conservation - 18%

Fire - > 20 > 400ha 9 > 2000 ha 90% Mar - June 2. 4000ha - July  
None before March; 4 after Oct Since 1940s - 1 > 600 ha; 1965 - none > 40

Good description.

N outwash - high + steep high S Coast - high + drop w/ ES

S shore dissected + altitud + big diff w/ ES

DCA's Mor - Be, O, Bir, Hic; NO - <sup>more</sup> Pine; S Shore - intermed O, Hic, Bi, P, less Be, Grass

Variation - reduced ↓ tree, ↑ Grass + Scrub NTS sites <sup>+ Cedar Tree</sup> grouped, Harlock least Δ

Mudch - big ↑ open

W Mor - O (30), Be (10); RM, BG, Hi, Ostrya - low Pine, Grass + Bracken

HP - 2400-1500 - little Δ; 1500 - drier ea ↓ Be, RM, BG; Rel little Δ w/ ES

SS - More open, pine, less O, Hi, Be; more aquatic wetland + herbs

NO - Abund P + O, low oth.

DCA - all samples; all spp abundances

Break down into pre ES; mid + modern

Disc ① Long-standing variation - soils + geomorph; varied w/ climate + LV  
distinct areas persisted thru time (towns also reflect)

② Direct pre-hist human; firz etc more obvious people

③ Eur LV major impel

Extreme variation remarkable (true back to 10-15 k?); Harlock - modest vs Δ

Whiting Hill - 7 Gates Farm

Plain continuity

Coastal S Shore Cultural Landscapes



Hall et al. 2002 Ag

Tax evaluations, state ag census records,

↳

Largest forest patches - CC + Islands 1830 map

Two large ca 26,000 ha forest blocks

Forest maps - CC + Islands 1830, 2000

Pre-settl + modern - ↓ Be, Hick, Chest ↑ maple + cherry

Climate important in both but less strong w/ 6/7 trees today

Modern veg ordination correlated w/ LU

Mass witness tree maps - don't show MV

Brg ↑ RH, PB, Pop, BC, WP(?), WA ↓ Be, SH, Hem, YB

CC + Islands - shifts O+P (↓ mesic) Be bark, Chest, Hem

Scale-dependent response - regional vs landscape - patchy at landscape  
general at broad

Foster/Bernardos 2002

Wildlife - human pop'n - distribution

Forests 1830 + 2010 (Mass + Coast + MV)

Wildlife mgt <sup>- CC, Berks, Navaton</sup> Deer, Grassland Birds (2 graphs)

Turkey, deer, birds, woodcock, whippoorwills etc.

① Decline + recovery ② Openland spp ③ extirpated ④ natural expansion ⑤ non-natives

⑥ pests/shifts Osprey threatened endangered

Openland taxa - Upland sandpiper, vesper sparrow, grasshopper

sparrow, low intensity Ag

Military bases, landfills.

Passenger pigeon + heath hen

New - Coyote, opossum, turkey vulture, northern mockingbird, tufted titmouse,  
cardinal - climate change, new food, reduced competition

Starling

Social consequences

Illusion 2007

Increase wood substitutes - reced

Decrease consumption - paper use, house size

Protect forests - W+W

Resilient forests, oversight, social ethics

FB to private ownership

Enviro ethic

# Conservation Mgt Chapter

11-7-2014

## Box - Duck Ponds + Spruce Forests

Aldo Leopold 1939 Farmer as Conservationist

Conservation = land does well by owner and reverse - both better by the partnership  
Need semieconomic land uses - marsh, woods, ponds; fence rows for birds  
snags for coons + flying squirrels

vs Doctrine of ruthless utilitarianism tendency towards monotypes

Principle of wholeness in the farm landscape - not a luxury

+ heart  
Interspersion of land use - woven by individual farmer - colors that warm eye

"The landscape of any farm is the owner's portrait of himself"

orchard, wildflowers, historic oaks, pond  
Creek crooked; banks wooded + ungrazed; woods with snags + downed trees  
tame attributes, all built on a foundation of good health

"The fields + pastures of this farm, like its sons and daughters, are a mixture of wild and

Varied heterogeneity - burn, graze, mow; high P grass - low diversity, good hay

Katama - 1640 on - 40 ac lots; Creev 1784 - sheep pasture

MV cultural landscape mgt - consistent with history, produce local resource, create habitat

Farms - habitat permeable to many spp.; engagement +

Wildlands with stonewalls, woods roads, quarries + pits, mined boulders, channels  
and cellar holes

on MV"  
Katama TNC "reserve is the largest example of native sandplain grassland left  
shrublands, and savannas are natural vegetation types with sig. rare spp assembl.

DEM 1997 Ecosystem Mgt program operates "on assumptions that grassland, heathlands,  
in presettlement times"

DFW Ecological Restoration Program manages for open and early successional

habitat based on interpretation that "many of our dry forests, shrublands and  
grasslands were managed for thousands of years by Native Americans. Now, lack of

Accomodate disturbance, climate change, sea level rise

Map % Weed + Grass Pollen - before/peak settlement

Richard Bradshaw book - Mgt, Natural Forests, Sustainability

Motzkin + Fein

Guerrillas

Return + Review

Largely forested

Mobile farmers + fire

Cronon

Droge 1998- quote on mosaic ag/06, fire maintained grasslands  
etc.; humanized; Pyne + Denevan

Mang Quotes

Motalein et al. Cape Cod Veg 2002

352 20x20 m plots 1999-2000

Pre-hist P+O w/ H<sub>2</sub>O<sub>2</sub> inner

< 40 yrs; 44% < 25 yrs  
19<sup>th</sup> C - 41% ; 1885 - 91% harvested

43% cover 1990 due to residual + commercial - fragmented

1985 - < 270 ha heathlands - 63% ↓ since 1967

O-P-Hick + PP-SO primarily on primary

O-P-Maple + O-P-Hick - predom on moraines

PP-SO P-O-Desch - outwash

PP-Desch, Arcto-SO, Hud some-Desch - Beach dune

Ploughed + Disturbed - Desch, Bluskm, Hudsonia, Arcto

Undist - many ericads - Epigaea, Gaylussacia, Gaulth, Vacc, Kalmie, Pteris  
also Q abla + Q coec.

Moraine - Lycopod, Ilex, Uvularia, Pinus strob, Hick, Hick

Q strata - N distrib - mid Cape

+ charcoal  
Fire scars - 52% plots - but obviously under represent; recalcitrant

Heathlands - sandy, outer Cape, dunes + sites ploughed, grazed, or  
other severe soil disturb; GDP + PP-SO - gen. continuously wooded

Fire - modifies

May spp - early succ - dunes, heath, grass heavily disturbed - so

unlikely mod distrib parallel<sup>pr-</sup> Eur.; may require intensive mgmt

## Oliver Rackham - Notes

**Oliver Rackham. 1975. Hayley Wood. Its History and Ecology. Cambridgeshire & Isle of Ely Naturalist's Trust LTD, Cambridge, England.**

**W.H. Palmer.** One of finest ancient woods in eastern England; unrivaled detailed study of the social history of a site.

**Harry Godwin.** "...Conservation of an ecosystem must be based upon though knowledge of its many components and of the mechanisms by which they operate. The need for management, like the need for adequate knowledge and controlled experimentation on which to base it, is now fully conceded. The means for realizing this in practical terms is another matter..."

"detailed ecological study in the field has revealed again and again that, even in quite unexpected regions, past human activity has strongly shaped the apparent natural cover of the landscape."

**S. Max Waters.** 1962 purchase. Clay soils so despite dry climate the flat site hold waters; wet spring, may dry suddenly in summer. Largest surviving semi-natural oak-ash wood in West Cambridgeshire; fame as an oxslip wood and large primrose population. Secluded yet near Cambridge; square so could accommodate experimentation.

1963 on – coppice plots to show traditional cyclical coppice treatment; small permanent clearings (glades) – opened and maintained by annual cutting and partly as thickets and brambles; re-open rides, removal of silt accumulated in Great Pond; studiously avoided anything that would encourage drainage as detrimental to distinctive plants. Shelter, two hides and bridges for visitors.

**Rackham.** Ancient woods (doesn't definitely characterize – or distinguish from primary; page 50 infers ancient = primary) – biologically important and historical monuments in themselves. Hayley Woods recognizable single element to resident of Domesday Book times. Form is intricate blend of natural and artificial elements including features derived from practices of centuries long past and even prehistoric forest. Comprise half of county's total woodland. West Cambridgeshire – 25 ancient woods mainly on chalky boulder-clay.

Subject – development of woodland as an element in local topography; function as an element in local economy; influence of past management on present-day ecology.

Generalizations of English history are detrimental to historical study of woods – regional differences, specific distinct qualities.

Sources – pollen analysis, earthworks, woodland structure and vegetation (annual rings of living trees), maps and other documents, timber of ancient buildings.  
World's earliest large mosaic air photo – 1922 (no plates just published prints)

Hayley – 95% primary – 114 acres, Old Hayley Woods “a site which has never been other than woodland since prehistoric times”. “woodland continuously since prehistoric times”. Two secondary woods.

1251 first mentioned. Appears in every succeeding century. Probably much older. Maps reconstructed – 1251, 1600, 1810, 1969. Reconstructed some details from air photos – don't plow forests and seldom dig in them, etc.

Woods preserve surface features that have been on the site since wooded. Ridge-and-furrow etc. indicate secondary woods. Bank and ditch – banks invariably on woodland side as earthwork to drain field and fence the woods. Stabilizes the outline of a wood. Not straight as went around large trees. Often scattered pollarded trees. Irregular hollows – characteristic of primary woods – few inches deep up to so feet across. Natural irregularities form glaciation. Non-woodland origin. Easily destroyed by plowing, can't survive outside primary woodland.

Describes the history of the roads, ownership, splitting and merging. Depicts elm invasion and other plant movement, clearing etc. with arrows and lines.

Great Pond – “armed” with 3-6 arms, starfish; 5 feet deep, steep-sided with flat bottom. One per 100 acres – provided large edge for herd – possibly >1 field. Most woods have ponds – for horses working in them (?but shape?). No mound – worked form existing hollow? Dry in summer.

Medieval woods common as medieval churches until 1945. Managed for sustained yield beginning 600 years ago and maintained for half-millennium. Produced timber and wood or underwood. Main regular product was such wood – mostly for fuel. Coppice from stump or stool. Standards – mainly oaks, allowed to each full size, scattered among coppice. Felled to yield timber and wood form branches. Two crops compete against each other. Woodmanship NOT forestry (forester plants trees). Intensive and yet conservative as maintains continuity of site. Woodmanship always taken for granted by contemporaries and seldom discussed in abstract. History needs to be laboriously reconstructed.

Management descriptions from five centuries. 1251 – cut rods, hurdles, fencing. 1356 – underwood sold every seventh year = average coppice rotation. 1584 – felled twice in 21 years, keeping animals out, oak as timber separate from underwood. 1765 – timber, bark, underwood. Coppice cycle lengthened from 7 to 10 years and then to 20-30 in 1900s. Great detail by OR from data in other woods. Rings show decline after cutting followed by a gradual recovery.

Complexity of features drainage etc. in primary



Most fuel was domestic – industrial elsewhere. Went to lord's demense farm, villagers, other estates. Timbers reconstructed form buildings – posts, joists, rafters. Trees 5-40 per acre.

*Loppium et chippium* – bark, branches, rotten wood, leaves. Very little allowed to burn or rot.

2 – 4 men to run the woods.

Reconstructed coppicing form one stool back to 1785 – 9 coppicings, 14 year cycle. Coppice cycle lengthened presumably because growth declined. Wattle and daub form buildings show a decline. Exhausting the phosphate in the soil (no climate influence? Evidence strong for P and soil explanation?).

1000 BC – West Cambridgeshire almost a continuous forest. Anglo-Saxons destroyed most of prehistoric forest. No idea how – killing the stumps is the difficult part. By Domesday – 1086 - about as open as today. Minimum around 1279.

Most woodlands not grazed. Some for pigs but relative unimportant overall for pigs.

Hayley Wood in Decline – He means woodland management. Economic and political – cheap coal, investment in wood industry to forestry, which is not woodmanship. Commercial woodmanship ended about 1950. Most of Hayley last cut in 1887 – 1915. Also more valued for sport than produce. Deer also arrived (~1900?unclear)

Most woods heavily cut between the wars. But such “devastation” was once part of woodland practice. But preferentially cut larger trees – unusual.

Prehistoric flora – mosaic pattern. Moisture a strong factor and sections very wet.

Certain plants characteristic of ancient woodlands others of secondary. *Mercurialis perennis*, *Paris quadrifolia*, *Millium effusum*. Slowly invade adjacent secondary woods. Absence of secondary woodland indicators. Some are good indicators even after centuries.

Oxlip – ancient woodland indicator is gradually invading, slowly advancing into the Triangle (secondary). Whereas Primrose usually on woodland margins. Cowslips form grasslands – remain around Old Wood.

Many woodland species don't cross open country so each wood left with species that were in it when separated, less those becoming extinct. Possible hedge connections. Possible evolution.

Underwood is a much better indicator of history – less control by the woodmen, little direct manipulation. Represent the prehistoric forest as modified by centuries

of coppicing acting indirectly as an environmental factor. Floras little changed since Ray's 1660 records.

But no controls, no comparable unmanaged woods. Some changes in the reverse direction due to the decline in woodland management but not possible to revert.

Coppicing impacts – decline in species that don't stand coppicing or don't compete well as a coppice. Beech – poor; pine – never; lime – doesn't compete well, good by itself; exterminates herbs that don't fare well with exposure – sun, drying, or competition by tall vegetation; tidying up and removal of wood that reduces bryophytes, fungi, etc.; removal of big trees and their epiphytes; grazing – pigs etc. Conditions now more uniform

Loss of marginal grassland very damaging – plough and expanding woods. Also decline of coppicing and declining management in general. Many light demanding species of woods declining. Increase of dead wood – good.

Even in a remote place – flora tends to increase by migration and accidental introductions.

- ✓ Stools – some low and massive; some small and underground;
- ✓ Maidens – originate from seed
- ✓ Suckers – form roots or underground stems
- Emergents – very tall
- ✓ Standards – single-trunk trees
- Large coppice – low massive stool with a few trunks, telegraph pole size
- Small coppice – many slender stems, small form small stools
- Scrub – trees of coppice height, no stools; hawthorn
- Clones

Ash stools – gets bigger with each cutting; diameter is rough guide to age. Generally elongate, not round. Typical – massive hollow trunk 3 ft in diameter and 2 ft high with 3-4 large poles. Always rotten inside. Some in Suffolk and Essex up to 3m in diameter. Among oldest trees in Britain. 7-12 inches – cut once. Decreasing numbers with size. Death due to shading. A few very old ones. Some medieval. One with rings to 1775. Poles on given stool generally same size. Average height 16 inches, larger are taller – possible due to higher cutting each time or earlier woodmen cutting higher so out of reach of rabbits.

Maple – stools uneven in size and age (presumably). Stools lower (<18 in) as cut near the ground.

Plots diameter versus number of stems.

Tree ring chronology.

Unusual in that a number of trees are dying, near end of normal lives. Rare in GB. Oaks form 1916-24 caterpillar outbreak. Die at different age sin elm woods where doesn't compete. 50-100 years to decay. Oldest trees 200 years.

Foresters – most trees form seed. Woodmen – from suckers and coppice.

Oak – rarely establishes from seed. None in Hayley since 1840. Abundant seed. 92% germinate. Predation of seeds and seedlings. Rodents, deer, caterpillars.

Need to establish oaks for 22<sup>nd</sup>. But don't know how to do this.

Drainage – bad for rich woods – turn valued plant communities into dull ones.

Managed woodlands – gets complete light when cut. Few species require shade. Continuous shade not a natural feature of deciduous woods. Coppicing leads to cycle of conditions and ground vegetation. Flowering and growth. Light, temperature, moisture,.

Management – Trust opened up rides, started coppice experimentation. 57 species confined to railway – 1/5<sup>th</sup> of species. 13 recorded in woods in 19<sup>th</sup> C.

The Hayley Wood railway, with its complex structure and history, is the most interesting wood margin in the country...Unfortunately there is no substitute for railwaymen in managing railway vegetation.”

Deer incompatible with oxlips, coppicing and oak replacement

**Oliver Rackham. 1986. The History of the Countryside. Dent, London.**

Reviews sources of information – plants, air photos, maps, boundaries, written records (place names, Anglo-Saxon charters, Domesday Book, medieval records,), testimony and tradition. Many peats have lost their top layer from digging.

Domesday Book. William the Conqueror. 1086.

“I cannot analyze the historic landscape without noticing how much almost every aspect of it has been lost since 1945”.

Due to modern ag, modern forestry, development comes a long way behind; also “neglect of traditional land-uses and consequent natural changes, especially trees growing where they do not belong”.

Leads to loss of: beauty, freedom, vegetation and wildlife, and meaning.

- Beauty especially the loss of the small and complex and unexpected.
- Freedom from movement into open spaces.
- Of historic veg – “to recreate an ancient wood is beyond human knowledge, though we might re-create a historic grassland if we were to live to the age of 200”.
- Meaning – of our roots and the growth of civilization. Each historic wood, hearth, grassland etc. is unique and has something meaningful to tell us.

Myth – countryside always changing. Kaleidoscope Myth. Evidence and tendency make the most of change versus stability. Changes in some places and at some times.

New habitats do not replace old. Most new ag has spread the commonplace at the expense of the wonderful or rare. Subsidize ag to have expensive food and a ravaged countryside.

“Conservationists should not usually seek the restitution of features already destroyed, which is rarely worthwhile. They should seldom seek to remove land from production: long-standing land-uses should be maintained or restored. But they should resolutely oppose any further advance of the commonplace or loss of meaning. Historic landscapes and buildings are similar in many ways...”

“More intractable than destruction...is the blight of tidiness which every year sweeps away something of beauty or meaning.” Grind away stumps, remove mis-

shapen trees, cut hedges to ground, “unconscious vandalisms that hate what is tangled and unpredictable”

“The landscape is like a historic library of 50,000 books. Many were written in remote antiquity in languages which have only lately been deciphered; some of the languages are still unknown. Every year fifty volumes are unavoidably eaten by bookworms.” (Imperfect metaphor)

“Education in the knowledge and care of the countryside has far to go and has yet to reach many important people. No art gallery’s conservation department would think of burning a picture by Constable, however badly decayed...Yet this kind of pastiche is daily perpetrated in the guise of the ‘conservation’ of the landscape.”

Auroch – woodland animal. Last extinct in 1627 in Jaktorowa Forest, Poland.

Bear, wolf, beaver, wild swine, crane.

Loss of plants – destruction and alteration of habitat – drainage, ploughing, neglect of management, increasing heath fires; collecting and eradication; air and rain pollution;

“Allowing heath, grassland, or fen to become overgrown with trees does more damage than burning and is almost as destructive as plowing.”

Many woodland plants are affected by the decline in woodland management”.

“The most severe declines in all wild plants are among the weeds”.

Naturalized animals – rats, mice, rabbit, fallow deer, pheasant, grey squirrel, dove.

“Many weeds, such as plaintain, mugwort, and shepard’s purse, were originally arctic plants living in the tundra of late-glacial Britain; they somehow survived the millennia of wildwood, and in Neolithic times found a new lease of life as weeds. Other weeds...came from the oriental homeland of agriculture.”

Naturalized plants – chestnut (shown to be non-native by pollen), sycamore (*Acer pseudoplatanus*), *Rhododendron ponticum* in Ireland (was there in prior interglacials) now a menace to conservation, rosebay willowherb (*Epilobium angustifolium*), *Spartina anglica*, *Bromus interruptus*

Woods...result from long-running interactions between human activities and natural processes, to both of which the historian has to give due weight”.

“The history of woods is infiltrated and corrupted by myth and pseudo-history”.

Wildwood – natural forests. E NA patches still survive.

Woodland – lands on which trees have risen naturally. Managed by the art of woodmanship. Reproduce by natural growth.

Wood-pasture – land-use involving grazing animals and trees. Conflict with techniques to resolve these.

Plantation – not natural vegetation. Few species, often conifers that do not maintain themselves. Established and replaced by planting = forestry in GB.

Forest – with capital F is land on which the king or other magnate has right to keep deer. Place of deer to medieval, not trees.

Coppicing and suckering – efficient and very reliable ways of getting a new crop.

Pollard and bolling (permanent trunk)

Timber trees vs underwood – timber buildings and wood fires. Both have different meanings and uses.

“Woods do not cease to exist through being felled”. Self-renewing, not exhausted.

Some woods derived from the original wildwood. Others are secondary – arisen on land that has at some time not been woodland.

“Almost all land by nature turns into woodland. Let a field be abandoned – as many fields have been down the centuries – and within a year it will be invaded by oaks springing from acorns dropped by passing jays, or by birches from wind-blown seed. In ten years it will be difficult to reclaim; in thirty years it will have ‘tumbled down to woodland’. The same happens to chalk downs, heaths, fens, and some moorland whenever the grazing and burning cease that had held trees in check.”

Secondary woods may be of any age – prehistory onwards. Primary woods = ancient woods. Secondary = ancient woods.

Secondary – generally pioneer species that easily invade.

Wildwood. To understand the wildwoods of British prehistory we should look across the Atlantic to the wildwoods encountered by early American settlers and still surviving in fragments.”

Within each geographic province – many types of wildwood. Soils, etc., mosaic, varied structures, disturbance (no fire, less destructive storms). Few native trees that can grow up in the shade of other trees.

Mesolithic impacts. Hunting, gathering and may have involved definite management of land and vegetation.

Neolithis – sudden impact. “They immediately set about converting Britain to an imitation of the dry open steppes of the Near East, in which agriculture had begun.”

Attacked elm and may have let loose the elm disease.

Neolithics spread almost instantly throughout British Isles. 50% decline in wildwood by early Iron Age – 2500 BP.

“To convert millions of acres of wildwood into farmland was unquestionably the greatest achievement of any of our ancestors. It belongs to an age far beyond record or memory, and we know little of what men were involved, how they were organized, how much of their time they spent on it, how many man hours it took to clear an acre and what they lived on while doing it”. “Cattle, sheep and goats probably helped the clearance process by browsing the regrowth and eventually killing the stumps.” But may doubt whether in prehistory there were enough livestock to do this except close to settlements.

In New England a task of similar magnitude was accomplished by European settlers in about 180 years (1650 to 1820).” Metal tools, partially combustible woods, large population continually reinforced from homeland, places already [periodically burned by Indians, conifers easily killed, lived where hurricanes kept trees small, grew maize which gave them time. But boulders to remove and even more rapid regrowth than GB.

“Almost the whole area had become woodland again by 1900 – American agriculture is a story of wasted toil”.

British trees difficult to kill. Don't burn, difficult even with machine and poison.

“British woodlands (except pine) burn like wet asbestos”.

Some Neolithic areas regrew – were abandoned for unknown reasons.

Farmland doesn't result from people felling trees for use. Most wood wasted. Big trees not much use. But the resprouting stems are much more useful than the original tree. First evidence of this woodmanship and elaborate coppicing to produce rods of exactly the same size – 6000 years old – Somerset Levels.

New England ...”thousands of miles of field-walls lost in the woods, and the cellar-holes where thousands of farmsteads had rotted back into the ground. In America there was merely an economic cataclysm, and only pots lie under the bushes...”

Domesday (1086 A.D.) – 6208 of 12580 settlements reported woodland. “Most of England consisted of farmland with islands of wood”. Norman England – few woods > 4 miles across, many areas > 4 miles from woods.

Anglo-Saxon earlier times are similar. Woods have individual names and were permanent. No real evidence of A-S clearance – already tamed.

**Buildings.** Over 90% timbers are oak. Most made from the smallest pieces possible. Waney – rounded corners on piece squared up to work form roundwood.

Typical 15<sup>th</sup> C farmhouse – 330 trees – only 3 18 inches; half <9; 10% <6”

Good roads; large import business from Norway, Baltic, C Europe – pine.

Woodland in 1086 – 15% of England 10% by 1350, decline slowed by Black Death in 1349. Much of that then survived to 19<sup>th</sup> C.

Can rarely ascertain why one woods survived and another not; social value, economic value and cost of destroying them.

Not destroyed for fuel. Woods not used up. Not aware of a single woods which was destroyed for iron, etc. Not fly by night operations; actually more woods in areas around industry; industry protects against farmland; large tracts protected; not destroyed for shipbuilding;

Oak bark for tanning – principal tree; initially as by-product for timber felling; 1780-1850 became gigantic industry – huge consumer from almost every source of wood;

Since 1800 – long careful wood management declined; goods linked to boom and bust economy; management for timber not energy – wood replaced by coal, oil, atoms; paper and pulp from other countries; clearing for farms etc; gamekeeping and removal of public; Not so in France, Germany, Switzerland.

1870 most woods survived to 1945.

“Ancient woods have great powers of recovery” – 1914-45 fellings not damaging overall and allowed some to catch up on neglect.

“The greatest threats to ancient woodland for a thousand years came from the destructive course which both agriculture and forestry took in Britain after 1945... Foresters acquired woods and treated them as if they were moorland, trying to poison or otherwise destroy the vegetation and to replace it by plantations”

Conifer plantations destroy trees and herbs – shade and litter.

“Many ancient woods refuse to die; replanting merely wastes money but has no lasting effect”.

Woods are not on land that was good for growing trees., but on land that was bad for anything else”.



Sinuuous outline to woods – digging trench and bank around existing trees. Bank to inside.

“Stools are not men or machines; they do not die of old age or wear out; the process can go on indefinitely.”

Red maple stools 2 ½ feet across; English maple may be 15 feet; ash rings may be 18 feet; giant coppice stools are among the oldest things in Britain.

Tilia cordata – pry tree. Lime. Largely confined to AW. Oxlips. Suite of indicators. Recent woods – ivy, Alliaria, cow parsley.

Agriculture = real destroyed of woodland. But les in last 10 years; more fuel use.

“Our historic woods are not mere isolated relics of antiquity, but belong to an unbroken tradition extending through the Middle Ages back to the beginnings of coviliazation and beyond”.

“Almost every wood of which the coppice stools still remain is worth preserving.”

“If we cannot coppice for the present, let use not be ashamed of doing nothing”.

“...all over Wales, Scotland, and Highland England woods have been ravanged for decades by sheep getting in through breaches in the boundaries. The simples conservation of them all is three strands of barbed wire”.

Wood pasture – 1200 years. Pannage – not very important. When grazing suppressed the wood pasture reverted to woodland.

Bets preserved woodland – Hatfield – deer, cattle, coppice woods, seven species of pollard, scrub, timber trees, grassland, fen, lodge and rabbit warren.

“Old trees are almost as rare as in the United States”. (!!??)

Ancient wood-pasture – many creatures on them.

‘grey, gnarled, low-browed, knock-kneed, bowed, bent, huge, strange, long-armed, deformed, hunchbacked, misshapen oak men’ Francis Kilvert 1876.

Overtopped and shaded.

Hedges – planted; inadvertent due to misuse and neglect of edges; remnants of former woods hollowed out. Great loss of hedges after WWII.

Stag-headed trees – many like that for decades.

Oxford and Wallingford – “fords” of rivers.

Ancient roads – abandoned, plowed, privatized;

Heath – dry versus moor with peat; old belief that these were wholly natural; from clearings created by people; some Mesolithic, many Neolithic; form common woods, not form thin areas or lightly forested areas. Some ploughed (much more so in grasslands and moors); no evidence of deliberate destruction of trees for framing – effect of long-term grazing; Calluna, Erica, Broom, bracken,; rabbits added motive for maintaining heath. Warrens all over England.

Sherwood Forest – not wood – vast heath encompassing many woods in 1154.

Most heathland plants can be grazed; furze = *Ulex europaeus*; many harvested for fuel, litter, thatch, compost, potash (bracken), brickmaking,

Fire often called necessary; “but we must not suppose that all heaths were burnt”. Rarely burn a crop. Amny so closely grazed that they seldom burned; those not grazed were kept free of animals for other purposes;

“Fire in a heath, as in a wheatfield, was a rare accident which most people did their best to prevent . . . many heathland plants and animals are now endangered by fires, and could not have survived to the present had heath fires been a regular event of the past”.

Ag reclamation destructive.

“On most heaths there is not enough grazing to keep down the oak and birch”

“Heathland is an ancient and beautiful part of our heritage. It is a symbol of liberty: most heaths are de facto open to the public, and their destruction has curtailed Englishman’s already meager right to explore his own country.”

Moorland – some natural due to rising water table and some generated by people. Wholly natural to wholly artificial. Much interaction of the two. Burning always more common than on heath.

Meadow = grassland mown for hay vs pasture grazed by farm animals. Very different plants as seasons different and selectivity different. Scythe does not pick what it bites.

All kinds of other artifacts.

## George Peterken – Natural Woodland

Potential conflict – conservation of the natural environment and the maintenance of historic conditions.

“The pattern of working is determined by modern limitations, not historical needs”.

“The woods are an expression of mankind as well as nature, and the people that matter have changed greatly”.

No one historic state.

Naturalness is a continuous variable. Woodland is natural if grown without direct management – quite impractical as all affected.

“Ancient” – wooded since 1600; versus “recent”. “Primary” if existed continuously since before original forests fragmented. “Secondary” originated on unwooded ground. Very difficult to prove conclusively if primary but relatively easy to determine Ancient.

Many slow colonists

Link between stability and diversity – uncertain.

Beech limited by – spring frost (sensitive), summer drought, late arrival after ice retreat.

Cline and Spurr 1942. “The primeval forest. . . did not consist of stagnant stands of immense trees stretching with little change in composition over vast areas. Large trees were common, it is true, and limited areas did support climax stands, but the majority of the stands undoubtedly were in a state of flux resulting from the dynamic action of wind, fire and other forces of nature. The various successional stages thus brought about, coupled with the effects of elevation, aspect, and other factors of site, made the virgin forest highly variable in composition, density and form.”

Nature conservation management – natural woodland; traditional management; and management designed to achieve explicit targets such as diversity or conservation of a rare species.

Britain – distinctive: predominantly temperate broadleaf; native woodland reduced to a scatter of small remnants by extensive and prolonged deforestation; substantial reforestation in 20<sup>th</sup> C using non-native conifers such that Britain remains poorly wooded.

Rackham – importance of “meaning”.

“Surviving examples of traditional management demonstrate relationships between people and nature which cannot be re-created once they have been abandoned.”

“The countryside is a ‘book’ where we can study in minute and varied detail the long coevolution of human societies and the environment” (Rackham 1986) but only if preserve pollard etc. along with records to interpret.

Value in research, social and economic history. Historical monuments, some of oldest features in land.

Epping Forest and Dalby Woods show...“the diversity created by and inherited from traditional management is likely to be lost if reserves are allowed to grow naturally.”

Traditional management – manage as in the past. Protects the complement of species, usually maintains the greatest diversity of habitats, preserves the historic interactions between people and nature. Maintain traditional management where it survives and restore it elsewhere. SO, maintain some reserves as coppice. But what to do as management actually changed slowly over time? What are the essential features of traditional management? What to do with damaging aspects of TM? What to do with natural disturbance? Do forests need restoration from degradation?

Woodland conservation in Britain characterized by underlying conservatism. Including keeping forest types as what they are. Prudent, based on primary woods recognition, reinforced by limited amount of natural woodland. But kept people from recognizing value of secondary woods; plantations; purist attitude towards sycamore and other species;

Widley believed initially that natural woods were degraded – needed rehabilitation. Envisioned dense reproducing and self-replicating stands. Assumed stable forests, diverse, increasing richness over succession.

“It was believed that human actions had sacrificed this diversity, degraded this original state and created instability in a system which was naturally stable. These assumptions led further to a belief that existing forests could be rehabilitated to a highly productive, diverse condition.”

“Foresters have long found professional inspiration in the supposed need to rehabilitate degraded woodland. They have an urge to control and to predict”.

“Everyone was aware that mankind had destroyed most of the original woodland, but few entertained the possibility that the remnants were richer in some respects than the original on that site.”

Restoration of ancient semi-natural woodland to natural woodland limited by: difficulty in effacing effects of past management, restoring lost species, etc.; cannot insulate site from surrounding landscape or human activity including management; need to accept instability.

Restoration goals: original natural woodland; present-natural woodland; future-natural woodland. Or accepting present condition and configuration.

Various options: restore site and soil; remove planted and naturalized trees; reintroduce trees and shrubs; accept and simulate natural disturbance; re-introduce keystone species; control grazing; re-introduce other wildlife; (Transport lichens, beetles, fungi, bats; buffer form surrounding area; control physical process; - herbicide, fertilizer, nutrients form birds etc., soil, water flows; control people;

Recreating natural woodland is largely a benefit to science. Only approximate, always a facsimile, many values realized even when not very natural;

Broad principles:

- Historical principle – wildlife etc. better when historical approaches adopted and maintains features long present
- Natural principle – wildlife will propose to the degree that management approaches natural conditions appropriate to site. Can be in conflict with #1
- Graded response – nature conservation interest should be highest priority in woods that hold greatest interest

Wood Pasture – conflict owners of wood and rights to graze. Reduced from 87230 ha in 3 counties in 1086 to 1450 ha in 1976. Most to farmland.

Coppice – generally 4-30 year rotation; standards 60-100 years; widespread in pre-historic times; 18% of all British woodland in 1924; 1/6<sup>th</sup> that in 1980. In Middle Ages likely grazed once shoots tall;

Wood Meadow – cut for hay, branchwood burned for fertilizer. (Sjors). Pollard meadows, orchard meadows, coppice meadows.

High Forest

“Don't waste time, Jump to conclusions'. This exhortation was found whilst surveying Castle Crag Wood, Borrowdale, Lake District, etched into the walls of a small cave. It seemed appropriate for scientists in nature conservation”.

**The Woods of South-east Essex**  
**The Ancient Woodlands of England.**

Oliver Rackham. 1986. Rochford District Council, Essex.

Earliest map for woods of all SE Essex – Chapman & Andre. 1772-4.

**Ancient Woods** defined then = all primary woods and those secondary woods established before 1772. Versus recent woods.

**Woodbanks** – massive banks and ditches with bank on wood side. Pollards on banks. Short pollards = stubs.

Forests were grubbed out. Ancient woods = wildwoods least worth grubbing out.

Archaeology of different features

Building timbers and the medieval uses of woods.

Main use of wood – renewable source of energy not timber;

Wood used in carpentry – round, minimum size needed; whole tree; rounded;

Almost no relationship between isolation and number of species; no systematic effect on how many species; size makes more difference – 1.8 x species in 40 acre vs 4 acre – not much;

55 ancient forest species in E England

Giant stool of chestnut; stools >300 years; hornbeam to 10 feet or more;

Coppicing plants – species that flourish when wood is cut; not necessarily visible all of the time; broom survives as buried seed; many show up excellently in strips under electricity cables in areas coppiced frequently to keep growth low;

Need to restore woodland grasslands; “place for emptying dogs”

Many woods have an understory of brambles

Woods long neglected with too many timber trees, too long between coppices; excessive shade; plants destroyed by horses, cattle; loss of plants due to shade;

Threat of agriculture and housing;

Gradually learning how to manage these – knowledge came slowly; public amenity' avoided the "Curse of Too Much Money" – over restoration and excessive tidiness;

"Woods have a life of their own; men have been given the power to preserve or destroy them, but have little control over how they develop."

Badgers in some.

### Some Illustrations

#### **Photos**

**Maps of same region** showing different features on each

#### **Leaf shapes**

#### **Ancient maps reproduced**

**Cartoony maps hand-drawn** to show details

**Timeline of forest cover** showing % with % lost to agriculture, % lost to development; % recently reformed.

Old Air Photos

Thomas's County

DRF 2002

3 directions of Conservation

Wilderness, Cultural, Nat Resource

HDT quote

Modern NE - many natural processes

[DRF]

→ 2 wildlands + Managed Lands

↳ Increase natural processes

↳ extraction, cultural, human

Template for proactive mgmt

19th C - defining era + 20th C

20th C - Peak + decline; older, wider, natural; native wildlife sustainability; haphazard;

Quabbin Mgt - RESTORE, MAS; Sweetwater generally;

Suburban pop'n

Cultural landscapes - E cottontail; bog turtle, smooth green snake, leopard frog, Potw. fishless shrewby squirrel, vesper sparrow, some tiger beetles + slug beetle, woodcock, whip-poor-will, meadowlark

Fire - variant on wildland ethic - NA

Illusion

Regional Conservation Plan - advantages for NE - 60-80% forest; fire not much of an issue; little extraction; no massive plantations; substantial primary forest;

Transience - unreproducibility - WP, Menemshie structures

Research, goals, measure progress, LT mgt, needed:

Cannot return, multiple options - no roll way, future A inevitable  
Some spp + h. h. it is impossible

HDT suite - eternally behind + before



## Water

MV Shellfish Group  
Blue Pages  
~ 2012?

3 Aquifers - Great Plain; Moraine; Chappy

WT → Lagoon Pd groundwater - 30 yrs

Many Watersheds - Indian Hill + State Rd

Recycled from  
Puget Soundbook  
1991

Acid rain 29%, Landscapes 4%, Farms 5%, Wastewater 62% N

Eelgrass sensitive habitat Shellfish filterers Waterfowl

Herring run active Richard Madeiras - OB - April

90% of 15,000 housing units - backyard wastewater systems

Trees, shrubs, infiltration, natives

Understanding of

75% N from each home in watershed → pond

Cost to clean \$150-250m

VG 2-27-2014

Islandwide DCPC for fertilizer use. All towns support

Licensing process for landscapers, golf courses Matt Poole

Problems coming. No turf fertilizer Nov 15 - April 15, amount

+ content restricted, No P Uniform across town

Statewide more focus on P than N. MV N biggest problem

3.31.2014

MVC designated lawn fertilizer DCPC - started by town bds health

All land except Indian common lands + settlement lands + Nomans

Lawn fert = 5-15% Islands controllable N

Towns need to adapt by 3-1-2015 Exempt: home veg + flowers, ornaments,  
ag + horticulture

Penalties Warning, \$50, \$300 Includes golf 3 yr license

## Conservation Mgt Notes

Field management - Mow after August 1

Second brood cow finish 1st by Late June

Burning - more heterogeneity

Graze - varied preferences:

Graze - mosaic of hts: removes ground litter, benefits  
bunch grass, wildflowers & shrubs

Overgraze - trample, bare ground, erosion

High P sites + grasses - little diversity but good hay.

+ fertilizer + mowing - low value

Fire + burnings - native site + mgt

Katama - 1640 onward: - 40 ac lots, Crev 1784 sheep pasture

Cultural landscape mgt - works on MV where consistent with  
history, producing local resources, maintains habitat

Farms - habitat, permeable to many spp.

Id potential habitats farming can offer to nature

Farms - Engage + mobilize; augment protection;

Leopold, A. 1939 Farmer as Conservationist

Most of NA impoverished.

When land does well by owner + rivers - both better by <sup>= conservation</sup> partnership

Think of losing flora/fauna as inevitable - not

Need to stock ponds + rivers; erosion of soils:

Semi-economic land uses - woods, marsh, pond, windbreaks - needed, as are fence rows for birds, space for coons + flying squirrels.

Conservation pays. But rural landscape has a wholeness.

Should not remove natural features. E.g. WI farm ponds - eliminated.

Doctrine of ruthless utilitarianism

But we can cast off this yoke

Principle of wholeness in the farm landscape - not a luxury

Tendency to create monotypes

Conservation implies a certain interspersing of land use

Woven by the individual farmer - colors that warm eye + heart, not just feet

What is best for the community?

Bog birch - one of 500 dramas on the land

Drama in bushes + on farms

"The landscape of any farm is the owner's portrait of himself"

Conservation implies self-expression

Creek cooled; banks wooded + matted; Woods have songs + downed logs; hickories + walnut

"The fields + pastures of this farm, like its sons and daughters, are mixture of wild and tame attributes, all built on a foundation of good health."

Like old NY

Fence rows; historic oaks; orchard; wildflower beds; pond;

## Managing Farms for Conservation not Indian Fire

Foster & Motzkin 2003

Department of Environmental Management (DEM—the agency responsible for forests and parks) Project in Ecosystem Management operates on “assumptions that grasslands, heathlands, shrublands and savannah’s are natural vegetation types with significant rare species assemblages . . . in presettlement times” (Rivers, 1997)

Ecological Restoration Program of the Massachusetts Department of Fisheries and Wildlife (DFW; the state agency responsible for wildlife and biodiversity) manages for open and early successional habitat based on the interpretation that “many of our dry forests, shrublands and grasslands were managed with fire for thousands of years by Native Americans. Now, lack of occasional fire has caused significant changes in those communities, decreasing habitat for many of our rare plants and animals.” (<http://www.state.ma.us/dfwele/dfw/nhosp/nhrest.htm>)

Biodiversity Initiative of the Natural Heritage and Endangered Species Program of DFW cites that “Fires were not only used [by Native Americans] to create and maintain agricultural fields but also to drive game. In using fire, many fire-adapted natural communities, such as grasslands and scrub oak barrens were created and maintained.” (<http://www.state.-ma.us/dfwele/dfw/bdi/Landuse3.htm>).

TNC - Katama grassland because “this reserve is the largest example of native sandplain grassland left on Martha’s Vineyard” (<http://nature.org/wherewework/northamerica/states/massachusetts/preserves/art5320.html>).

few miles away, TNC and DEM are collaborating to burn oak forest as “restoration of the property’s original grassland and woodland habitat” (<http://nature.org/wherewework/northamerica/states/massachusetts/preserves/art5334.html>).

Katama Plains, the large grassland on the southeastern corner of Martha’s Vineyard jointly managed by The Nature Conservancy, State of Massachusetts, and Town of Edgartown. The area has been variously described as “native sandplain habitat” and “one of New England’s largest and best sandplain grasslands” (Scott, 1989; Liptak, 1998; TNC, <http://nature.org/wherewework/northamerica/states/massachusetts/preserves/art5320.html>) and its dark soil profile has been interpreted as indicating grassland continuity for thousands of years (Scott, 1989). The area supports an array of uncommon species, including more than 18 birds, invertebrates and plants that are rare and declining. In order to reverse a trend of habitat deterioration, including shrub and tree invasion, the area has been managed through fire, mowing, and stem cutting in recent decades. According to site managers, the use of fire is preferred due to its perceived congruence with the site’s native status and history. Nonetheless, despite ongoing management, many species have declined or disappeared over the past two decades, including a wide range of plant, bird, and invertebrate taxa.

Historical review provides an alternative interpretation of the site’s origins. Located adjacent to Edgartown, Martha’s Vineyard’s oldest and most prosperous town, the Katama Plain was one of the first sites to be settled by Europeans on the island and was probably originally wooded (Herbster and Cherau, 2000). By 1642, the area was divided into 40 acre lots that were cleared for agriculture. Maps from 1776 onwards depict the area in fields; it was mapped as “sheep pasture” by Crevecoeur in 1784; supported dairy cows in the 1880s; and, currently is comprised of varied fields and a grass airfield. As in the case of the North Haven sand plains, the dark soils are Ap horizons that developed through deep plowing of the sandy soils. The site and its assemblage of interesting species are clearly the recent products of human history. Encroachment of woody species is therefore a consequence of historical shifts in management. Whereas the current management regime appears to be largely ineffective in maintaining the habitat and eliminating woody plants, the site might well respond favorably to management that mimics the agricultural practices that gave rise to its historical condition over past centuries.

The insights arising from historical perspectives force us to address quite fundamental questions. What landscapes do we value, and why? Should we attempt to maintain cultural sites and assemblages? Are we

seeking to maintain or recreate landscapes and assemblages from specific time periods? Should we use any and all means to support as much of our local biodiversity as possible? Once we have addressed these and related questions we can return to historical information for further insights into management with some expectation of success. While we may open new policy and ethical discussions through historical-ecological studies, we also learn much about ecological process and options for conservation.

### TTOR Cape Poge Management Plan

The Native Americans inhabiting Martha's Vineyard - known as the Wampanoag - have lived on the island for an estimated 12,000 to 13,000 years, and had profound effects on species composition and landscape structure. The Wampanoag imposed drastic changes on their surroundings, predominantly through the deliberate setting of large-scale fires. Setting these fires assisted the Wampanoag with hunting game, maintaining berry patches, and creating fertile soils for cultivation... Because of Wampanoag land-use practices, many explorers that traveled the waters surrounding the Vineyard in the 17<sup>th</sup> century found an "open" (unforested) landscape. Because a substantial proportion of Martha's Vineyard was open at this time, the Europeans reasoned that this land would be well-suited for agriculture and pasture.

ii. Manage as little as necessary. Hubris - Nature is fine without us. Human, not ecological need to respond. Impact often much greater than natural damage.

iii. Allow natural processes to reassert themselves + shape land

i. Work with nature - trying to change what is happening in nature and naturally happening in wild usually causes unanticipated problems

Hazard and mitigation plans - SLOSH + fire + windthrow

\$49m 177 bldg T; \$30m 108 bldg OB; \$65m 75 bldg E

Coastal DCPC - 1970s - controlled development for ecology, helped mitigation

HMP maps - 100 + 500 yr flood; Funded 2012; meetings

Fire - 1867-1929 16 > 1000 ac; 1916 - 12,000 ac WT to <sup>Ocean Hts</sup> Farm Neck, Edg; 1965 1200 ac <sup>Last bison</sup>

Salvage/mitigation - often generate more impact than correct

Hubris - nature is fine without us

Value to unmanaged - Pisgah, Naushon, Woods

v. Accept nature

ii. Broaden conservation Equal value - cultural + natural  
historically accurate

Farmstead - Argument for Ag: direct expenses + investment into infrastructure + production more dependable + cheaper than fire; direct human involvement

Habitat is by-product of employment + resource production

Broaden conservation land base + broaden Ag area + land base

Scales + involve all - weed whacker + backyard sheep, llamas

Works in concentrated areas

ix. Neighbors/homeowners - coordinate mgmt

v. undevelop

Grazing - ↓ fuel, work in all settings, cost effective

Photo IMG 4272 Aerial West Tisbury, Tisbury Great Pond - options

Quotes

Next Steps

①

Incorporate these 2 pp into Planning

VTA Ridership 2001 - 360,595 2010 - 1,099,340

Finish IP section by what has been implemented

Include Land Bank purchases.

Then turn corner to look specifically at what might be done with land protection + land management to achieve goals. Use MV but serves as microcosm and useful laboratory. Most extreme prices + pace of building in MA/NE. But innovative conservation, active planning, desire to bring pieces together.

Recognition of absolute limits

Land Protection - Advance as much as possible. Effectively integrate and coordinate as many groups as possible.

Value of Island is in land, water, views, character - need to be maintained and sustained. Driver of economy, Future towards more sustainability - agriculture, wood resources, education.

Approach - pragmatic - fee, CRs, easements; underdevelopment - small + large. Just as ~~big~~<sup>new</sup> house owner tears down to build bigger, conservation can tear down to improve. Self property.

Take advantage of big land-holdings. Manage in coordination Land protection as brake on <sup>over</sup> crowding - doesn't alter build-out rate or end-date but does lead to different end point. ~~Not~~ Implicit in M+E but not considered

(2)

they mapped priorities not any futures.  
taken into consideration in Island Plan, Also ignored in build-out projections and mappings. As if M+E tried to plan and map retaining the 1970 ~~land~~ protected land overlay. M+E grounded in defined greenways + defined coastal ownership, Use that framework to structure the landscape and subsequent discussions of residential, commercial areas, and housing densities.

Basic relationship of recent activity. 57,000 acres with 30% (16,980) fully developed, 40% (22,889) protected and 30% (17,181) available. If 200 acres protected to 800ac developed then 3,440 will be protected and 13,741 will be developed. 26,329 protected = 46%

Conservation + development not opposed. Earth/Island is finite. There is a build out and end to new housing. Not a question. Rather - balance and proportions. With nature driving economy + well-being argue for more.

Priority - Biodiversity, connectivity, greenways, access - IP and MVLB approaches. Big blocks, avenues to settlements, movement of people and organisms; boundaries and separation of towns, villages and activity areas.

Be massively proactive. Bold vision.



## Approach to management.

Pragmatic - balancing human + nature's needs; acknowledging constraints imposed by laws, ownership, conservation priorities. Guided by strong sense of the history of the land and science. How has it been used historically? How have conditions been achieved previously? Science to add guidance, test these ideas and study effectiveness and consequences.

W+W+F = Balances + serves human needs/desires and broad natural conditions and habitat types + biodiversity needs. Accomplish as much of the conservation mgt as possible through resource production - farming and forestry for timber, cordwood + other products.

Rationale - historically accurate + consistent - land was worked hard. Achieves objectives - open areas of grass, scrub, shrub, young forest, heathland is highly desirable and was produced by a history of use and resource production. To maintain this most likely approach to work is one that produced them historically.

MV needs resources - food, wood, timber, mulch - predominantly from off island. Island cannot produce the bulk of it - one estimate for food is x%. But more than a symbolic gesture. Food + products produced locally are good; they support local enterprise, and they provide important lesson for consuming adults and growing kids. We depend on the earth. Land is finite. Our food preferences and consumption habits have real consequences. Our decisions lead to

real impacts on the ground. The Illusion of Preservation. Applies to farmland as well as woodland. Can set it aside or burn or mow it producing nothing but habitat (while consuming much fuel etc.) but our wood and food come from somewhere else. Less oversight-environmental impact + quality. Good for everyone to see that our wood comes from cutting down trees, our chickens and beef from animals killed and butchered at slaughterhouses and our mulch from shredding and grinding tall trees. Important lessons.

Conservation land may play critical role in enabling farming to be a viable enterprise, to provide adequate land such that dairy, slaughterhouse, mill facilities can operate. For conservation way to reach a broader audience - with educational messages, with value to those who don't use the land for e.g. hiking, etc.

Economic for conservation orgs.

Also returning conservation to its roots. Conservation is not solely preservation, rather a balance of sustainable utilization and hands-off preservation.

Our Modern approaches to farming and timber harvesting are well suited to this. Farming <sup>is becoming</sup> more organic, diversified, uses land and less extractive; <sup>intensive and</sup> putting nutrients back in by composting, mowing, rototilling. Scale diversifies. Harvesting also diverse - chipping to single tree; horses to small lumberyards.

assert; provide control and contrast to other areas

Mention first as often most controversial + difficult to

Reserves - wildlands - intentional decision to manage by allowing nature to develop without any active interventions. No extraction of resources; no directionality; no salvage or clean-up after disturbances. Large areas to allow for variation in forest growth and landscape-scale variation soils, vegetation and disturbance processes. Big, old ancient trees - living and dead, standing and fallen; coarse woody debris on ground, in streams, into ponds; uproots and standing dead.

Landscape of structure and process - has many values for people and for nature. For humans these areas yield beauty, awe, surprises and many lessons. Offer insights into forest processes - especially intriguing on MV where forests are recovering from 300 years of intensive use. How does a forest return and become more natural? What qualities will emerge - how large will the trees get? How will they become tall-timbered forests with open understories? How will the species change over time will we see a re-emergence of beech, beechbuns etc. Or will disturbances - hurricanes, insects and the like continually or episodically disturb the forests.

Will yield habitats in woods, wetlands, streams and ponds missing for 400 years. Provide control for other, adjacent areas to contrast how areas develop and change under different management regimes.

Wild forests like wild stretches of beach or broad expanse of salt marsh, which, these days, we would not imagine disturbing.

Value and potential for these kinds of reserves seen in many parts of Vineyard. While no areas that I know of have

Box. When doing nothing is a viable alternative

⑥

been formally designated as wildland reserves a number of properties have been managed in hands-off way that illustrate their value and potential.

Mesic and richer morainal area - broad stretch from Polly Hill through Woods Reserves and Waskosims over to Seven Gates and Cedar Tree Neck. Includes areas with diverse history and ownership from ~~to~~ old woodlots and a few stands that have escaped much logging over past centuries to many areas ~~to~~ of that were cleared pastured through multiple generations by sheep and cattle and then allowed to reforest. Includes the oldest trees on the island and a great diversity of types - large stands of beech and beethbuns, scattered pockets of hickory and to broad expanses of oaks.

Recent years large areas of oak forest has been killed by the fall canker worm across especially Woods, Waskosim's, PHA and parts of Seven Gates. Landowners have ~~allowed~~ forgone salvage and allowed dead trees to stand, providing a ~~striking~~ example of the diversifying impact of disturbance and the phenomenal power of recovery by forests. Impact was variable - from <sup>near</sup> one hundred percent mortality to scattered trees, <sup>Has</sup> yielded broad areas with standing and fallen carcasses over open stretches of huckleberry, blueberry, arrowwood and regrowing trees to ~~scattered~~ occasional canopy gaps and forest openings.

On the plain large areas of the state forests yield an opportunity with great access to ~~to~~ highlight the growth of pine and oak woods on sandy soils. Part of the largest continuously forested area on the Vineyard the forests are

Planning to Add

Mention VOLF

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## Questions

Mark London etc. JoAnn Taylor, Jim Athearn, Tom Chase

How has IP been implemented? Were those strategies followed and has progress been monitored?

Have the trading sheets been used?

Did the Steering Committee reconstitute itself?

What about the website?

What should happen 5 years on

Relationship of Planning Efforts - M+E, Kennedy, 1997, VOLF,

MV = microcosm; big issues + challenges broadly; case study; metaphor  
L

Lessons: Vision helps; future scenarios are critical

History informs

Need to be massively pro-active - 40% inadequate

Absolute limits

57,000 acres. 30% (16,980) fully developed; 40% (22,889) <sup>available</sup> prot; 30 (17,181)

If 200 ac prot / 800 ac. developed annually  $\rightarrow$  13,000 <sup>more</sup> developed

- Balance of development vs undevelopment + protection

Broad Approach - <sup>①</sup> All groups into land protection; neighbors  
Protect as much as possible; create very large and  
intact blocks; forge connections + greenways (movement, separation, boundary)  
<sup>avenues to settlements</sup>  
<sup>efficiency</sup>

CTN <sup>②</sup> W+W+F - Reserves, active woodlands + farmlands; Smart Growth complement  
SGF-Woods-PHA  
W Chop Woods  
S Woodlands  
MFCSF  <sup>retard change</sup>  
W - large reserves = big + ancient trees; blow-downs + disturbance; CWD + uproots that  
become legacies for the future; landscape of structure + process - for people -  
awe, beauty, lessons, education, science; for nature - habitat missing 400 yrs  
~~Illusion of preservation; connect actions + consequences~~  
MFCSF, 50 areas  W - manage - local lumber, cordwood + mulch = local products + economy; good products,  
<sup>cultural</sup>  
pest + pathogen control; manage + produce habitat - savannas, young + successional  
habitat; use local resources - not self-sufficiency but education + reinforcement

F - Opportunity - diversified, small scale, varied intensity, low input  
diversity of grazers  $\downarrow$  fuel

Approaches to management - landscape - scale

Undevelop - T Chase, J Longell; CCNS, Self; Remove tree invasives

local backyard with adjoining reserve - habitat, fire, etc.

Coordinate Mgt - MFCSF/Greenlands/Pohogonot/Airport; 50 areas; big wildland

Anticipate + accommodate change - not static, don't attempt to freeze

- i. Work with natural process - sea level, erosion, wind not fire, ephemeral  
Draw lessons from history + apply - big old forest, role of mgt in fields, you,  
<sup>hurricanes</sup>

- ii. Broaden the definition of conservation = ~~from~~ combine conservation with  
living lands that produce tangible products that yield resources  
+ human benefits. W<sub>i</sub> = water; W<sub>o</sub> = habitat + wood; Farms

Respect the recuperative power of nature - accept disturbance as natural

Equal value of cultural + natural - TIOR

maturing and beginning to enter a phase when old trees will die, replaced by new growth that will diversify the forest in age, structure and perhaps competition. Contrast with adjoining areas of MFCSF ~~that~~ and adjoining woods that are actively managed for restoration, resources, structures.

Many small ~~to~~ areas could provide local reserves of magnificent trees that are more accessible to neighborhoods for local walks.

Woodlands. Vast majority of woodlands because of ownership and ~~interest~~ owner interest provide opportunity ~~to~~ for active management. Can be motivated by a variety of objectives: interest in local production, conservation objectives to create particular structures of vegetation, or desire to restore areas, eliminate non-native tree species.

Examples. Large plantations and spreading areas of white pine and spruce on MFCSF could be harvested to produce lumber or mulch for landscaping. Effort would slow the expansion of non-native species.

Cordwood could be generated from removal of trees ~~for~~ encroachment in scrub oak bottoms and expanses, from effort to selectively remove trees and create savannas or to encourage the growth of remaining trees for local timber. Interest by many conservationists to maintain areas of young forest - easily achieved by clearcutting.

Portions of state forest, town forests, town watersheds, Land Bank and many conservation organizations. SMF tables



a lead in promoting this and using small amounts of wood from properties in projects.

Farming. Given their historic abundance and captivation, beauty exposure of open landscape are highly valued in as heavily forested area as MV. ~~These~~ As grasslands, heathlands and shrublands decline and lead to reductions in their abundance of plants, butterflies, birds, ~~amphibi~~ and other species that inhabit them, these habitats increasingly become major foci for conservation. As they are purchased and protected for their beauty and conservation value these sites change inevitably as they become overgrown with woods species, topped by trees and wooded.

~~to~~ Over the years conservationists and land managers have forgotten the <sup>historical</sup> origins of these areas and so struggle to manage them effectively and with success. Today we either approach them as seminatural swardplain grasslands, heathlands, shrublands and woodlands and manage them with fires, seeking to restore ~~purported~~ pre-European conditions managed by native people. Or, we expend great quantities of ~~fossil~~ resources on machinery, personnel and fossil fuels to mow, shred or brushcut the growth and leave it on the ground.

Yet, the Island was heavily forested four hundred years ago. ~~and~~ Each of these distinctive habitats emerged through intensive management by farmers and landowners in need of resources and keen to create expansive pastures for sheep, cattle, horses, hogs and poultry.