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Inside and Outside the Lines: The Socio- Ecological Differences of Landscape Conservation Partnerships and Their Surrounding Regions

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**INSIDE AND OUTSIDE THE LINES: THE SOCIO-ECOLOGICAL DIFFERENCES OF LANDSCAPE
CONSERVATION PARTNERSHIPS AND THEIR SURROUNDING REGIONS**

A Master's Project presented

By

SOMAYE GARMROUDI DOVIRANI

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment

Of the requirements for the degree of

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Department of Landscape Architecture and Regional Planning

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Approved as to style and content by:

Elisabeth Hamin, Chair

Mark Hamin, Member

Elizabeth Brabec, Department Head Department of
Landscape Architecture and Regional Planning

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ABSTRACT

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LANDSCAPE CONSERVATION PARTNERSHIPS AND THEIR SURROUNDING REGIONS

MAY 2013

SOMYE GAMROUDI DOVIRANI

SOMAYE GARMROUDI DOVIRANI, B.S., UNIVERSITY OF TEHRAN

MRP, UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor Elisabeth Hamin

This study examines the socio-ecological criteria forming physical boundaries of regional conservation partnerships and the differences between outside and inside the boundaries. The purpose of this study is to first of all know more about the existing condition of regional partnerships' boundaries, and to seek a method to maximize the efficiency of regional partnership goals to conserve more land. Using a patch-and-corridor matrix ecological model to proves to allow for stronger conservation plans than the existing more opportunity-driven approach currently taken by RCPs.

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CHAPTER 1

INTRODUCTION

Background

New England in the late nineteenth century was largely deforested, and the landscape has been recovering ever since. Since the turn of the century, land trust, municipalities and agencies have sought to preserve woodlands and encourage the reforestation through land and easement purchases. This has been effective on a local level, but has resulted in fragmented preservation that lacks regional vision. Since 1994, these organizations have begun collaborating in their conservation goals, forming regional partnership conservation (RCPs). In the New England region, 26 regional partnerships have been formed to accept the responsibility of conserving lands in this area.

This project investigates the relationship between geographic areas and ways of knowing in the context of how the RCPs are formed. The examination uses data from 20 conservation partnerships which work in New England. According to the GIS file these partnerships area is 10,228,421 acres in New England. Each partnership begins in a unique way and for unique reasons, but all must determine some set of boundaries for their region (Labich, Hamin and Record, 2012). This leads to a set of research questions: What makes the included lands different from the

excluded lands? What is the relation between partnership boundaries and physical boundaries? Which factors affect the creation of these areas? Can physical boundaries be optimized to more efficiently conserve land?

The results should support the proposition that some indicators, as discussed in next chapters, can significantly affect the formation of existing regional partnership area. Also there are some common characteristics of RCPs which protect more lands. Finally, we will discuss which characteristics could increase the efficiency of the RCP's efforts.

For answering these questions I focus on three key concepts: defining regions, conceptions of place, and the collaboration issue. Specifically, how do regions tend to be defined? What is the concept of place and how does it link to people? Which characteristic create regions? And finally I examine the relation between partnership and physical boundaries to find out how, why and based on which factors regional collaboration boundaries has been formed. These results suggest **the most important physical boundary factors which affect the ability to conserve more lands.**

This research builds from a project initiated by Bill Labich, Dr. Elisabeth Hamin, and Sydne Record (2012). That research focused on determining characteristics separating RCPs that tended to be successful at preserving land from those that were less (or not yet) successful at this key task. The identification of New England RCPs, maps, and data come from the original project. In my research, I focus on examining the relationship between the RCPs and their external boundaries, which was not part of the

Labich et al study, and the primary data is from mapping, for which I developed the regional data, mapped the results, and prepared the analysis.

Research questions and hypothesis

Based on the literature above, my primary research question is: **how are the collaboration regions different than the areas outside of their boundaries? Why do some areas have partnerships, while other areas do not? And what affect to some area can be consider as a part of collaboration area and some part cannot be considered?**

Below are the specific questions I seek to answer:

1. What are the existing criteria that partnerships use to define their regional partnership area?
 - a. My hypothesis is that geographic characteristic has significant effect on defining a region and creating place concept. As a result, the physical characteristic of the land is most important indicator to define an area.
 - b. To test this, I will map the boundaries of the collaboration regions to watershed, political, economic boundaries, and test to see what has the most explanatory power.
2. In what ways are the partnership regions different than their surrounding regions?
 - a. My hypothesis is that (because these are land-conservation partnerships, the included areas will be significantly less populated than their region, or

maybe that the socio-economics of the partnership areas are better than those of surrounding areas, or ecological opportunities vary between them. Also the age, size of RCPs region, partner contribution and funding have very important role to protect more land and make them success to protect more lands.

- b. To test this, I use statistical analysis to find out what characteristics are different between inside and outside lines of RCPs boundaries.

The ultimate goal of the research is to assist in understanding the relationship and the homogeneity in the specific regional partnership areas, to increase the efficiency of regional partnerships and finally to increase the functional independence in the region, all leading to more **place-based Conservation**. It means that that concept of place is in service for better conservation land management. This key conceptual relationship is shown in Figure 1, below.

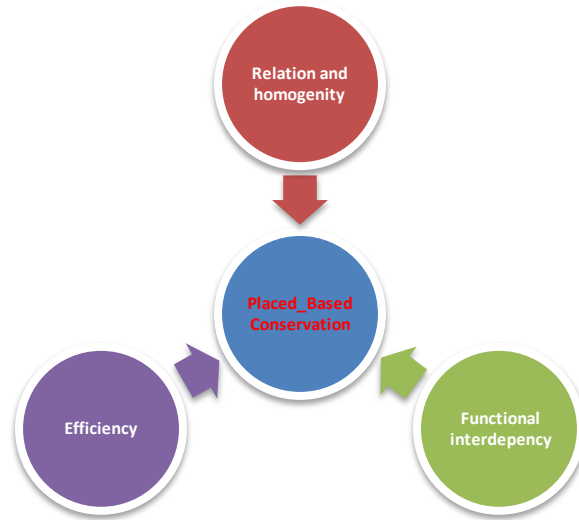


Figure 1: The main goals of the research project

CHAPTER 2

BUILDING A CONCEPTUAL FRAMEWORK

Regions

The concept of the region is used for many purposes. The region allows one area to be distinguished from others, because a region will share some critical feature. In other words we can say that the region can give the idea that for at least one thing, every feature in the region has the same characteristic physically or having the same human characteristics. They can nest within one another, forming a multilevel mosaic. Their scale varies from local to global or reverse. (National Standards for Geography, 1994)

Definitions of region

In the literature about regions and regionalism there are many different definitions of what a region is. For this work, a useful definition is from Paasi (1996):

"A region is a territorial unit which has a relative independence in relation to the spatial history of individual actors. A region is produced and reproduced through various institutional practices (policy, culture, economy, etc) by individuals and groups." (Paasi, 1996, p. 208)

Visions of regions

Geographers (and also other scientists) have had different perceptions about what they see as a region. In this section we describe five important visions about regions which give a good representation of the diversity of perspectives that can be used. The first vision is a traditional one while the other four are more modern.

A region as a part of a 'mosaic'

A region can be considered as a part of the world that has distinct characteristics from other parts. The world includes a lot of different regions and each region has a unique character. This character has been determined by the intra-regional relation within the region. As a result, all the regions together can be seen as a mosaic.

Alfred Hettner (1859-1941) was one of the most important geographers within this vision. In his opinion the character of a region is made by a combination of different aspects (cultural, physical, economical, biological and social aspects). The gathering of all these aspects creates intra-regional relations, which are responsible for the development of the unique character of that region (Westero, 2006).

As noted by DePater (2202, p. 48): "Within the traditional vision of 'regions as part of a mosaic' there is a traditional typology of regions. This typology, made by

the geographer Derwent Whittlesey (1890-1956) divides regions in three categories:

1. The uniform region: A uniform region is also known as a single feature region. This means that in the region there is one main phenomenon, for example a wheat-region.

2. The homogeneous region: In this region there are more features that are connected with each other. These regions are also known as multiple feature regions.

3. The polarized (or nodal) region: A polarized region is a region that includes different places that are orientated on one central place. For example, all places where 30% of the citizens work in the central place belong to the polarized region of that same central place.”

Region as an element of a world-system

In this perspective, the character of a region is made by the relations that this region has with the world-system (all the other regions in the world together). When these external relations are changing, the character of the region will change too (Westero, 2006).

A region as a combination of layers

Another approach understands regions as systems of different layers. Each layer is made by the position of the region within the international economic, policy, or climate system, or other factors which create or change the layers at a

specific moment in time. All these layers will have influence on the possibilities of the region in the future.

An example of this is the regions in world-system of the 19th century. During the Industrial Revolution, the existence of coal in regions was important. This coal played a significant role in iron/steel-industry. Because of this, coal rich regions developed very fast and became rich and wealthy. When the iron/steel-industry moved to other areas the first regions became less important and that lead to increase in unemployment in those regions (Westero, 2006).

This example explains that different periods in time or effect of some factors will influence the development of a region and create or change different layers during the time. And therefore they will also have influence on the opportunities of the region in the future.

A region that creates its own opportunities

This vision indicates that a region can have the potential power to create its opportunities to improvement. A region can create its own opportunities on different ways. For example, a region can have collaboration with other regions in different ways and level. This can lead to development of the economy of that region. Another example can be the creation of the new industries in a region. This can lead to more employment and after a while that improve the economics of that region. (Westero, 2006)

A region as a network of social relations

A region may be defined by its network of social relations. Groups can create their own region, and changing of the social relations can led to changes in the character of the region. The different characteristics of the social groups within a region can create or change the character of the region (Westero, 2006). It means that every group can change the character of the region by their way of thinking about the region. For example in the regional collaboration issue, people who lives in that region and the partnerships who work on the land conservation are two different social groups that can have different view and according their ideas that they can change the characteristics of that region too and can see different opportunities of the region.

People-Place Connections

One of the very important discussions here is the how people connect to the place. This section provides an overview of the geographical and psychological foundations of the study of **people-place connections**.

Government policies often prefer to focus on environmental aspects of resource areas as their key management issue. Recent scholarship and practice, however, shows why managers should address people's affective relationship with the resources they want to manage:

“One of the great and largely unmet challenges associated with ecosystem management is treating people as a rightful part of ecosystems. In many ecosystem models, despite occasional rhetoric to the contrary, there is still

a tendency to treat people as autonomous individual agents outside of the ecosystem, at best a source of values to be incorporated into decisions, at worst agents of catastrophic disturbance of an otherwise smoothly running system. (Williams and Stewart 1998, p. 18)”

The study of how people recognize their physical surrounding and value and characterize it is called human geography and environmental psychology. Low and Altman said “Place is defined as a physical setting imbued with meaning as a result of human action and interaction” (Low and Altman 1992, p. 5). When a space has a social meaning beside the physical structure, we have the transfer of space to place. The characterization of place derived from Canter (1977, p. 158), Relph (1976, p. 42), and Sack (1992, p. 97) studies is shown in Figure 2. It shows that Place is the center of interaction between where biophysical attributes and processes, social and political processes, and social and cultural meaning.

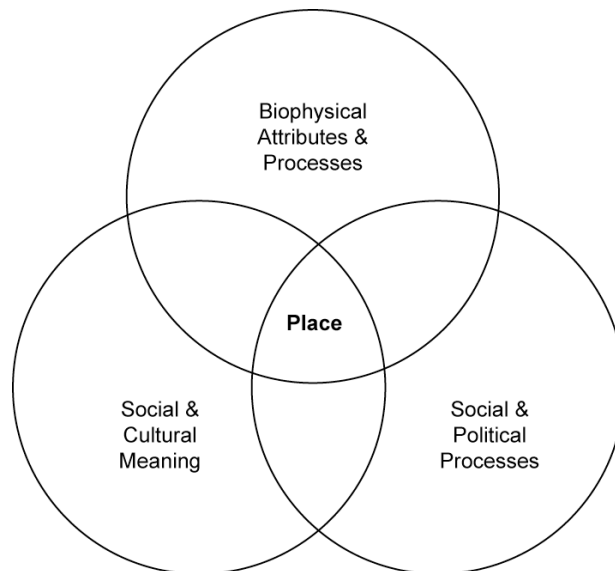


Figure 2: Schematic of place as the intersection of social and biophysical forces

Source: Based on diagrams and discussions from several authors: (Canter 1977; Cheng, Kruger and Daniels 2003; Relph 1976; Sack 1992)

According to this model, the biophysical attributes and processes of a setting enable certain human uses and activities. The social and political processes that emerge from these activities assign meanings to the biophysical setting. Marketing cooperatives, scientific assessments, land use arguments, zoning policies, special designations, and property assessments are examples of social and political processes that apply to place meanings. Places, therefore, can have many layers of meaning resulting from uses, activities, and social and political processes. These meanings are expressions of how people use, value, and come to know their physical surroundings (Greider and Garkovich 1994).

The connections between people and places are complex. Place meanings are expressions of how people come to know and value a biophysical setting. Stakeholders participating in place-based planning processes bring with them diverse ways of knowing the place. Place-based planning, then, involves more than analyzing and allocating biophysical resources among interest groups. These diverse ways of knowing can create the relation among stakeholders and provide opportunities for stakeholders to move beyond traditional user or interest group conflicts. (Greider and Garkovich 1994,)

In this area of study, Low and Altman (1992) provide one of the best interdisciplinary overviews of people-place connections in their introductory

chapter, "Place Attachment: a conceptual inquiry," to their edited volume *Place Attachment*. They count three principles that define their conception of place attachment. First, place attachment is basically an integrating concept, and study on it is very difficult because it doesn't include from separate and isolated parts. Second, place attachment has varied and complex origins. Finally, place attachment contributes to self-definition and integrity at multiple levels of society, from the single individual to cultural groups. With these assumptions in hand, they go on to identify several important features of place attachment. It is about the concept of the place and attachment that can include the variety and broad of meaning which show the flexibility and the efficiency in different application. Other feature is about the social role in place attachment concept and the process of the attachment can corporate with social relationship. And finally it's about the influence of time on the place. All place change during the time like people and they believe that place attachment exists as a flow and transforming during the time. (Low and Altman, 1992)

Geographic Scale and Ways of Knowing in Place-Based Collaborative Planning

There is some evidence that suggests that collaborative processes that center on specific places can improve the chances of improving ecological conditions (Cestero 1999). There is also some evidence that not all place-based collaborative planning processes are having the same results.

For example one factor that may affect these results is the geographic scale of the place. For example, moving from a small-scale urban neighborhood to a large-scale rural landscape for environmental planning can affect collaborative stakeholder participation (Jones, 1999). Moving from the neighborhood to a landscape scale can have both opportunities and problems; one solution is to break the larger region into smaller sub regions with which stakeholders can be identify. However, the borders need to cohere to the bioregion identity, and management of place-based planning efforts within larger regional scales can create unique analytical, institutional, political, and legal challenges (Lovell et al. 2002).

Landscape ecology and ecosystem management

Landscape ecology addresses the interaction between the human activities and natural process. Landscape ecology provides the theoretical foundation for the landscape planning. Landscape planning recommends seeks to minimize settlements' impacts on ecosystem and natural resources. (Grant et al. 1996)

Ecosystem management can be defined as: “driven by explicit goals, executed by policies, protocols, and practices, and made adaptable by monitoring and research based on our best understanding of the ecological interactions and processes necessary to sustain ecosystem structure and function. To be truly being effective, ecosystem management must include: intergenerational sustainability as a precondition for management, being based on goals, not deliverables, and on the sound ecological models and understanding, complexity, connectedness and uncertainty; recognition of the dynamic character of ecosystem and ecosystem

management; context and scale as an ecosystem components; and finally adaptability” (Ad Hoc Committee on Ecosystem Management 1995). Ecosystem management focuses on the dynamic interaction of people and environment (Labich, 1999). Ecosystem based management is more general system approach in regional, bioregional, watershed and integrated sources management approaches. (Solocombe, 1998). An important point for this research is, as argued by Lackery (1998), if ecosystem management is place based, then it has to have defined boundaries. One of the principals which need to be considered in the ecosystem management is the scale. Ecosystem management has been adopted as a policy by the United States Forest Service (USFS) since 1992 (Labich, 1999).

The patch-matrix model: landscapes as a mosaics

Richard T.T. Forman, a prominent landscape ecologist, has developed the patch-corridor-matrix model as a way to understand the elements we see in landscapes and the relationships between them. Forman in his books land mosaic indicate that The arrangement or structural pattern of patches, corridors, and a matrix that built a landscape which is important criteria of functional movements through the landscape, and its pattern and process changes over time.

The definitions of these criteria are:

A patch is a nonlinear area that differs from its surroundings in structure and function. Patches have a defined shape and spatial configuration, and can be

described by internal variables such as number of trees, number of tree species, height of trees, or other similar measurements.

A corridor is a linear element that mostly has transportation or energy purpose, such as a river corridor or a hedgerow. Corridors have important role as strips of a specific type of landscape differing from sides' lands.

A matrix is the area surrounding patches and corridors that has a different structure and function. Matrix has a high degree of connectivity.

The combination of patches, corridors, and matrices network called land mosaic. A network is an interconnected system of corridors while mosaic shows the pattern of patches, corridors and matrix that form a landscape in whole area.

Connectivity is the measure of how connected or spatially continuous a corridor, network, or matrix is. Landscape patches have a boundary between them which can be defined. The every area includes the edges of adjacent ecosystems which is the boundary. Here, Edge means the area of an ecosystem which is near to its perimeter and influences of the adjacent patches can cause an environmental difference between the interior of the patch and its edge. (Forman, 1997)

For example, when a landscape is a mosaic of obvious different types, such as a forest adjacent to grassland, the edge is the location where the two types connect. In a continuous landscape, such as a forest giving way to open woodland, the exact edge location is fuzzy and is sometimes determined by a local gradient exceeding a threshold, such as the point where the tree cover falls below thirty-five percent. (Forman, 1997)

In landscape planning, it is necessary to consider the pattern of the landscape, which ideally may include a few large patches of the forest, wide vegetative corridors along the major rivers, connectivity for movement among large patches.

Regional Conservation Partnerships

Regional conservation partnership mostly are informal groups of people who are represent land trusts, municipalities, state agencies and others who are active to protection of land in a region and define boundaries. In 2010, 26 of these partnerships were active in the New England region and 20 of them are our subject of our research.

Literature summary

The preliminary conclusions gained from the literature review are:

Most of the literature sources emphasized on the region and identity of the region which lead to conserved or ecological based land, but these issues is very controversial some of them believe that this is a general concept and some of them who research in ecological management studies believes that it is needed to consider scale as very important parameter. In our study we try to combine some general concept includes scale, land conservation and region identity. We need to consider the ecological identity although our study area scale is regional with regarding to conserve lands. Then the patch-matrix model is the best one which fit

in our desired need. This model not only considers regional scale but also is based on the ecological management. The patch-matrix model brings an idea from concept to practice. And with getting help from patch corridors and matrix try to define an area with ecological concern. One of the ways that regions are being defined is through regional conservation partnerships, which will be the topic of the next chapters. In next chapter first of all we will discuss about the existing condition of lands and RCPs after that we are going to use this model and explain how this model can be fit into this area.

CHAPTER 3

RESEARCH DESIGN

This research addresses the research questions through case studies of RCPs which are active in New England. In the end of 2010, the Wildlands and Woodlands organization identified 28 RCPs who were active in protecting land in New England. The map below identifies the location of the RCPs in the study, while the table identifies the number of acres each RCP claims within its territory.

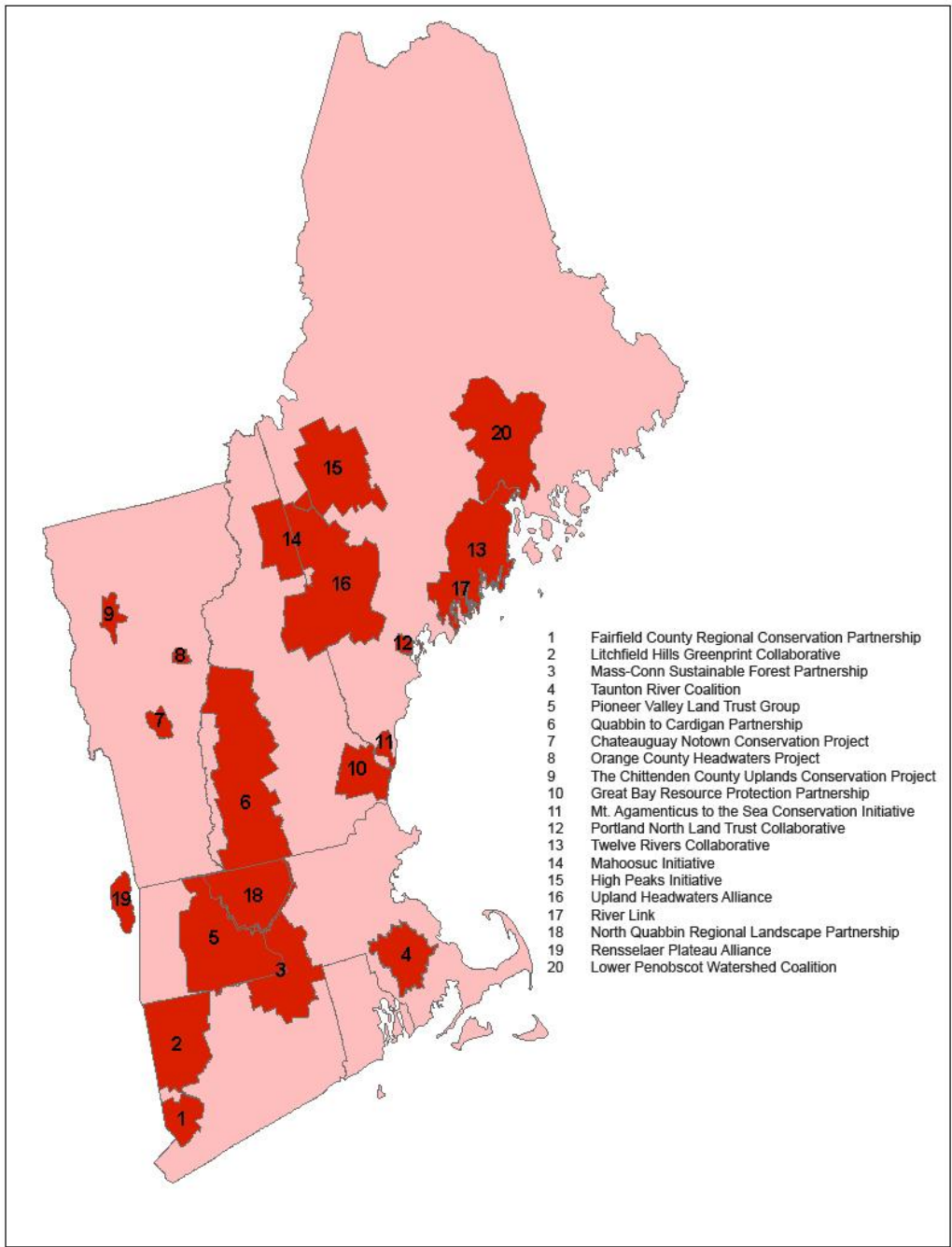


Figure 3: Existing regional conservation partnership

Figure 4: Name of the RCPs with their area (Acre)

Name of regional partnership	Area (Acre)
12 Rivers Collaborative	860,692
Chateaugay No town Conservation Project	68,850
Fairfield County Regional Conservation Partnership	184,768
Great Bay Resource Protection Partnership	280,074
High Peaks Initiative	716,964
Litchfield Hills Greenprint Collaborative	641,214
Lower Penobscot Watershed Coalition	898,022
Mahoosuc Initiative	598,764
Mass-Conn Sustainable Forest Partnership	692,719
Mt. Agamenticus to the Sea Conservation Initiative	49,887
North Quabbin Regional Landscape Partnership	504,475
Orange County Headwaters Project	28,119
Pioneer Valley Land Trust Group	975,303
Portland North Land Trust Collaborative	36,322
Rensselaer Plateau Alliance	120,904
River Link	11,944
Taunton River Coalition	332,561
The Chittenden County Uplands Conservation Project	85,804
The Lower Connecticut River and Coastal Region Land Trust Exchange	302,748

Upland Headwaters Alliance	1,310,165
Sum of area	8,700,299

Mapping the Shape files

Principles from each of these RCPs were interviewed by Labich between October 2009 and April 2010. Each interview lasted between 60 and 120 minutes. The seventy-four questions asked included partnership history, activities, partners/partnership, conservation vision/planning, funding, communication, and needs. Then with constant comparative technique (Glaser 1965), interview responses were organized and reported in Labich et al 2012.

To test the findings of the interviews and explore the relationship of the regional partnerships' boundaries to lands outside of RCPs, I mapped a variety of data in SHP (GIS) format. Each of these layers can show the characteristics of the region, but the important thing is to find the relation between them and finally the relation with regional collaboration area. My goal was to identify which regional partnership criteria have the most effect.

The figure below shows the research process method.

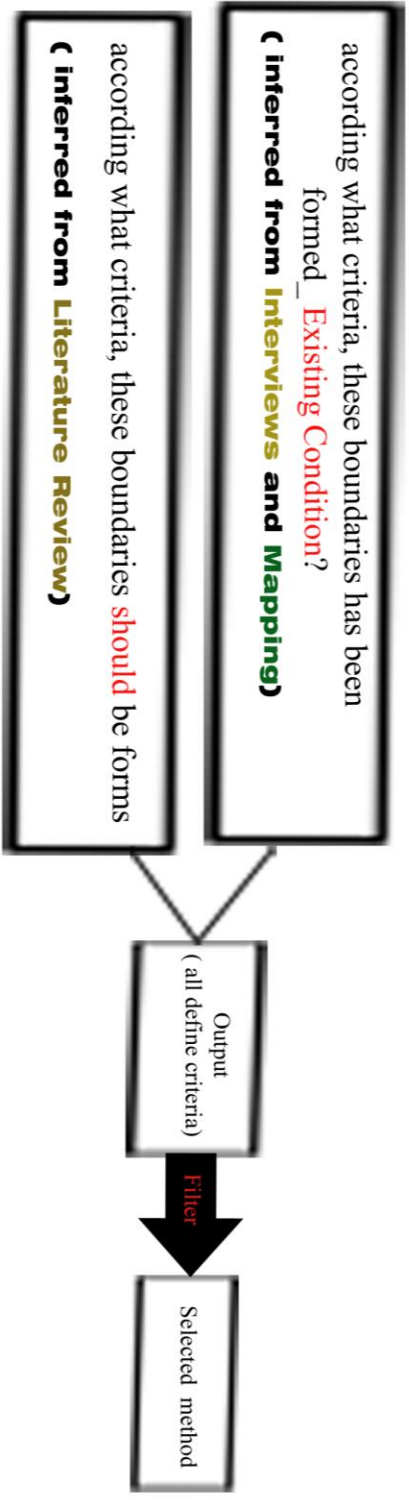


Figure 5: model for data collection

These are all criteria that are effective to create physical boundaries, in next parts we just select some of them to test out hypotheses.

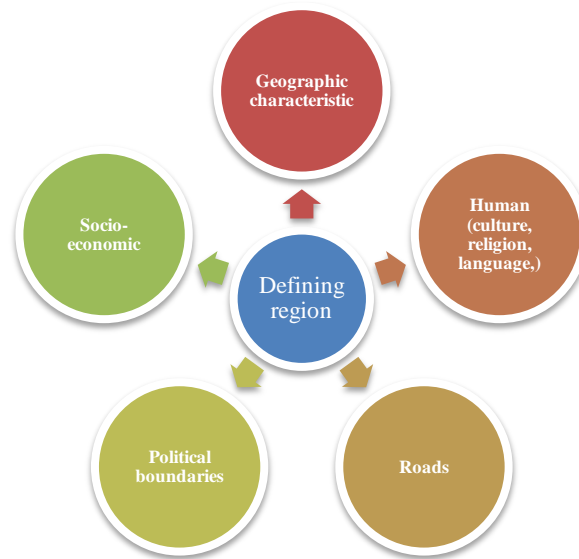


Figure 6: the qualitative and quantitative factors which effect on the defining region

And the table below that I prepared based on existing maps is selected criteria according to the importance relation with the RCPs boundaries and the access to the data. I try to organize them into the importance relation with the RCPS.

Table 1 : the selected criteria from literature review

Selected criteria derived from Literature review		Criteria Significance level related to RCPs
Geographic characteristic	Watershed	Strong
Roads		Weak
Political boundaries	Town boundaries	Strong
Socio-economic	Total population	Average
	Population density	Average

A limit to the mapping: Unorganized Territory

The Unorganized Territory of Maine (UT) is that area of Maine having no local, incorporated municipal government. The Unorganized Territory consists of over 400 townships, plus many coastal islands that do not lie within municipal bounds. The UT area is 9,599,216 acre and covers more than 45% of the State of Maine. Despite its size, residents number approximately 9,000, so it is very sparsely settled. (Maine.gov) The map below shows that RCP boundaries are outside the Unorganized Territory, and I therefore exclude it from the calculations below.

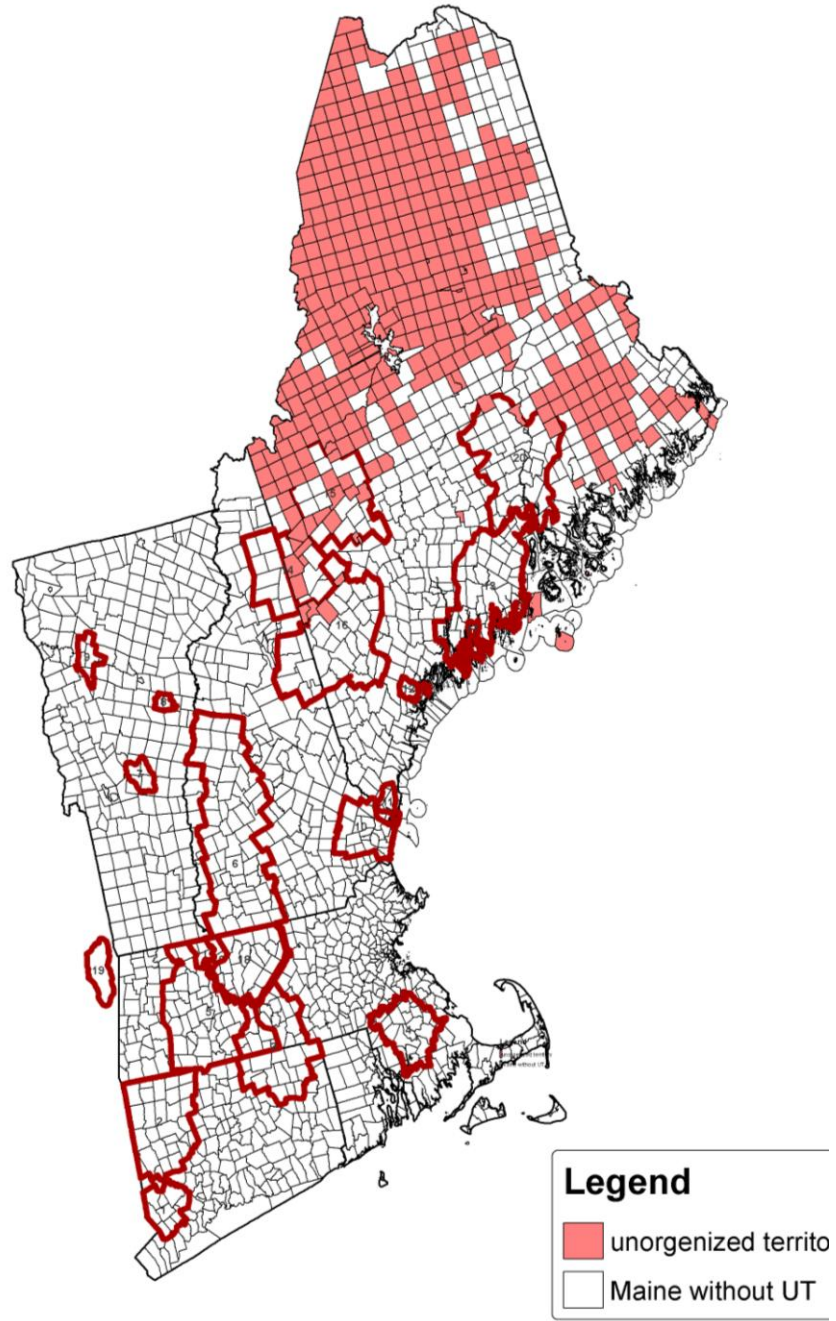


Figure 7: unorganized territory area in Maine

CHAPTER 4

QUALITATIVE ANALYSIS

The Labich, Hamin and Record research data was used to generate the following results.

Who started the RCPs?

The first question is about the History of RCPs and Why/How did RCPs start?

Most of the RCPs (14/20) were initiated by people who lived/and or worked in the region, who can be considered inside leaders. And just one quarter (5/20) of the RCPs were initiated by people outside of the region.

What did they do to increase the numbers of acres protected?

RCPs in response to the question what did they do to increase the number of the acre protection, 10% aren't trying to increase pace of conservation but 90% are 25% went after forest legacy applications, 20% believes the diverse coalition helped them fundraising and 33% report mapping and regional conservation planning as helping protect more land.

What are they Natural Resource Priorities?

According to the interviews 75% of RCPs natural resources priorities are unfragmented forest tracts and 70% are interest in ecologically significant lands(it is clear that there is overlap in these two categories)

Vision/think/plan based on Landscape Ecology Concepts?

90% of RCPs believed that their Vision/Thinking/Planning is based on Landscape Ecology Concepts and 56% indicated that their activity focused on areas with science-based ecological values.

Table 2: the RCPs response to the landscape ecology concept

Believe their Partnership's vision, planning and thinking are based on landscape ecology concepts	90
Reported that connectivity was part of their thinking	44
Mentioned that extending and connecting forests was part of their vision	56
Mentioned having a landscape-scale approach or systems approach	17
Mentioned fragmentation	17
Mentioned that their activities focus on areas with science-based ecological values	56

Does conservation focus on resources that cross political boundaries?

All the RCPs believe that their conservation focus on resources that cross the political boundaries; the table below shows the frequency of these criteria.

Table 3: the frequency of the crossing the physical RCPs boundaries and political boundaries

		Does your conservation focus on resources that cross political boundaries?							
RCP Name	Yes =1	Resource Crosses these Boundaries							
		Private lands	Just towns	Towns	Counties	Just town and county	States		
12 Rivers Group	1			1	1	1			Many towns and counties
Borderlands	1			1	1		1		towns, counties, states (RI/CT)
Chittenden County	1			1	1	1			4 towns and two counties
Chateaugay-Notown	1		1	1					4 towns
Great Bay	1		1	1					towns and talking across state line NH/ME
High Peaks	1	1							private land boundaries
Litchfield Hills	1			1	1	1			town and county lines
Lower Penobscot	1			1	1	1			towns and counties
Mahoosuc	1			1	1		1		towns, counties, states (NH/ME)
Mass-Conn	1			1	1		1		towns and state line (MA/CT)
Mt.A2C	1		1	1					6 towns
Pioneer Valley	1			1	1	1			towns and counties
Portland North	1		1	1					Towns
Q2C	1			1	1		1		towns, counties, states (NH/MA)
Rensselaer	1		1	1					10 towns
River Link	1		1	1					3 plus towns
Taunton	1			1	1		1		43 towns, and two states (MA/RI)
Upland Headwaters	1			1	1		1		towns and two states, ME and NH
NQRLP	1			1	1		1		towns and counties and forests that cross into NH
Orange County	1		1	1					two towns
	20		7	19	12	5	7		

According to the table 35% believe that their boundaries only cross town lines and 60% indicate that resources cross county boundaries.

Resources that RCPs conserve

The RCPs focus their conservation primarily on forest blocks (12/20). For 4 of them the focus is the whole watershed, while for 3 it is topographical features and just one works primarily on recreational resources.

Table 4: the focused resources that RCPs conserve (based on Hamin, Labich research)

RCP Name	Resource						
	Contiguous Forests	Wetlands	Whole Watershed	Mt. Ranges or other topographical feature	Recreational Access	Farms/soils	Resource
12 Rivers Group	1					1	Connect farms and forests across landscape
Borderlands	1						Borderlands forest
Chittenden County	1						A large forest greenway
Chateaugay-Notown	1						Unfragmented forest block
Great Bay		1					Waterfowl habitat
High Peaks				1	1		AT and the High Peaks Region surrounding the trail no one was attending to
Litchfield Hills	1						
Lower Penobscot			1				The Penobscot River Watershed
Mahoosuc	1						
Mass-Conn	1						Forest blocks
Mt.A2C			1				Almost the whole York River watershed
Pioneer Valley				1		1	Mt. Holyoke Range, Mt. Tom, farmland soils
Portland North	1						Forest blocks
Q2C	1						Forest blocks
Rensselaer				1			The plateau - 107,000 acres
River Link	1						Interior forests and connections wetlands
Taunton			1				TR watershed
Upland Headwaters			1				CRI watershed
NQRLP	1						Forest blocks

Orange County	1						Remote forest blocks
	12	1	4	3	1	2	

Summary of key finding from the interviews

According to the interviews, most RCPs believe they make decisions based on landscape ecological concepts, and plan to conserve more land even across political boundaries. This suggests that, the ecological values have a very important role in defining the physical boundaries.

Table 5: Summary table of finding from interviews

Poll of interviews and respondents	Claim
Who started the RCPs?	70% were begun by inside leader
What did they do to increase the numbers of acres protected?	25% undertook forest legacy applications
	20% credits their diverse coalition
	33% report mapping and regional conservation planning
What are they Natural Resource Priorities?	70% prioritize large block unfragmented forest
	70% identify ecologically significant lands
Vision/think/plan based on Landscape Ecology Concepts?	90% believe that their plan is based on Landscape Ecology
	56% believe that they actively focus on science-based ecological values
Does conservation focus on resources that cross political boundaries?	All of them believes that they cross political boundaries

In the next chapter I will use mapping to see whether these beliefs appear to be matched by spatial realities.

CHAPTER 5

SPATIAL ANALYSIS

Political Boundaries

The below tables shows the most of the RCPs are located in Maine and Massachusetts states. According to the table more than 44% of RCPs located in Maine State and after that 24% of RCPs are in the Massachusetts. It is need to indicate that some of RCPs are work more than one state.

Table 6: RCPs area in every state

State	Acre	Percentage
ME	4,482,760	44.4
MA	2,505,058	24.8
VT	182,773	1.8
CT	760,163	7.5
NH	2,176,763	21.5
RI	0	0.0

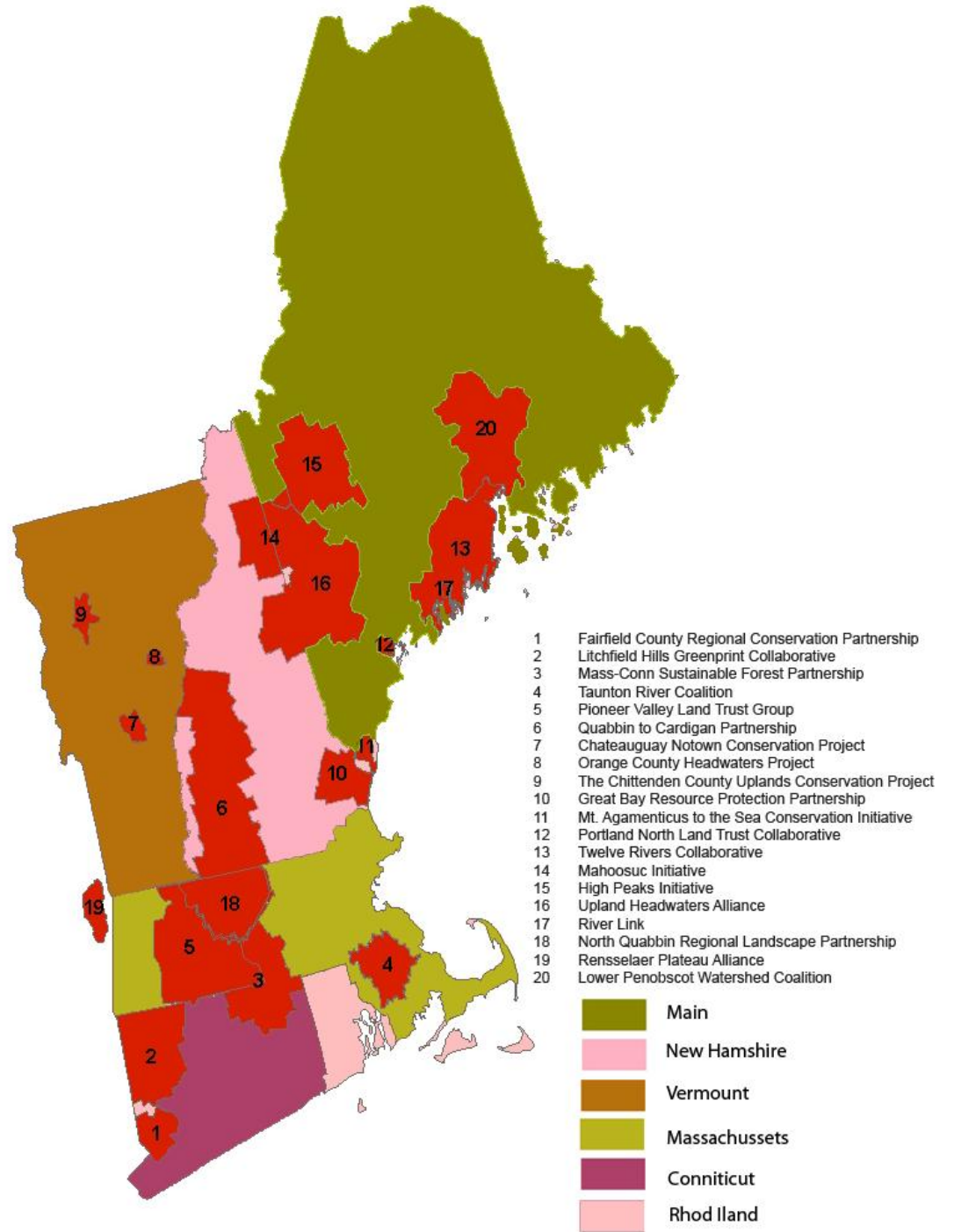


Figure 8: RCPs boundaries in five state of New England region

Town boundaries

Below map shows the relation between the town boundaries and RCPs boundaries.

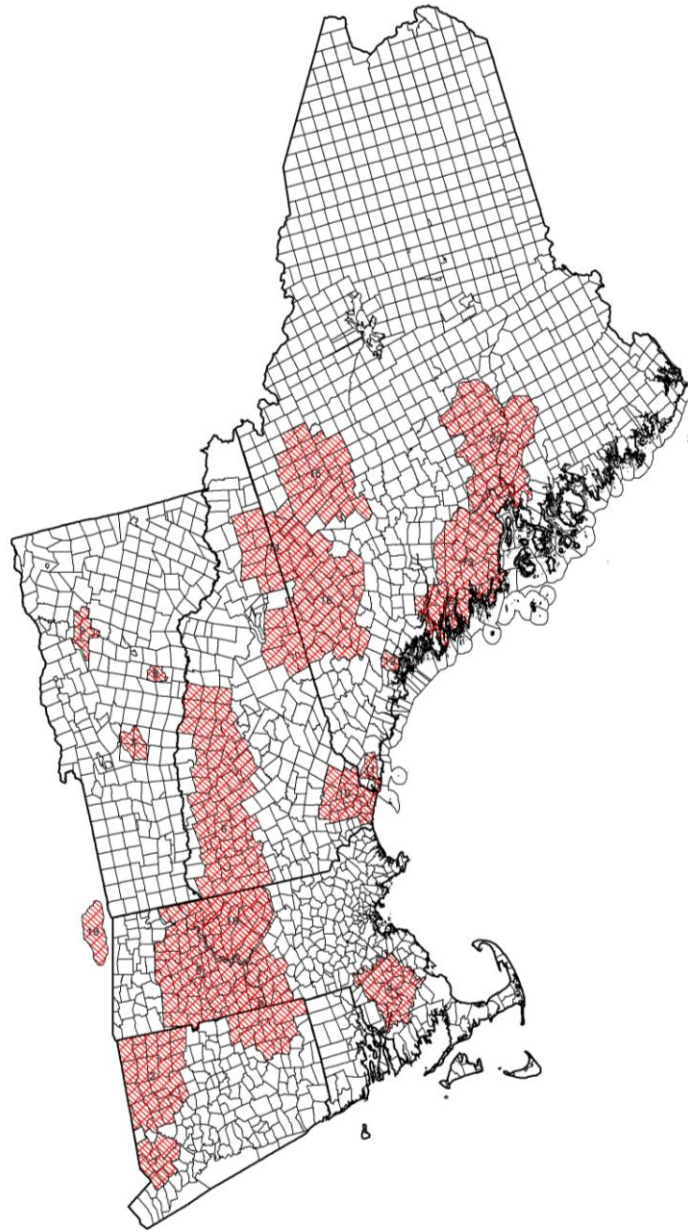


Figure 9: the physical boundaries and the town boundaries

Table 7: the RCPs boundaries based on town boundaries or not

RCP Name	RCP boundaries match town boundaries?
12 Rivers Collaborative	No
Chateauguay Notown Conservation Project	No
Fairfield County Regional Conservation Partnership	yes
Great Bay Resource Protection Partnership	Yes
High Peaks Initiative	Yes
Litchfield Hills Greenprint Collaborative	Yes
Lower Penobscot Watershed Coalition	No
Mahoosuc Initiative	Yes
Mass-Conn Sustainable Forest Partnership	Yes
Mt. Agamenticus to the Sea Conservation Initiative	No
North Quabbin Regional Landscape Partnership	Yes
Orange County Headwaters Project	20% Yes
Pioneer Valley Land Trust Group	70% Yes
Portland North Land Trust Collaborative	Yes
Quabbin to Cardigan Partnership	Yes
Rensselaer Plateau Alliance	No
River Link	No
Taunton River Coalition	No
The Chittenden County Uplands Conservation Project	60% Yes
Upland Headwaters Alliance	Yes

As it can be derived from the table, 53% of RCPs boundaries are based on the town boundaries and 32% are not. Despite an interest in ecological landscape principles, this was not the key issue when determining boundaries.

Table 8: the summary of the relation between town boundaries and the RCPs boundaries

Town boundaries	number	Percentage
RCPs boundaries lay down on town boundaries	10	52.6
RCPs boundaries totally different from town boundaries	6	31.6
having both of them	3	15.8
	19	100.0

Roads

In analyzing of the road in New England, the RCPs boundaries don't have overlap with the roads, although roads are one of important criteria of forming physical boundaries.

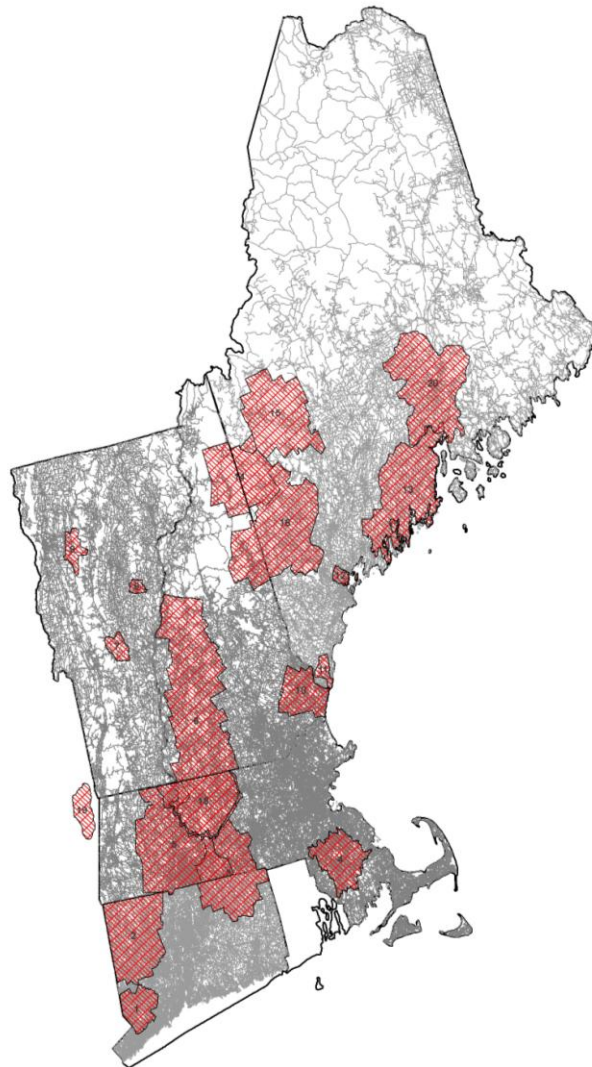


Figure 10: Roads in the New England

Land cover

Forest conservation efforts in New England are an important part of continent-scale initiatives within the extensive, continuous forest stretching from the southern Appalachians to the Maritime Provinces of Canada.

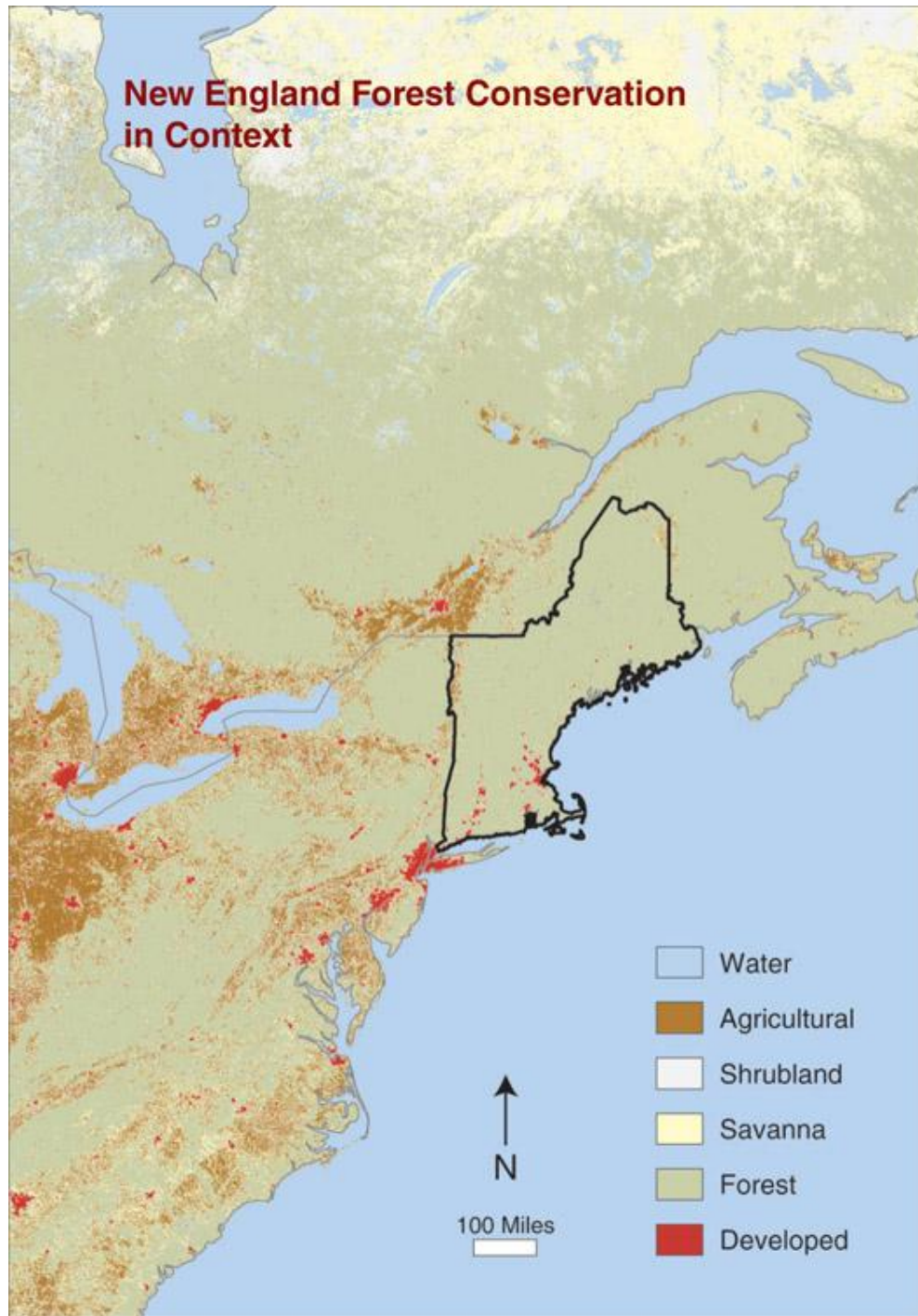


Figure 11: New England conservation lands in context source: Wildland and woodland

The distribution of land cover types demonstrates that New England is one of the nation most forested regions and also contains some of most density settled areas.

Because most of the New England land cover with forest and grass land, the overlay of the cover land and RCPs boundaries is not meaningful. The RCPs areas are characterized by forestlands and grassland, but outside of the boundaries is also covered by forest and grassland.

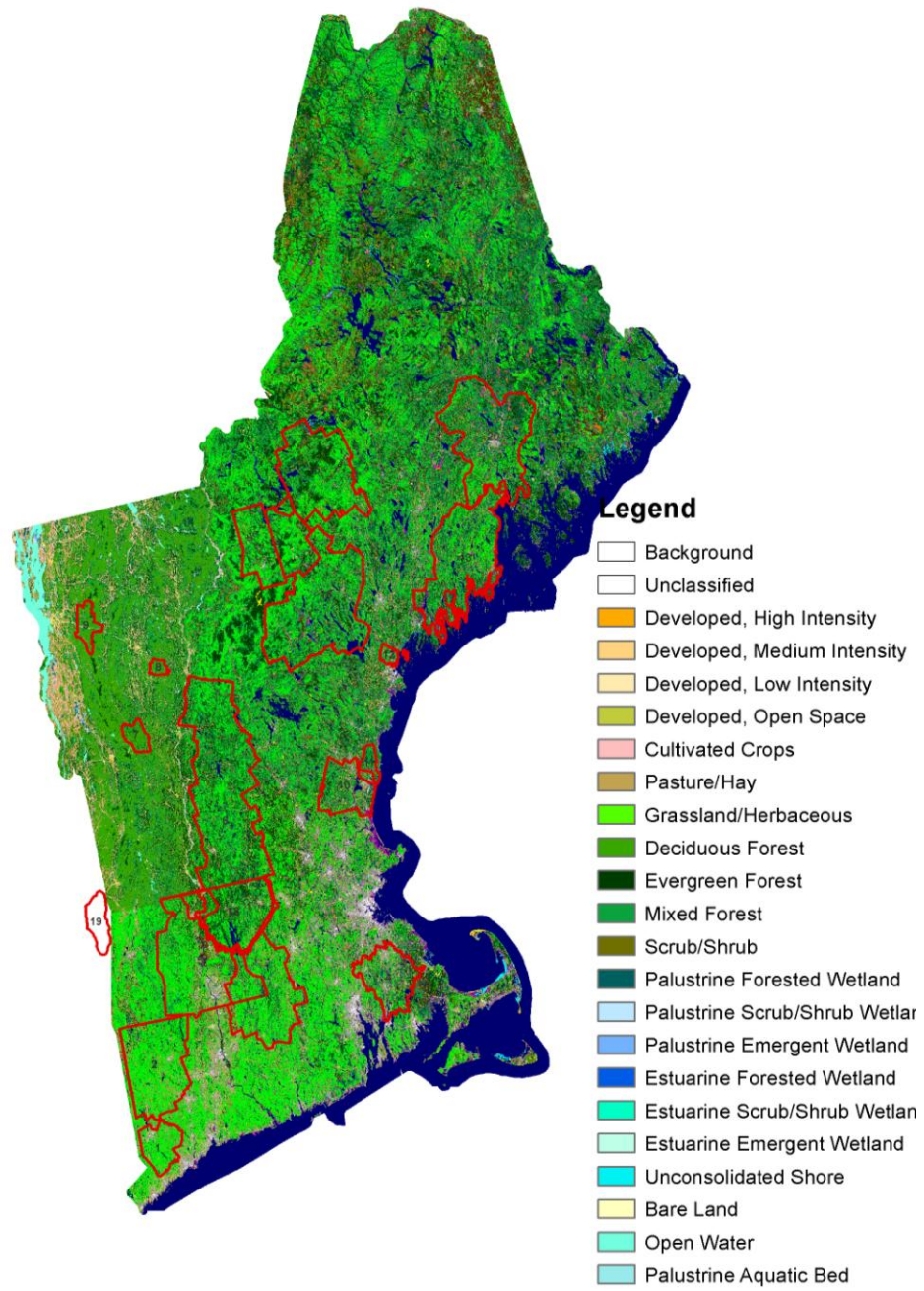


Figure 12: Land cover and the RCPs boundaries

Conserved land

According to the table the total conserved area in New England is 7,095,634 acre and the total area of conserved land which RCPs covered is 1,177,356 acre. This means that that only 16.59% of the conserved land are covered by the RCPs and more than 85% of conserved land are in the outside of RCPs boundaries. Given that RCPs just got started in the last ten years while land conservation goes back a century, this is not too surprising.

Table 9: area of the conserved lands in the each state and RCPS

*This area is just the Maine conserved land without considering the unorganized territory.

State	Total acre conserved lands	total conserved land in RCPs area
ME	2737224*	167958
MA	1392841	516269
VT	915146	35170
CT	215074	78426
NH	1738454	379533
RI	96895	0
Total	7095634	1177356

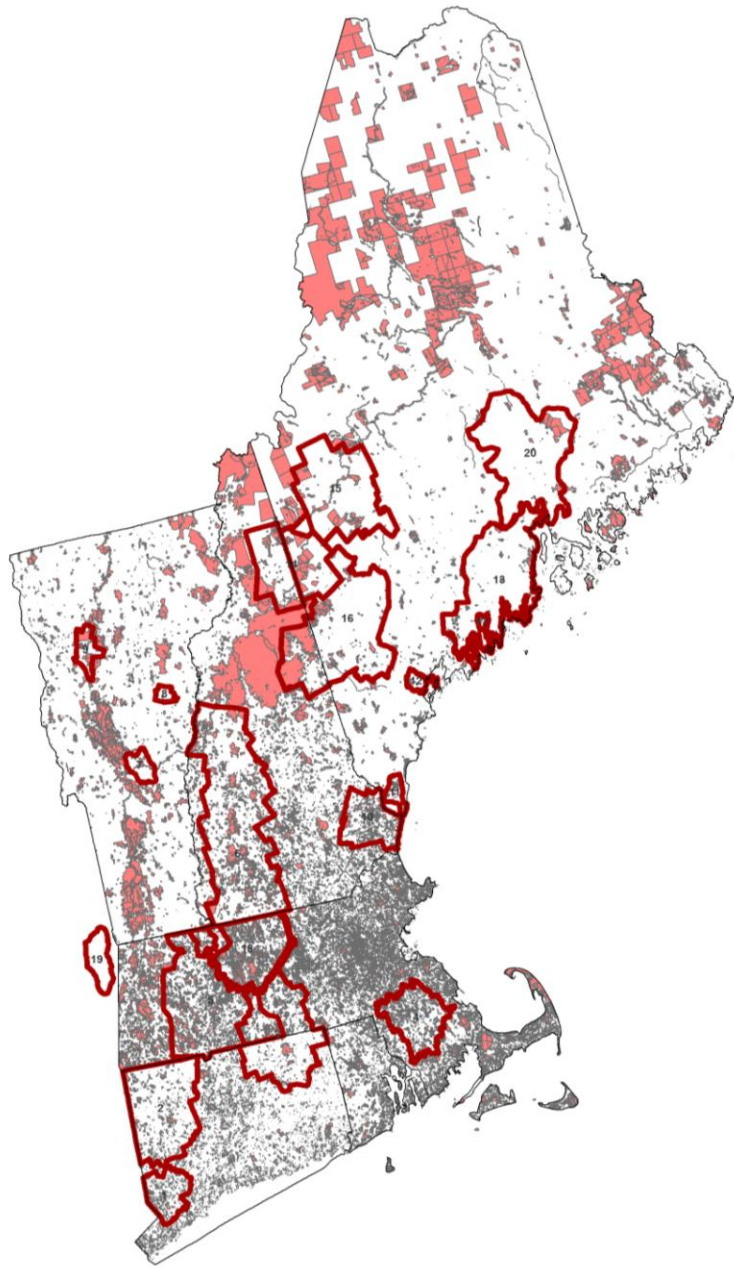


Figure 13: Conserved lands and RCPs boundaries

Projected development of forest

As the map shows that most of RCPS are located to the area that are expect the lose the forest over the next 18 years and taunton river coalition and 12 rivers collaborative Partnership overlap with those have the increase in development

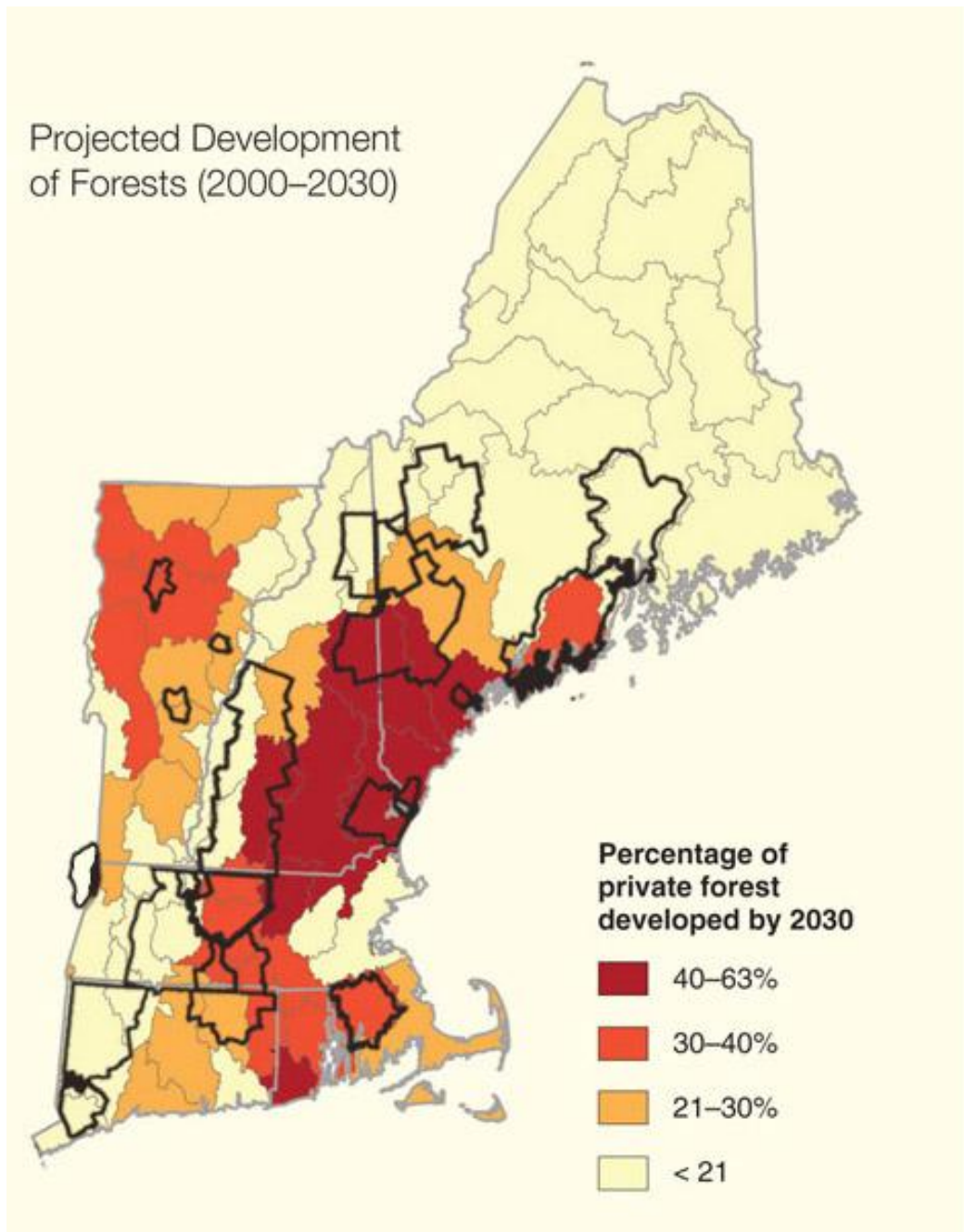


Figure 14: Projected development of forest (2000-2030)

Source: wildland and woodland report

Urban area

According to the urban area data on 2003 census, about 861552 acre is in the RCPs boundaries. It means that more than 20% of the urban areas are covered by the RCPs. This is one of the interesting maps. Below map shows that especially in CT and MA the RCPs boundaries try to not having overlap with urban area.

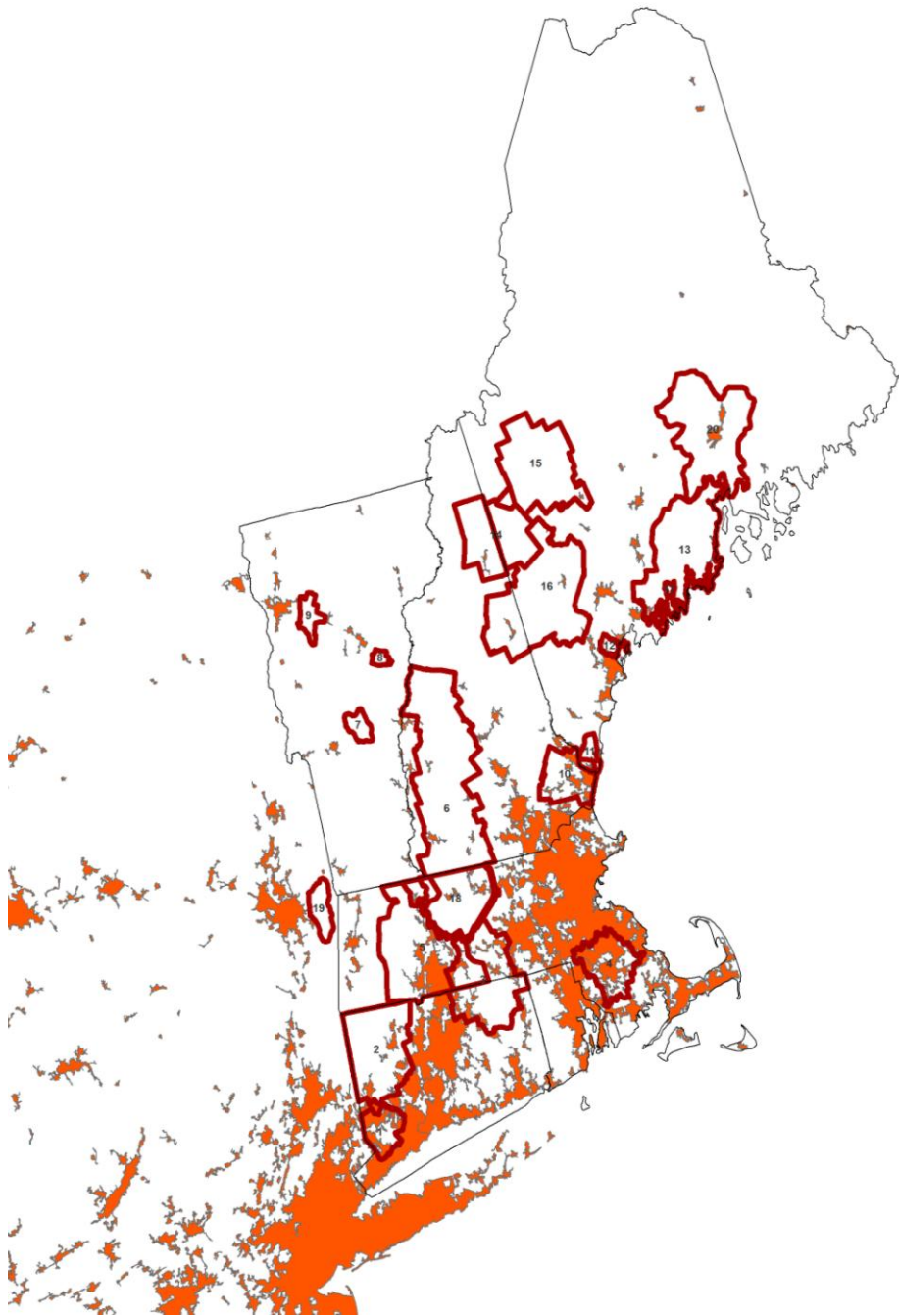


Figure 15: urban area in 2003

Population

Historical changes in forest cover demonstrate that forest from mid 20th through the late 20th centuries was in the good situation although more recently we face dramatic loss of forest throughout the region.

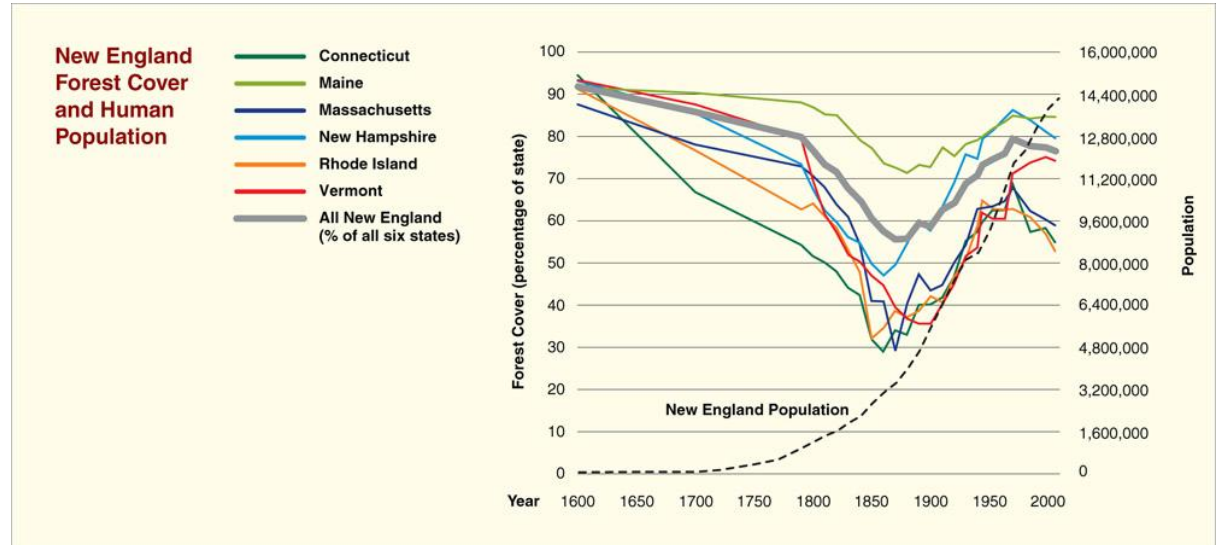


Table 10: New England forest cover and human population

Sources: Wild land and woodland

All six New England states are expected to experience dramatic rates of forest loss over the next 20 years. (Wildland and woodland). The below map shows that the areas of most future development overlap with those that have the greatest increase in population in recent years.

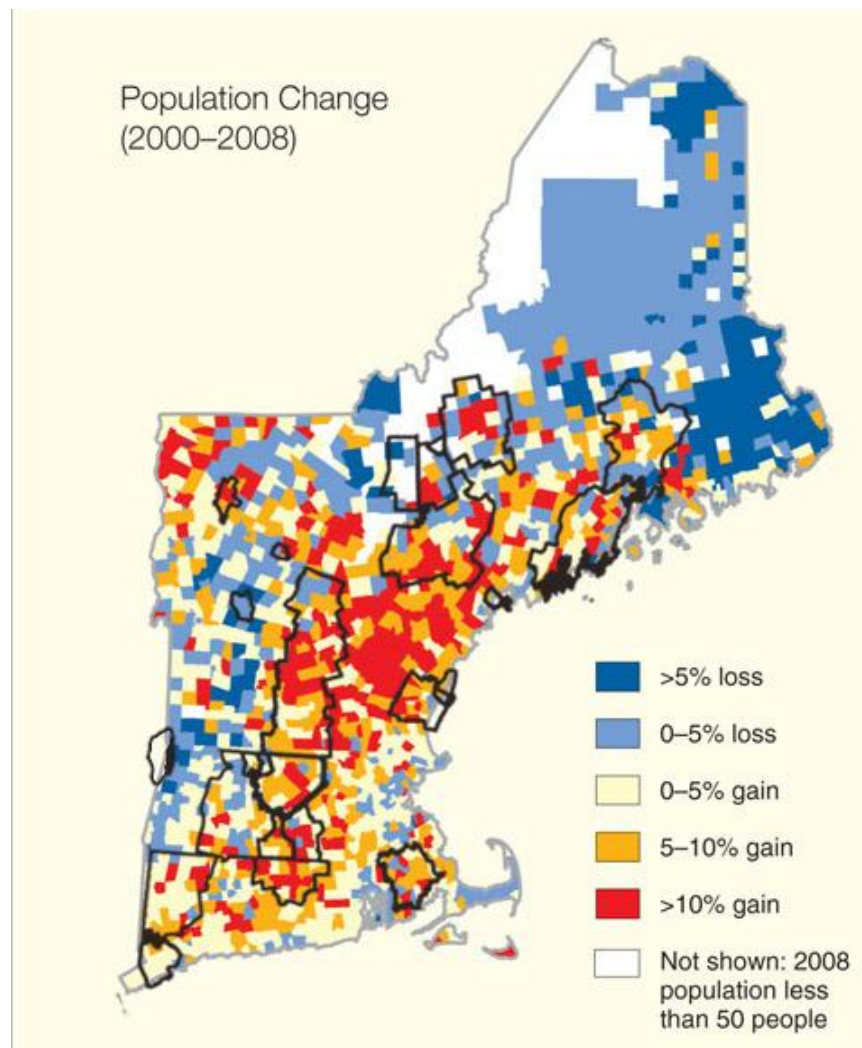


Figure 16: population change

Source: wildland and woodland

Wild land and woodland future

The below maps shows the wild lands and woodlands future and the RCPs boundaries which cover mostly connected forest. This is good but not enough for

conserving more land from development, maybe for the future of the woodland and wild land need to change the RCPs boundaries and according to the rate of the changes in development define some scenario and boundaries.

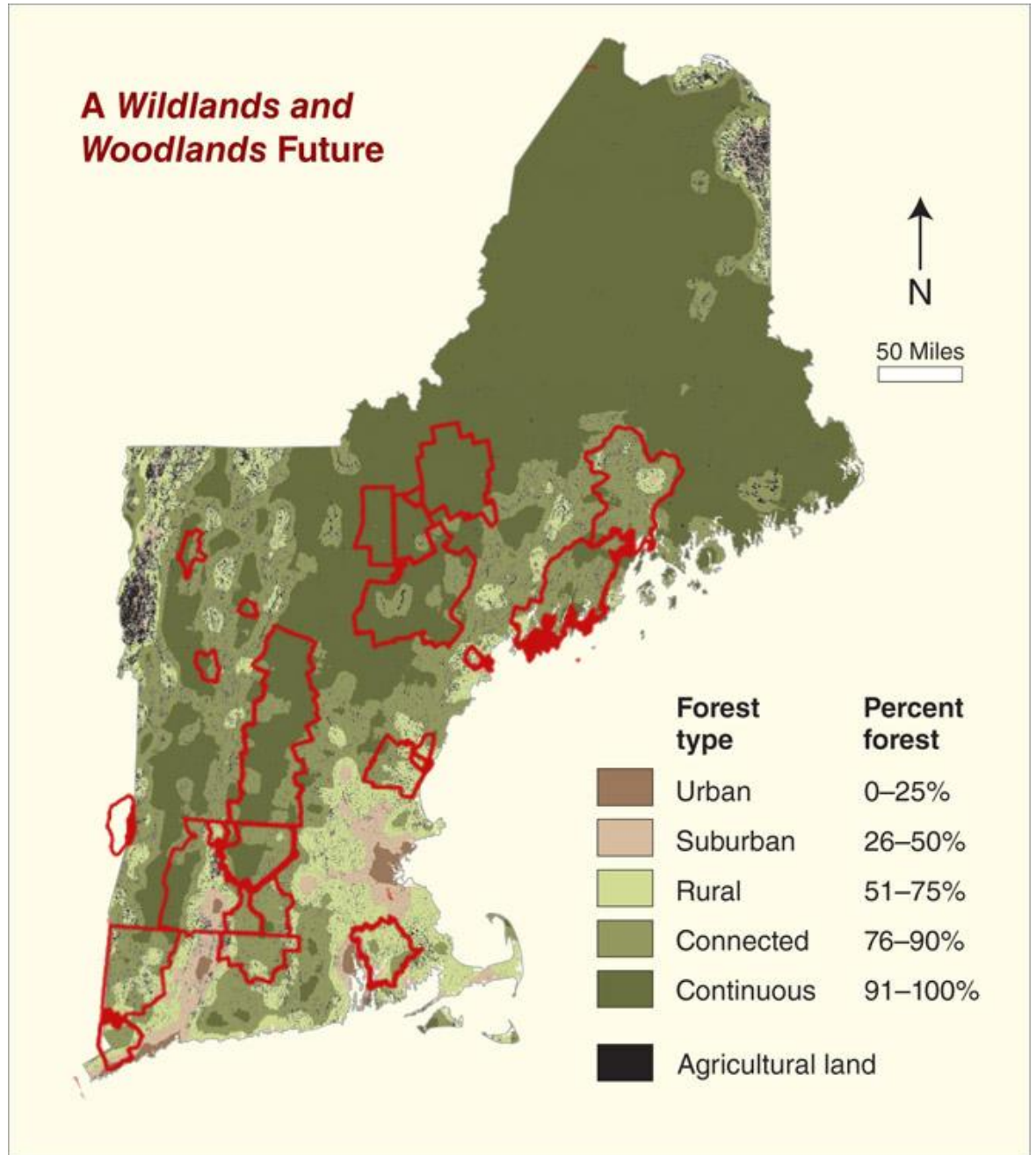


Figure 17: Wildland and woodland future

Summary of findings from the case studies

The following principals were generated from interviews and the mapping

- 1- The most important criteria that RCPs boundaries follow is political boundaries (Town boundaries)
- 2- Almost all the RCPs claim that their physical boundaries cross the political boundaries because of ecological concern.
- 3- The RCPs boundaries are in danger of the development.
- 4- The RCPs boundaries tend to include more populated areas in compare with whole area.
- 5- RCPs which located in MA try to have less conflict with urban area.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

In this research, the physical boundaries of RCPs formation have been explored through three methods. The first one involved a literature review to help to clarify of concepts of region and formation and identity of the place and the role of ecological management, and introduces a landscape-ecology model that brings the physical concept of boundaries to practice. The second one involved analyzing interview data regarding RCP leadership's perspectives on the physical boundaries and their RCP's plan and vision regarding ecological planning at the regional scale. And the last one was mapping the data to show the overlay of the socio-ecological criteria and the RCPs physical boundaries. This chapter tries to bring together the conclusions of the literature review and the result of the analysis of the case studies.

In the introductory chapter I identified a set of research questions and hypotheses. Below I represent those, with the findings of the study:

1. What are the existing criteria that partnerships use to define their regional partnership area?
 - a. My hypothesis is that geographic characteristic has significant effect on defining a region and creating place concept. As a result, the physical characteristic of the land is most important indicator to define an area.

- b. To test this, I will map the boundaries of the collaboration regions to watershed, political, economic boundaries, and test to see what has the most explanatory power.

The political boundaries especially the town boundaries are the most important factors for defining the RCPs boundaries.

Also the watershed boundaries are another important factor for defining RCPs boundaries which are protect watershed area.

- 2. In what ways are the partnership regions different than their surrounding regions?

- a. My hypothesis is that (because these are land-conservation partnerships, the included areas will be significantly less populated than their region, or maybe that the socio-economics of the partnership areas are better than those of surrounding areas, or ecological opportunities vary between them. Also the age, size of RCPs region, partner contribution and funding have very important role to protect more land and make them success to protect more lands.

- b. To test this, I use statistical analysis to find out what characteristics are different between inside and outside lines of RCPs boundaries.

The maps and figures show that RCPs boundaries don't cover the all area of the conserved lands and there are a lot forest and conserved land which is outside of the RCPs boundaries.

But in analysis of the urban area maps shows that urban area are mostly outside of the boundaries.

In general the RCPs boundaries don't cover all the conserved land but tries to show the difference between urban area and conserved lands Based on the literature, the regions can potentially be characterized as

Applied Criteria to define physical boundaries in placed- based conservation

As noted in the literature review, geographers define regions in these basic ways:

Homogeneous region: in this region, the homogeneity is the main feature which defines the region. Similarity of features creates the area that we consider as a region.

Functional region: having some specific functions in the area can define an area as a region. Examples include industrial region or agricultural region. Our case studies would need to define their role and function in the larger New England region.

Formal region: the politic issue is very important factor to create this region like political boundaries. It is very important to have the easy management over these areas

Ecological Region: in this category, the ecological features play the important role to create this region.

All these categories can be considered as a planning region and they are needed to focus on their main characters. It means that they are thought of as being spatial units, although they do not have exact borders.

<http://www.nationalgeographic.com/xpeditions/standards/05/index.html>



Figure 18: the four main region categories which their combination result the PLANNING REGION

DISCUSSION AND RECOMMENDATIONS

When setting their boundaries, RCPs must recognize multiple goals. It is important for regional partnerships to conform to political boundaries to ease administration and encourage funding. However, because they work at the eco-region and watershed scale, their land conservation goals mostly must be based on the ecological systems. RCPs that are first organized around political boundaries may need to change their existing boundaries to better match their landscape ecology boundaries

in practice and the theory. I found the corridor- patches-matrix model by Forman to be provided the best model regarding to this research concern about how RCPs boundaries can be more effective.

In our case studies, the various elements including forests, farm lands corridors, waterways, neighborhood vegetation, agriculture vegetation, industry, and natural vegetation are all a patch in a patch corridor matrix. In New England the natural vegetation is forests and the forest and agriculture land play the large patches role and developed area is in medium patches. A vegetated corridor connects the two forest patches providing connectivity for both wildlife and hydrological flows.

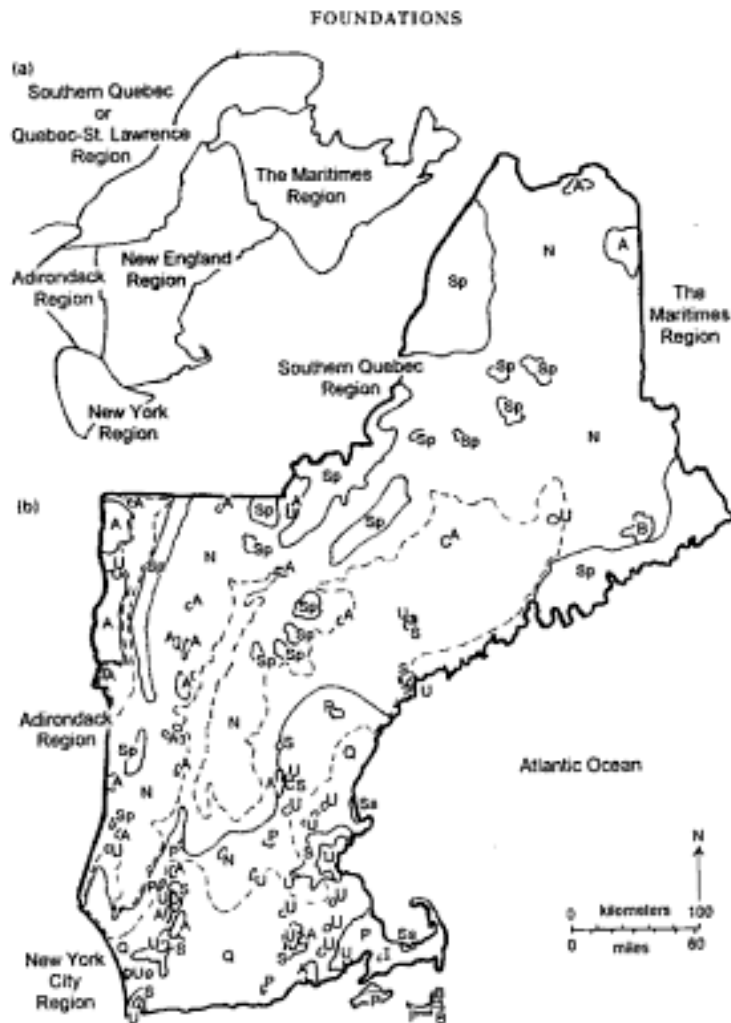


Fig. 1.9. The New England (USA) region, showing (a) surrounding regions and (b) landscapes within. Sp = spruce-fir (*Picea-Abies*); N = northern hardwoods (*Acer-Fagus-Betula-Pinus-Tsuga*); A = agricultural; Q = oak forest (*Quercus*); P = pitch pine-oak (*Pinus rigida-Quercus*); U = urban; S = sub-urban; Sa = salt marsh; B = barrens; I = industrial. Area surrounded by dashed line is sometimes differentiated as a 'transition hardwoods landscape'. Synthesized from many sources, several courtesy of W. H. Rivers.

Figure 19: New England landscape Source: land mosaic

The above map shows, different patches and corridors in the New England landscape that can be used as guidance for RCPs if they need to adjust their physical boundaries to manage their ecological landscape resources. The RCPs have the

opportunity to demonstrate how the popular phrase, "Think globally, act locally" can be changed to "Think globally, plan regionally, and then act locally" to grow regions that are balanced in conservation and use.

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