Regional Supply Chains: Strengthening Urban-Rural Connections Around the Benefits from Natural Areas

Report of the 2017 Berkley Workshop

Held at the Inn at Shelburne Farms, Shelburne, Vermont
June 2017

Bradford S. Gentry, Eve Boyce, Abigail Martin, Maxwell Webster, and Rachel Weston
Yale Program on Strategies for the Future of Conservation
Bradford S. Gentry, Director

The purpose of the Yale Program on Strategies for the Future of Conservation is:

- To support the efforts of the Maine Coast Heritage Trust, the Land Trust Alliance and similar private organizations to develop and apply new, innovative strategies for land conservation by linking the convening, research, and teaching activities at the Yale School of Forestry & Environmental Studies ever more closely to the needs of the land conservation community.

Established by a gift from Forrest Berkley '76 and Marcie Tyre, the Program has two parts:

- Sponsoring student internships and research projects (through the Berkley Conservation Scholars program), to bring the passion, experience and creativity of Yale graduate students to bear on these issues; and
- Convening workshops and other conversations across sectors and perspectives in the search for new approaches to expanding the resources applied to land conservation in the United States.

Berkley Conservation Scholars are students of high potential who receive funding for their research and professional experiences at the cutting edge of land conservation. Support is available during both the school year and the summer, creating a virtual “R&D Department” for the U.S. land conservation community. The Berkley Conservation Scholars play a critical role in helping to bring together practitioners and academics in the search for new conservation tools.

The Yale Program on Strategies for the Future of Conservation is a major extension of the Yale School of Forestry & Environmental Studies’ continuing efforts to enhance the effectiveness of land conservation. Working with an advisory group of land conservation leaders, the program hosts workshops, training programs and other activities around the themes of engaging new communities in conservation, expanding the conservation toolkit, and ensuring the permanence of conservation gains.

For more information, visit the Yale Program on Strategies for the Future of Conservation website at yaleprogramfutureconservation.com.
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Introduction and Participants

Bradford S. Gentry
Yale School of Forestry & Environmental Studies

The “Berkley Workshops” are an annual exploration into the future of land conservation. Convened by Yale University and the Land Trust Alliance, each workshop explores a particular topic that most land trusts have not had the time, energy, or relationships to address. It does so by bringing together experts with whom land trusts would not typically collaborate in their daily work.

As part of efforts to address these unsettled times, the 2017 Berkley Workshop explored the potential benefits that regional supply chains may provide—socially, environmentally and economically. Starting with some of the goods and services that natural areas supply—water, recreation, renewable energy and wood products—the workshop brought together participants from across the country and with varied interests to compare their experiences and identify useful paths forward.

This year’s topic was chosen for a number of reasons, including the:

· Growing disconnects across U.S. urban and rural populations/economies, as highlighted in the recent election

· Working assumptions/hypotheses that:
  · “The best route to a healthy forest [or habitat] is a healthy forest economy;”2 and
  · Regional sources of/supply chains for needed goods and services provide valuable public benefits/goods that may be worth maintaining/investing in, even in the face of competition from “more efficient” global supply chains

The workshop was structured to help inform and catalyze work going forward by drawing participants from:

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1 The publications from prior year’s workshops can be downloaded from http://environment.research.yale.edu/publication-series/land_use_and_environmental_planning
2 As reflected in the work of groups such as The Northern Forest Center (https://northernforest.org/)
• Five major regions—Northeast, Southeast, Midwest, Intermountain-West and Pacific Northwest;
• Four major resource sectors—water, recreation, renewable energy (wind, solar, biomass, hydro); and
• Key perspectives—supply/rural, demand/urban, regional funders, plus others such as regional think tanks and finance institutions.

Kick-off speakers for each resource sector were asked to offer ideas and pose key questions before the participants had opportunities to explore what they each are seeing across their experiences. Given the uncertainties around many of these topics, the expectation was that the workshop outputs will be more in the form of questions to be explored further—although any and all solutions and/or ways forward were most welcome.

The participants represent a wide range of perspectives (see list below) and the structure for the workshop was designed to encourage creative interactions. At the end of the workshop, each participant was asked to identify specific action steps they may take (alone or in combination with others) and areas in need of further research. Yale will publish the workshop proceedings. The Land Trust Alliance will distribute the findings and areas for action to the land trust community via social media.

### Participants

1. Ben Alexander, Chief Program Officer, LOR Foundation, MT
2. Forrest Berkley, Board Member, Maine Coast Heritage Trust, ME
3. Lucy Blake, President, Northern Sierra Partnership, CA
4. Andrew Bowman, President, Land Trust Alliance, DC
5. Eve Boyce, Yale F&ES (Master’s Degree 2018), CT
6. Indy Burke, Dean, Yale School of Forestry & Environmental Studies, CT
7. Graciela Cabello, former National Director, Latino Outdoors, CA
8. Megan Camp, VP and Program Director, Shelburne Farms, VT (portions)
9. Sam Cook, Executive Director of Forest Assets, College of Natural Resources, North Carolina State University, NC
10. Kim Elliman, President, Open Space Institute, NY
11. Jay Espy, President, Elmina B. Sewall Foundation, ME
12. Brad Gentry, Associate Dean, Yale School of Forestry & Environmental Studies, CT
13. Travis Green, Program Manager, The Aspen Institute’s Community Strategies Group, DC
14. Rick Huffines, Executive Director, Tennessee River Gorge Trust, TN
15. Marcy Lyman, Bullard Fellow, Harvard Forest, MA
16. Rue Mapp, Founder, Outdoor Afro, CA

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3 Lessons/ideas/questions from local food, carbon storage and similar regional efforts will be pulled into the wider workshop discussions.
17. Kevin McAleese, President, Sand County Foundation, WI
18. Jay McLaughlin, Executive Director, Mt. Adams Resource Stewards, WA
19. Jim Rokakis, Vice President, Western Reserve Land Conservancy, OH
20. Mackenzie Sehlke, Director, Programming & Community Engagement, Boston Public Market, MA
21. Joe Short, Vice President, Northern Forest Center, NH
22. Marc Smiley, Principal, Solid Ground Consulting, OR (facilitator)
23. Peter Stein, Managing Partner, The Lyme Timber Company, NH
24. David Warne, Assistant Commissioner, NYC Dept. of Environmental Protection, NY
25. Rachel Weston, Yale F&ES (Master’s Degree 2018), VT
26. Ethan Winter, NY Senior Program Manager, Land Trust Alliance, NY
27. Alec Webb, President, Shelburne Farms, VT (portions)
28. Max Webster, Yale F&ES (Master’s Degree 2017), OH
29. Barbara Wyckoff, One Foundation, MD

The information provided in the following chapters is not intended to provide an exhaustive treatment of these topics. Rather, the background information was designed to offer attendees from many different backgrounds an introduction to some of the key concepts to help inform the workshop discussions.
Summary of the Major Themes and Areas for Action

Bradford S. Gentry
Yale School of Forestry & Environmental Studies

The purpose of the 2017 Berkley workshop was to consider the opportunities and challenges facing efforts to strengthen urban-rural connections by expanding regional supply chains for the goods and services renewably provided by healthy natural areas—particularly water, recreation, renewable energy and wood products.

The resulting discussion revolved around two major questions—what are the possible roles for:

- Regional supply chains to help meet the needs of both rural and urban communities—in ways that reflect both historical legacies and resource specific aspects?

- Conservation organizations to help strengthen the ability of regional supply chains to meet those needs—in ways that are consistent with their missions, build from their strengths and meet community needs?

Given that the focus of the current strategic planning process for the Land Trust Alliance is on increasing the “relevance” of its members’ work, this felt like a particularly useful set of discussions in these political times.

“Can we help build robust, renewable economies?”
—Jay Espy, E.B. Sewall Foundation

Meeting the needs of both rural and urban communities through regional supply chains

Regional supply chains for renewable resources will only be sustainable over the long term if they are valued by both rural and urban communities. Creating that value will certainly involve analyzing the content (costs and benefits) of the specific trade involved—such as wood for money—and how that compares to other trades on offer (say wood from global markets).
As the workshop discussions progressed, however, it also became clear that a series of much deeper, historical issues will also need to be addressed.

**Finding/building shared value in ways that address historical legacies/resentments:** During all of the discussions of specific resource systems (see below), various participants spoke of historically “extractive” relationships—in which wealthy urbanites were seen as unfairly taking resources from rural communities—and the anger that that has left behind in many rural areas.

“In many rural communities, issues of control are at the fore: Where did an idea originate? Who makes decisions? Who benefits? Rural to urban ‘supply chains’ smack of colonial rule.”

— Lucy Blake, Northern Sierra Partnership

Clearly, any efforts to build shared value will need to find ways to work with this resentment/anger where it exists. Some of that will involve just listening—for example, rather than pushing their own conservation goals from the first meeting, land trusts will need to take considerable amounts of time to gather insights on the hopes, fears and needs of the communities involved. Doing so should not only help identify possible areas of shared interests on which collaborations might be built, but it should also help strengthen the personal relationships on which any such collaborations are based.

“What speaks for rural communities?”

— Marcy Lyman, Harvard Forest

New mechanisms for bringing together representatives of all the affected groups should then be explored. Creating or expanding regional supply chains cannot be done by any one person or group—many different folks will need to add value to those efforts drawing from their own resources. In some cases, existing organizations might provide the “backbone” for such networking efforts. In others, entirely new organizations will need to be created—such as the example of the Watershed Agricultural Council described below—possibly extending to new structures for regional governance.
The Watershed Agricultural Council – Economic and Water Quality Benefits, Local Governance, Urban Funding

The mission of the WAC is: “To promote the economic viability of agriculture and forestry, the protection of water quality, and the conservation of working landscapes through strong local leadership and sustainable public-private partnerships.” It was formed in 1993 to administer the voluntary, incentive-based Watershed Agricultural Program, fully funded by New York City’s Department of Environmental Protection (its water utility). A 16-member Council of Directors represents the interests of farm and forest landowners within the New York City water supply region. Charged with the WAC’s policy making and fiscal oversight, Council members are selected from within the Catskill, Delaware and Croton watersheds.

Source: http://www.nycwatershed.org/

Finally, exchanges of value that are seen as meeting the needs of all sides will need to be found and put in place. Financial costs and benefits will clearly be the primary driver for most parties—quality jobs, ability to compete with resources available from global markets, etc. Opportunities for conservation organizations may include finding ways to “monetize” or otherwise use the non-financial co-benefits provided by natural areas (habitat, clean air, etc.) to help make these exchanges sustainable over time. In addition, if healthy, sustainable rural economies are the product of these efforts, policy makers should examine the even wider array of public goods provided by such economies and consider investing in them even more directly.

“There is a false dichotomy when livelihoods are separated from conservation.”

— Barbara Wyckoff, One Foundation

From listening to working together to meet complimentary needs, the purpose of these efforts is to try and work through any historical resentment/anger through awareness, acknowledgement, participation and shared benefit.

Finding sustainable business models for renewable resources at the regional level

The workshop discussions specifically around water, tourism, renewable energy and wood products yielded both some differences across resources, as well as some shared issues. The highlights from the discussions included the following (see the following chapters for deeper dives into each of these resource systems):

**Water:** Natural areas are increasingly being recognized as providing clean water and helping to manage stormwater. In some cases, particularly as a way to meet regulatory requirements, water utilities may be able to save money by investing in such “green infrastructure”, rather than more traditional pipes, pumps and other “grey infrastructure” (see Chapter 2).
Given the increasing interest in these multiple benefits, much of the discussion focused on why it has been so hard to increase the amounts actually going from water ratepayers, through the water utilities to the owners/managers of natural areas/lands in rural communities. Among the possible reasons offered were:

- From the water utility perspective:
  - A lack of familiarity with green infrastructure options among water engineers, including how best to determine/value the costs and benefits of different approaches/designs.
  - A lack of confidence that managing systems of decentralized green infrastructure installations performs better at scale than more centralized, traditional systems.
  - Difficulties figuring out how best to optimize combined grey and green infrastructure at scale, including when comparing likely costs and benefits.

- From the watershed community perspective:
  - A perception that managing land for water quality imposes uncompensated costs upon the communities involved.

One intriguing question raised was whether water ratepayer funds could be used to help lever other investments in a region—for example, through co-investments in viable farming, forestry, tourism and related efforts—in ways that might meet the needs of both the water utilities and the watershed communities?

**Recreation/tourism:** A number of participants noted how the use of parks is growing across the country. This clearly offers economic opportunities in and around parks—particularly if entire families are being attracted to visit for extended periods (see Chapter 3 below).

At the same time, there are a number of questions being raised by different parties from their different perspectives:

- Visitors: Do I feel welcome? Is this a park where people like me want to gather?

  “I don’t want to leave my culture at the trailhead.”

  — Graciela Cabello, Latino Outdoors

- Year-Round Residents: Can I get paid a living wage by working in or near a park? What packages of “good” jobs can be part of an outdoor recreation economy?

- Conservation Organizations: Are the increasing numbers of tourists irreparably harming the nature they came to see? Where should the balance lie on types of access to park areas?

Visitors are increasingly seeking destinations that offer multiple experiences for the entire family. For example, this is seen as driving the growing popularity of areas of Vermont that offer both hiking and mountain biking, as well as local food and craft breweries.
**Barriers and Opportunities for Attracting New Communities into Outdoor Recreation**

Outdoor Afro (http://outdoorafro.com/) is one of a growing number of organizations working to attract more diverse, often urban communities into natural areas for recreation and healing. Some of the key findings of their polling on barriers to outdoor recreation include the following:

- **Fears**—the risks posed by wildlife, not feeling welcome, no knowledge of the equipment that would make the time outdoors more enjoyable
- **Transportation**—gaps in public transport that make it hard to access natural areas
- **Time**—how fit into busy schedules, why prioritize time outdoors?

Based on these and similar findings, Outdoor Afro has created relevant and attractive outdoor experiences working with a community of support to help address these barriers. One of the key learnings from this work is that engaging whole families is critical to their continuing participation.

In addition, during her time with Latino Outdoors (http://latinooutdoors.org/) Graciela Cabello developed a number of suggestions for attracting more diverse communities into outdoor recreation, including the following:

- **Adding culturally relevant resources.** When families arrive at a park is there a park ranger or interpretive specialist who speaks their language or looks like them? Historically, staff in outdoor recreation or conservation organizations have not been from diverse communities.
- **Expanding access to generational knowledge and recreation mentors for diverse communities.**
- **Taking lessons from the sports and fitness industries which have more inclusive, diverse marketing teams.** The tourism/outdoor recreation industry is way behind in marketing outdoor recreation and natural areas to diverse communities.
- **Promoting outdoor recreation and time off as a health necessity, rather than as a luxury.**
- **Having parks come to people if the people are not going to the parks.** Land management and/or park agencies should be more present in urban areas in order to form relationships with urban communities and invite them to the parks.
- **Use technology to connect communities to recreation.** Land management agencies have a long way to go to get visitors to their open spaces. This is an opportunity for private industry.
• Winning millennials over in the “experience” economy. Creating more mission
  driven/meaningful recreation experiences and opportunities for millennials to
  recreate with locals in rural communities.
• Using recreation as a means for upward mobility and relationship building in
  rural communities. Conservation organizations and other nonprofits can really
  play a useful role in making these connections.
• Working with other sectors such as education and health to connect more
  communities to outdoor recreational opportunities.

The keys to success in tourism economies for year-round residents often include extending across multiple seasons the times that families/tourists visit, as well as finding other economic activities that can be performed in the off seasons (such as making clothing or other light manufacturing). Such combinations can help provide the living wages that local residents need.

“Conserved lands are the anchors for destination developments. Which raises the question of how local communities can capture more value from visitors?”

— Joe Short, Northern Forest Center

Renewable energy: As the prices of solar and wind equipment continue to decline, and interest in decentralized power systems grows, more projects are being developed in different locations (see Chapter 4 below).

One of the major questions raised in the discussion was whether these developments would substantially change the traditional model of large power plants being sited in more rural areas and sending their power to cities via long transmission lines. If more power can be generated through decentralized installations in or near the cities themselves, then there should be less of a need for rural areas to bear the impacts of such development—unless it is for their own use.

Another question was how land trusts and other conservation organizations might help with the siting of renewable energy facilities, regardless of where the power ultimately goes? Some examples of efforts to address this question can be found in the box below on LTA’s work in New York state, as well as in the 2010 Berkley Workshop report on “Land Conservation and Energy Infrastructure: Threats and Opportunities” (http://environment.yale.edu/publication-series/land_use_and_environmental_planning/5976.html).
**Land Trusts and Renewable Energy: Exploring Upsides as Well as Downsides**

As one part of LTA’s new Land and Climate Program (https://www.landtrustalliance.org/topics/climate-change), it has been working on a pilot project in New York to empower land trusts to encourage the buildout of renewable energy facilities, while steering the facilities away from sensitive lands. This effort is intended to help land trusts in other states effectively navigate similar challenges. As part of a larger stakeholder process led by The Nature Conservancy, this effort will also help shape New York state policy and guidelines related to renewable energy siting.

Source: https://www.landtrustalliance.org/blog/engaging-land-trusts-clean-energy-conversation

**Wood products:** Of the four resource systems considered, wood is the most affected by global markets—making the creation and maintenance of regional wood markets that much more difficult.

At the same time, different participants are working on different approaches for helping landowners get the most out of managing their forests:

- Sam Cook described his efforts at his previous employer (the Center for Heirs’ Property Preservation) and now at NC State University College of Natural Resources to connect African-American land owners with forestry consultants and other natural resources or legal professionals who can help them:
  - Resolve their land title issues;
  - Manage their smaller forests/farms and keep them in their families by making some money doing so; and
  - Connect them into available markets and help make sure that they get paid a fair price for the goods and services from the forest that people, mostly in cities, need.

“The key question for owners of forestland is: are you getting true value? If landowners see value from their forests, they will take care of them. Many African-American landowners have never heard of conservation easements. So, a key question is how might easements bring value to them?”

— Sam Cook, N.C. State University

- Joe Short and the Northern Forest Center have been working to substitute more local wood heat for fuel oil systems in the Northeast (https://northernforest.org/programs/modern-wood-heat/overview).
“Strong markets for products from sustainably managed forests are the best way to conserve working lands. Cutting trees can save forests.”

— Joe Short, Northern Forest Center

- Others are exploring how best to substitute more wood for steel and concrete across more uses—such as by trying to increase demand for and reduce barriers to (such as building codes) using more high performance building materials (such as cross-laminated timber) in apartment and office buildings (see Chapter 5 below).

**Difficulties facing regional markets:** While most pronounced in the discussions around wood, there are a variety of issues facing any efforts to build or rebuild regional markets. Among those raised in the discussions were the following:

- The reality of current global markets and their negative impacts on the competitive positioning of many locally produced goods in many regions of the U.S.
- The absence of regional processing and distribution facilities—for example: How do we keep mills/processing facilities for wood open and up to date across different regions of the U.S.? What scales of facilities can be supported and where? From where will the investment in those facilities come based on what market projections?
- The absence of regional intermediary/advocacy organizations seeking to connect the dots from rural to urban and back again.
- The need to aggregate urban demand for regional products in ways that create attractive sales channels for producers—such as that being built by the Boston Public Market for regionally produced food (see box below).

### Aggregating Urban Demand for Regional Products: The Boston Public Market

The Boston Public Market is an indoor, year-round marketplace for locally sourced groceries and specialty agricultural products, where residents and visitors can find fresh, seasonal food from Massachusetts and New England. The Market houses over 35 local farmers, fishers, and food entrepreneurs selling items such as: farm fresh produce; meat and poultry; eggs; milk and cheese; fish and shellfish; bread and baked goods; beverages; flowers; and an assortment of specialty and prepared foods. Everything sold at the Market is produced or originates in New England.

Source: [https://bostonpublicmarket.org/](https://bostonpublicmarket.org/)
Possible Roles for Conservation Organizations in Strengthening Regional Supply Chains

Helping to build urban-rural connections by strengthening regional supply chains for renewable resources feels like an opportunity for the land trust community—albeit a challenging one. As more land trusts conserve more land, finding on-going funding for stewardship of those lands is a growing need. Generating cash flows from those lands in ways consistent with their conservation values/purposes seems like an important part of these efforts.

“I am surprised by how little economic development activity there is in the Land Trust community.”

— Lucy Blake, Northern Sierra Partnership

In addition, land trusts will never be able to own all the land that they would like to see remain in comparatively natural condition. In order to build biodiversity corridors or assemble landscape scale habitat areas, working lands—such as those providing water, tourism, energy, wood and other renewable resources—will need to be included and pay for themselves over time.

“This is not about the threat of development, but a threat to the continuation of lifestyles that invest in natural areas because they depend on them.”

— Peter Stein, Lyme Timber

Finally, the membership of virtually all conservation organizations starts with people who love the lands being conserved, and often includes both people who live in cities, but like to visit, as well as those living in the more rural areas under active conservation. Might that shared interest in particular landscapes provide a starting point for building connections to address a wider range of needs?

“Many African-Americans do not see themselves as environmentalists, but they love cookouts...how do we build from that energy? Building durable relationships over time is key—not just as part of a grant deliverable on diversity.”

— Rue Mapp, Outdoor Afro

Maybe the question for the land trust community is “what is the scope of the relevance you believe you should reflect?” For example, what assets might you bring to efforts like Sam’s to blend sustainable land management with the production of income (see wood discussion above)?
“Our economy needs to move from depleting natural capital to restoring and adding to it as part of building vibrant rural communities.”

— Lucy Blake, Northern Sierra Partnership

During the discussions, the participants offered an attractive list of skills that many land trusts already have and that should be helpful to such efforts. They included:

- Helping to inform local and regional land use planning efforts;
- Finding funding for parcel-based projects across a wide range of funding sources;
- Influencing policy affecting the use of land, such as tax incentives; and
- Connecting rural and urban actors around their love of particular places.

“Can land trusts find ways to help landowners manage land to meet their own goals?”

— Rick Huffines, Tennessee River Gorge Trust

“Most land trusts were engineered for transactions. Now, for greater relevance, many are recognizing a need to migrate to meeting community needs.”

— Ethan Winter, Land Trust Alliance

In addition, some new areas in which land trusts might seek to expand their capacities were noted, including:

- Connecting landowners to technical/market assistance on managing their land in environmentally and economically sustainable ways (see description of Sam Cook’s work above).
- Following the lead of community members in identifying and helping to address what they see as their key needs, such as access to broadband or ownership of land (see box below).

### Supporting Community Ownership/Protection of Productive Land

Increasing numbers of conservation organizations are also exploring ways to help acquire land, not for their ownership, but for ownership by the communities in which they are located. Two examples, one more rural and one more urban, are provided below.

**Community Forests and the Northern Forest Center:** When a community owns forestland, it can earn income from timber harvests, support the local outdoor recreation economy, guarantee space for educational opportunities, and permanently conserve scenic views and wildlife habitat through conservation easements. Pioneering projects have shown that Community Forests are an
excellent strategy for economic and community development, delivering both social and economic benefits.

The Northern Forest Center helps communities acquire and prepare to steward their locally owned forests. It assists in many ways, from early exploration and feasibility studies all the way through acquisition and forest management planning. Throughout these multi-year projects, the Center helps communities develop the capacity and skills they need to effectively own and manage the forestland they love.

Source: https://northernforest.org/programs/community-forests/overview

**County Land Banks and the Western Reserve Land Conservancy:** Like plants, humans and communities cannot thrive in an unhealthy environment. The important first step in creating a healthy ecosystem is to secure our cities’ vacant, abandoned and unsafe properties.

For Western Reserve Land Conservancy’s Thriving Communities Institute, this is the work of establishing and supporting county land banks throughout Ohio. This tool is seen as an essential element for stabilizing the region’s fragile cities and towns. County land banks, formally called county land reutilization corporations, provide counties with a much-needed ability to quickly acquire foreclosed and vacant property. These land banks can safely hold a distressed property, clean its title and prepare it for a better day. The goal is to secure vacant properties—which would otherwise attract crime, lower neighboring home values and incur public services costs—so that they can be put to better use in the future.

Source: https://www.wrlandconservancy.org/county-land-banks/

- Developing renewable energy projects on their own lands or helping to advise landowners on negotiating the community benefit plans that are usually required from developers of energy projects.

- Helping to understand the opportunities for and then to build value chains for regional products, including identifying gaps, as well as supporting the creation of clusters of owners, processing facilities, sales outlets and similar actors.

- Forging new collaborations with organizations working on rural economic development, such as those described in the box below or found in the 2012 Berkley Workshop report on “What Do Healthy Rural Economies Look Like in the U.S. and How Might Conservation Organizations Help Support Them?” (http://environment.yale.edu/publication-series/land_use_and_environmental_planning/6129.html).
New Collaborations: The Rural Development Innovation Group

Convened in 2016 by the Northern Forest Center, the U.S. Endowment for Forestry and Communities, and the Aspen Institute Community Strategies Group, the Rural Development Innovation Group is made up of rural development practitioners, intermediaries and others who have been deeply involved in advancing rural community and economic development through “wealth-building” approaches that add value to local assets, create jobs and build regional and local capacity to adapt to changing conditions.

The Group’s principal goals are to accelerate the adoption, adaptation and impact of innovative rural development strategies and convene key innovators to increase leadership, learning and dissemination to the field.

Source: https://www.aspeninstitute.org/programs/community-strategies-group/rural-development-innovation-group/

The hope is that the Land Trust Alliance will consider such options as it moves forward with its strategic planning process.

“How can land trusts use land to serve the needs of the communities in which they work?”

— Andrew Bowman, Land Trust Alliance

“How should land trusts evolve over time to help steer the land-economic development conversations in the communities they serve?”

— Lucy Blake, Northern Sierra Partnership

Possible Ways Forward From the Participants

At the end of the workshop, the participants also offered a variety of possible ways forward—both within regions, as well as across them.

Within regions, the focus was on how one might determine who should be talking with whom to make progress on any of these possible connections? Lessons might be taken from the increasingly successful efforts of folks interested in local food to build networks across the regions in which they work.

“How do we create space for these conversations?”

— Mackenzie Sehlke, Boston Public Market
Those efforts suggest that focusing on a particular resource that urban consumers need and then involving both rural producers and urban consumers in efforts to bring those resources to market may be a good place to start in any particular region. For example, efforts to expand the use of cross-laminated timber in both the Pacific Northwest and the Northeast appear to be building momentum—albeit slowly.

“How do we build or uncover a scale of regional demand that is meaningful?”
— Joe Short, Northern Forest Center

Across regions, the question was—given how different each region is—are there valuable ways to learn from each other’s efforts in different locations? The sense of the group was that the answer was yes, maybe illustrated by comparison with two very different examples:

• How does one think about managing any particular forest stand? Clearly each stand is different, but there is a consistent group of questions around which one often starts—about soils, precipitation, species mix and related topics. Understanding how these differences play out across stands helps managers organize their thinking when they approach a new forest.

• How does one think about building resilient cities? Again, clearly each city is different, but they face a similar set of shocks and stresses—such as flooding, economic downturns or social unrest. The Rockefeller Foundation and its 100 Resilient Cities Program (http://www.100resilientcities.org/) is showing that cities can learn from each other’s experience—not necessarily to replicate what each other are doing (although that is an efficient approach if it fits), but to spark new ideas that can be used to accelerate progress.

Maybe in similar ways, conservation organizations and their collaborators can dive deeply into the needs and opportunities in their key regions, while also making time to compare lessons learned across different regions. Regional funders of both conservation and rural economic development initiatives might be helpful initiators of such efforts—possibly as part of LTA’s strategic planning process.

**Possible Ways Forward at the Yale School of Forestry & Environmental Studies**

While the School of Forestry & Environmental Studies has a global reach, it is deeply embedded in the Northeastern part of the U.S.—actively managing over 10,000 acres of working forestland in Connecticut, New Hampshire and Vermont, with the possibility of adding additional parcels in the future.

“How listen. Build credibility. Do what you say you are going to do. Respect economic values. Find commonalities.”
— Rick Huffines, Tennessee River Gorge Trust
These locations and their operations provide credible bases from which to work both locally and regionally, as well as across research, teaching and community engagement. For example:

- **Regional wood markets**: While the School Forest produces wood for sale, it has not used that as a starting point for figuring out what it might mean to try and sell into regional markets for wood. The first step in that direction was taken in the spring of 2017 through a gathering of local log brokers and some of the new intermediary buyer’s groups from New York City that are looking for local wood. That work is now continuing through student research on the opportunities for and barriers to selling more of the School’s wood into regional markets.

- **Market barriers to high performance wood products**: The growing interest in high performance wood building materials has led groups from rural conservation organizations (such as the New England Forestry Foundation) to urban architects (such as Gray Organschi Architecture in New Haven) to promote efforts to bring a production facility to the Northeast—and there are rumors that firms are looking at that possibility. Building demand for such products, however, involves deeper dives into the difficulties caused by building and fire codes on a state by state or even city by city basis—the types of projects that students often find useful in their graduate work.

- **Layered funding for watershed management**: By definition, all of the School Forests are in watersheds—some of which provide drinking water, all of which receive storm water. Continuing to explore the links between managing forested watersheds and regional water systems—and the different funding streams that might be connected in new ways—is an area for further exploration.

- **Renewable energy deployment**: While our School has been doing a lot of work in urban and suburban areas on deploying more decentralized, renewable energy technologies (particularly rooftop solar—see https://cbey.yale.edu/programs-research/solar-energy-evolution-and-diffusion-studies-seeds), we should also think more about ways to support those efforts in rural areas—solar and wind, but also renewable thermal technologies such as woody biomass.

- **Shared experiences around the lands we love**: At a recent event in the School’s Connecticut forest, local loggers, local residents (seasonal and year-round), faculty, staff and students all came together to learn about how migrating birds can help spread invasive species—offering a unique opportunity for a shared experience across traditionally separate communities, which might be replicated as part of regional tourism efforts.

- **Learning from networks across scales**: In addition to these efforts in the Northeast, our School is deeply engaged with global networks to learn from and help inform efforts to invest in and manage natural areas along the urban-rural continuum—from the 100 Resilient Cities Program and its work on green infrastructure (http://action.100resilientcities.org/page/content/water-management#/-Yz46MTU7MCdpPTEocz5j/), to the Environmental Leadership and Training Initiative and its work on landscape level reforestation efforts (https://elti.yale.edu/). Our work in the Northeast will continue to inform and, we hope, benefit from these global networks.
We believe that engaging at the local, regional and global levels across a range of urban and rural communities is critically important to meeting the School’s mission of producing knowledge and leadership for a sustainable future.

**Note From The Series Editor:**

This was the last of the Berkley Workshops taking place in this format—which many believe have had a significant impact on the strategic directions being taken by the land trust community. Many thanks are owed to all the people who have contributed to mightily to these efforts, including:

- Our funders, Forrest and Marcie Tyre Berkley, The Overhills Foundation (Kim Elliman), The Elmina B. Sewall Foundation (Jay Espy), The Land Trust Alliance (Rand Wentworth and Andrew Bowman) and anonymous donors to the Yale School of Forestry & Environmental Studies—who gave us the freedom to pursue important topics by engaging our masters students, as well as bringing really insightful people together to explore important topics in beautiful places;

- Our facilitator, Marc Smiley, from Solid Ground Consulting—who made sure that everyone had an opportunity to contribute to the discussions, while leaving me free to listen and ask questions;

- Our masters students, this year including Eve Boyce, Abby Martin, Max Webster and Rachel Weston (as current students who wrote the background paper) and also Jay Espy and Ethan Winter (as alumni who were attendees)—who made sure that we brought “science to solutions” by connecting great knowledge to critical issues facing the conservation community; and

- Our participants across all of the workshops—who gave of their time, knowledge and passion to help maintain the health of the natural systems on which we all rely.

I am so grateful for all of their support and friendship across more than a decade of annual workshops. I look forward to seeing how all of them build on the ideas shared and networks created to strengthen still further our efforts to invest in natural areas.

Brad Gentry
Yale School of Forestry & Environmental Studies
January 2018
1. Why Are Regional Supply Chains an Important Topic Now?

Rachel Weston and Abby Martin
Yale School of Forestry & Environmental Studies

1.1 Introduction
As the most recent presidential election illustrated, the United States currently faces deep political divides. Much of the popular rhetoric suggests that these divides are often between densely populated urban areas and sparsely populated rural ones.

Regardless of whether this rhetoric is well-founded, urban and rural areas are not as well connected—physically, economically, socially—as they could be. How might tighter regional connections help overcome these divisions? Might regional supplies of renewable resources help strengthen both cities and their surrounding rural areas?

As cities grow, so too do their needs for resilient supply chains of essential goods and services. As rural areas consider their future, durable markets for the goods and services they supply are a key part of maintaining the jobs their residents need. Urban areas benefit from the natural resources concentrated in rural areas, and rural areas often depend on the revenue streams that originate from cities.

At the same time, as the land conservation community has acquired more natural areas for protection, it must now fund the management and stewardship of those lands over time. Are there ways to manage these more rural natural areas so that urban dwellers will pay for the renewable goods and services they provide? Might doing so on a regional basis provide a large enough range of private and public benefits that both private and public investors would be interested in funding their management over time?

The purpose of the 2017 Berkley Workshop is to explore ways that natural areas might help address these challenges, particularly focusing on the potential for regional supply chains of the renewable goods and services that they provide. This background paper starts with a general overview of urbanization, rural decline, and supply chains to help identify some of the big questions that seem worth exploring. It then moves to examples from current efforts around regional supply chains of water, recreation, renewable energy, and wood products.
to help highlight some of the issues that need to be considered. At the conclusion of the Workshop, each attendee was asked to identify some questions in need of further analysis, as well as any actions they may choose to take, to help capture opportunities around regional supply chains.

### 1.2 Why Consider Regional Supply Chains?

The current political climate and rhetoric have emphasized a growing gap between urban and rural areas. Indeed, certain current trends in poverty, unemployment, and urbanization can be interpreted in a way that suggests that while rural areas are on the decline, urban areas are becoming more vibrant and revitalized. But is this assessment fair and accurate?

**Trends in Rural Poverty and Unemployment**

Between 1990 and 2013, global poverty levels (defined as the number of people living with less than $1.90/day) fell from 4 in 10 to 1 in 10. In fact, fewer people around the world live in extreme poverty today than ever before (World Bank, 2017).

![Fig 1. Global Extreme Poverty Levels](image)

*The World Bank, 2017*
Despite overall declines in global poverty, there still exists a gap between rural and urban poverty in the United States. According to the U.S. Census Bureau, the percentage of non-metro people living in poverty has been higher than the metro population since poverty rates were first officially recorded in the 1960s (USDA, 2017). The gap between non-metro and metro poverty levels has decreased significantly since the 1960s, but it has been roughly stable at 3% higher for non-metro populations in recent history.

In tandem with poverty is the issue of unemployment. The 2008 recession caused spikes in unemployment rates across the country. While the economy has largely recovered and employment rates are increasing, urban areas are enjoying a swifter recovery of jobs than rural areas.
Fig 3. U.S. Employment Rates in Urban and Rural Areas

U.S. employment, metro and nonmetro areas, 2007-2016 (quarterly)

Employment, index (2008 Q1=100)

Notes: Data are seasonally adjusted. Shaded area indicates recession period.

United States Department of Agriculture Economic Research Service, 2017
Though overall employment rates have been increasing in the last few years, certain areas of the country continue to experience falling employment. Many of these areas have forestry, mining, oil, and gas industries that have seen a decline in activity despite employment growth in past years. Many of these parts of the country voted heavily for Donald Trump in the most recent election. One of President Trump’s campaign promises was to bring back jobs to struggling rural economies that had been lost to globalization and automation.

Fig 4. Changes in U.S. Jobs in Rural Areas, 2015-2016

Many of the counties that saw declines in jobs in 2015 and 2016 voted heavily for Donald Trump in the presidential election.

Despite Donald Trump’s political rhetoric and the fact that urban areas have recovered from the recession more swiftly, current data suggests that jobs are also coming back to some rural areas. Could regional supply chains further speed up economic recovery in these areas? Is there a way to monetize the multiple benefit streams from natural areas to support wealthier, more resilient rural areas?

**Urbanization**

Over the last hundred years, American society has moved from a primarily agrarian society to an urban, industrialized one. All signs point to this trend continuing well into the future, as rural populations decline and urban populations continue to grow.
Growing urban areas will have increasing demands for supplies of natural resources provided by rural areas, such as water, energy, timber products, and food. What role(s) can regional supply chains play in the facilitation of this exchange?
1.3 Should Regional Supply Chains be a Part of Any “Resilient” City?

Resilient cities are becoming a major focus of attention. Sustainable community certification programs, such as Sustainable Jersey\(^3\) and New York Climate Smart Communities,\(^4\) are becoming more popular. In the wake of several large storms in the past few years, coastal resilience has come to the front of many a city planner’s mind (for example, see the work being done by Rebuild by Design: [http://www.rebuildbydesign.org/](http://www.rebuildbydesign.org/)).

With the focus on creating resilient urban areas, it is important to remember that cities also need supply chains to provide them with many of the resources required for resiliency—most of which start in rural areas. More of the money that cities are willing to pay needs to go to support resilient economies built around the resources that natural areas provide, as these natural areas benefit urban areas as well. The question becomes, how do we optimize these urban supply chains to make them as resilient as possible? How do we best prepare for and respond to interruptions in supply chains?

**Milk for Vancouver?**

As part of conversations around the City of Vancouver’s work as a member of the 100 Resilient Cities Network ([http://www.100resilientcities.org/cities/entry/vancouver#/-_/](http://www.100resilientcities.org/cities/entry/vancouver#/-_/)), a question was asked about the major sources of milk in the city. It turns out that most of the milk comes from New Zealand.

This led the folks involved to wonder how one might best optimize both the demand side (i.e. storage facilities in case of supply chain interruption), as well as the supply side (i.e. should an effort be made to add more local supplies of milk from the surrounding region)?

Source: Personal conversation with Murali Chandrashekaran, University of British Columbia, April 2017

1.4 Global versus Regional Supply Chains

**Comparative Advantage and Global Free Trade**

Much of the reduction in poverty around the world noted in section 1.1 above is attributed to the growth of global trade (Le Goff and Singh, 2013). Many analysts see this as “comparative advantage” in action—allowing people to make what they are best able to produce and then trade with others to increase overall wealth.

Under this analysis, a focus on regional supply chains will be seen as inefficient—either regional products reflect their comparative advantage and will outcompete those available

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3 Sustainable Jersey: [http://www.sustainablejersey.com/](http://www.sustainablejersey.com/)
4 New York Climate Smart Communities: [http://www.dec.ny.gov/energy/so845.html](http://www.dec.ny.gov/energy/so845.html)
from global markets or they will not and should then lose in the competition with products from elsewhere.

**Externalized Costs and Benefits**

The current system of global, relatively free trade, however, is also under attack from a number of angles—many of them linking to externalized costs and benefits.

On the externalized costs side, some critics say that goods produced in many countries do not reflect their true costs of production—due to unfairly low pay, unsafe working conditions, uncontrolled pollution, and other costs that are not reflected in the price of their products. (Frankel and Rose 2002, Helpman, 2016). As a result, they compete with regionally/locally produced goods at unfairly low prices and drive local producers out of business. This argument was a major part of President Trump’s campaign.

Less well understood is the externalized benefits side—are the benefits associated with vibrant regional economies based on renewable resources being captured by our current economic system? Are we underinvesting in the social, political, and environmental benefits—both public and private—that come with healthier regional supply chains?

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**The Aspen Institute and Regional Wealth**

The Community Strategies Group at The Aspen Institute promotes a regional wealth building approach to community and economic development in the US. Successful wealth building strategies maintain or increase the various forms of capital that are the foundation of a region’s future prosperity, increase local ownership and control of that capital, and support low-income people, places, and firms by conscientiously designing them into development strategies. Wealth building expands economic development beyond typical goals of immediate profit, income, and job creation; it also factors in non-financial assets that boost a community’s future outcomes.

Taking a regional approach is seen as vital. Stronger rural-urban linkages can help creatively address major problems, particularly in rural communities without the essential resources to alleviate those threats. As program manager Travis Green says, “It’s not an either/or proposition—both rural and urban communities have to flourish,” though striking that balance remains a major challenge.

Aspen and its partners in the broader WealthWorks initiative advocate for establishing a wealth-building value chain—a network of people and organizations addressing a market opportunity arising from urban demand. Successful rural wealth creation, says Green, will be “building value chains from scratch”: thinking about how to help rural communities in engage urban places in roles beyond simply demand partners to rural supplies of goods and natural resources.

1.5 The Potential Advantages of Local Businesses and Regional Supply Chains

As more attention is paid to ways to improve rural economies, a number of efforts are focused on improving locally-owned businesses and expanding regional supply chains. Some of the arguments being made in favor of those efforts are summarized below.

Arguments for More Locally-Owned Businesses

Reduced Inequality. Economic consolidation and the growing market share of very large firms have contributed to the dramatic increase in income inequality since the early 1990s. Researchers found a strong relationship between growth in firm size and rising levels of income inequality, particularly in the U.S. and the UK: “part of what may be perceived as a global trend toward more wage inequality may be driven by an increase in employment by the largest firms in the economy.” (Mueller et al., 2015)

Economic Returns. Local businesses often recirculate a greater share of every dollar in the local economy by engaging in locally owned supply chains and investing in their employees. A British Columbia study found that spending directed to independent retail and restaurant businesses instead of larger chains translated into 2.6 times as many local jobs created (Civic Economics, 2013). Independent businesses spend more than chains locally: they support their regions by hiring local labor, procuring goods locally for resale, and buying services from local providers (Civic Economics, 2012).

Employment Resilience. During high unemployment periods, small businesses both retain and create more jobs than large firms do. In every other recession and recovery in a 1979-2009 study, large firms took years to recover relative to small firms; the correlation remains consistent across industries and ages of firms. The conclusion also holds across developed countries of different sizes: in the U.S., the UK, Denmark, France, and Canada, small firms create more jobs as a fraction of their employment only when unemployment is high, forming a valuable counter-cyclical function to large firms (Moscarini and Postel-Vinay, 2012).

Better Wages and Benefits. U.S. counties with higher percentages of employment in locally based, small businesses have stronger local economies (Rupasingha, 2013). U.S. cities and counties with a larger density of small, locally owned businesses experienced greater per capita income growth between 2000 and 2007; in that same period, the presence of large, non-local businesses had a negative effect on incomes (Goetz and Fleming, 2011).

Arguments for Regional Supply Chains

Proximity-Driven Innovation. Economists use the term “industrial commons” to describe potent regional clusters of suppliers, manufacturers, and researchers; they argue that distance matters for exchanging knowledge even in an intertwined global economy. An established industrial commons can feed a virtuous cycle of skilled workers and firms both flocking to the knowledge and job centers to be competitive and stay close to suppliers and potential partners (Pisano and Shih, 2009).
Increased Social Capital. Small, local businesses with regional supply chains confer benefits on employees and the local community, strengthening community attachment and sustainability. Strong ties between employers and employees create deeper roots in the community and reduce the impetus for out-migration (Halbesleben and Tolbert, 2014). High levels of local ownership and local sourcing improve a community’s “collective efficacy,” or residents’ capacity to act together for mutual benefit. The community well-being extends to lower crime rates and better public health, as researchers have found that locally engaged business communities tend to create the kinds of infrastructure that fosters healthier choices (Blanchard et al., 2011).

Greater Economic Sustainability through Transparency. Smaller-scale production with more transparent supply chains allows consumers to use embedded information to make a value judgment about the desirability of a product. Shorter supply chains enable “re-socialization” and “re-spatialization” of food and other products via clear communication on the location and method of production, making more environmentally and economically sustainable supply chains more accessible to consumers who value those criteria (Park et al., 2013). As one set of researchers concluded, “it is not the number of times a product is handled or the distance over which it is ultimately transported which is necessarily critical, but the fact that the product reaches the consumer embedded with information” (Marsden et al., 2000).

Reduced Environmental Footprint. Climate change concerns are often cited as a rationale for local and regional production systems. These concerns include the environmental costs of shipping products long distances and the vulnerability of centralized production systems to climate shifts. (Critics regularly point out that local food is not necessarily a lower-emission product, given the higher energy requirements of growing produce in northern climates under greenhouses and the relatively low emissions from trans-oceanic shipping. See “A Math Lesson for Locavores.”) In contrast to large, industrial farms, small family farms are more likely to spend their dollars in the community on farm-related inputs (machinery, seeds, farm supplies, etc.) and to engage in farming practices that do not harm their community’s physical environment (Community-wealth.org, 2017).

Local Control Over Resources. Particularly for those in the food sovereignty movement, the primary driver of re-localization is the desire to maintain democratic control over the local food supply in the face of global commodification (Feenstra and Campbell, 2011).
Lessons from the Local Food Movement

The local food movement provides valuable lessons for other regional products. Across the country, a few best practices have emerged:

**Local food campaigns** are the foundation for building awareness and demand. Campaigns create supportive climates for local farms and businesses by engaging customers around product stories and value chains. Demonstrating how consumers’ values are reflected in a product—whether in the product itself or associated environmental or social attributes—gives insight into the “true cost” of food while explaining the values-based relationships along the local supply chain.

- **Boston Public Market** provides a year-round indoor marketplace for locally sourced groceries and specialty agricultural products, housing 40 local food producers and a retinue of rotating pop-up vendors. Beyond these market spaces, Boston Public Market offers test kitchens, technical assistance, and other resources to support the development of local food producers and help customers understand the true cost of local food.

  For more information: [https://bostonpublicmarket.org/](https://bostonpublicmarket.org/)

**Regional trainings and conferences** help build regional capacity to support local farms, fostering partnerships along diverse community members. Research and toolkits for producers, teachers, decision-makers, and consumers are especially effective when tied in with comprehensive branding programs around values-based criteria.

- **The Central Appalachian Network** hosts annual gatherings of community leaders across sectors in the region to generate and implement regional economic strategies that create wealth and reduce poverty while restoring and conserving the environment. The network has long worked on creating a local food movement; efforts to increase buyers’ understanding of the value of buying local and organic products has led to a 37% increase in the number of buyers engaged in value chains.

  For more information: [http://www.cannetwork.org/index.asp](http://www.cannetwork.org/index.asp)

**Bringing people together** by linking farms directly with businesses and institutions provides visibility for locally grown food. These direct-market relationships drive sales of regional products by cultivating customer loyalty; they also build a constituency for local farms and food, helping to identify and advocate for public and private policies that strengthen regional food systems.

- In Wisconsin, **Fifth Season Cooperative** connects small farms and food businesses with anchor institutions in Madison, Milwaukee, Chicago, and Minneapolis. Cooperative members include producers, food processors, distributors and buyers from northwest Iowa to southeast Minnesota.

  For more information: [http://www.fifthseasoncoop.com/](http://www.fifthseasoncoop.com/)
1.6 From Acquisition to Stewardship of Conserved Lands

At the same time that thinking about urban-rural connections is evolving, so too is the work of the land conservation community. Over the past several decades, the amount of conserved land in the U.S. has increased dramatically—and with it, the need for stewardship has grown.

![Fig 7. Land Conserved by State and Local Land Trusts, 1985-2015](image)

*The Land Trust Alliance, 2015*

While there certainly are more areas that should be acquired for conservation, there is also an increasing need to think about funding the stewardship of conserved areas over the longer term. When stewardship funding can also translate into healthier rural economies or more jobs, funding is likely to be more readily available.

1.7 The Four Resources: Why did we choose them? Why are they in the order they are in?

In this report, we will explore regional supply chains through the lens of four natural resource opportunities:

- Water—drinking, storage and flood management
- Recreation—accessible by public transit or car
- Renewable energy—produced in surrounding rural areas for use in cities
- Timber products—produced in surrounding rural areas for use in cities
For purposes of the discussion during the workshop, we will be moving from the most inherently regional supplies (starting with water), to those most affected by larger-scale supply chains (wood products). Our hope is that by moving along this gradient, the group’s insights can build on its earlier discussions.

We also recognize that the efforts around locally sourced food (see Box on page 34) and carbon storage (see the report from the 2016 Berkley Workshop) are incredibly important for our understanding and strengthening of supply chains from natural areas. We have chosen to include attendees with deep experience in these efforts so that the lessons they are learning can be reflected in the discussions.

At the same time, given the importance of, and comparatively less attention being paid to, the other four resource systems, we decided to focus our discussions there as part of an effort to broaden efforts around regional supply chains.

**Possible Questions for Discussion**

- How do we talk about and/or value the connections between urban and their surrounding rural areas? By paying attention to these regional relationships, can we address issues associated with urban and rural development as related rather than as two distinct entities that operate independently?

- What are the opportunities for regional supply chains to help overcome some of the divides between urban and rural areas?

- When and where might regional supply chains of renewable resources be good investments? When and where might global supply chains offer a preferable approach?

- Should land conservation organizations be doing more to explore this area of work? Can they use it to further their goals?

**Some of the Organizations Doing Interesting Work in this Arena**

- **The Democracy Collaborative** – The Democracy Collaborative envisions a new economic system focused on shared control, equitable and inclusive outcomes, and ecological sustainability. One of their projects, Community-Wealth.org, focuses on bringing together into one place information on the broad range of community wealth building strategies and organizations across the country. For more information: [http://democracycollaborative.org/](http://democracycollaborative.org/) and [http://community-wealth.org/](http://community-wealth.org/)

- **Ecotrust** – Ecotrust works across several arenas, including forestry, food, water, climate, and green building to create more resilient regional communities, economies, and ecosystems. For more information: [https://ecotrust.org/](https://ecotrust.org/)

- **Evergreen Cooperative Initiative** – The Evergreen Cooperative Initiative is a group of Cleveland-based institutions focusing on building a local grassroots economy in a low-income area known as the Greater University Circle. By creating jobs and finding local
1. **why are regional supply chains an important topic now?**

workers to fill them, the Evergreen Cooperative Initiative is working to build a more resilient and inclusive economy. For more information: http://www.evgoh.com/

- **New Economy Coalition** — The New Economy Coalition works under the belief that we need a fundamental economic and political shift, and that a new economy that meets human and environmental needs is necessary to creating a more equitable, just world. For more information: http://neweconomy.net/

- **WealthWorks** — WealthWorks connects community assets to market demand with the aim of building more resilient regional economies, increasing self-reliance, creating jobs, and increasing incomes. For more information: https://www.wealthworks.org/

**Useful Readings/Works Cited**


1. Why are regional supply chains an important topic now?

Discussion-Papers/2013/01-Do-Local-Business-Ownership-Size-Matter-For-Local-Economic-Well-Being-2013-08-19.PDF.


Figures

Figure 1:

Figure 2:

Figure 3:

Figure 4:

Figure 5:

Figure 6:

Figure 7:

Personal Conversation

Murali Chandrashakeran, Associate Dean, University of British Columbia, March 13th, 2017.
2. Watershed Investment for Rural-Urban Connectivity

Eve Boyce  
Yale School of Forestry & Environmental Studies

2.1 Investment in Upstream Natural Areas

In many senses, watersheds across America are examples of urban-rural connectivity. The nature of settlement has meant that cities are often established alongside water sources and therefore a connection between rural and urban communities has always existed. Typically, rivers flow downstream from rural areas into cities and, all along the way, water is used for drinking, waste management, and recreation.

Historically, urban users have provided little compensation for the services provided by the natural areas in upstream watersheds—which include water purification, water storage, and flood management (World Resource Institute, 2016). Conversely, there have been few conversations about how upstream water users and landowners should manage their natural areas for, and be compensated for, these services.

So, while the urban-rural connection around water exists naturally for most cities, that connection has not been made explicit in terms of how municipal governments, urban businesses, and other water users think about investing in the more “natural” parts of the water “systems” on which they rely.

This chapter focuses on the ways that urban and rural communities sharing a watershed can leverage their relationship to provide improvements in water quality, quantity, and flood control alongside financial benefits. Through initiatives described as “watershed investment programs” or “watershed investment projects,” some municipalities, utilities, and other entities are investing in upstream forest and land management improvements with the expectation of downstream ecological and financial benefits, such as reduced occurrences of dangerous wildfires and reduced water treatment costs. These programs have the potential to provide additional resources, both through direct payments and provision of additional non-monetary resources to rural communities, such as support for management practices.
This chapter will highlight the various potential benefits of such programs, along with the challenges to more widespread adoption and some strategies for overcoming those challenges. While some aspects of each watershed will be unique, there are a number of general observations that can be made about these types of programs that will be helpful for promoting more widespread development of these strategies.

2.2 Benefits Provided by Watershed Investment Projects

There are a number of benefits that are often provided by more resilient regional connections around water resources. Improved water quality, water quantity, and flood control are all outcomes from improved upstream ecosystem management. At the same time, payments for these water services from natural areas can provide important resources to rural communities.

**Urban Benefits**

One of the major benefits of improved upstream natural area management is enhanced water quality, which can lead to a reduction in water treatment costs for urban areas. In extreme cases, such as the watersheds in New York City, San Francisco and Portland, Maine, upstream conservation of land and the promotion of good water quality protections has allowed cities to forego expensive treatment plants entirely.

Famously, in the mid-1990s, New York City found that constructing the necessary water treatment facilities would cost between $8 and $10 billion dollars, with additional operating expenses of $1 million each day (Kenny, 2006). Instead, New York City opted to invest $1.5 billion in protecting their watershed by buying conservation properties abutting reservoirs, and improving upstream treatment plants and septic systems. The strategy has paid off, as the EPA has provided the city with a waiver to the federal requirement for treatment of drinking water, saving the city considerable expense.

Most municipalities are receiving water from upstream sources that will never reach the water quality standards necessary to waive the EPA's treatment requirement. Regardless, improvement of water quality through upstream management can decrease treatment costs. Practices like decreasing agricultural runoff, increasing streamside forest cover, and forest-fire prevention can reduce operational risks and treatment costs. One estimate found that local and national authorities will need to invest more than $1 trillion over the next 25 years to maintain, repair and expand water infrastructure to meet drinking water demand (AWWA, 2013 in World Resources Institute, 2016). Some of the costs of these investments may be offset through upstream ecological improvements.

Improvements in upstream forest and open land management can also lead to increased water storage and decreased flood events. The soil composition in well-managed forests and riparian zones can improve infiltration and storage, making water more available during periods of low rain (World Resources Institute, 2016). Conversely, the same sort of healthy forest management, particularly alongside rivers and streams, can be important in slowing run-off, which can prevent erosion and flooding.
Both of these benefits can reduce the operating costs of water utilities and municipalities. Wildfires have a significant impact on the quality and quantity of water resources and can have disastrous effects on urban water sources. Sedimentation from ash, changes to the flow of rivers and streams, blockages due to tree damage, and increases in future flood damage can all result from wildfire and cause considerable expense to water providers. The risks of wildfire are much higher in the West, where utilities and municipalities are well-aware of the impacts. Public utility Denver Water estimated that big wildfires in 1996 and 2002 cost the utility over $26 million dollars in repairs, increased treatment, and other associated expenses (World Resources Institute, 2016).

**Rural Benefits**

The same benefits that are provided to urban communities through healthy upstream ecosystems are also benefits to rural users. Perhaps even more significant than water quality protection (due to the compounding nature of the issue downstream), flood control, fire prevention, and improvements in water quantity can benefit all communities within a watershed.

Additionally, watershed investment programs can provide financial returns to rural communities, both through direct payments for management of natural resources and through the creation of jobs and other secondary financial benefits associated with upstream conservation and improved natural area management.

In some cases, upstream landowners are paid directly to improve their land management. Often, these types of payment programs are associated with farmland—it is fairly common for payments to be made to rural landowners in exchange for their conversion of agricultural or ranch lands into streamside buffer areas. These buffer areas can provide additional filtration services for agricultural run-off and improve water quality and erosion issues. The Natural Resource Conservation Service’s Conservation Reserve Program and Conservation Reserve Enhancement Program provide rental payments to landowners to convert their highly erodible cropland into areas of permanent cover.

More common than direct payments are programs that provide free or reduced-cost management services to upstream landowners. These services typically encompass the provision of technical skills and advice, such as the development of property management plans for specific goals or the provision of labor to complete specific management tasks. As an example, public utility Denver Water provided $1.65 million to the Colorado State Forest Service to fund forest management work on private lands to reduce wildfire risk through better forest management (World Resource Institute, 2016).

Job creation is another economic benefit associated with watershed investment programs. Increased management of forestland, such as improved thinning practices, require labor which is typically locally sourced. Watershed investment programs can provide funding for the purchase of conservation lands, which may require land managers or other staff. The influx of additional financial benefits to rural communities may be important in allowing businesses to stay afloat that would not have been able to do so otherwise.
2. Watershed Investment for Rural-Urban Connectivity

Watershed Agricultural Council and NYC DEP Partnership

In September 2016, the NYC Department of Environmental Protection (DEP) and the Watershed Agricultural Council (WAC) announced the creation of a $43 million endowment fund for WAC to use to steward agricultural and forestry easements in the New York City watershed. The WAC owns easements on more than 25,000 acres of working lands surrounding New York City’s water supply reservoirs in the Catskills. The endowment is meant to aid in the joint missions of protecting New York City’s water supply into the future and ensuring economic viability in the region. The program is a great example of how watershed investment programs can have additional economic benefits for rural communities. For more information: www.nycwatershed.org

2.3 Challenges to the Development of Watershed Investment Projects

While there are quite a few example projects across the country, watershed investment projects and natural infrastructure projects associated with water resources are not yet mainstream. This is largely due to a number of challenges associated with the development of these types of projects – as discussed below. A major theme in a conversation with Martha Lyman, a Harvard Bullard Fellow working on these projects, is that the field of watershed investment is still in a very early stage and will require considerable research, funding, and time to become more widespread.

Difficulty Quantifying Benefits

One of the major challenges to developing watershed investment programs is the difficulty of fully or correctly anticipating and then quantifying the benefits of management actions in upstream watersheds. This quantification is extremely important when making the case to long-term investors such as utilities or municipalities for why it is worth investing in upstream management strategies. Without the data to support the effectiveness of the methods employed in these programs, it is difficult to make a strong case for their adoption.

Case studies may provide some support for the adoption of the various management strategies, but most investors will want to see watershed specific modeling that demonstrates the expected outcomes, including information about expected financial returns. This type of modeling is quite difficult and can be expensive. Additional research is needed to develop accessible and affordable strategies for quantifying anticipated outcomes of watershed investment projects.

Once a project has been implemented, it will be incredibly important to collect data on outcomes, both to maintain support for the project and to provide cases for reference elsewhere. For projects aimed at improving water quality, data collection and monitoring can be fairly straightforward. Data-points like water temperature, dissolved oxygen content, and perhaps most importantly reductions in the cost of treatment, will all provide indicators of management success.
For practices like fire prevention, quantification can be much more challenging because it is nearly impossible to quantify the number of fires prevented or the intensity reduced. While utilities can measure the costs of previous wildfires to their businesses, it is difficult to determine whether improved management practices may have prevented a fire in a given year. Proxy measurements may be useful, but ultimately this is one of the major challenges to future adoption of these types of investment programs.

**Difficulty Finding Investors and Financing**

Almost certainly linked with the difficulties around anticipating success, one of the major challenges to widespread implementation of watershed investment programs is finding the financing necessary for these types of projects. Most programs find that initial start-up investors, such as those who will support a pilot project, will be different than long-term program supporters. Municipal governments and water utilities are the logical source of long-term funding, but usually require proof of a return on investment and the evidence may not yet exist for those returns. Grant-making entities and federal government programs may be alternative financing options for the start-up or pilot phases of programs.

In some cases, philanthropic dollars are used to finance watershed improvements. One example of a philanthropically-funded project is The Northern Forest Fund, which was developed by The Salt River Project and the National Forest Foundation as a way for businesses and individual community members to contribute to watershed improvement projects on nearby National Forest properties. The philanthropic dollars are used for forest thinning, prescribed burns, stream and wetland restoration, sediment and erosion management, and habitat improvement to prevent wildfires and improve watershed health.

Once the case for the watershed investment program has been made, utilities and municipalities may be able to provide support for the ongoing program. Many utilities have been able to fund these types of programs through water rate increases, bond measures or surcharges imposed on customers. Ultimately, most programs end up leveraging several types of financing to make their project whole.

It is likely that the ultimate challenge to more widespread adoption of watershed investment programs is developing a wider and more readily available pot of funds for implementation. Because these programs are still outside what is considered normal in terms of water infrastructure investment, there is a lag in the availability of what might be considered traditional investors. Currently, financing these types of projects requires creativity and flexibility.

**Land Use Concerns**

Rural communities may also have concerns about the effects of watershed investment programs on their communities, particularly when the conservation of widespread areas of land is an important component of the program strategy.

When New York City was in the process of conserving land around its reservoirs through its watershed investment program, communities expressed concern about the loss of traditional
2. Watershed Investment for Rural-Urban Connectivity

uses such as hunting and fishing on the newly minted conservation lands, as well as the ability to develop certain lands in the future for manufacturing or other uses. Rural landowners may worry that increased conservation will affect the ability of the region to maintain extractive industries, such as a working forest economy. Concerns about the effect of natural infrastructure investment projects are an anticipated challenge as these projects become more widespread.

2.4 How Might Challenges Be Addressed?

Improved Methodologies for Quantification of Benefits

A number of organizations across the country are working on developing robust methodologies for quantifying watershed investment outcomes. As more watershed investment programs are undertaken, their monitoring protocols will be useful cases for how to quantify program success (or failure).

Organizations currently use a number of metrics for quantification, including acres conserved; various water-quality measurements, such as turbidity and dissolved oxygen content; acres of land actively managed; hazardous fuel load monitoring (World Resource Institute, 2016). Some utilities have reported that the institutionalization of natural capital planning in their day-to-day work would be an important component of allowing them to compare the costs of “green” investment with traditional infrastructure, but that they do not currently have the skills to do so.

Building the Case for Green Infrastructure

The Nature Conservancy has partnered with Dow Chemical Company, Shell, Unilever, Swiss Re, and a resiliency expert to develop a white paper that recommends the utilization of green and hybrid infrastructure solutions to improve overall business resilience. The joint-effort will continue to explore the ways that green solutions can be a cost-effective investment, which will hopefully encourage more companies and organizations to pursue green or hybrid solutions when appropriate. For more information: www.nature.org/about-us/the-case-for-green-infrastructure.pdf

Development of Additional Financing Mechanisms for Watershed Programs

The World Resources Institute report on drinking water protection programs found that most of the programs they surveyed identified financing as their primary barrier to implementation (2017). While most of the projects of this ilk will likely be financed through a combination of grants and utility/municipal investment, there are other alternatives models that are worth exploration. Corporate investors may play an increasing role in watershed investing. Anheuser-Busch InBev, Coca Cola and SAB Miller have all announced strategies for source water protection. The private sector remains a largely-untapped potential source
of support for watershed investments, although an increase in the certainty around financial returns will likely be necessary.

While Green Bonds have largely funded conventional built infrastructure thus far, these types of bonds (which offer financial and environmental returns) are an additional potential source of capital for watershed investment projects.

Blue Forest Conservation, along with WRI and Encourage Capital, is developing an investment platform to leverage private dollars to protect Western forests from drought and wildfire through pay-for-performance contracts. The pilot will focus on National Forest lands, with the hope of expanding to private lands.

Bonneville Environmental Foundation has also launched a Water Restoration Certificate Program that provides support for projects that restore water. Each certificate represents 1,000 gallons of water “that directly contribute to restoring economic, recreational, and ecological vitality of national freshwater systems.” Projects include water management agreements related to water rights, irrigation infrastructure investments, natural hydrologic restoration, and information technology systems. So far, the program has restored 13.5 billion gallons of water in 7 states through the purchase of certificates (BEF, 2017).

Financing is critical to making watershed infrastructure projects happen and is one of the primary barriers to the implementation of these projects currently. There are a number of potential structures for financing this type of work and additional resources should be devoted to developing the case for their utilization. As it stands, there are a number of remaining questions about how to successfully leverage funds for this work.

2.5 Linkages Between Healthy Water and Rural Supply Chains

One important note is that building resilient rural supply chains in the other arenas discussed in this workshop (recreation, renewable energy, and forest products) is likely to contribute to the health of watersheds and provide benefits to water quantity, quality, and control. The conservation of land for recreation, the protection and active management of forest lands, and the conservation of land for energy use, can provide the same benefits as the conservation of land for the explicit purposes of watershed improvement.

As such, there may be potential to combine the goals of each supply chain to develop a model of regional resiliency that provides water quality benefits to urban users – and allows water investments to be layered in with other sources of finance.
2.6 Conclusion

The market for natural infrastructure projects and watershed improvement programs is still very much in the early stages of development. A number of questions remain about how we can develop mechanisms that help urban water users to recognize and pay for the important services provided by healthy watersheds.

Increased capacity of land conservation organizations to act as intermediaries to promote these projects will be important. Linking the science and financial language to make the case for this type of work will help institutionalize an understanding that these mechanisms may be important. The promotion of case studies and pilot projects can help encourage urban users to take the risks associated with this new type of venture.

Unlike the development of water treatment systems or the installation of dikes, investment in watershed improvement projects has the potential to provide a number of additional benefits to a region. Both ecological and financial benefits, to upstream and downstream communities, can be leveraged through increased use of these types of strategies in the future.

Possible Questions for Discussion

- Who should take on the work of developing and promoting these types of watershed investment projects?
- What role should conservation organizations play in promoting or undertaking this work?
- What mechanisms can be created so that urban water users recognize and are willing to pay for the services provided by healthy, regional watersheds?
- What additional knowledge needs to be created to make the case for these types of projects?
- What are the alternative financing mechanisms that could be leveraged for these projects?
- What policies might help institutionalize these types of projects?
- What role might water quality trading schemes play in the future, if any?
- What role does scale play in either preventing or promoting this work?
Some of the Organizations Doing Interesting Work in this Arena

• **Blue Forest Conservation** — Blue Forest Conservation is developing the first outcome-based security — the Forest Resilience Bond (FRB). The FRB will deploy private capital to invest in restoration projects on public lands that improve forest health. They aim to create a new model for public-private partnership to enhance climate resilience. For more information: [http://www.blueforestconservation.com](http://www.blueforestconservation.com)

• **Bonneville Environmental Foundation** — The Bonneville Environmental Foundation is a non-profit that generates a significant portion of their revenue through the sales of their suite of environmental products, which includes Water Restoration Certificates. Their Water Restoration Certificate (WRC) program allows businesses and other entities to purchase credits to offset their water footprint. Using the funds from the credits, BEF completes restoration projects such as providing payments for in-stream flows or retrofitting irrigation systems. For more information: [http://www.b-e-f.org/environmental-products/water-restoration-certificates/](http://www.b-e-f.org/environmental-products/water-restoration-certificates/)

• **Carpe Diem West** — Carpe Diem is a non-profit based in California with a focus on scaling up innovative forest headwater resilience and restoration programs. They lead the Healthy Headwaters Alliance, which is a coalition of water utility managers, conservationists, public agency staff, scientists, community advocates, and businesses aiming to do watershed resilience projects. For more information: [http://www.carpediemwest.org/](http://www.carpediemwest.org/)

• **The Freshwater Trust** — The Freshwater Trust is a non-profit dedicated to protecting and restoring freshwater ecosystems using science, technology and incentive-based tools. They focus on research and technology, river restoration, water quantity projects, and natural infrastructure solutions to compliance issues. For more information: [https://www.thefreshwatertrust.org/](https://www.thefreshwatertrust.org/)

• **Sand County Foundation** — The Sand County Foundation is a public charity based in the mid-West and working on a number of water conservation projects in the region. Of particular interest are their Yahara Lake Watershed project, which is developing Wisconsin’s first phosphorous pollution reduction project allowing municipal governments to save money by preventing phosphorous instead of treating water. The foundation is also working on developing a pay-for-performance project for farmers. For more information: [https://sandcountyfoundation.org/our-work/soil-and-water-conservation/](https://sandcountyfoundation.org/our-work/soil-and-water-conservation/)

• **Willamette Partnership** — Willamette Partnership is a conservation non-profit based in Portland, Oregon that is a leader in the development of a water quality trading program. They are a convener of the National Network on Water Quality Trading, which includes organizations representing farmers, utilities, environmental groups, regulatory agencies and others to discuss and develop solutions to the challenges of developing a national water quality trading program. For more information: [http://willamettepartnership.org/our-stories/nnwqt/](http://willamettepartnership.org/our-stories/nnwqt/)
• **World Resources Institute** — Non-profit WRI’s Natural Infrastructure for Water program works both nationally and internationally to scale-up the use of innovative natural infrastructure approaches. They leverage their geospatial mapping and economic expertise to help identify opportunities. For more information: [http://www.wri.org/our-work/project/natural-infrastructure-water](http://www.wri.org/our-work/project/natural-infrastructure-water)

### Useful Readings/Works Cited


### Useful Readings/Works Cited


Todd Gardiner of WRI, telephone conversation, March 27th, 2017.
3. Opportunities and Challenges for Regional Recreation

Rachel Weston
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3.1 Introduction

In some ways, recreation stands as a case apart from the other natural resources analyzed in this report. Unlike water, energy, and timber, recreation is not a tangible natural resource that can be extracted from the land or manipulated. However, in natural areas that also provide water, energy, and timber, tourism can offer an additional revenue stream that can be tapped for the stewardship of those same areas. In this way, recreation dollars benefit the other natural resource economies in the region.

Therefore, within the context of creating a vibrant regional economy, what does it take to attract people to explore the regions surrounding where they live? Given that people have the option of recreating within walking distance of their homes, or flying long distances to enjoy one-of-a-kind destinations, how can regional economies draw visitors?

This chapter will focus on the opportunities for regions created by recreation opportunities, the challenges to building a sustainable recreation economy, and some ways in which land trusts and conservation organizations can think about and address these challenges. While we recognize the importance of providing recreational opportunities to all communities on the spectrum from urban to rural, this chapter will focus on building urban-rural connections through recreational opportunities provided in more rural areas around cities.

3.1 Opportunities Provided by Regional Recreation

Outdoor recreation provides many benefits for both participants and the communities that offer recreational opportunities. In this section, we will focus on two main opportunities that can come out of expanded regional recreation activities in natural areas: economic growth and advancement of conservation goals.
We do want to note that the health benefits of recreating outside in both rural and urban environments are many. However, for this workshop, we have chosen to focus on the ways in which regional recreation can support regional economies and how land trusts and other conservation groups can address challenges to creating regional recreation areas. For further information on the myriad of physical, mental, and spiritual health benefits of recreating in the outdoors, please refer to the 2013 Berkley Workshop report, Improving Human Health by Increasing Access to Nature: Opportunities and Risks and the 2014 report on Improving Human Health by Increasing Access to Nature: Linking Research to Action at Scale.⁶

Outdoor Recreation as a Key Economic Driver

In 2016, President Barack Obama signed the Outdoor Recreation Jobs and Economic Impact Act into law, which requires the outdoor recreation industry to be counted as part of the nation’s gross domestic product (GDP). The Outdoor REC Act signified a recognition among the nation’s leaders that the outdoor industry is no longer considered a fringe industry, but a vital and lucrative part of our nation’s economy. According to the Outdoor Industry Association, a membership-based trade organization, the outdoor industry currently generates about $646 billion in consumer spending each year (this includes both outdoor recreation product sales and trip-related expenses) and includes 6.1 million direct jobs (Outdoor Industry Association, 2017).

From hunting and fishing, to skiing, hiking, biking, snow machines and ATVs, outdoor activities have long been economic drivers for the regions in which they are concentrated. In addition to revenue directly linked to the activity (ski passes, hunting permits), revenue is generated from the use of the infrastructure associated with recreation. This infrastructure includes, but is not limited to, hotels, restaurants, and retail stores.

In some cases, revenue generated from a particular activity can be a very significant driver of a state or regional economy. A recent study commissioned by Colorado Ski Country USA and Vail Resorts found that Colorado’s ski and snowboard industry has a $4.8 billion annual economic impact on the state (Colorado Ski Country USA, 2015). That economic impact is not reserved exclusively for the ski resorts, but to the surrounding towns that provide accommodations, food, and entertainment to tourists and employment (46,000 year-round jobs) to Colorado residents.

States such as Colorado and Vermont have well-established outdoor tourism economies, but the recreation economy impact in states not traditionally considered major recreation destinations is no less important. One standout example: outdoor recreation in Ohio generates more consumer spending than Colorado and Vermont combined (Outdoor Industry Association, 2017).

Outdoor Recreation as a Key Economic Driver

Expanding regional recreation opportunities is also a chance to advance regional conservation goals. When people are attracted to beautiful areas, there generally follows a desire to

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⁶ Available at [http://environment.yale.edu/publication-series/land_use_and_environmental_planning.html](http://environment.yale.edu/publication-series/land_use_and_environmental_planning.html)
see those areas protected and conserved for future generations. State and National Parks are habitat refuges for a number of endangered and protected species, such as the redwood trees and giant sequoias in National and State Parks across California. Expanding opportunities for regional recreation can increase visitation to such areas and consequently increase investment in their conservation and protection.

**Gateway Communities in the Northern Forest**

The Northern Forest Center works across the forested areas of New York, Vermont, New Hampshire, and Maine to increase the economic and community vitality of towns in the region.

Recognizing that many Northern Forest communities have the potential to be “gateway” communities to the region’s wealth of outdoor recreation opportunities, the Center works (particularly in Maine) to offer financial assistance to help tourism providers bolster their businesses, strengthen pathways to livable-wage tourism jobs, and advocate for the creation and support of rural Recreation Destination Areas.

For more information: [https://northernforest.org/](https://northernforest.org/)

### 3.3 Challenges to Regional Recreation Opportunities

Despite the benefits that recreation provides to many regions, there are several challenges to making regional recreational opportunities major contributors to healthier rural economies. In this section, several of these challenges are examined in order from most concrete to most complex and intangible.

**Transportation, Infrastructure, and Expense**

One obvious challenge to creating and attracting people to regional recreation opportunities is lack of sufficient available transportation. Many national parks, national forests, and wilderness areas are difficult to get to without a personal vehicle, and many urban communities lack sufficient public transportation to regional or national parks. Lack of access to recreation areas limits the number of potential users of these areas, which can in turn restrict potential income generation for some of these rural communities. Many studies have shown that low-income communities and communities of color are disproportionately affected by lack of access to natural areas (see Box below).

Similarly, though rural areas around National Parks may have sufficient infrastructure — accommodations, businesses, support services — to support visitors, other rural areas with potential recreational opportunities may not. Even access to the Internet, which is essential to many businesses and services and which many urban dwellers take for granted, is not
available in many rural areas. According to a 2016 article in U.S. News & World Report, only 55% of people in rural areas have access to Internet speeds that qualify as broadband.

In addition to transportation and infrastructure issues, the cost of participation in certain recreation opportunities can be cost-prohibitive for many families. Activities such as skiing and backcountry camping require a fair amount of disposable income for transportation, equipment, lift tickets, and food. Many urban and rural dwellers alike simply cannot afford to participate in some of the activities that could be offered through regional recreation opportunities.

**Taos Trail System Case Study, Headwaters Economics**

Headwaters Economics, a non-profit research group based in Bozeman, Montana, recently published a study on the Enchanted Circle Trails system in Taos, New Mexico. The purpose of the study was to provide Taos County with relevant information for improving the network of trails in the area. Headwaters Economics surveyed residents of the area and found that Hispanic and low-income respondents were less likely to have used the trail system than non-Hispanic and wealthier residents of the community. In addition, the survey found that Hispanic and low-income residents were much less likely to have easy access to trails and walking paths, and much less likely to have bike and pedestrian-friendly infrastructure (sidewalks, wide shoulders and bike lanes) near their homes.

**Difference in Access to Trails, Paths, and Public Lands Between Hispanic and Non-Hispanic Respondents**

![Graph showing differences in access to trails, paths, and public lands between Hispanic and non-Hispanic respondents.]

For more information:
Headwaters Economics, [http://headwaterseconomics.org](http://headwaterseconomics.org)

*Image Source: Headwaters Economics*
Tourism and conservation goals do not always align

In certain instances, increased tourism in rural areas becomes a hindrance to achieving conservation goals. In some places, the infrastructure of a region is no longer sufficient to meet the needs of the growing number of visitors to those areas, and therefore puts the conservation objectives of those areas at risk.

The National Park Service in particular is facing this problem in a number of their units. In 2016, visitation to National Parks reached an all-time high. Coinciding with the 100th anniversary of the creation of the U.S. National Park Service, 331 million people visited the parks in 2016. While these visitation numbers underscore the support the National Parks enjoy across the country, stagnant funding and low staff mean that often, parks are understaffed, cannot support visitors adequately, and lack funds for upgrades and other projects.

In addition, some park infrastructure simply cannot accommodate the sheer numbers of visitors. This is the case in Zion National Park in Utah, which is currently considering imposing visitor limitations during peak visitation times (Salt Lake Tribune, 2016). In understaffed parks with overwhelmed infrastructure, increased visitation can also mean additional stress and damage to protected landscapes and endangered species.

Not all rural areas embrace the recreation model

In the previous section, recreation was presented as an economic opportunity for rural areas. Though many see recreational tourism opportunities as a benefit to rural economies, there is disagreement in some communities about the benefits of recreation:

- What is “recreation?” Is it hiking and camping in wilderness? Is it four-season resorts with five-star amenities? Is it hunting and fishing? Is it riding on snowmobiles and ATVs?
- Who should benefit from recreational opportunities? The communities they are based in? Outside visitors?
- Does recreation benefit a community at all? Do tourism dollars stimulate a vibrant local economy or create an “Aspenization” effect?

In addition, simply creating a recreation-based economy in a region is not necessarily a silver-bullet replacement for the loss of other industries in rural areas. Many factors contribute to the challenges of building a sustainable recreation economy:

- Temporary and seasonal jobs
- Low-paying jobs
- Seasonal dependence of certain recreation activities
- Visitors who spend little money (e.g. backpackers, backcountry skiers)
- Lack of infrastructure for additional goods and services that support recreation
- Lack/limited access to Internet
Lastly, and perhaps conversely, recreation models can be too successful in certain rural areas, which can lead to a perceived loss of rural character and the inability for rural residents to continue to live and work in their communities. This effect, coined “Aspenization,” describes communities where a tourism economy has brought in enough wealth and development so as to displace local residents and make it difficult for them to live, work, and recreate in those areas. Aspen, Colorado, and Jackson Hole, Wyoming, are oft-cited examples of this phenomenon.

**Katahdin Woods and Waters National Monument, Maine**

When Katahdin Woods and Waters National Monument was established by executive order in 2016, it was accompanied by great controversy. The over 87,000 acres of land in Maine’s north woods were donated to the federal government by Roxanne Quimby, founder of Burt’s Bees.

Quimby spent many years buying property in northern Maine, and angered many local residents by closing her land to hunting and snowmobiling—activities that, in local Maine tradition, are often allowed even on private land. Many locals oppose the additional restrictions on the land that an official National Park Service designation brings.

Furthermore, the new national monument has angered some communities that have been suffering economically as the pulp and paper industry in the region has declined. Some residents worry that remaining paper mills in the area will have further air pollution control restrictions placed on them to benefit the new national monument. Governor Paul LePage has recently called on President Trump to rescind the national monument designation and return the land to private ownership.

Despite opposition, supporters of Katahdin Woods and Waters National Monument are confident in the monument’s success and the success of the region as a whole. Supporters claim that the new parkland will stimulate the local economy through increased tourism and recreation. Lucas St. Clair, son of Roxanne Quimby and leader of the movement for national monument status, said, “People are now working together for the first time in years, and the momentum is so, so positive.”

It is also interesting to note that land and house prices in Millinocket, near the Monument, are starting to increase—much to the delight of homeowners who lost value with the closure of the mills. How much prices can rise without causing other difficulties remains to be seen.

For more information:


Competition from local and global recreation economies

Another challenge to making regional recreation more attractive and feasible is the reality of competition from other recreation markets, both local and global.

Some people prefer to recreate close to home—and there is a variety of factors like income, health, and work that impact whether people stay close to home. There are many communities with ample local recreation opportunities (parks, trail systems, waterways) that negate the need to travel elsewhere.

Other people enjoy taking vacations to locations that require travel by plane. In fact, many recreation economies depend on these long-distance travelers. It must be noted, however, that this kind of travel requires money, and therefore excludes anyone without the means to afford an airline ticket.

Improving affordable access to regional recreation areas should open up more opportunities to more people, beyond those who can afford plane tickets.

Cultural Perceptions of Nature—Who Feels Welcome in the Woods?

Earlier in this chapter, transportation and infrastructure challenges were outlined as barriers to successful regional recreation economies. In some cases, however, the disconnections between people and nature run deeper than a mere physical limitation. An impression of separateness from nature exists in both urban and rural populations. In some instances, there is a lack of understanding of how natural areas and natural resources benefit people. If people do not understand or perceive themselves as connected to nature, how will they care enough to visit it or protect it?

In addition to modern society’s general disconnect with the natural world, cultural perceptions of nature shape willingness to recreate in it. A 2015 study by Cassandra Johnson Gaither and Nina Roberts of visitors in National Forests found that in USFS Region 8 (US Southeast), African Americans made up over 60% of the population in counties adjacent to the forest region, but accounted for a mere 2% of visits to national forests in Alabama, Georgia, Mississippi, and South Carolina between 2005–2009. By contrast, Gaither and Roberts found that in Southern California, where the Hispanic population is about 42% of the total population of the region, Hispanic visitors to National Forests accounted for up to 25% of the total.

Gaither also notes that “historical associations of both wild and cultivated lands with oppression—in the form of plantation agriculture, harsh working conditions in forest products industries, and episodic violence—have combined to produce a ‘wildland aversion’ among many contemporary African Americans” (Gaither et al., 2015). Such studies underscore the fact that not all individuals and communities see natural areas as welcoming places, for a variety of cultural, social, and historical reasons.
Pulse of the Parks, Open Space Institute

Pulse of the Parks, a series of reports on parks in New York State, is designed to find out what user groups are visiting parks and how they value them. Each park survey has a variety of demographic information ranging from area of residence of the visitor to ethnic and racial characteristics.

The reports show that there is a wide range of user groups visiting parks in New York, but not all parks attract the same visitors. Sunken Meadow State Park on Long Island has about 30% of visitors who identify as non-white, with the weekend crowds being the most racially and ethnically diverse. On the other hand, at Lake Welch (in Harriman State Park, less than an hour from New York City), nearly 75% of visitors are Hispanic.

For more information: http://www.osiny.org/site/PageServer?pagename=Publications_Alliance

In addition, recent increases in the enforcement of immigration laws have had a major impact on programs aiming to bring, for example, farmworkers out for organized hiking and similar family outings. In one case, a program that used to attract 75 or more people per trip are now seeing hardly anyone turn up for fear of being concentrated in vans or other group transport (Gentry, 2017). It seems reasonable to assume that under the new administration, questions and concerns over safety and welcome in regional natural areas will continue to pose issues to be addressed.

3.4 How Might Challenges to Regional Recreational Opportunities Be Overcome?

The following section proposes some potential solutions to these challenges and highlights some of the ways that organizations are addressing the challenges of creating recreation opportunities in their communities.

Addressing Transportation and Infrastructure Challenges

Physical connections between urban and rural communities are an essential component of tackling transportation and infrastructure challenges. Without access to transportation, many recreation opportunities are automatically off the table. Transit to Trails, a partnership initiative in Southern California between The City Project, the National Park Service, Mountains Recreation and Conservation Authority, and Anahuak Youth Sports Association, provides regional public transit access for low-income communities to reach parks and open space (see http://www.cityprojectca.org/transit-to-trails). The Open Space Institute’s work on “Take the Train to the Trail” in the Hudson Valley is also opening up regional opportunities for New York City residents (for more information: http://www.osiny.org/site/PageServer?pagename=Feature_Train_Trail&printer_friendly=1).
There are other opportunities for connections between urban and rural communities through networks of trail systems. Creating regional public trails not only connects communities, but provides walking, hiking, and biking opportunities. The closer people live to trails, the more likely they are to use them. One such example of a region connected via trails is the Chief Ladiga Trail System, a rails-to-trails project that extends 32 miles from Weaver, Alabama to the Georgia state line. It connects several municipalities in Alabama to the Silver Comet Trail, which ends just northwest of Atlanta in Smyrna, Georgia. The entire Chief Ladiga-Silver Comet trail system is over 90 miles long (for more information: http://silvercometmap.com/chief-ladiga-trail-map/).

Connecting urban and rural areas with better transportation options and trail systems is only the first step in creating a regional recreation economy. In order for such an economy to be sustainable, infrastructure challenges at parks and other recreation areas must be considered as well. Are there affordable accommodations on-site or accessible nearby to support overnight visitors? Does the area cater to a variety of recreationalists, from families to single travelers? Are there restaurants, shops and other businesses and services available? Is Internet access readily available to support these businesses? Are services available in Spanish, Chinese, and other languages besides English?

### Increasing Affordable Accommodations on the California Coast

In February 2017, California State Assemblywoman Lorena Gonzalez Fletcher (D-San Diego) introduced Assembly Bill 250, a measure which would require the California Coastal Conservancy and the California Department of Parks and Recreation to work together to address lack of affordable accommodations on the California coast.

California’s Constitution guarantees the right of all Californians to access to the coast, but for many Californians, especially low-income residents and people of color, the high cost of coastal accommodations makes visiting the beach impossible. Assembly Bill 250 would require the California Coast Conservancy to “survey and assess the current availability of affordable overnight accommodations” as well as “develop strategies for increasing the availability of economy lodgings along the coast.”

Assembly Bill 250 was approved by the Assembly Natural Resources Committee by a 7-1 vote in March 2017.

For more information:

Making Nature a Safe and Welcoming Place for All

For a long time, advocates of parklands and wilderness areas have grappled with the question of how to get urban residents engaged in using and protecting these uninhabited landscapes in rural areas. Conservation organizations often work to protect landscapes in rural areas with funds that they receive from urban populations, and are therefore uniquely poised to foster more robust connections between these two groups.

Beyond merely attracting urban dwellers to explore their regional parks and rural areas, land trusts and conservation organizations should be thinking about where making people feel welcome in the outdoors fit into the scope of their work. If the diversity of our population is not reflected in populations of outdoor recreationists, how can conservation groups better address this disparity? The responsibility to address these challenges cannot rest solely on the shoulders of groups like Outdoor Afro and Latino Outdoors. Every land trust, conservation organization, park group, and recreation association should be actively engaging on this topic.

Are there opportunities for land trusts to collaborate with landowners as well as with groups looking for land on which to recreate? Are there opportunities for conservation organizations to start programs to bring people on field trips to their regional parks? How can conservation organizations make natural areas more inclusive to more users while maintaining sensitivity to historical and cultural context? How can they reframe their missions to better serve and include diverse communities?

Similar questions are the subject of the 2008 Berkley Workshop report, Broadening the Base through Open Space: Addressing Demographic Trends by Saving Lands and Serving People and the 2015 Berkley Workshop report, Increasing Access to Natural Areas: Connecting Physical and Social Dimensions.7

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7 Available at http://environment.yale.edu/publication-series/land_use_and_environmental_planning.html
Recreation has the potential to be a powerful connection between urban and rural areas. In light of the recent presidential election, political rhetoric has emphasized an inherent disconnect between these two groups. Connecting groups to nature, and urban populations into surrounding rural areas, may be one way to help address this disconnect.

However, studies like Cassandra Johnson Gaither’s highlight the ways that different groups use and relate to natural areas. It is evident that there is much work to be done in building trust between groups and making natural areas safe, accessible, and inclusive to all people.

Possible Questions for Discussion

- How might land trusts and conservation organizations help to address the economic and infrastructure challenges to successful regional recreation economies? Are there regions of the country where recreation economies are not feasible or desirable?
- What level of tourism is consistent with land conservation goals?
- Is creating a regional recreation economy a viable goal at all, given that people can recreate at all levels, from their backyards to the National Parks? Should we be focusing on recreation opportunities at local and global levels, or is there a place for a thriving regional recreation system?
- How can land trusts and other conservation organizations help address the social barriers to recreating across regions, taking into account the diversity of ethnic, racial and economic communities involved?
Some of the Organizations Doing Interesting Work in this Arena

- **The City Project** – The City Project works to ensure that underserved residents of Los Angeles are given equal access to parks and open space, climate justice, physical education, and economic vitality. The City Project’s environmental justice work has garnered awards and recognition from across the country. For more information: http://www.cityprojectca.org/

- **Latino Outdoors** – A Latino-led organization, Latino Outdoors is committed to connecting Latino communities with nature and outdoor experiences, engaging youth, and celebrating Latino/a cultural connections to the outdoors. For more information: http://latinooutdoors.org/

- **National Park Service** – The National Park Service Program Healthy Parks, Healthy People US is part of a global movement to promote parks and public lands as important contributors to healthy societies. The program “advances the fact that all parks - urban and wildland are cornerstones of people's mental, physical, and spiritual health, and social well-being and sustainability of the planet.” For more information: https://www.nps.gov/public_health/hp/hphp.htm

- **Outdoor Afro** – Outdoor Afro has state and city chapters nationwide that “celebrate and inspire African American connections and leadership in nature.” Outdoor Afro is focused on empowering people to become outdoor leaders in their own backyards. For more information: http://www.outdoorafro.com/about/

- **Resources Legacy Fund** – Resources Legacy Fund works with their donors to find customized solutions to philanthropic goals related to conservation. For more information: http://resourceslegacyfund.org/

- **Open Space Institute** – Open Space Institute is a land conservation organization working to preserve parks, forests, and preserves on a landscape-scale. OSI also administers grant funds for habitat and water protection, working lands, and recreation. For more information: https://www.openspaceinstitute.org/

- **Northern Forest Center** – The Northern Forest Center works to increase the economic and community vitality of the northern forest region of New York, Vermont, New Hampshire and Maine through a variety of programs aimed at enhancing the wood products industry, improving community forests and increasing regional tourism. For more information: https://northernforest.org/

- **Western Reserve Land Conservancy** – Based in northern Ohio, the Western Reserve Land Conservancy leads a variety of land conservation programs to connect the region’s farms, towns, cities and natural areas. Areas of focus include farmland and open space preservation, community park building, land banks, and reforestation. For more information: http://www.wrlandconservancy.org/
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- Brad Gentry with colleague in Oregon, March 16th, 2017.
4. Building Resilient Regional Economies Around Renewable Energy Development

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4.1 The Future of Renewable Energy in America

50 years from now, if we imagine our energy economy, there will likely be a lot more electricity. As we electrify heating, cooling and transportation, and decarbonize our energy system, we will see significant demand for renewable energy as part of the mix.

The increased development of renewable energy, which will largely be sited in rural areas across the country, will impact the way that urban and rural communities are connected. Renewable development has the potential to provide both financial and ecological benefits to both rural and urban areas but, as we have already seen in a number of high-profile cases, is also ripe for conflict.

This chapter will focus largely on the development of wind and solar energy in rural areas for urban consumption, with some additional discussion of the implications of transmission lines connecting rural renewable projects to urban centers and the role of wood in energy production.

A number of important topics are outside the scope of this chapter, including:

- Renewable generation for purely local consumption in either urban or rural areas (i.e. small-scale rooftop solar projects, single wind turbine projects).

- Efforts to expand liquid biofuel production (for more information: https://www.nrel.gov/workingwithus/re-biofuels.html).

- Impacts of fossil-fuel based energy production on rural landscapes (aspects of which were covered in the 2009 Berkley Workshop on Land Conservation and Energy Infrastructure).

The National Renewable Energy Laboratory found that the average solar energy array requires around 7 acres of land per MW of energy produced (2009) and that the average wind energy
site requires approximately 2.5 acres of land per MW (2009). While solar energy has a larger direct footprint on the landscape, the height of wind turbines makes them visible from much greater distances, creating a much larger area of general impact than solar.

Where and how future renewable development projects are sited in rural areas will likely dictate the nature of the relationship between urban users and rural suppliers. Much has been made of the so-called “Not in My Back Yard” mentality of many communities faced with renewable energy proposals. Regardless, if we are to secure our energy future, projects will need to be sited somewhere and they will most-likely predominate within our rural communities.

Of note is the fact that this chapter largely focuses on the rural impacts of renewable development. This is because urban impacts from increased renewable development are anticipated to be widely positive—many predict localized renewables could lower energy costs, provide for cleaner air and water, and increase jobs in the energy sector (many of which will be located in urban areas). When thinking about the linkages between rural and urban regions, it makes sense to place a greater focus on rural communities because the potential benefits and costs in those areas are more complex.

Renewable energy policy is highly variable across U.S. states and this has a significant effect on the renewable development landscape. Discussion on a national scale is highly generalized. As Ethan Winter of the Land Trust Alliance said in a phone conversation, “in some cases, renewable development is happening because of state policy while in others it is happening in spite of state policy” (2017). The following discussion is kept very general largely because each state’s policy structure for its energy sector is so different.

4.2 Opportunities Provided by Renewable Development in Rural Communities

Rural and urban communities will benefit from increased renewable energy development regardless of whether the practice also leads to more robust regional economies. These benefits will come in the form of increased energy created through renewable sources and the associated declines in pollution from coal and natural-gas usage, the decrease in reliance on foreign imports, and a reduction in climate-change causing greenhouse gas emissions.

Rural communities are also likely to see benefits from renewable development in several other ways: through the supplemental income provided by land leases, the increases in local property taxes and the creation of clean-energy sector jobs. Additionally, the more unconventional model of community-developed renewable energy—in which communities directly own their energy facilities—could be a more creative strategy for creating more regional resilience. Each of these opportunities is discussed below.

Land Leases as a Source of Income

Renewable energy development projects all need to be sited somewhere and because the lifetime of a project is often 15-20 years, many developers prefer to lease land rather than
Energy from Woody Biomass

Several organizations across the country are looking at the potential for woody biomass to provide energy to communities while also creating a market for an additional local forest product. Energy can be produced through both wood pellets (which are a processed wood product) and through the burning of wood chips (which does not require processing). Both can be used as an alternative heat source, as well as a source for electricity generation, and simultaneously provide support for a local forest economy, creating jobs in forestry, logging, manufacturing and trucking.

The Northern Forest Center has identified the development of a market for “modern wood heat” as a strategy for strengthening rural economies in the Northeast, which has struggled with the loss of the traditional lumber industry. When oil prices were high, wood heat made for an economical choice to heat home and commercial buildings. Now that oil prices have dropped, the case for wood heat development is more challenging, but revolves around the idea that consumers can “buy local.” In either case, modern wood heat may be an additional renewable energy source that can contribute to rural economies in the future, assuming a more robust market is developed.

For more information: https://northernforest.org/programs/modern-wood-heat/

Craft3, a Community Development Financial Institution, is working with a coastal tribe in the Northwest to install a wood chip energy generator that will help ensure the tribe gains energy independence and has an additional use for the large amounts of forest lands within their reservation. The tribe is concerned that, in the event of a natural disaster, they may be unable to maintain connection to the grid. The wood boiler will allow the tribe to produce electricity in the event they are cut off from the rest of the energy system.

For more information: https://www.craft3.org/

The Sierra Institute sees the potential for wood energy to be a good use for the large amounts of woody biomass being removed from the Northern Sierra forests as a part of forest fire management practices. Without a good use for the small diameter wood being removed, it may be difficult to convince landowners that it is worth the trouble. If the wood could be transformed into electricity, it may be easier to incentivize forest fire management practices.

For more information: http://sierrainstitute.us/biomass/
In either scenario, land leases have the potential to provide an important source of income to rural landowners. Already we have examples of farmers leasing field boundaries and other unused portions of their property for solar and wind, allowing them to continue their farm business with a new diversified income stream. This is perhaps the best-case scenario in terms of supporting a diverse rural economy and could even be seen as a potential land conservation tool—allowing struggling landowners to stay afloat and maintain the ownership of their land when they would not have been able to do so otherwise and might have sold to development.

In other cases, farmers or other landowners whose businesses depend on the land may choose to replace their other businesses with just the income from an energy land lease. This option may have more implications on the nature of the rural community and its economic resilience, which will be discussed later in this chapter.

In either case, the increased development of renewable projects in rural communities means a useful income diversification option may be on the table where it would not have been otherwise.

**Taxes as a Source of Income**

The development of renewable energy has the potential to provide income to rural communities through property taxes however many states offer tax exemptions for renewable energy and so revenues will be dependent on local policy. Thirty-three states offer some form of property tax exemption for solar energy projects (Zientara, 2017). As an example, New York State provides a 15-year property tax exemption for the value a solar system adds to the overall value of a property. The State views this policy as an important incentive to the development of solar in the region. While local governments can choose to opt out of this exemption, they may find that developers simply choose to engage with a locality that has not opted out and therefore they may miss out on development opportunities (NY-Sun, 2017).

**Job Creation**

The development of solar and wind energy will contribute to some job growth in rural communities. An Environmental Defense Fund report (2017) found that solar and wind power jobs have grown in recent years at rates of around 20% annually and are creating jobs at a rate 12 times faster than the rest of the economy. Some of these jobs require on-site labor and so will likely go to rural populations. New York State, which was ranked seventh in cumulative solar installed capacity in the United States in 2015, estimates that more than 8,250 jobs have been created in the state, with a projection of at least another 1,000 additional jobs in the future (NY-Sun, 2017).

Job growth will be most significant during the construction phases of development, after which the number of local jobs created will likely be less significant. Considerably more jobs will be associated with regions where the manufacturing of renewable energy equipment is located.
Community Renewable Projects

Community renewable projects are an innovative model that has potential to be leveraged in a number of different ways to promote rural community resiliency. The general idea of a community renewable project is that a municipality, town, or community group invests in the development of their own renewable project, which can be used both to provide power to their community and/or to create power that is then sold to the local utility for consumption elsewhere.

The profits from the project can be invested in the community in a number of ways, such as augmenting the local government budget or going to a community development non-profit to be spent on programming. According to the American Public Power Association, there are currently over 2,000 community-owned electric utilities serving 14% of the country (2017).

Powering the Elimination of Poverty

The Coastal Community Action Program (CCAP) constructed a 6-megawatt wind farm in 2010 which generates revenue that supports the organization’s programming aiding low income individuals in rural Grays Harbor County in Washington State. Grays Harbor is a traditional timber community struggling with the loss of the mills that supported most of their community’s livelihoods.

The Coastal Energy Project was funded with help from the State of Washington and Craft3, a Community Development Financial Institution lender, along with New Markets Tax Credits and Renewable Energy Investment Tax Credits. The four turbines generate 13.5 million kWh of clean energy that is sold to the local public utility company. The Coastal Energy Project is projected to provide an average net income of $400,000 a year of revenue for the next 20 years to the organization—to be used to provide a wide-variety of services to 1,000-2,000 low income families in the region.

While Craft3 had hoped to replicate the project elsewhere, they have yet to find a community with the interest, readiness and resources necessary to undertake financing another project of this type.

For more information: http://coastalcap.org/coastal-energy-project/
4.3 Challenges to Renewable Energy Development in Rural Communities

While there is significant potential for the development of renewable energy to improve economic resiliency in rural communities, there are also a number of areas of potential conflict or challenges to this development and to the benefits reaching rural populations.

**Who Will Benefit From These Projects?**

For one, there may be some question about the extent to which renewable development will actually benefit rural people unless development is undertaken with that explicit goal in mind. Traditional renewable development may simply provide for meeting urban demand and increasing urban economic benefits.

If the ownership, financing, and jobs associated with the project come from urban areas, the externalities of renewable siting that we will discuss below may outweigh the benefits to the rural community in which the project exists. When we are imagining a traditional large-scale solar farm in the middle of the desert, it is easy to surmise that the surrounding rural economies may not be influenced. Where tax incentives are provided to developers, such as in New York State, local governments may not be able to collect taxes on the new businesses within their jurisdictions. The siting of projects on public lands may also preclude local communities from collecting many economic benefits.

Some questions arise: To what extent must rural economic benefits be explicitly fostered in order to ensure their existence? And how can the conservation community promote those strategies?

**Implications for Rural Landscapes**

Conflicts over the siting of renewable energy projects and their associated transmission lines have dominated the conversation around renewable development in the United States more than any other issue. For example, the controversy over the development of a wind energy project off of Cape Cod led to intensive media coverage and strong emotional responses both for and against the project. The controversy and attention has stalled progress on the project for over 16 years and the fate of its development still remains in limbo today.

Loss of rural character and changes in landscape are often cited sources of opposition for renewable development. This type of opposition may relate specifically with the loss of a particular viewshed (such as the view from a house being obstructed by wind turbines), but it also may be a more general reaction to the development of new industry even without direct visual impacts. According to Maarten Wolsink (2007), community evaluation of the visual impact is the most dominant factor in determining community acceptance of or opposition to wind power.

Loss of rural character complaints are often tied to changes in land use: traditional agricultural lands transitioning to solar energy arrays or forestland used for recreation now housing wind power turbines. Even when losses do not have a direct impact on the daily lives of...
individuals, the knowledge of a transition from what may be seen as a pastoral community to a more industrialized or industry-focused landscape can be a cause of opposition.

Van der Host (2007) found that the general context of the community played a large role in determining whether this type of resistance would be prevalent. He found that communities that have traditionally relied on industry or the extraction of natural resources generally provided less resistance to development than those whose livelihoods were not dependent on the natural resources of the area, such as communities with many retirees or commuters. Van der Host attributes this trend to the fact that communities in traditionally extractive industries, such as mining, have an understanding of the land as a resource to be used rather than simply an amenity to be protected. Additionally, these communities often put a greater value on the job creation potential of renewable development. Conversely, Van der Host found that communities with a number of residents who moved to the area specifically for its beauty or pastoral character and without a need to rely on its lands and jobs were more likely to resist these types of developments.

The Northern Pass Controversy

Wind and solar projects are not the only energy-related investments that are attracting controversy. There is a seven-year-old fight ongoing today over the installation of a transmission line which would bring hydro power from Canada, through New Hampshire, to southern New England markets.

Supporters believe the project will help lower high electricity costs in the region, as well as provide a source of cleaner power. Opponents believe the siting of the transmission towers, which would be as high as 155 feet, would ruin scenic views and hurt the tourism industry.

The case reminds us that the siting of renewable energy projects also requires ways to transport the energy to consumers in the urban load centers. For more information: http://nhpr.org/topic/northern-pass#stream/0

Policy Uncertainty

One of the biggest barriers to even more widespread development of renewable energy is the uncertainty associated with the market (Winter, 2017). Because state and federal policy around renewable development and the associated tax incentives are continually evolving, some investors may be hesitant to finance projects over concerns that the assumptions underlying their projects are subject to change. General institutional hesitation around the viability of renewable energy will likely affect the rate of development, at least in some areas of the country.
4.4 How Might Challenges Be Addressed?

There are a number of ways that the challenges to developing resilient regional economies around the renewable energy sector may be addressed. This section highlights a few potential strategies for overcoming some of the difficulties outlined above.

**Community Dividends**

Some rural communities feel that they bear the brunt of the externalities associated with renewable development projects (particularly when they are large-scale projects) without receiving any benefits. As renewable projects are scaled across the country, there may be the potential to develop a community dividend system to help offset the externalities associated with the impacts on the rural landscape.

One potential model could be the Alaska Permanent Fund, which sets aside a share of oil revenues from public land leases. Through this fund, every permanent resident in Alaska receives a dividend payment each year.

Developing ways for communities or individual citizens to benefit from the renewable sector, particularly as it grows, may be an important strategy for offsetting resistance to development. Such benefits might range from increased local property taxes to receiving a share of the power produced at reduced rates.

**Varied Incentives Depending on Land-Use**

Massachusetts has recently redesigned its solar incentive program to prioritize support for projects built on low-income properties, public land, or that benefit entire communities. Additionally, the incentive program alters the value of the subsidy depending on where the project is built—higher subsidies are available for projects built on rooftops, brownfields, landfills, or solar canopies. Subsidies decrease if the project is built on open space (Schoenberg, 2017).

This program is meant to help address the concerns over the development of solar on important open space properties, as well as to increase the number of solar development projects that have a community-benefit component.

**Smart Planning for Renewable Siting**

Generally, regulation of the development of renewable energy is done at a very localized scale across the U.S. The planning departments or planning boards of rural towns may not have the experience or expertise necessary to adopt or alter regulations in a way that allows for strategic development of renewables and mitigates for some of the potential negative impacts of development. Land-use policy and zoning may be useful strategies for smart development, but can be limited by the resources available for small municipalities.

Providing planning advice to towns may be an important strategy to ensuring that siting does not conflict with other land-use or community development goals. To address these challenges, New York State has convened a “Renewables on the Ground Roundtable”, led
by the Nature Conservancy and the Alliance for Clean Energy. This group aims to bring together different constituencies such as land use planners, renewable developers, conservationists, agricultural interests, utilities, and government officials to develop high-level renewable development principles as they relate to land use. Providing additional resources to local planners may be an important tool for ensuring that smart renewable development benefits, rather than hurts, rural communities.

4.5 Conclusion

It is certainly not a given that increased renewable development will bring wealth to rural communities—in fact, a number of questions remain about whether the externalities associated with this type of development will outweigh its benefits.

Recognizing that increases in this type of production are almost certainly on the horizon, additional thinking about how to leverage the renewable market to benefit rural populations will be important in developing more resilient and equitable regional supply chains.

Possible Questions for Discussion

• How do rural economic benefits need to be expressed in order to ensure they are captured by projects?
• What are some best practices for ensuring that rural economic benefits are accounted for in project development?
• How might the land conservation community best add value to the development of such programs?
• How should energy, economic, social and habitat values be compared as part of siting decisions?
Some of the Organizations Doing Interesting Work in this Arena

- **Rocky Mountain Institute** — RMI advances market-based solutions to drive institutions to shift to renewables. Their research shows that by 2050, at least 80% of electricity should be able to be affordably and reliably produced through wind, solar and other renewable sources. Their “SHINE” program focuses on promoting community-scale solar. For more information: [http://www.rmi.org/](http://www.rmi.org/)

- **Garfield Foundation/Re-Amp** — The Garfield Foundation co-founded the Re-Amp Network in 2003 with a number of other Midwestern groups with the goal of promoting cleaner energy development in the region. The group has 175 members today and has developed the lofty goal of 80% renewable energy by 2050 in six Midwestern states. The Re-Amp Network has been lauded for demonstrating effective ways to build organizational capacity in a region and promote systematic and collaborative thinking. For more information: [http://www.garfieldfoundation.org/programs/#re-amp](http://www.garfieldfoundation.org/programs/#re-amp)

- **Northern Forest Center** — The Northern Forest center is a non-profit in the Northeast focused on building the economic and community vitality of rural communities within the Northern forest region. Their work around energy largely centers on the promotion of modern wood heat as a way to develop new forest products for the region and provide a more renewable energy source. For more information: [https://northernforest.org/](https://northernforest.org/)

- **Sierra Institute** — The Sierra Institute, based in rural California, has a program to promote the use of woody renewables in impoverished communities facing high threats of wildfire. They hope to develop a market for small-diameter woody biomass energy, which would be a fire prevention strategy and provide an alternative income stream for rural communities. For more information: [http://sierrainstitute.us/biomass/](http://sierrainstitute.us/biomass/)

- **The Nature Conservancy** — The Nature Conservancy has been a leader in convening the “Renewables on the Ground Roundtable” aimed at bringing a number of practitioners together to discuss the implications of increased renewable development on land use in New York State. For more information: [https://www.nature.org/ourinitiatives_regions/northamerica/unitedstates/newyork/climate-energy/energy-development.xml?redirect=https-301](https://www.nature.org/ourinitiatives_regions/northamerica/unitedstates/newyork/climate-energy/energy-development.xml?redirect=https-301)

- **The Land Trust Alliance** — The Land Trust Alliance launched a “Climate Change Initiative” in 2017, with a core focus on empowering land trusts to encourage the buildout of renewable energy facilities while steering those facilities away from sensitive lands. The pilot project is located in New York State and is in collaboration with the “Renewables on the Ground Roundtable”. For more information: [https://www.landtrustalliance.org/topics/climate-change](https://www.landtrustalliance.org/topics/climate-change)

- **Craft3** — Craft3 is a Community Development Financial Institution (CDFI) which has funded both a community renewable project (highlighted above) and several woody biomass projects. For more information: [https://www.craft3.org/Borrow/conservation-loans](https://www.craft3.org/Borrow/conservation-loans)
Useful Readings/Works Cited


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5. Regional Markets for Solid-Wood Products

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5.1 Introduction
The United States consumes 28% of the global supply of forest products (USFS, 2014). Domestic wood supplies provide about 79% of that consumption, mostly from harvests in the Southeast and the Pacific Northwest (USFS, 2014).

Still, the forest products industry has been strained over the past three decades as it has struggled to keep pace with a rapidly transitioning economic landscape. This has been especially true in the years since the Great Recession. From 2008-2011, over one million forestry and related economic sector jobs were lost and 1,000 wood processing mills were either temporarily or permanently closed (USFS, 2014).

Since then, global competition has continued to erode the U.S.’ grip on the pulp and paper industry. Total exports of paper products have decreased steadily since 2012. Over that same period, imports have increased by almost 5% (USFS, 2016).

While the market for solid wood products has recovered modestly with the housing market, it also faces significant challenges. Lumber production in 2014 stood at its lowest levels in 60 years (USFS, 2014).

These shocks have already been felt acutely in the rural communities that rely on a forest-based economy. Twenty year lows for timber prices in the Northeast have challenged forest managers to meet costs and complete harvests (MassWoods, 2017). Western states that lost up to 50% of their forest products workforce have struggled to create new jobs (Keegan et al., 2012). In the South, wages that fell by an estimated 23% during the recession have remained depressed (Hodges et al., 2011).

The importance of forests as natural capital—supplying not only wood, but also clean air, clean water, and other goods and services—cannot be overstated (Flora, Flora, and Gasteyer, 2015). As the economic value of forestland changes, the consequences can be far reaching.
conversion of forestland from resource stewardship to other uses, such as residential development, poses risks to carbon storage, watershed protection, and wildlife habitat. These potential impacts have wide ranging implications for the function of ecosystem services, as well as the ways in which rural communities work in relationship to the land.

As the forest products industry finds its way forward, serious attention must be given to developing competitive alternatives to traditional wood markets that allow rural communities to be resilient to economic uncertainty and manage forests in ways that maintain their integrity, while also providing livelihood and employment opportunities.

For solid wood products, such efforts are already underway. Many have focused on creating enterprises around furniture making and the manufacturing of secondary wood products such as flooring, ceiling surfaces, and other decorative elements that can be featured in building design.

However, the increased use of engineered wood products as a structural element in the construction of multi-story buildings appears to provide the greatest opportunity for future wood utilization in regional urban markets. Often called Mass Timber construction, the use of these engineered wood products is an attractive option for green building design.

The remainder of this chapter focuses on the opportunities and challenges presented by Mass Timber and the considerations that land managers and planners must keep in mind while working to create more sustainable landscapes and communities.
Finding a Path Forward for Maine’s Forest Economy

The forest products industry has been an essential component of the culture and livelihood of Mainers for the past century. However, perhaps no other state has seen such a rapid decline in its forest economy. In just the past two years, Maine has seen multiple mill closures, accounting for a 50% loss in its softwood pulp market and 5,000 jobs (MFEGI, 2016).

In response, the Maine Forest Economy Growth Initiative, led by the Maine Development Foundation, initiated a full evaluation of the state’s forest economy. The nine focus priorities of the project include:

- A global market assessment of the demand for Maine wood products
- A statewide analysis of wood supply and new market opportunities
- Identifying needs for improvements in transportation infrastructure
- Growing markets for low-value and under-utilized wood products
- Increasing investment in research and development of emerging wood technologies
- Supporting small-landowners and their harvest goals
- Investing in loggers and the wood products workforce
- Redevelopment and repurposing of closed mill sites
- Diversifying and strengthening Maine’s rural economy

5.2 Opportunities Provided by Regional Supply Chains for Solid-Wood Products

Green Building and Engineered Wood Structures

The growth of green building is currently outpacing that of overall construction and is projected to contribute $300 billion and 3.3 million jobs to the economy by 2018 (Shutters, 2015). This trend does not show signs of slowing down. It is projected that two-thirds of the buildings that will be needed by 2050 have yet to be built (McAvey, Brandes and Johnston, 2008). In addition, cities like New York have adopted standards and regulations that require new construction to contribute towards meeting city-wide sustainability goals, including through an increased focus on green building construction (NYC Mayor’s Office of Sustainability, 2017).

The domestic forest products industry has always been tied to construction. Saw timber is the primary building material for single family homes and many other wood-based materials, such
as various particle boards and plywood panels, are common elements in most construction projects. Currently, building construction accounts for 60% of all the wood consumed in the U.S. (Goergen, et al., 2013). However, recent innovations in wood products technology have presented opportunities to utilize additional wood products in the construction of multistory and non-residential buildings.

Called at different times Tall Wood, Mass Timber or Advanced Wood Structures, these practices are driven by the use of engineered wood products that significantly increase the capacity for wood to be used as a structural element in building design (reThink Wood, 2017).

One of the most promising examples of these engineered wood products is cross-laminated timber (CLT). Currently, most CLT is made by bonding multiple layers of softwood boards together with industrial adhesives to create prefabricated panels or beams. Different from many other composite wood materials, CLT is made from solid boards rather than chips or sawdust. As a result, it has load bearing capacity.

This means that CLT can be used as a substitute for steel and concrete beams in a building’s frame allowing for the construction of wood structures up to 14 stories tall. While it is estimated that 77% of new non-residential structures are under 12 stories, 90% are made of steel and concrete. By substituting these materials for CLT, it is estimated that increased manufacturing and use of engineered wood products has a market potential of $4 billion (Watts and Helm, 2015).

Mass Timber construction has several advantages for green building construction. For example, wood harvested for CLT panels from FSC certified forests or from salvage operations from mountain pine beetle outbreak areas meets LEED certification standards (Evans, 2013).

CLT is also relatively light weight and customizable for specific jobs. CLT buildings have a lower environmental footprint and provide improved indoor air quality when compared to traditional steel and concrete construction (Robertson, Lam, and Cole, 2012). Additionally, wood used in a building’s frame represents a significant opportunity to store carbon throughout its lifetime. This carbon storage can be enhanced through the regrowth of forests after harvest or through additional afforestation efforts to create new sources for wood to be used in engineered wood products (Darby, Elmualim, and Kelly, 2013).
What Wood Is Right for CLT?

Most CLT is manufactured from softwoods including spruce, fir and pine. However, hardwoods can also be processed into CLT. For example, CLT manufactured from tulip poplar has shown potential for higher performance than softwood CLT (Mohamadzedeh and Hindman, 2015).

CLT is typically manufactured from low-grade materials not suitable for traditional solid-wood products such as boards and beams. This makes CLT an attractive substitute for areas that have traditionally depended on pulp and paper markets.

While much has been made about the potential for CLT to create a market for small-diameter trees and accelerate forest restoration efforts, there is still much that needs to be learned about how the increased use of CLT will impact forest management goals and long-term sustainability efforts geared towards protecting ecosystem services (Patterson, 2016).

Green Building for Smart Growth

Based upon existing urban growth and development patterns, forest cover is expected to decline by 7% nationally by 2062 (Alig, Haim, and Todd, 2010). Beyond the construction of a single building, the ability to assemble multi-story wood buildings opens up the prospect for CLT projects to be incorporated into high density and smart growth development in cities.

Smart Growth practices have the potential to drive development back into city centers and away from urban edges where, otherwise, forest cover is likely to be impacted by future sprawl. Additionally, such new markets have the potential to add value back to forest lands and promote their long-term management/preservation by providing landowners with new options for selling timber grown on their land.

Efforts to Promote Mass Timber Products

Already, there have been many efforts to advocate for the adoption of Mass Timber technology in the U.S. The Forest Service (USFS) instituted the Wood Innovation Grant directed at supporting initiatives to build markets around engineered wood products as a construction material (USFS, 2016). USFS and the Softwood Lumber Board (SLB) jointly
sponsored Timber City, a Mass Timber exhibit at the National Building Museum from 2016-2017 (National Building Museum, 2017). The Obama White House and the USDA sponsored a Tall Wood building challenge in Portland, OR, to develop a project that could be replicable and foster joint urban and rural economic development (rethink Wood, 2015). The bi-partisan Timber Innovation Act introduced to Congress initially in 2016 and then again in 2017, would continue these efforts and also call for a directed effort for enhance research and development from the USFS Forest Products Lab to promote the further adoption of new wood technologies (Senate, 2016; GovTrack, 2017).

5.2 Challenges to Regional Supply Chains for Solid-Wood Products

Despite this positive movement, adoption of Mass Timber technologies and practices is still in its very early states in the U.S. All told, fewer than a dozen tall timber buildings have been built or are currently planned (USFS, 2017). Only a few of these structures have been built with domestically sourced CLT (Njus and Harbarger, 2017). Nationally, there are only five operating CLT manufacturing plants (APA, 2017). The oldest of these facilities is only two years old.

There are many reasons for the slow growth and adoption of these technologies. Understanding where the obstacles are is essential for developing new market opportunities.

Local Building Codes Prevent Mass Timber Construction

Perhaps the biggest obstacle is local building codes that ban the construction of wood framed buildings more than four stories high. Largely enacted in the early 1900’s in response to the risk of fire in wood building construction, these regulations have been a significant barrier to Tall Wood construction in almost every major U.S. city (LP Building Products, 2016). This remains true despite Mass Timber’s safety performance (National Research Council Canada, 2012).

In addition to fire code requirements, many building codes simply do not have standards in place to account for wood structures taller than four stories. Current CLT structures that have been built or are underway have relied on developers to provide computer simulations and models to demonstrate a building’s safety, adding costs and time to each project (Njus and Harbarger, 2017).
Challenge of Marketing Local Wood Products

Marketing for local wood has often been difficult. Rather than seeing forest products as the result of good forest management, many consumers see the increased use of wood as accelerating the decline of an important ecosystem.

These concerns are greatly heightened when those harvests are happening close to home. Without communicating the silvicultural and land management goals associated with local harvests, telling the “wood story” can be a difficult challenge to overcome.

Need for Coordinated Research and Development Efforts

Coordinated Research and Development has also been lacking. While the USFS Forest Products Lab and other industry leaders have provided guidance on engineered wood use and manufacturing standards, there is still significant work to be done to assess the total demand and capacity for Mass Timber projects (Gagnon and Pirvu, 2011). This includes the evaluation of existing infrastructure as well as workforce and market opportunities in specific regions around the country.

These efforts require the coordination of industry leaders and leading education institutions in addition to local and federal government efforts. The formation of organizations such as the Michigan Forest Biomaterials Institute (MIFBI) at Michigan Tech, represents a step in the right direction, but much work is still needed to coordinate resources, identify funding and demonstrate successful pilot projects (MIFBI, 2017).

Lack of Funding Support Outside of USDA

Historically, the Department of Agriculture (USDA) has led national rural development efforts through the funding of programs and initiatives. This includes significant investments in community development, infrastructure, the bioeconomy, and land access (USDA, 2016).

Many organizations have therefore become reliant on USDA funding to support coordinated action among stakeholders. In an uncertain political climate, there are no assurances that this funding will continue to be there to promote the further adoption of engineered wood technologies. This adds new responsibilities for local and regional actors to develop strategies that utilize creative financing to establish new markets – potentially including contributions from the land conservation community.

Change Resistant Forest Products Industry

CLT is not a new technology and has been used effectively in European construction for decades. However, innovation has also been slow in coming to the forest products industry. While individual actors along the supply chain have optimized their own operations, very little has been done to improve communications and access to financial resources across the supply chain as a whole (Tesch and Maness, 2011).

This has resulted in a change resistant culture and a lack of cooperation that has seen land managers, products manufacturers and end-users operating out of sync with one another’s interests. Simply adopting new technologies will not overcome these real barriers to progress.
A Connecticut Wood to New York City Case Study

Tri-Lox is a small wood products manufacturer and design build practice located in Brooklyn, NY. Salvaged wood from building deconstruction has served as the businesses’ primary source of material. As it has expanded, however, Tri-Lox has sought ways to source wood from local harvests in order to promote its environmental mission and support local forest management efforts.

In April 2017, the Yale School of Forestry & Environmental Studies hosted a Local Wood Roundtable that included the ownership from Tri-Lox, the management team from the Yale Myers Forest, a Connecticut logger, and several faculty members and students from Yale F&ES to explore pathways toward a potential pilot project for sourcing local wood from northeast Connecticut to New York City.

Some of the major obstacles identified by the group that stand in the way of developing a local supply chain include:

- Challenges for marketing local wood products and telling the “wood story”
- Siloed communication and a lack of supply chain coordination
- Balancing market and forest management goals
- Access to financial resources for a pilot project to serve as “proof of concept”
- Determining appropriate scale for sustainable sourcing

The group also indicated that these efforts could be greatly improved by an active intermediary group that could operate as a “wood hub” to aggregate supply and coordinate activities across the supply chain.

Future efforts towards building regional markets must work to improve supply chain relationships in order to enhance collaboration and innovations that promote the long-term sustainability of the overall, regional system rather than the wellbeing of individual firms in global markets.
5.4 How Might Challenges to Regional Supply Chains for Solid-Wood Products Be Overcome?

Overcoming these challenges requires cooperation across such stakeholders as land managers, small business leaders, as well as local and state government and community-oriented foundations to better coordinate efforts along the wood products supply chain. It is also worth exploring the potential roles for the conservation community in these efforts.

**Potential for Joint Urban-Rural Development**

Mass Timber construction is appealing because it takes what is often a low-valued resource and turns it into a high value asset for both urban and rural communities and their economic development. It also provides a step-in ready alternative to account for the loss of demand in places that have traditionally relied on the production of wood products such as pulp and paper for jobs. Additionally, engineered wood products represent a substantial opportunity to rally support around a restoration economy that can drive sustainable land management efforts.

The barriers that have slowed the use of engineered wood widespread adoption are not insurmountable. Rather, they need the collective attention of multiple stakeholders working at different levels to find and implement solutions. These solutions must consider:

- Establishing clear building and fire codes that maintain public safety and allow for the construction of multi-story wood buildings;
- Developing a workforce that is capable of managing land and creating products that are suitable for the sustainable use of engineered wood products;
- Creating incubators and pilot projects to attract new investment in the growth of small and mid-sized businesses related to CLT manufacturing;
- Finding creative financing mechanisms that reduce reliance on USDA funding for innovation and growth;
- Identifying new intermediaries to foster better communication along the supply chain; and
- Providing a full evaluation of local and regional impacts to ecosystem services as a result of increased forest harvests.

A single community cannot address these problems on its own. These actions must involve institutional cooperation and the alignment of goals and interests at multiple levels. Achieving this level of collaboration is a challenge in its own right. However, it is a necessary step to develop a resilient forest economy that continues to provide value to communities for generations to come.
Ways for Conservation Organizations to Engage

For conservation organizations, there are many ways to engage around Mass Timber or the development of local wood economies. These pathways require the conservation community to take on the role of stewarding communities alongside stewarding resources. For many land conservation organizations focused on protecting local values in place, the reach is not so far and the resources and relationships that many conservation organizations already have in place can be adapted to encourage the development of a more resilient forest economy.

- Land trusts already carry exceptional convening power. Their capacity to work with a diverse range of stakeholders including land owners, stewardship professionals, and local government is what makes land conservation possible. Building on what they do best, land trusts can act as important intermediaries between the various actors on the supply chain. In this role, land trusts can facilitate conversation and identify common goals and priorities along a supply chain in order to protect lands and provide for communities.

- While not all forests are right for harvest for use in Mass Timber projects, land trusts can help with telling the “local wood story” and sharing the importance of working lands and resources they provide. The local food movement has been extremely successful in communicating the regional benefits to the environment and communities from a healthy agricultural economy. A similar effort needs to be made for forests in order for a wider public to embrace the values of sustainable forest management.

- Forest inventories suggest that forestland is adding stock and is capable of sustainably supporting more harvests and local wood utilization. However, the true implications of local wood and how it might affect people and landscapes will vary from place to place. In anticipation, land trusts can work with land owners and land managers to develop appropriate forest management strategies and sourcing standards as a means of protecting the resource and the livelihoods it supports.

- In order to protect local interests, land trusts can also pursue conservation strategies that increase local decision making power over the use of forest resources. This includes the formation of community forests and woodland councils to maintain local ownership and advocate for management around local values. Partnered with these efforts, land trusts can use community forests as a wealth building tool to increase revenue for local governmental services through harvest revenue and provide space for forest business incubation and workforce development.
Kennebec Land Trust and Local Wood WORKS

Led by the Kennebec Land Trust, Local Wood WORKS (LWW) is a partnership between Maine’s conservation community and a group of economic development organizations, including the Sewall Foundation, to use local resources to address the crisis facing the state’s forest industry. LWW organized a local wood conference in 2014 and a Local Wood Day in 2015 to showcase ongoing success stories within Maine’s forest industry.

To promote their local objectives, LWW has six priorities:

• Create a Coalition for Local Wood Heat
• Promote greater use of wood in buildings and consumer goods
• Develop and promote locally-preferred procurement policies for governments, businesses, non-profits, and individuals
• Support the permanent conservation of working woodlands and ecological reserves
• Maintain and promote Maine’s current-use taxation programs
• Promote business management education and training within the forest products industry

(Burnett, 2017)

Possible Questions for Discussion

• How might the conservation community best engage in these efforts to increase the markets for Mass Timber?
• How should one balance the need to promote economic development opportunities in forest dependent communities, while also preserving the role that forests play in providing valuable ecosystem services?
• What roles can different organizations play to connect forestland management to potential market opportunities in particular regions?
Some of the Organizations Doing Interesting Work in this Arena

- **Sustainable Northwest Wood** — is a for-profit subsidiary lumberyard for Sustainable Northwest. Sustainable Northwest Wood has been successful in connecting rural saw-mills to urban consumers and creating markets for products that fund ongoing restoration efforts. For more information: [www.snwwood.com](http://www.snwwood.com)

- **New England Forestry Foundation** — NEFF’s Build it with Wood Initiative is an effort to promote Mass Timber construction and local wood utilization in the Northeast. NEFF has also partnered with the Boston Public Market to showcase local wood products alongside local food. For more information: [www.builditwithwood.org](http://www.builditwithwood.org)

- **Central Appalachian Forest Alliance** — CAFA founded WoodRight, a social enterprise and web-based platform that markets and sells wood products from central Appalachian communities. For more information: [www.woodrightproducts.com](http://www.woodrightproducts.com)

- **State of Connecticut Department of Energy and Environmental Protection** — CT DEEP and the state office of Forestry maintain an interactive map for Connecticut’s Primary Wood Processors. As a tool, it works to connect local harvests to manufacturing and product marketing opportunities. For more information: [http://www.ct.gov/dEep//cwp/view.asp?a=2697&q=588940&deepNav_GID=1621](http://www.ct.gov/dEep//cwp/view.asp?a=2697&q=588940&deepNav_GID=1621)

- **Timber City** — A multi-year research project by New Haven-based Grey Organschi Architecture, Timber City is an ongoing evaluation of the environmental efficacy and architectural potential for Mass Timber construction. For more information: [www.timbercity.org](http://www.timbercity.org)

Useful Readings/Works Cited


Patterson, B. (2016). Saving America’s forests one wooden high-rise at a time. E&E News. Madison, WI.


Figures

Figure 1: Oregon Forest Resources Institute. “Cross laminated timber blocks.” https://www.flickr.com/photos/oregondepartmentofforestry/14329312300.

Figure 2: Barbosa, Andre. Oregon State University. “IMG-2032.” https://www.flickr.com/photos/oregonstateuniversity/34949295073.

Figure 3: Next Portland (2015). “CARBON12, AN 8 STORY WOOD BUILDING, PROPOSED FOR N WILLIAMS.” from http://www.nextportland.com/2015/05/14/carbon12/.
5. REGIONAL MARKETS
FOR SOLID-WOOD PRODUCTS

Personal Conversations

Ellis Isenberg and Alexander Bender, Tri-Lox, telephone call, February 1, 2017; workshop, April 26, 2017

KC Eisenberg, Sustainable Northwest Wood, telephone call, February 9, 2017

Steve Whitney, Bullitt Foundation, telephone call, February 13, 2017

Deb Markley, Center for Rural Entrepreneurship, telephone call, February 17, 2017

Bob Pershel, New England Forestry Foundation, telephone call February, 21, 2017

Mark Rudnicki, Michigan Forest Biomaterials Institute, telephone call, February 22, 2017

Peter Stein, Lyme Timber, in-person interview, February 28, 2017

Alan McGregor, US Endowment for Forestry and Communities, telephone call, March 27, 2017

Jay McGlaughlin Call, Mt. Adams Resource Stewards, telephone call, April 12, 2017

Sam Cook, North Carolina Forestry Endowment, telephone call, April 17, 2017
Biosketches of Authors

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The purpose of the Yale Program on Strategies for the Future of Conservation is:

- To support the efforts of the Maine Coast Heritage Trust, the Land Trust Alliance and similar private organizations to develop and apply new, innovative strategies for land conservation by linking the convening, research, and teaching activities at the Yale School of Forestry & Environmental Studies ever more closely to the needs of the land conservation community.

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- Sponsoring student internships and research projects (through the Berkley Conservation Scholars program), to bring the passion, experience and creativity of Yale graduate students to bear on these issues; and

- Convening workshops and other conversations across sectors and perspectives in the search for new approaches to expanding the resources applied to land conservation in the United States.

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