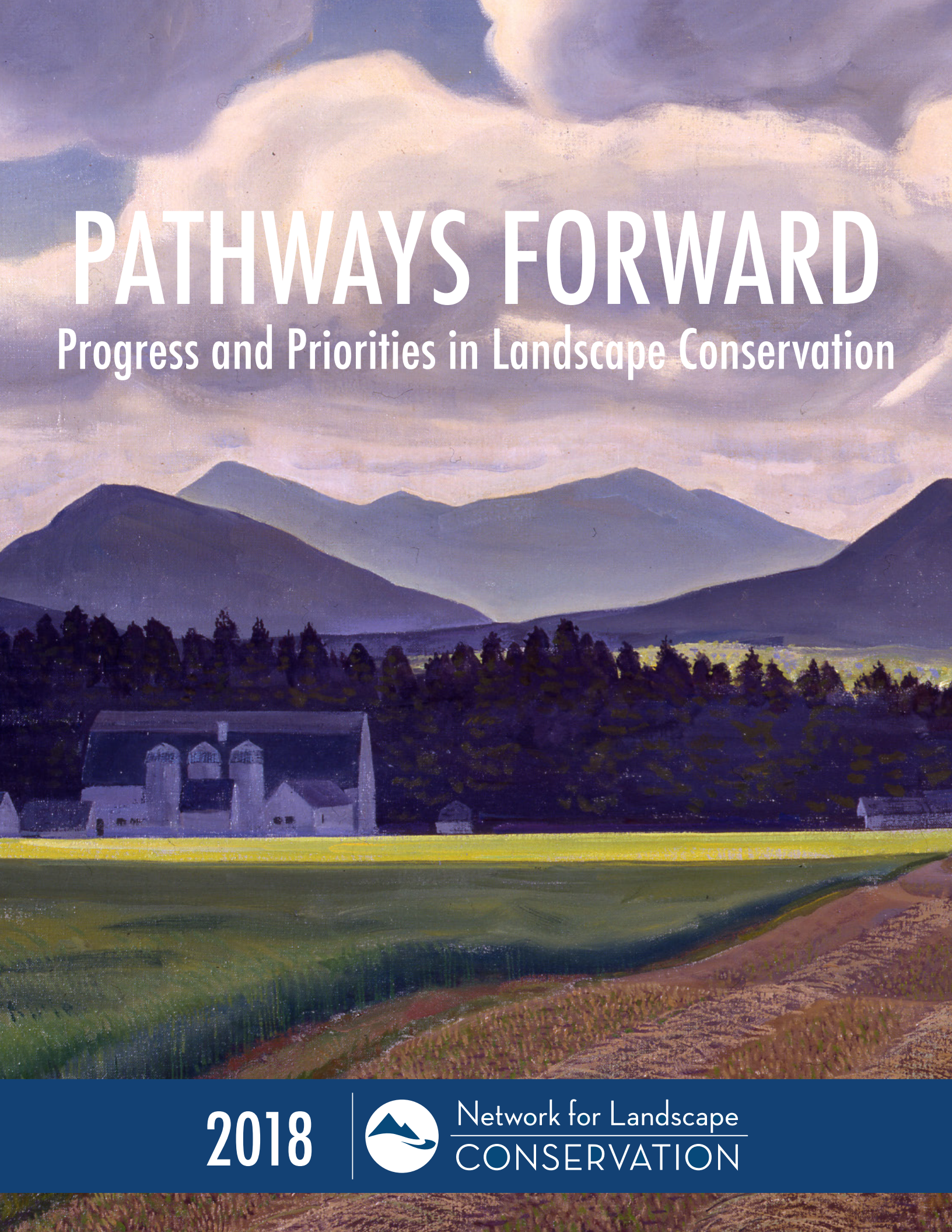

PATHWAYS FORWARD

Progress and Priorities in Landscape Conservation

2018

Network for Landscape CONSERVATION

About the National Forum on Landscape Conservation

On November 7–8, 2017, the Network for Landscape Conservation convened the National Forum on Landscape Conservation, bringing together 200 leading landscape conservation practitioners from the United States, Canada, and Mexico. The Forum provided an opportunity to share lessons learned, discuss ongoing challenges, and explore pathways forward to advance the practice of conservation at the landscape scale. Materials related to the 2017 National Forum, including video recordings of plenary sessions, are available on the Network's website.

Many thanks to the sponsors whose generous support made the National Forum possible:

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Doris Duke Charitable Foundation
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Tahoe Regional Planning Agency
The Conservation Fund
The Trust for Public Land

About this Report

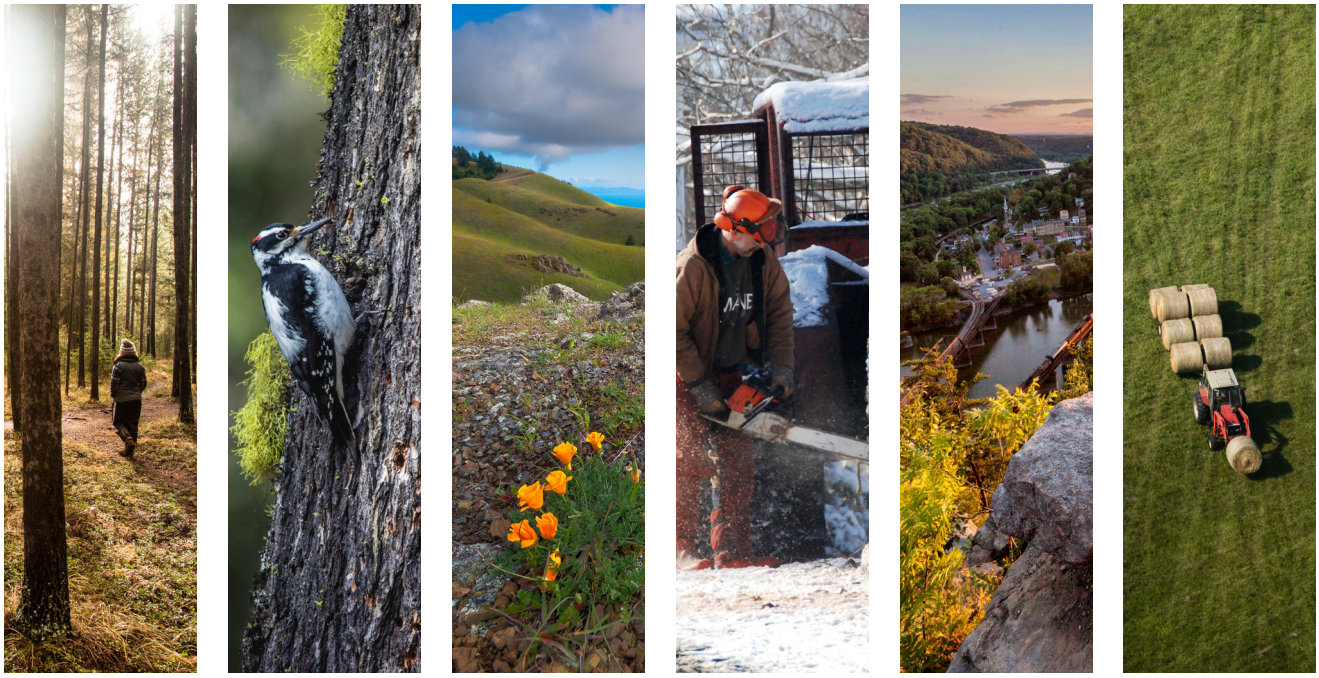
The purpose of this report is to make a meaningful contribution to the evolving practice of landscape conservation by sharing the insights that emerged from the 2017 Forum. The report provides an in-depth look at five important landscape conservation topics, with a focus on recent innovations, on-the-ground examples, and action-oriented strategies. Each chapter closes with a set of five-year aspirational benchmarks. Building pathways toward these benchmarks will require additional collaboration, inspiration, and concerted action.

About the Network for Landscape Conservation

Founded in 2011, the Network for Landscape Conservation (NLC) connects people to ideas and innovations—and to each other—in order to build a community of practice for the field of landscape conservation. This broad-based network today includes more than 100 organizational partners and 2,000 practitioners, fulfilling a unique purpose as an umbrella network and hub of activity to advance the practice of landscape conservation. The Network is coordinated by a 30-person leadership team in the nonprofit, private, public, academic, and philanthropic sectors in the U.S. and Canada and is fiscally sponsored by the Center for Large Landscape Conservation in Bozeman, Montana. This growing community is working together to develop effective tools and strategies and to advance best practices and policies to help people safeguard the landscapes that enable people and all of nature to thrive.

PATHWAYS FORWARD

Progress and Priorities in Landscape Conservation



Network for Landscape Conservation 2018
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Network for Landscape
CONSERVATION

The Network for Landscape Conservation advances collaborative, cross-border conservation as an essential approach to connect and protect nature, culture, and community.

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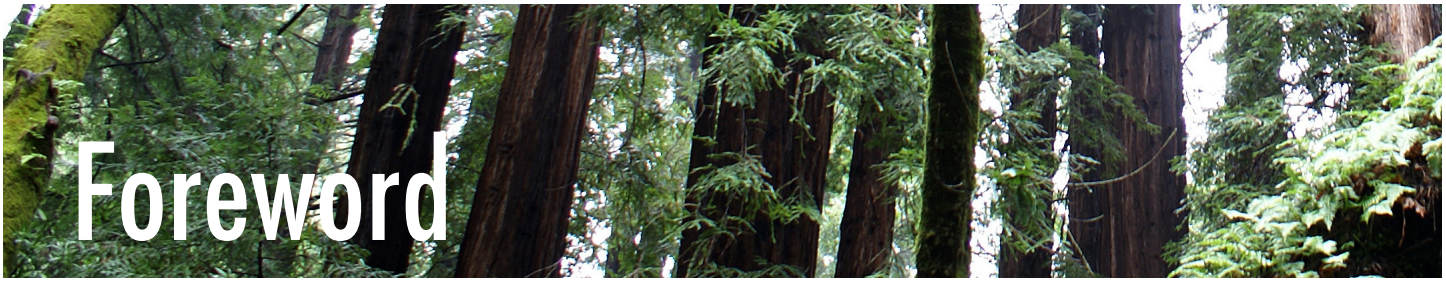
A conserved farm in the Ann Arbor Greenbelt Initiative, Michigan. Credit: Ivan LaBianca, courtesy of The Conservation Fund.



Foreword

Across North America (and around the world) a transformative change in land conservation is taking place. People are connecting across private and public lands, and from cities to the wildest places, to reweave the natural and cultural fabric of the larger landscapes that define and sustain our character and quality of life. Conservation is no longer just about remote protected areas, piecemeal conservation, or top-down processes. People are stepping forward in community-grounded ways to embrace and advance something more integrated, more dynamic. Individual acts of conservation are being enriched by ecosystem-scale thinking—the scale at which nature and culture function. It is an exciting time.

The stakes are high as we confront the impacts of escalating habitat loss and climate change. At risk are the extraordinary values landscapes provide society. Our landscapes provide clean air and water and healthy outdoor recreation. They buffer us from floods and fire, mitigate climate change, improve public health, and safeguard cultural heritage, wildlife, and ecological systems. Our landscapes provide food, fiber, jobs, and community vitality. And they provide the special sense of place that defines a community and region and—if not diminished—is passed down through the generations.

To reflect on the ongoing transformation of conservation and strategize on pathways forward, the Network for Landscape Conservation convened a two-day Forum in November 2017. More than 200 people attended and brought stories of their landscapes with them. Like travelers along a trail gathering around a campfire, these landscape conservation pioneers shared where they have been, what they have learned, and how to navigate trails to come.

Forum participants have now all returned home to continue work in their own landscapes. But there were many lessons learned around the campfire of the Forum. This report distills these lessons, shares many of the stories, and offers guidance on pathways forward. We hope these pages inspire robust conversation, new innovations, and strategic action as we all move forward.

As people continue to come together to tackle today's large and complex societal challenges, it is clear that the places where we live offer tremendous power to bridge divides and bring us together. This shared commitment will build social capital and fuel collective impact in the years to come. The significant progress and immense potential of landscape conservation fills us with great hope and optimism for the future.

Ernest Cook
Co-Chair, Network for Landscape Conservation
The Trust for Public Land

Julie Regan
Co-Chair, Network for Landscape Conservation
Tahoe Regional Planning Agency

Robert Bendick
National Forum Committee Chair
The Nature Conservancy Gulf of Mexico Program

Emily Bateson
Coordinator, Network for Landscape Conservation

Photo: Muir Woods National Monument, California. Credit: Golden Gate National Parks Conservancy.

Boundary Creek Wildlife Management Area, Idaho. Credit: Jessie Grossman, courtesy of the Yellowstone to Yukon Conservation Initiative.

"Landscape conservation presents a huge opportunity . . . to touch down in people's lives, to address climate change, and to create resilient landscapes–all at the same time. Landscape conservation addresses biodiversity, water and air, food and fiber, jobs and livelihoods, and people's identities. This is occurring in just about every landscape that we know. And that's why I am optimistic, excited, and full of hope for the future as landscape conservation becomes the operative unit for conservation. The deep social capital you have built up on your own landscapes will allow us to succeed in the many years to come."

–Sacha Spector, Doris Duke Charitable Foundation

Introduction

Background on Landscape Conservation

The designation of Yellowstone National Park in 1872 and the birth of America's national park movement was a significant milestone in American land conservation history. As was the growth of the land trust movement starting in the 1980s. Today, we are in the midst of a new transformative era. People are moving beyond piecemeal conservation and embracing a conservation approach that includes the entire private-public land continuum and the broader ecological systems we now know are essential to sustain all life on Earth. This approach weaves together the idea of conserving our cultural heritage and community vitality across these same landscapes. An important hallmark of landscape conservation is moving beyond top-down approaches to a more inclusive framework, with informal governance structures built around bringing people and communities together across boundaries to create shared vision and action on these important, interrelated goals. Moving beyond the false "nature versus people" dichotomy, landscape conservation harnesses the power of people from diverse sectors, geographies, and cultures, providing pathways for them to work together to sustain the long-term health of the places where they live, work, and play.

A 2017 Network for Landscape Conservation (NLC) survey of 132 collaborative landscape conservation initiatives across the country confirmed the dramatic increase in such efforts over the last two decades:

> Nearly 90% of the initiatives surveyed have been founded since 1990, with 45% having been founded in the years since 2010. . . . The [survey results] also suggest that we are seeing a fundamental shift in how we approach conservation. The landscape conservation approach relies less on top-down or otherwise mandated efforts, and is rather most often characterized by voluntary, horizontal collaborations that are inspired by a shared vision and propelled by the power of collective impact to sustain the landscapes that participants call home.

In fact, 75% of the initiatives surveyed identified as informal collaboratives. Landscape conservation initiatives are small and large, urban and rural, and in all regions of the country. The collective impact of collaborative landscape conservation—locally, regionally and globally—is significant and growing.

The Network for Landscape Conservation and the 2014 National Workshop

The Network for Landscape Conservation works with partners to connect this growing group of landscape conservation practitioners to information and to each other, develops effective tools and strategies, advances best practices and policies, and helps build capacity and expertise in this evolving field.

The first major event hosted by the NLC and its partners was the 2014 National Workshop on Large Landscape Conservation in Washington, D.C. (At that time, the Network was known as the Practitioners' Network for Large Landscape Conservation.) Although roughly 200 people were expected, more than 700 participants attended, showcasing the breadth and depth of the landscape conservation community of practice—and the thirst for knowledge and peer exchange.

The National Forum on Landscape Conservation and this Report

In November 2017, the Network for Landscape Conservation and partners convened the National Forum on Landscape Conservation, gathering 200 leading landscape conservation practitioners from the United States, Canada, and Mexico at the National Conservation Training Center in West Virginia. The Forum built on the energy and momentum of the 2014 National Workshop, and added a more targeted focus. Through pre-Forum white papers, keynote presentations, plenary panels, and in-depth breakout sessions, the Forum focused on strategic dialogue across diverse sectors and geographies regarding lessons learned, challenges and barriers, and pathways

forward for achieving conservation at the necessary landscape scale.

The purpose of this report is to make a meaningful contribution to the evolving practice of landscape conservation by sharing the insights and aspirations that emerged from the Forum—in particular looking at the two central questions posed over the two-day event: 1) What is the current state of landscape conservation? 2) What can we do together and in our own landscapes to shape this essential practice and ensure a healthy, sustainable future for people and all of nature?

The report is organized into chapters around five major themes: collaboration, communications/engagement, science-based planning, funding/finance, and policy. Each chapter provides an in-depth look at one of these themes and includes best practices, on-the-ground examples, and action-oriented advice—weaving together stories and strategies shared at the Forum with additional information from the field. Each chapter closes with a set of five-year benchmarks that serve as aspirational targets for the landscape conservation community. Building pathways toward these benchmarks will require additional collaboration, innovation, and concerted action.

The Network for Landscape Conservation will look to the benchmarks in this report to guide its progress forward and shape its specific strategies. And it will look to learn from and partner with others along the way. Strength in the landscape conservation community comes from its remarkable diversity—across sectors, geographies, cultures, approaches, and more. Progress will come from people and partners, in varied roles and across varied landscapes, weaving the threads of the landscape conservation story into a broad tapestry of effective, strategic action. The Network looks forward to this expanding conversation and commitment.

The Potomac River near Algonkian Regional Park in Loudoun County, VA. Credit: The Piedmont Environmental Council.

The High Divide. Credit: Chris Boyer with aerial support from LightHawk, courtesy of the Heart of the Rockies Initiative.

"I believe that landscape conservation fundamentally must be grounded both in appreciation for the needs of wild nature and natural systems and in respect for the individual dignity of people in all sectors. With such a holistic perspective guiding the landscape conservation approach, I contend that we as conservation practitioners must very intentionally develop the skills needed to engage all sectors of local communities if we are to achieve big picture conservation results. Further, to successfully engage whole communities will require us to incorporate both social and cultural goals along with ecological targets into our planning if we are to conserve nature in the face of today's unprecedented challenges."

—Michael Whitfield, Heart of the Rockies Initiative

Why Landscape Conservation?

We know that healthy, connected natural landscapes are essential—for clean water, healthy ecosystems, cultural heritage, vibrant communities and economies, climate resilience, climate mitigation, flood and fire control, outdoor recreation, and local sense of place. And yet our approaches to these critical issues are too often piecemeal, scattered, isolated, and incomplete.

It is a matter of history. Since the beginning of European settlement, and particularly over the last hundred years, the land and waters of North America have been profoundly altered by increasingly intensive use. Not the least of these changes has been the dividing of what once were whole natural features and systems into fragmented pieces. Some of those divisions are physical—roads, dams, fences, and sprawling development that are barriers to the passage of fish and wildlife. Other divisions are legal and organizational—private ownerships, the boundaries of cities, towns, states and countries, and the patchwork of agency jurisdictions in public land management. And still other divisions are mentally or culturally constructed—the segmenting of knowledge and expertise into discrete and narrow sectors, and the false dichotomy of nature as separate from people.

Regardless of the form of division, we are increasingly recognizing that the divisions are damaging: Fragmented landscapes do not sustain the same quality, function, and utility of land and water for people or the rest of nature, nor does fragmented thinking position us to address systematic challenges confronting us today.

Landscape conservation is about bridging divisions. It brings people together across geographies, jurisdictions, sectors, and cultures to re-weave fragmented landscapes and safeguard the ecological, cultural, and economic benefits they provide. This collaborative practice embraces the complexity of working across scales to connect and protect our irreplaceable landscapes—across public and private lands, and from cities to the wildest places. This conservation approach represents an evolutionary step forward on three levels:

> **A shift in geographic scale.** Decades of scientific research have built a systems-level understanding of the natural world and have underscored the importance of habitat connectivity across scales. To sustain biodiversity, ecological function, climate resilience, climate mitigation, and other ecosystem services, conservation must transcend boundaries and move beyond a site-specific, parcel-by-parcel approach to the scale at which nature functions.
>
> **A shift in perspective.** Wildlands, farmlands, rangelands, timberlands, tribal lands, places of cultural and historical significance, rural communities, urban areas, and other private and public lands are part of a whole system—a landscape. The landscape conservation perspective is that the entire landscape, private to public, developed to wild, should be considered together in a thoughtful and integrated manner when planning conservation action.
>
> **A shift in process.** Landscape conservation crosses jurisdictional and topical boundaries, transcending traditional decision-making processes and organizational structures. The landscape conservation approach is generally characterized by a horizontal process and collaborative governance structure with long-term participation by a diversity of stakeholders.

In short, landscape conservation—also known as "large landscape conservation" and "landscape-scale conservation"—is about building a collective conversation and concomitant action on how we wish to shape our relationship with the land we live on and that is vital to sustain us and future generations.

Chapter 1

The Central Role of Collaboration in Landscape Conservation

"Conservation at a landscape scale will only happen through collaboration, through partnership—we all know that to be true."

Jessie Levine, Staying Connected Initiative

Introduction

Individuals and organizations throughout North America and around the world are exploring a variety of ways to work together to meet the landscape-scale challenges of the 21st century. Traditional approaches to conservation and management—ownership by ownership, agency by agency, and issue by issue—are simply not sufficient by themselves to address the necessary ecosystem scale or to think beyond single issues to the broader health and well-being of people and nature across the landscape. No one entity can go it alone. How do we build new, dynamic partnerships that weave people and processes together to achieve these critical objectives?

Bringing people together to address landscape issues in an effective and enduring way that is both community-grounded and regionally significant is not a simple or quick process. There is no one-size-fits-all solution as we move towards collaborative networked structures. Every landscape is unique in terms of the melding of people, place, goals, and approaches. People must listen to each other and find their own way forward in the landscape they call home.

That being said, a body of best practices and associated success stories (as well as the literature on social impact networks and collective impact) is on the rise in this growing field. Landscape conservation practitioners are sharing case studies and learning approaches from one another that can be adapted for other landscapes. There is no longer a need to reinvent the proverbial wheel in every instance. As one National Forum participant noted, "[Collaborative landscape conservation] may be a developing field, but we do have more and more information that is shovel-ready."

This chapter takes a look at the evolving practice of collaborative landscape conservation. It outlines key elements—or steps to success—in the collaborative process, followed by examples and insights shared at the National Forum. In closing, it offers five-year benchmarks.

"For most of the 20th century, the organization was the go-to way to marshal collective energy and get things done. . . . [But now] the network has become the favored unit of action for people who want to make any sort of difference in the world. . . . It's a unique and renewable capacity, and this makes it especially useful when taking on complex, unpredictable large-scale problems like climate change [etc.] that won't yield to a silver bullet solution."

—From *Connecting to Change the World: Harnessing the Power of Networks for Social Impact*

South Lake Tahoe, California and Nevada. Credit: Drone Promotions, courtesy of the Tahoe Regional Planning Agency.

Key Elements of the Collaborative Landscape Conservation Process

Conserving and managing natural and cultural resources (particularly at the agency or large organizational level) have traditionally involved multiple elements: establishing goals, collecting data, assessing risks and opportunities, developing strategies and plans, developing support and securing funding, and evaluating progress and adapting to new information.

With the shift to landscape-scale conservation, these activities must be integrated into a much broader context. They must be conducted collaboratively across ownerships, jurisdictions, and issues, and at multiple spatial scales and over time. And this integrated approach must be based on a foundation of trust, shared understanding of the issues and objectives, and effective vertical and horizontal communication and collaboration among affected interests.

Fortunately, collaborative landscape conservation is no longer in its infancy, and a growing body of field examples and academic analyses has helped identify important elements of a successful collaborative process. The Network for Landscape Conservation (NLC) has synthesized these common "steps to success" in the table at the end of this chapter.

These collaborative steps are common but not universal: Each initiative must find a path that works for the people and priorities of a given landscape. In particular, there may be substantial differences between different types of landscape conservation networks, such as: 1) multi-jurisdictional networks (composed primarily of governmental organizations); 2) non-governmental organization (NGO) networks (composed primarily of like-minded NGOs focused on improving coordination and collaboration in a specific geography); and 3) multi-party collaborative governance networks (composed of a full range of stakeholders—including government, businesses, NGOs, landowners, academic institutions, etc.). The table, and the report more broadly, focus primarily on the third category. The following section puts these steps to success in context with examples and insights from the field.

"Collaboration and from-the-bottom-up processes are essential in today's world, but it takes a lot of time and energy to do collaboration right."

—Bob Bendick, The Nature Conservancy Gulf of Mexico Program

Participants at the National Forum on Landscape Conservation, Shepherdstown, WV. Credit: Jonathan Peterson, Network for Landscape Conservation.

Collaboration in Focus: The 2017 National Forum

The National Forum provided an opportunity to ground collaborative landscape conservation theory in practice as participants focused on specific examples of people working together across sectors, scales, and issues to shape decisions and outcomes at the landscape scale.

The story of the Tahoe Basin was particularly rich and instructive. Since the late 1960s, the California-Nevada Lake Tahoe region has been managed by a congressionally approved interstate compact. The Tahoe Regional Planning Agency (TRPA) was the first bi-state compact agency in America focused on environmental conservation and restoration on a regional scale. TRPA Executive Director Joanne Marchetta presented a keynote address on collaboration, and explained how leaders in that landscape have experimented over the past 50 years with new ways of working together to achieve a shared vision—moving deliberately from a top-down, regulatory approach to "voluntary coalitions of the willing." She noted how organizational culture, particularly in governmental agencies, can be the single largest impediment to meaningful partnership, and how TRPA had changed its own culture:

> "Today, 'us versus them' is the prevailing culture nationally. Truthfully, we had to blow up that kind of thinking in Tahoe to be where we are today. . . . We made a 180-degree change. We made PARTNERSHIP our bedrock concept."

Many of the lessons that Marchetta framed in her keynote presentation were amplified and augmented by panelists. Insights included the following:

1. Effective collaboration is built on trust and respect

This was a consistent refrain throughout the Forum. Steve Jester, Executive Director of Partners for Conservation, explained: "It's not a grant program, a funding stream, or a policy. It's the individual relationships that make these things work. And the first step is building that trust and credibility that make relationships work."

2. Trust starts with authentic stakeholder engagement

Horizontal engagement, starting with listening and inclusion, is central to meaningful collaboration. (See more about communications and engagement in Chapter 2.) As explained by Mike Zupko, Executive Director of the National Wildland Fire Leadership Council, "You can't go in with the answer, you can't go in with all the information, the coolest maps, and all the things that drive the decision-making that we do. You have to find out what the community cares about and build from there."

3. Backbone coordination is central

Many speakers noted the critical value of a designated coordinator and a "backbone organization" to keep the complicated and time-consuming elements of a collaborative process moving forward. As explained by Marchetta (and as is well documented in the literature): "In collective governance, there needs to be a backbone organization. One of the five essentials for collective impact is a backbone organization to convene and

River restoration in the Salmon River Valley, Idaho. Credit: Heart of the Rockies Initiative.

Five Major Challenges to Collaboration
Identified by National Forum Participants

1. Insufficient capacity, most notably difficulty funding the "backbone" leadership and coordination identified as critical to these efforts, as well as difficulty finding funding in the longer time frames required for this work.

2. Insufficient skills and experience in working collaboratively; lack of access to training, models, and expertise in this evolving field.

3. Communications challenges, including connecting in meaningful ways with a broad range of partners on landscape values, communicating effectively with funders and elected officials on the pivotal importance and urgency of this work, and more fully capturing and sharing the key elements to success.

4. Meeting/collaboration fatigue, given that this work comes on top of other duties, and exacerbated in situations where the collaborative structure is under-developed and/or under-resourced.

5. Difficulty measuring/demonstrating success, especially demonstrating how the partnership is adding value in ways that may be different than "bucks and acres" evaluation metrics (e.g., measuring the value of increased social capital, better and more widely shared information, and more democratic and inclusive processes).

organize the partnership. TRPA is that lead convener [in the Tahoe Basin]."

4. Collaboration skills are important

The skills required for a long-term collaborative process are distinct. A number of speakers highlighted the need to have those skills in-house to facilitate or even participate in a landscape conservation partnership—through either hiring or training. As Marchetta explained, "It's the soft skills that matter: Communications, compromise, creativity, adaptability, flexibility, and critical thinking."

5. Shared ecological, cultural, and other information at multiple scales is key

Many Forum speakers spoke of the importance of shared landscape knowledge, and the power of harnessing timely and usable data for collaborative decision-making and action. Joel Dunn, Executive Director of the Chesapeake Conservancy and a member of the Chesapeake Conservation Partnership steering committee, noted that, "We are democratizing conservation through developing and distributing to partners new high-resolution data. We are empowering landowners, land trusts of all sizes, and others to fuel multiple conservation goals. We are partnering with Microsoft and Esri, and we are talking about days instead of months to produce updated data to fuel new conservation initiatives and defend existing ones." (For more information on the Chesapeake Conservancy's data production, see the "Precision Conservation" box in Chapter 3.)

6. Social capital has enduring power

Once people work constructively together on a shared goal, social cohesion and forward momentum tend to occur. Chris Miller, President of the Piedmont Environmental Council in Virginia, discussed his organization's "multi-generational focus," and how each generation builds upon the partnerships that came before it. Others affirmed the long-term dividends that effective partnerships yield: "When this trust and relationship building works, it can be incredibly enduring and is passed down through the generations."

As more than one Forum participant reflected, landscape conservation requires bringing together a wide range of people to have a shared conversation about the places where they live and work. In this sense, landscape conservation gets at the very essence of how we interact with one another. Through an emphasis on trust, respect, and genuine collaboration, landscape conservation has tremendous potential to not only enhance the health and resilience of our landscapes but to build a more civil society.

> "In a time when there is so much divisiveness in our country, here is a tried and true process of getting people to talk to each other from different cultures and different points of view. This is about building civility back into our country."
>
> –Gary Tabor, Center for Large Landscape Conservation

Heritage Hollow Farms, Virginia. Credit: Marco Sanchez, Piedmont Environmental Council.

Lake Tahoe West Restoration Partnership. Credit: Mason Bindl, Tahoe Regional Planning Agency.

Lessons for Landscape-Scale Collaboration

From Joanne Marchetta, Tahoe Regional Planning Agency

Think in Systems

"For us working in landscape conservation, it is the web of interdependencies to be understood and the geography around which to organize."

While We Love Our Politics and Turf, We Must Get Over It

"We had to admit our silo was no better than anyone else's. We had to move from MY way to OUR way."

Partnerships and Collaboration are Everything

"In the last two decades, we've secured and invested over $2 billion with contributions from every sector. How have we done this? . . . through epic collaboration. . . . And 20 years of hard work."

Think Creatively—Unearth Old Assumptions, and Don't Be Rule Bound

"Be creative with your ideas. Are you stuck in old stale models? Inertia has a way of thwarting change."

Provide Clear Governance of the Partnership

"Whether your governance is formal or informal, make it intentional. Assess its effectiveness often, and adapt those structures when circumstances call for change."

Reinvent Yourself Continuously—Change Your Culture for Results

"To make landscape conservation successful, we simply have to get better and better at working together."

Key Elements of a Collaborative Landscape Conservation Initiative

These are common but not universal steps to success; each initiative must find a path that works for the people, place, and priorities involved.

PHASES	ANTICIPATE	ARTICULATE	ANCHOR/ASSESS	ACHIEVE	ADVANCE/SUSTAIN
EMPHASIS	*Define Landscape Boundary and Need or Opportunity*	*Identify Shared Vision and Goals*	*Undertake Spatial Design and Strategic Plan*	*Fund and Implement Strategies*	*Evaluate Progress, Update Plan, and Adapt Over Time*
FOCAL TASKS	• Convene and galvanize core group of partners. • Identify shared geography and initial list of shared interests, concerns, and goals.	• Articulate shared vision and associated goals and strategies. • Explore how landscape vision is connected to efforts at different scales. • Agree on plan for moving towards goals and strategies.	• Map ecological and other resources of concern, identifying values, threats, trends, and opportunities. • Craft conservation/ management plan based on prioritization. • Identify knowledge gaps. • Develop strategic action plan.	• Identify and secure funding sources. • Implement activities identified in the strategic action plan. • Monitor appropriate indicators and measures of success.	• Celebrate successes. • Evaluate progress and effectiveness of action plan. • Recalibrate strategies and activities to reflect lessons learned. • Adapt, re-invent, and re-energize over time as necessary.
PARTNER BUILDING AND OTHER OUTREACH	• Start to build relationships and trust with core stakeholders and identify who else should be at the table. • Weave authentic engagement and communications into work from beginning.	• Continue trust-building; add stakeholders as timely. • Build upon/ celebrate individual partner contributions while building shared activities and understanding. • Ensure good internal communications to keep people informed, connected, and involved.	• Continue to build trust and partnerships to match the scope and scale of activities. • Build effective external communications (e.g., website, e-news) to build support, learn from one another, and achieve goals.	• Continue strategic outreach and develop new products (e.g., compelling case statements, media) to highlight and advance core messages and collaborative efforts.	• Give credit to all, showcasing successes and progress through storytelling and other effective communications.
STRUCTURE AND STAFFING	• Identify backbone organization, potential process, governance structure, and seed funding.	• Establish staffing plan (at least for backbone coordination). • Fund and hire staff accordingly.	• Develop steering committee, working groups, other structure as helpful (only as much as needed).	• Further develop and refine governance structures as needed; increase staffing capacity as needed.	• Remain nimble and adapt as the long-term collaborative initiative grows and changes over time.

Note: For more information on the phases of the initiatives, please reference the Network's 2018 report, Assessing the State of Landscape Conservation Initiatives in North America, *pages 13 and 14.*

Golden Gardens Park, Seattle, WA. Credit: Kelly Compton.

Five-Year Benchmarks

1. The significant value and key elements of collaborative landscape conservation are further developed, defined, and broadly understood by practitioners, policymakers, researchers, and funders.

2. Strategies for building meaningful collaboration are widely implemented to deepen, broaden, and sustain partnerships over time, with horizontal partnerships increasingly inclusive of the great diversity (across sectors, cultures, race, age, and more) of our society.

3. Policies and funding are aligned to recognize the central value and long-term nature of the collaborative framework necessary for landscape conservation success (including the need for "backbone" coordination).

4. Improved quantitative and qualitative evaluation metrics—including metrics that capture the social capital value of collaboration itself—more fully demonstrate the multiple ways landscape conservation partnerships are benefiting society and all of nature.

5. Robust services to landscape conservation practitioners—including information synthesis and dissemination, technical assistance and training, and peer-to-peer learning and exchange—are tangibly building expertise and effectiveness across the field as a whole, inspiring a growing collaborative community of practice and making a significant difference on the ground.

Chapter 2

Reimagining Communications and Engagement in the Landscape Conservation Era

"You are never going to develop trust and a relationship if you come with an agenda and are not willing to open your mind and listen to other ideas and respect people with other opinions and viewpoints."

Merrill Beyeler, rancher and High Divide Collaborative

Introduction

Conservation is undergoing a fundamental transformation as it expands to the holistic landscape scale. As the practice of conservation evolves, the traditional tools to advance it need an ambitious reimagining as well.

In the past, land conservation was mostly about protecting nature *from* people for important but narrowly defined reasons. Communicating often involved top-down explanations of what "needed" to happen and why. It was too often a one-way and narrow street. Today, landscape conservation is more about nature *and* people solutions across the broader landscape. Communications and engagement that foster trust, mutual understanding, inclusivity, and joint ownership of the conservation story are critical building blocks for effective collaboration and durable conservation success.

At the National Forum, participants talked about early, authentic engagement with stakeholders on the landscape, instead of "parachuting in" with a set agenda. They talked about the need to replace talking with listening—in order to understand diverse perspectives, develop shared conservation priorities, and expand the very meaning of conservation itself. And they talked about the powerful role of storytelling to help connect people to each other and to the regional landscapes where they live. This engagement cannot be an afterthought; it represents the fundamental core of weaving together a new conservation story for the 21st century. This chapter provides an overview of communications and engagement strategies from the National Forum and recommends five-year benchmarks for success.

The Art of Listening

Landscape conservation is not about a single top-down story. Instead, there are multiple stories that celebrate and amplify the many diverse voices and perspectives on the landscape. Multiple speakers at the Forum emphasized how critical it is to listen to hear those stories. As Joe Hankins, Vice President and Director of the Freshwater Institute at The Conservation Fund, noted: "How do we make conservation relevant

"Communications and relationship-building are most effective and sustainable when this happens on the front end of your planning process as opposed to being an afterthought and trying to sell it to your community."

—Steve Jester, Partners for Conservation

Lakeview Terrace community meeting. Credit: The Trust for Public Land.

Stories from the field

Connecting People and Place: Lakeview Terrace

In Cleveland, Ohio, The Trust for Public Land (TPL) is working on an innovative project that stitches together segments of an urban trail into a greenway network that would connect an isolated public housing project with the city's waterfront parks. Central to the project is the idea of creating something *with* a community, not *for* a community.

Lakeview Terrace was opened by First Lady Eleanor Roosevelt in 1937 as the first public housing project in the country, and the original concept envisioned the housing units surrounded by green space. After decades of urban development that has seen highways and industrial infrastructure built in and around the neighborhood, residents of the approximately 2,300-unit housing are now unable to access public green space around Lake Erie—just a short distance away—without going miles out of their way. TPL is working with the residents to secure funding and make pedestrian connections through the industrial landscape to renew access to the lake. The final connection, a bridge over a railyard, is scheduled to be completed in 2019. As Shanelle Smith, TPL Ohio State Director, highlighted in her remarks at the Forum, this project emerged out of listening to the residents of Lakeview Terrace, and the stories of the residents have been a driving force in sustaining project momentum.

and inclusive? How do we connect to different demographics and different people? We must listen to things we may not want to hear and work to bridge those divides."

National Forum discussions highlighted an important reminder for practitioners: Not to focus on bringing people to "our" table to solve the problems as we define them. Instead, practitioners should start with listening, and engage with people to define the problem, find shared understanding, and lay the groundwork for collective solutions. Doing so can deepen connections, expand understanding of culture and conservation, and reveal inspiration in new places. Shanelle Smith, Ohio State Director for The Trust for Public Land, noted about her work with the Lakeview Terrace project (see box): "The best part of this project is listening to the residents tell their stories. They love to talk about just getting down to the lake. They just want to fish, they want to walk, they want to be able to breathe clean air."

Some people have connections to their local lake; others are connected to the land through their farm or ranch, or through the rich cultural history on the landscape, or perhaps through hiking, hunting, birdwatching, or gardening with their families. Despite these different perspectives, if people listen to each other they will find a common denominator in their love of their home landscape and their hopes and dreams for its future. As Steve Jester, Executive Director of Partners for Conservation explained: "The shared vision in these landscapes is usually there, it's just a matter of discovering it. . . . It's not something you need to create; it's just something you need to listen for and to bring out."

> "It's really important to listen. Sometimes we as practitioners come to the room, we think we have the answers. . . . But sometimes if you just listen to the people who are in that community, they will tell you exactly what they need and what they want, and how you can help advance their community."
>
> —Shanelle Smith, The Trust for Public Land

"Our mission is storytelling . . . We find that people are seeking authentic experiences and authentic stories and the people behind them. People want to connect and do something to help conserve the corridor . . . We work to demonstrate how connectivity provides for quality of life. Right now, with all the hurricanes and natural disasters, resiliency is a great story–saving life, property, and quality of life. Health care and wellness remains an underrepresented part of storytelling that we are working on. It's important in these rural areas to have health tourism and eco-tourism and for us to demonstrate the tangible benefits that accrue."

–Mallory Lykes Dimmitt, Florida Wildlife Corridor

The Power of Storytelling

The "connective" power of stories emerged as a central theme at the Forum. Sharing stories helps people connect to each other, connect to the land, and connect to a shared body of knowledge. This in turn helps foster a shared sense of place and vision for the future. Storytelling is one of the oldest forms of communicating and is a powerful tool for building the trust, respect, and social cohesion necessary to achieve enduring conservation at the landscape scale. Photos, videos, maps, and drawings, as well as verbal and written narratives, can all be used to tell powerful stories that educate, resonate, connect, and inspire. The following examples distilled from the National Forum underscore the various ways storytelling can advance landscape conservation objectives.

1. Stories connect people to each other

People are attached to their home landscape for many different reasons: as hunters and anglers, farmers and foresters, urban park users and wilderness hikers, cultural and historic site enthusiasts, and clean water and air advocates, among others. Only by sharing these diverse perspectives—these stories—can we

understand each other and find the common ground necessary to move forward to safeguard the myriad values of our landscapes.

If people don't see themselves in the prevailing conservation narrative—either figuratively in the telling of the story or literally in associated photographs and visual elements—the implicit message is that their stories do not count, that their relationship to the land is not important. It is critical to seek out the full spectrum of diverse voices on the landscape, with an eye to those who may not have generally been in the traditional land conservation movement. Doing so enriches our collective understanding of place and strengthens the social fabric of our communities—increasing the potential to harness both on behalf of our shared landscapes.

2. Stories connect people to the land

With each passing generation, we are less connected to the land. More and more people live in cities or highly developed suburbs; fewer people work the land professionally or even know where their food comes from; and books have titles such as "The Last Child in the Woods." Stories can help celebrate and illuminate the deep connections we have to our home landscapes and the many ways we depend on them, reconnecting people to place and fostering a shared understanding of how linked our fate is to connected landscapes.

This is particularly relevant in landscape conservation, where the scope and scale of the challenges are often daunting. Stories can bring the issues down to scale and reframe them in ways that people can relate to and act upon. For example, at the National Forum Jodi Hilty, Executive Director and Chief Scientist of the Yellowstone to Yukon Conservation Initiative (Y2Y), talked about habitat connectivity—but not through a conservation biology lesson. Instead she told an engaging story about the trials and tribulations of a specific tagged grizzly bear, "Bear Number 148," that illustrated the habitat connectivity needs of grizzly bears and showcased how people in Y2Y communities had rallied to the bear's cause.

Paul Trianosky, Chief Conservation Officer at the Sustainable Forestry Initiative, expanded upon the challenges presented by the complexity of landscapes, reflecting on how to help people understand that the forests, farms, and rangelands surrounding their communities are deeply important to their lives—and the need to make that connection to gain their conservation support:

> "It's about storytelling and building relevancy to those audiences. It's about the relevancy of conservation on the ground and critters and clean air and climate down through the supply chain. I kid about putting a

The Gibson Mariposa Butterfly Park, Los Angeles. Credit: Amigos de los Rios.

Kayaks at Sunrise. Credit: Peter Turcik, courtesy of the Chesapeake Conservancy.

> picture of a frog on the back of a pizza box. But if you can make those supply chain stories real and relevant, it will translate into action once you have people's understanding and support."

Claire Robinson, Founder and Managing Director of Amigos de los Rios in the Los Angeles area, described how her organization is reaching children with the evocative imagery and story of a broccoli stalk to help them understand the larger landscape where they live:

> "The LA Basin is basically a broccoli stalk. We get 70% of our water and 70% of our open space from the Basin. . . . We need to connect our landscapes from the mountains to the sea. We need to reweave cities into the continuum of the larger landscape. My dream is for every third grader to know where they live within the region and in the watershed. If a child recognizes where they are in the broccoli stalk, then they can understand where they connect to the larger system. . . . And they totally get it."

Slogans like, "Farm to Table," "No Farms No Beer," and "Save Crabs then Eat Them" are also excellent examples of building upon this theme, using powerful shorthand stories to underscore our connections to the land by highlighting food traditions and food security—themes people deeply care about.

3. Stories connect people to a shared body of knowledge

Storytelling is a vehicle for sharing knowledge and finding common ground about a shared landscape. And this knowledge includes values at both the local and regional scales. At the Forum, participants spoke about communities learning about their landscape's value as a regional migratory corridor, or as a climate resilient site, or as a key piece of cultural heritage. This deepened understanding and shared sense of place is the foundation for developing a collective vision that in turn provides the springboard for taking collective action for an enduring local and regional future. A recent National Academy of Sciences study identified "a unifying theme or story" as a critical factor for working effectively on conservation at the landscape scale.

The High Divide Collaborative in southwestern Montana and Eastern Idaho provides an example of developing a shared regional narrative, as captured in the compelling *High Divide* film showcased at the National Forum. This story captures the voices of many different people who live and work in the region, their shared love of place for its intertwined ecologic, cultural and economic benefits, and their deep commitment to conserving this cherished landscape for future generations.

The story of shared vision and collective action in the High Divide is playing out in regions across the country as the field of collaborative landscape conservation continue to grow. Traditional conservation primarily conserved land *from* people, and the key tools were laws and regulations. The new era of landscape conservation focuses on land *and* people, integrating conservation of nature, culture, and community across the broader landscape. The key drivers are now relationships between people, people's relationships to the land, and people's shared knowledge about the land. Effective communications and engagement are essential to advancing all three and to finding collaborative success in the landscape conservation era.

"Weaving together all the diverse stories from a landscape is inspiring and enriching—and essential to a more inclusive and truly collaborative conservation approach. Never take communication for granted and always remember it's two-way."

—Julie Regan, Tahoe Regional Planning Agency

"It is the land that brings us—literally—together."

—Jim Levitt, Lincoln Institute of Land Policy

Credit: David Foster, Harvard Forest.

Stories from the field

The Power of Place: The High Divide Collaborative

The High Divide straddles the Continental Divide along the Idaho/Montana border, housing headwaters for the great Missouri and Columbia watersheds that flow to opposite oceans. It is a stronghold for wildlife that have disappeared from much of their historic range and is the centerpiece for connectivity between the Greater Yellowstone Ecosystem, the Crown of the Continent, and the great wilderness of Central Idaho. In the face of escalating growth pressures, a diverse group of community leaders, ranchers, state and federal agency representatives, and more began to informally reflect on the future of the High Divide. As these reflections grew into conversations, the High Divide Collaborative was born.

The conversations were about conserving the wildness and wildlife populations of the High Divide, about sustaining critical connectivity in the Rocky Mountain west. Yet the conversations were also about other challenges: Keeping working ranches on the land, sustaining the schools that are the lifeblood of communities, creating infrastructure, ensuring access to health care, and maintaining access to public lands. In short, questions about maintaining an economy and way-of-life in a cherished landscape, and being able to pass it on to the next generation. This is a challenge facing rural communities across the country: What are the opportunities that will allow the children, and the grandchildren, to remain in the community?

What brought ranchers, outfitters, community leaders, conservationists, state and federal agency representatives, and others together wasn't regulation or a formal structure. Instead it was a deeply felt connection to the High Divide, a love for the landscape and the communities that exist in it. The Collaborative emerged as a vehicle to consider and conserve the many interconnected and irreplaceable values—ecological health, economic vitality, cultural heritage, and a grounded sense of place. And what allows the Collaborative to continue to grow and flourish is the individual commitment to this place—and to each other.

The High Divide film was screened at the National Forum and was followed by a panel discussion from High Divide residents and collaborators to reflect on and discuss their collective work. What came through clearly in both the film and the discussion was how deeply embedded the landscape was in each participant's life, and how important it was to them to see the landscape remain for their children and their children's children.

As one panelist noted: "When I think about the High Divide, one of the things that just makes me smile is what one person said earlier because I think it's so true: 'First we got the fish back, then we got our children.' The collaborative work we've been able to do—all the partnerships, and all those things—it created opportunities, and now our children are returning."

Credit: Bureau of Land Management.

Sandhill Cranes, Wheeler National Wildlife Refuge, Alabama. Credit: Greg Wathen.

Five-Year Benchmarks

1. Practitioners embrace broad-based, horizontal, and authentic engagement as a bedrock principle of the landscape conservation approach—leading with listening and trust-building.

2. Practitioners work in partnership with others—particularly those with long-term connections to the landscape—to harness the power of storytelling and other communications to connect people to information, to the landscape, and to one another, fostering a shared sense of place and long-term conservation vision, and inspiring collective action to achieve it.

3. Effective communications are utilized more broadly within and across landscapes to achieve widespread recognition of the myriad ecological and cultural heritage values that functioning landscapes provide, and the significant benefits of sustaining them.

4. Communications strategies better highlight the intersection between landscape conservation, quality of life, inclusive communities, vibrant rural and urban economies, ecosystem services, climate resilience and mitigation, food security—in local landscapes and across the field.

5. Effective communications broadly capture and convey the power of the landscape conservation approach to bring people together to address intractable, integrated ecological, cultural, and social goals.

Chapter 3

Advancing Science-Based Planning for Landscape Conservation

> "Today it's all about connectivity conservation and dealing with the messy middle between protected areas. . . . How do we do this in a way that is compatible for both human livelihoods and all the ecological functions that preserve the planet?"
>
> Gary Tabor, Center for Large Landscape Conservation

Introduction

Our understanding of biodiversity and ecological systems has changed dramatically since Yellowstone National Park was created in 1872. This evolution in scientific understanding has fueled the growth of landscape conservation across the country, continent, and globe as we expand our conservation approach to the scale at which nature functions. This is a pivotal shift as people grapple with escalating ecosystem-scale threats including habitat loss, habitat degradation, and climate change.

Today, we recognize that protected areas must be "functionally connected and embedded within larger, permeable landscapes." (Trombulak and Baldwin 2010.) Embracing conservation across these larger, often private landscapes has also led to a sharper focus on the fact that ecological systems are intertwined with our social, cultural, political, and economic systems.

During the Forum, participants discussed the importance of a shared body of knowledge and analytic tools to inform the stakeholder process and provide a foundation for effective decision-making at the landscape scale. Pivotal knowledge includes ecological science at multiple scales as communities and regions wrestle with enormous challenges and changes in the natural world. Knowledge important for understanding a landscape also involves human dimensions (e.g., cultural, social, and economic), including indigenous and Traditional Ecological Knowledge.

Forum participants discussed the growing understanding of the tangible ecosystem services our landscapes provide, including new research on the significant climate resilience and climate mitigation benefits. And they noted the dramatic increase in the development of scientific data and innovative planning tools. According to National Forum speaker Mark Anderson, Director of Conservation Science for The Nature Conservancy's Eastern U.S. Region:

> "Scientific information in the landscape conservation arena is exploding—we have more information than we have ever had, and we are starting to solve problems we could not have solved even five years ago."

This chapter provides examples from the National Forum on recent advances in conservation science and technology, and recommends five-year benchmarks for success.

Analyzing Landscape Values at Multiple Scales

Sacha Spector, Environment Program Director at the Doris Duke Charitable Foundation, presented a keynote address at the National Forum focused on science-based planning advances and innovations. He explained how working effectively at the landscape scale must include data on the resources we care about at the scale necessary for landscape planning, but at a resolution high enough to also support site interven-

tion. Bridging that gap, and then also scaling up from the landscape to the national scale, "has been a challenge for science for a long time."

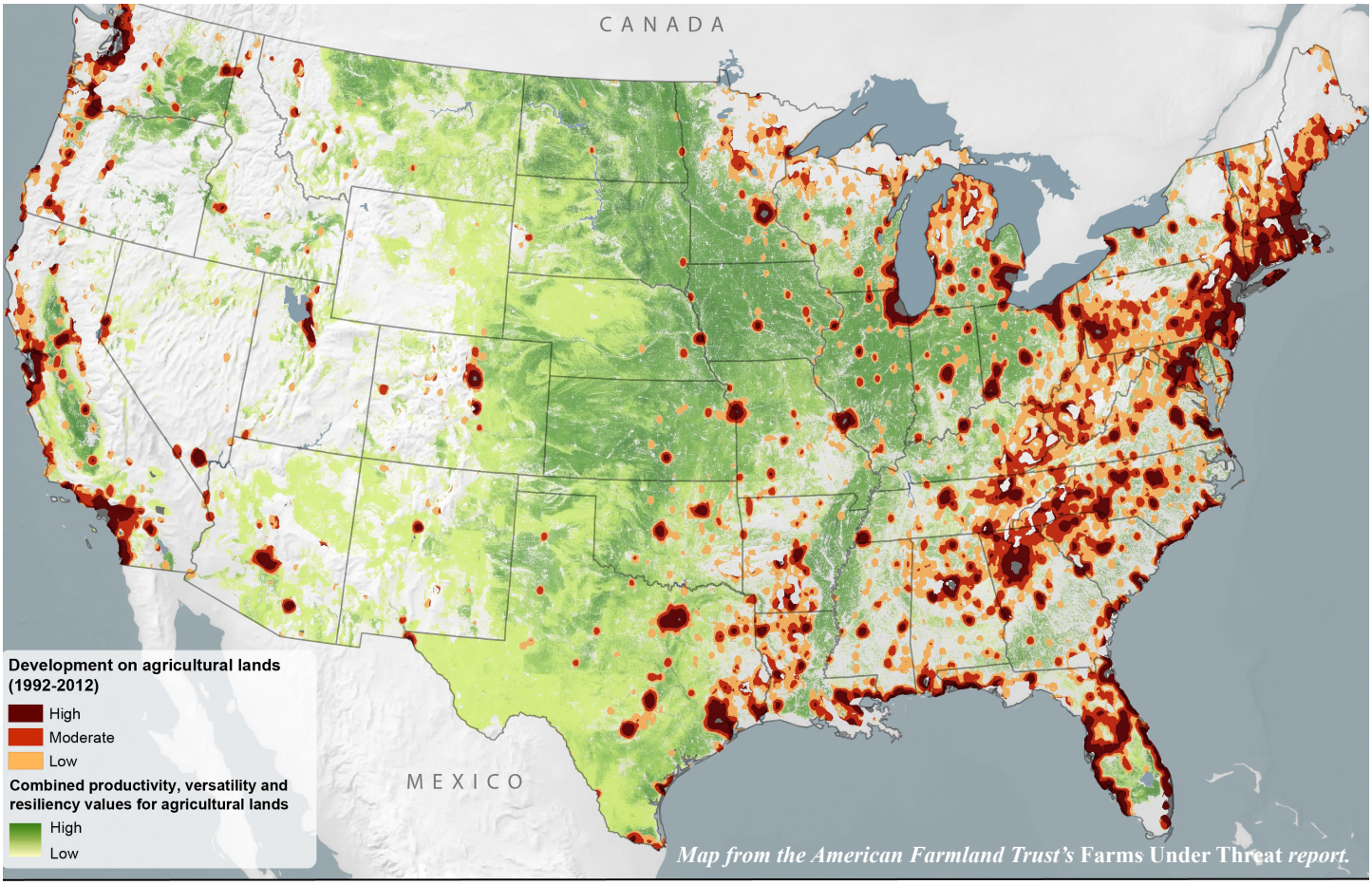
But today we have remarkable new regional and national data sets coming on line that are very high resolution and can thus be utilized from the landscape to the site-specific scale: "Our ability to understand landscape connectivity at intensely high resolutions has evolved by orders of magnitude over the last few years," according to Spector. For example, researchers have used Circuitscape datasets at the 30-meter scale across the entire Pacific Northwest to build landscape-level analyses of ecological flow across even long-distance movements (up to 50 km). Such data allows one to understand the landscape-level patterns of ecological flow and habitat connectivity, but to also bring the data, "right down to the site level and the decision-making moment."

Similarly, American Farmland Trust and Conservation Science Partners have recently released very high resolution agricultural data for the country that also allows one to see land use change and development patterns on an annual basis and incorporate threat detection into site-specific conservation planning. As Spector explained, "We can now do site-level change detection and forecasting at a national scale and validate those models; this is exciting."

Understanding Landscapes as Dynamic Systems

Conserving biodiversity and ecological function must account for a changing climate and changing permeability of the landscape. As The Nature Conservancy's Mark Anderson queried at the National Forum: "How do we sustain nature in all its diversity and function in a way that still allows it to adapt to a changing climate?"

Forum speakers discussed how our increased understanding of landscapes as dynamic systems is deeply informing innovation in landscape conservation practice. In particular, our ability to map these dynamics is allowing us to design conservation



Map from the American Farmland Trust's **Farms Under Threat** *report.*

Stories from the field

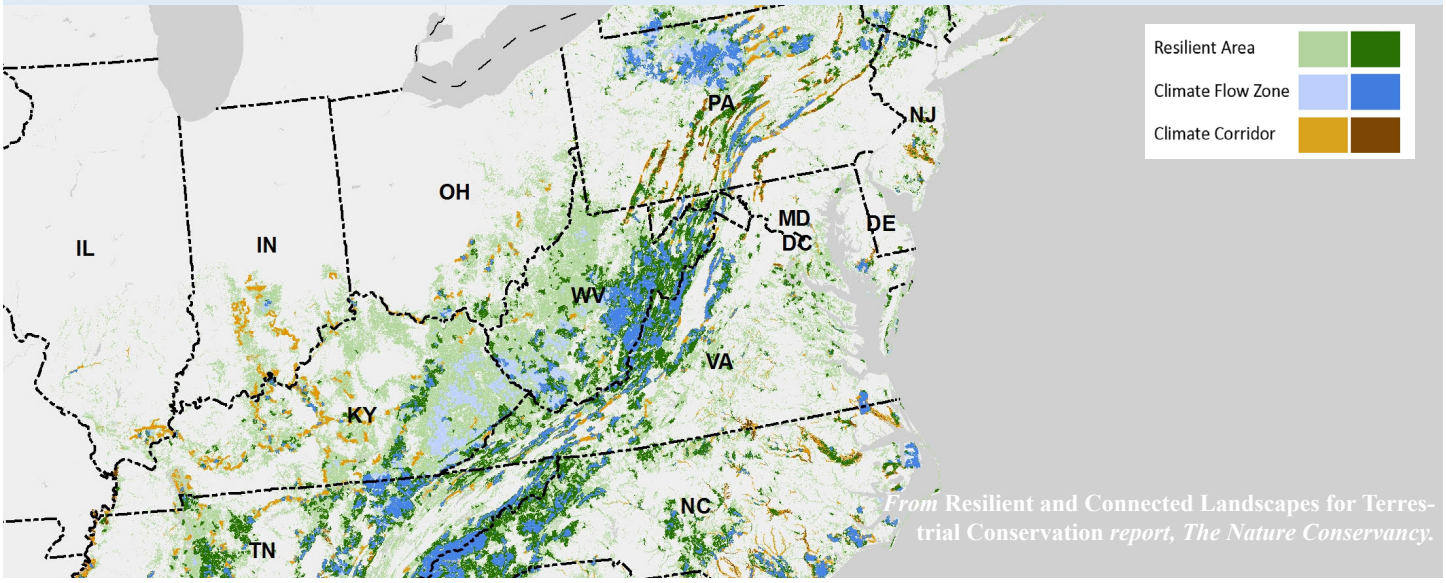
Conserving Nature's Stage: The Nature Conservancy's Approach to Conservation in a Warming World

The climate is changing, and nature is in flux. Plants and animals must relocate to survive. How do we ensure that the North American landscape will continue to support its iconic wildlife and vast botanical diversity? That nature will continue to provide the wealth of materials, food, medicines and clean water we depend on? As Mark Anderson explained at the National Forum, The Nature Conservancy (TNC) is focused on mapping and conserving current biodiversity and the conditions necessary for it to adapt over time. The approach, called Conserving Nature's Stage, recognizes that biodiversity depends upon the physical landscape—soils, geology, elevation—and that conserving a connected array of resilient sites is important so species can move and adapt over time.

TNC's explicit protection goal is to conserve a network of resilient sites and connecting corridors that will sustain North America's natural diversity by allowing species to adapt to climate impacts and thrive. In the Eastern US, the mapped network covers 23% of the landscape, and includes:

- Physical landscapes: Conserving a representative array of physical landscapes focused on the underlying geology as well as soils and elevation is important so species can move and adapt over time.
- Climate Resilient Sites: Species experience climate at a very local level; conserving sites with a rich diversity of microclimates is essential.
- Key Connectors and Linkages: Species need the ability to move through permeable, connected landscapes, particularly where current habitat models show concentrated range shifts over time.
- Confirmed Diversity: Including a focus on known locations of rare species or unique communities is an important component of planning for biodiversity transition and change.

In the East, the mapped network not only supports 30,000 species of plants and animals but also a $25 billion outdoor recreation industry. Additionally, protecting the network would store an estimated 3.9 billion tons of carbon, secure more than 66 million acres of high-value source-water-supply land, provide 1.8 billion tons of oxygen annually, and mitigate over 1.3 million tons of air pollution, avoiding $913 million in human health costs. TNC anticipates that the resilient and connected landscape analysis for the entire US will be complete by 2020, allowing a concerted national focus on conserving the lands that will provide the best chance possible for species to adapt to a rapidly warming world.



From Resilient and Connected Landscapes for Terrestrial Conservation *report, The Nature Conservancy.*

solutions that manage for change rather than for persistence. The Nature Conservancy, for example, has developed a specific approach to identify and prioritize a conservation network of climate resilient landscapes that will allow nature to adapt and change over time (see box).

In another example of dynamic conservation, eBird, a project of the Cornell Lab of Ornithology, is tracking the shifting timing and locations of seasonal migratory routes of several grassland birds. With this information, habitat can be managed to accommodate the birds exactly when and where they need it (e.g., temporary flooding of specific rice fields)—providing short-term interventions that have long-lasting implications.

At the National Forum, Julie Kunen, Vice President of the American Program at the Wildlife Conservation Society (WCS), spoke about dynamic conservation approaches for protecting walruses given the dramatic declines in summer sea ice for "haul-out" in the Arctic. Walruses are now hauling out in unprecedented numbers along the Alaskan and Russian coasts. These haul-outs are sometimes close to villages, attracting tourists, startling the animals, and leading to stampedes to the water that can result in hundreds of dead animals.

WCS has worked with Native communities in Alaska to implement flexible, local stewardship programs to minimize impacts as the climate continues to disrupt walrus behavior. According to Kunen, "Some species are reasonably adaptable if you give them time and space to adjust and provide the enabling conditions."

The natural world is shifting under our feet. Recent innovations in science and technology help us craft dynamic and flexible conservation solutions to help species adapt to that change.

Landscape Conservation is a Critical Climate Mitigation and Adaptation Strategy

Land conservation is not a minor player in the climate arena. Strategic conservation at the landscape scale will have pivotal benefits as both a climate mitigation and adaptation strategy. As Sacha Spector noted in his keynote address:

> "We are talking about using nature—the original carbon capture and storage machine—to put that carbon back on the lands and make that forest more resilient at the same time. We are also talking about a hugely important restoration economy. The climate agenda is a landscape conservation agenda."

It is increasingly understood that healthy, connected landscapes provide climate resilience for people (e.g., flood buffering) and for other species as they move and adapt to a changing climate. But the significant role that natural landscapes can play as a climate mitigation strategy is just starting to come more clearly into focus. *The Proceedings of the National Academy of Sciences* recently published research from The Nature Conservancy and fifteen collaborating institutions from across the globe that documented the climate mitigation potential of improved stewardship of landscapes. The authors assessed 20 "natural climate solutions"—conservation, restoration, and/or improvement of land management techniques across global forests, wetlands, grasslands, and agricultural lands that increase carbon storage and/or avoid greenhouse gas emissions. And they concluded that cost-effective land stewardship approaches can mitigate 11.3 billion tons of carbon dioxide pollution a year—30% more than has been previously estimated.

This means that natural climate solutions can provide up to 37% of the mitigation needed between now and 2030 to keep global temperature rise below 2 degrees

> "[Natural climate solutions] offer a powerful set of options for nations to deliver on the Paris Climate Agreement while providing soil productivity, cleaning our air and water, and maintaining biodiversity."
>
> –Griscom et al. 2017. Natural Climate Solutions.

Stories from the field

Scenic Hudson: Leveraging advances in science and mapping

Whistledown Farm, the Hudson Valley. Credit: Scenic Hudson, Inc.

A key challenge to science-informed landscape conservation is gathering data at an appropriate scale to make landscape-level planning possible without losing the resolution that allows for actionable interventions and site-specific projects. As increasingly sophisticated data-management and planning tools become available, inspiring examples are emerging. Just north of New York City, in the 4.5 million-acre Hudson River Valley, Scenic Hudson has led pioneering work around systematic conservation planning at the regional level. The Hudson Valley Conservation Strategy is a dynamic planning tool that works to prioritize efforts across multiple goals, including climate resilience, landscape connectivity, biodiversity, and agricultural resources. Working with a set of more than two dozen partners in a consultative process, Scenic Hudson utilized spatially explicit conservation planning software to model conserved land networks (or "solutions") that would most efficiently achieve specific targets for each goal. Starting with data on the existing network of protected lands—and with the software iterating choices of potential additions to this network 100 million times—Scenic Hudson was able to assess land units across the suite of criteria to determine potential solutions to meeting its multiple conservation goals. By running the software repeatedly, the Strategy points to particular units of high "irreplaceability"—that is, land units that almost always were included in the various potential solutions. The Strategy is designed to be easily updated—to incorporate newly conserved lands, new data on natural resources, and shifting priorities—allowing Scenic Hudson and its conservation partners to pursue efficient, timely, and coordinated action across the Hudson Valley landscape. This Strategy optimizes the value of conservation investments and aligns the investments of diverse partners to achieve the greatest collective impact.

Celsius, the widely recognized target of the Paris Climate Agreement.

Natural climate solutions represent a pivotal climate change strategy, and also benefit local communities through better water supply and filtration, flood buffering, soil health, air quality, public health, outdoor recreation, biodiversity protection, and ecological health. Forum speakers highlighted a number of examples where climate management of the landscape could provide significant economic benefits to local and regional economies.

Science Tools for Cross-Disciplinary Planning

The "explosion" of scientific data at scale is producing an enormous volume of information, and the risk is that we can end up with, "more science than we want, but not all that we need. Unless it is packaged to be useful, we just end up on massive overload," according to Dan Ashe, Director of the Association for Zoos and

Credit: Chesapeake Conservancy.

Stories from the field

Precision Conservation: Advancing Conservation through Technology

In the Chesapeake Bay Watershed, the Chesapeake Conservancy is leading efforts to accelerate conservation through the strategic application of technology. In collaboration with partners, the Conservancy is pioneering the production of high resolution land cover datasets that cover the entire six-state Chesapeake watershed. The resulting new land cover data is at a one-meter resolution, meaning this new classification contains 900 times the amount of information as the conventional 30-meter resolution land cover data—and is capable of being updated on a monthly basis as opposed to the five years that previously passed between updates. The Conservancy and partners like the Chesapeake Conservation Partnership, a collaborative aimed at recognizing the value of land conservation to the Chesapeake Bay restoration effort, are working to "democratize conservation" by making this powerful data openly available to all partners throughout the landscape. Such data opens the potential for precision conservation—targeting projects at the right place, the right scale, and the right time—to greatly accelerate efforts to restore and conserve the Chesapeake Bay landscape.

Aquariums and former Director of the U.S. Fish and Wildlife Service.

Landscape data must be available on issues practitioners care about, in forms they can use, and at high resolution to allow both landscape-scale perspective and site-specific planning and action. National Forum speakers from both the private and public sectors emphasized the need to rank conservation investments through a science-based prioritization process in order to optimize conservation gains with finite resources. User-friendly, accessible models and planning tools make that possible.

New information and tools also make the cross-disciplinary planning at the heart of landscape conservation possible. With recent scientific and technological advances, Spector explained:

> "We can now juggle more cross-disciplinary thoughts in our digital minds than ever before, including ecological, cultural, energy, recreation, economic subsistence, urban health, and more."

Programs like Zonation and NatureServe's Vista provide critical new information and analytical tools to practitioners wrestling with multiple, important values across their landscape. This is an exciting advance for the integrated landscape conservation approach.

Scenic Hudson's use of Marxan (see box), a leading systematic conservation planning tool, and the Chesapeake Conservancy's innovation on high-resolution land cover classification data across the Chesapeake Bay watershed (see box), are examples of mapping and planning tools that enable multiple-issue landscape conservation prioritization and regular recalibration. Development of cross-disciplinary landscape-scale science-based planning tools, and training for practitioners to use them, are on the rise but remain central needs in the field.

Researching and Mapping our Cultural Resources

Over the past several years, there has been a growing appreciation of the interconnectedness of culture and nature across our landscapes. At the 2016 IUCN

World Conservation Congress in Hawai'i, for example, there were 50 separate sessions on the "Nature Culture Journey."

However, there is currently no model that integrates inventory and assessment of cultural and natural heritage across the landscape and allows cross-region comparisons. This is a problem, explained National Forum speaker and Living Landscape Observer Editor Brenda Barrett, because: "What gets mapped gets saved."

Barrett underscored the need to develop methodologies to map and analyze cultural landscapes at a landscape scale. If we had information on cultural heritage comparable to what we have for natural heritage, a truly effective multidisciplinary approach would be possible. One innovative example is the National Park Service (NPS) mapping of "Indigenous cultural landscapes" in the Chesapeake region—landscapes that demonstrate aspects of the natural and cultural resources that supported American Indian lifeways and settlements in the early 17th century. This approach could be applied more broadly. The NPS Natural Heritage Areas Program could perhaps be strengthened and expanded and contribute to further developing this methodology. Outreach to indigenous peoples and local communities should be better recognized as central to understanding and conserving cultural heritage. Lands with cultural and other values, such as agricultural lands in New England and elsewhere, need more recognition for their significance as heritage. There are an increasing number of landscape conservation initiatives that are awakening to the benefits of connecting cultural and natural heritage for a far richer landscape story. Additional research, methodologies and implementation strategies would help people better articulate and safeguard that important story.

Science-Informed Landscape Conservation at the National Scale

Major advances in conservation science and planning tools show extraordinary promise for helping conserve broader, connected landscapes. Forum participants repeatedly affirmed the value of science and research in understanding how larger systems work, prioritizing conservation within larger landscapes, ensuring effective, dynamic conservation, addressing multiple values, defending decisions, and building support and knowledge for the considerable work remaining.

How do we build on this regional momentum and scale up to a focus on durable ecological health and cultural heritage at the national (and even continental) scale? The first national effort to focus on this objective was the Landscape Conservation Cooperative (LCC) Network, created in 2009 by Department of the Interior Secretarial Order. The goal was to bring state and federal agencies and other partners together to advance landscape-level conservation science and planning within 22 separate regions across the country and cross-border regions. In 2016, a National Academy of Sciences Report commended the important purpose and progress of the LCC Network. (See "Moving

The indigenous cultural landscape of Werowocomoco, Chesapeake Bay. Credit: National Park Service/Matt Rath.

Toward a National Landscape Conservation Policy" box in Chapter 5 for more background.) As of this writing, the LCC framework is being restructured as state fish and wildlife agencies, the U.S. Fish and Wildlife Service, and other private and public partners work to determine how best to continue this pivotal work.

Science and technology advances are helping us better understand the extraordinary value of landscapes, and are providing us with unprecedented tools to step up and conserve these irreplaceable resources at multiple scales. We can also now approach conservation planning in a far more cross-disciplinary way, with simultaneous consideration of the multiple values that we care about as a society. Now it is up to all of us to harness this science and knowledge and new collaborative energy to conserve our natural and cultural heritage at this critical time.

Stories from the field

Including Traditional Ecological Knowledge and a Holistic Approach in Landscape Conservation Planning

At the National Forum, Loren BirdRattler, Project Manager of the Agriculture Resource Management Plan of the Blackfeet Nation, spoke about Traditional Ecological Knowledge (TEK), holistic management planning, and the importance of the broader conservation community collaborating with tribes to achieve landscape conservation and to benefit from the knowledge and values they bring to the table. Tribes own a significant amount of land and can play a major role in both framing and achieving landscape conservation. As explained by BirdRattler: "In the Blackfeet Nation, we use traditional ecological knowledge and our core values to inform all facets of policy development. We have a real respect for all living things, and believe that everything really does have a voice and needs to be at the policy development table along with us. When we were having all of our pre-meetings on buffalo reintroduction, for example, we had an empty chair at the table for the buffalo to signify their presence and to remind us that we need to speak for them as well."

BirdRattler talked about the need to balance ecological and cultural conservation with other priority needs, including education and economic vitality. In closing, BirdRattler noted that the tribes are sovereign nations and so the opportunity to do pilot projects on reservations and then duplicate them in non-native areas is very ripe: "And so we invite you to have those conversations with us."

Credit: Melly Reuling, Center for Large Landscape Conservation.

Fall in the Downeast Lakes Community Forest. Credit: Downeast Lakes Land Trust.

Five-Year Benchmarks

1. Landscape conservation planning tools that utilize high-resolution data in user-friendly formats are widely available to practitioners; and practitioners have synthesized information resources, training, and technical support available to utilize these data and tools to achieve prioritized, multi-disciplinary conservation on the ground.

2. Additional data and tools are developed on landscape-scale information across multiple ecological, cultural, and social values in sufficiently high-resolution to inform on-the-ground actions.

3. An increasingly robust body of applied science quantifies and synthesizes information about the contribution of landscape conservation to ecosystem services, including in particular the value of landscape conservation as both a highly significant climate adaptation and mitigation strategy.

4. There is significant progress in developing analytic tools and improving outreach to indigenous and local populations to conserve cultural heritage and the nature-culture connections on the landscape.

5. A national framework is in place, with associated funding, in which local, state, and federal agencies with other nonprofit and academic partners are working collaboratively to build on the progress of state and federal agencies to date, including the former Landscape Conservation Cooperative Network, to advance science and planning at scale and to connect and conserve landscapes capable of sustaining natural and cultural resources for current and future generations.

Chapter 4

Investing in an Enduring Landscape Future

"We are getting more and more sophisticated at recognizing and monetizing the enormous value that healthy natural systems bring to our human communities–from water filtration and flood buffering to carbon storage and more. Now we have to build on that momentum and advance innovative new funding and finance mechanisms for both landscape conservation and the collaborative process that makes it all happen."

Ernest Cook, The Trust for Public Land

Introduction

There are two major challenges to funding conservation at the landscape scale. The first challenge tracks the traditional conservation field closely: access to acquisition and easement dollars. Despite broad bipartisan public support of conservation, significant private philanthropy, and important funding programs at the local, state, and federal levels, a significant gap remains between available conservation funding and critical conservation need. And available funding does not always have the landscape-scale focus that would better help shape priorities and catalyze the field.

The second major challenge is finding funding to support the collaborative efforts necessary to achieve landscape conservation. As discussed throughout this report, long-term and broad-based collaboration is driving the landscape conservation movement, and this framework and process takes time and resources. Analyses consistently point in particular to "backbone" organizational support for convening stakeholders and providing the institutional "glue" for advancing collaboration as a key ingredient to success. There are also key collaborative planning steps that are often underfunded. Investment in the basic infrastructure necessary for this rapidly growing field to flourish is not yet sufficient, particularly in the longer time frames necessary for this work.

Speakers and participants at the National Forum discussed these challenges and also promising advances in the field. In particular, with the growing recognition of quantifiable ecosystem services, private and public conservation investment in those values has emerged as a significant and rapidly growing source of conservation financing. These strategies, which rely on market-based mechanisms to achieve positive conservation outcomes as well as financial returns, complement traditional funding mechanisms and have enormous potential to help close the funding gap.

There are also important programs and significant potential in the traditional funding arena, and growing awareness of the value of funding collaboration support. This chapter provides an overview of landscape conservation funding and financing innovations and recommends five-year benchmarks.

Land has Quantifiable, Ecosystem Services Worthy of Private and Public Investment

Over time, people have gained a greater appreciation of the tangible ecosystem services that natural landscapes provide society, and that these services—including water quality and quantity, clean air, public health, mitigation of climate impacts including flooding, wildfire and drought—are relatively low cost compared

to alternative solutions. Increasingly, natural resource economists are quantifying those values. And that in turn allows us to translate those ecosystem benefits and avoided risks into money that advances conservation in a timely way. Some examples of quantified ecosystem values highlighted at the Forum:

1. Wetlands are nature's sponges

Coastal wetlands slow down storm surges, physically impeding water from coming onshore. Freshwater wetlands, lining rivers further inland, soak up torrential rain. For example, research estimates that during Hurricane Sandy in 2012, intact coastal wetland systems helped absorb the impact of the storm and saved New York, New Jersey, Connecticut, and the other nine coastal states affected more than $625 million in direct flood damages.

2. Tree cover improves water quality and public health

An October 2017 article in *Nature Communications* drew on data from 35 countries around the world to document that higher upstream watershed tree cover is associated with lower incidence of diarrheal disease in rural areas. The authors found that the effect of an increase in tree cover of 30% was found to be similar to the effect of improved sanitation: "We conclude that maintaining natural capital within watersheds can be an important public health investment, especially for populations with low levels of built capital."

3. Conserved lands provide direct human health benefits

Spencer Meyer and his collaborators at Yale University's Center for Business and the Environment and the School of Public Health have documented how residents with ready access to open space and conserved lands across 13 towns around New Haven have lower rates of chronic heart-related diseases, such as hypertension, diabetes, and heart disease. The lower rates of these diseases associated with access to open space amounts to a savings of approximately $37 million per year in avoided healthcare costs for the New Haven region.

Investment in Ecosystem Services Should be Further Harnessed

The increasing ability to value our natural landscapes in economic terms is an enormously important advance for the field, and groups like the Natural Capital Project with their signature tool InVEST are working hard to move the needle further. Today, there is an almost 50% yearly growth in private conservation investment—mostly for food and fiber, but also for habitat and water quality. How do we better capture this exponential growth for permanent landscape conservation gain? A number of examples emerged at the Forum:

1. Green bonds

The U.S. green bond market impressively grew from $700 million in 2013 to $12.6 billion in 2016. This is not a new source of funds for conservation and the environment. Rather, issuers of bonds for water quality projects, land conservation, and other "green" purposes have recognized there are investors that are particularly eager to buy bonds that finance environmental benefits. When these bonds are packaged and sold separately with a "green" label, they sell quickly to a broad class of buyers. The popularity of these bonds sends a positive signal to the financial markets that the appetite among investors for environmentally responsible products is growing.

2. Water-focused markets

Water funds—generally involving an extra fee charged to ratepayers to fund conservation of watersheds as a lower-cost alternative to new treatment plants or other physical infrastructure—are on the rise. Today,

Nanticoke River wetlands. Credit: Chesapeake Conservancy.

Public opinion surveys show that people readily understand the link between protection of their watersheds and the quality and safety of the water they drink. And they are more willing to support investments in land conservation to protect their drinking water supply than for any other purpose. But most people do not know where their water comes from. Educating the public about the water quality linkage can create strong support for landscape conservation efforts, including water utility fees and ballot measures that authorize state and local government bonds, fees, and taxes.


Credit: Greg Wathen.

there are 25 robust global water funds and 40 in development, and they will drive billions of dollars towards forest conservation and restoration over time. Such vehicles are getting increasingly sophisticated and multi-value in approach, as illustrated by forest resilience bonds in the western United States. In this public-private partnership, investors pay for high-priority forest restoration and then get paid back by the beneficiaries: primarily the water utility (for clean and abundant water supply), the U.S. Forest Service (for decreased fire risk), and in some cases state and local governments (for avoided fire suppression costs, avoided carbon emissions, protected communities, and job creation).

3. Climate markets

Most of the world recognizes that we must stop increasing the concentration of greenhouse gases in the atmosphere to avoid the catastrophic impacts of global warming. Clearly, reducing greenhouse gas emissions is central. But there is growing recognition that the other side of the equation—greenhouse gas absorption—is also vitally important. The only proven "technology" for capturing and sequestering carbon dioxide at scale is photosynthesis. Therefore, protecting the existing capacity of the landscape to take carbon dioxide out of the air through a variety of conservation strategies is critically important. Conservation, restoration, reforestation, and improved management of forests and agriculture are all key. This has enormous implications for landscape conservation and related investments in forests, urban trees, and other land-based strategies to mitigate greenhouse gas emissions. Imagine, for example, the impact on conservation if a state were to adopt a policy for "no net loss" of trees. That time is coming.

More than a dozen states have pledged to make dramatic reductions in greenhouse gas emissions and to embrace "natural and working lands" strategies that will help to offset and absorb emissions. Some of them are also considering carbon taxes that can simultaneously depress demand for carbon-based fuels and provide new revenue for landscape conservation and restoration. Others are considering cap-and-trade legislation that will create carbon markets that can be used to finance conservation.

For example, California has adopted a greenhouse gas cap-and-trade program that generates significant new revenue through the sale of emissions "allowances" and recognizes the importance of forestland conservation and improved management by allowing landscape conservation to enter into the trading system as an offset to emissions.

The costs of verifying carbon sequestration potential and monitoring compliance over 100 years, as the

Stories from the field

Capturing Carbon Dollars for Landscape Conservation

In the inland eastern corner of Maine, the Downeast Lakes Land Trust (DLLT) has recognized the climate value of landscape conservation and has innovated around utilizing forest management projects as a means of generating revenue through carbon offset markets. In 2010, DLLT registered a portion of the Farm Cove Community Forest (19,000 acres out of the nearly 34,000-acre forest) with the Climate Action Reserve as the first "Improved Forest Management" carbon project outside of the state of California. To qualify for offsets, DLLT has agreed to follow the California Air Resources Board's Compliance Offset Protocol for U.S. Forests, which requires forest management projects to maintain or increase forest carbon stocks above the expected levels under industry standards of forest management in the region for 100 years—objectives that were compatible with the DLLT's existing stewardship actions and stocking plans. The 200,000 offset credits from this project sold through the California Air Resources Board for more than $2 million in 2013. Following this initial success, DLLT worked with the Lyme Timber Company to create a second "Improved Forest Management" project on a 22,000-acre Lyme Timber-owned forest in Grand Lake Stream Plantation, which generated offsets of nearly 600,000 metric tons of carbon dioxide equivalents that were again sold through the California Air Resources Board. This innovative financing mechanism helped DLLT purchase the 22,000 Grand Lake Stream property from Lyme Timber. Approximately $4 million out of the $19.4 million purchase price came from the sale of the carbon offsets. The newly acquired property and the Farm Cove Community Forest now combine to form the more than 55,000-acre Downeast Lakes Community Forest. According to DLLT: "Carbon offsets enabled a small, rural community land trust to conserve a large amount of land, protecting it from fragmentation and conversion to other uses. The project guarantees environmental benefits while creating a revenue stream for conservatively managed timberlands."

Downeast Lakes Community Forest. Credit: Downeast Lakes Land Trust.

California program requires, are daunting. That alone limits the applicability of this type of carbon market to the landscape. Despite the challenges, the opportunity to access the California market—and potentially to expand that market to other states—should be seized by landscape conservation practitioners where possible. An early example from the Lyme Timber Company and Downeast Lakes Land Trust highlights the opportunity (see box).

4. Coastal land and hazard mitigation funding

One area of emerging financial and conservation interest is the first meter or two of coastline as sea levels rise and the need for future-focused resilient coastal habitat grows. There is almost a trillion dollars of real estate in this two-meter coastal contour in the U.S. alone. Structured correctly, coastal buyouts will drive billions of dollars into land conservation on the coastal plain over time, helping all species (including human communities) adapt to a changing world.

Some conservation interests are giving special attention to coastal policy and funding—as well as hazard mitigation more broadly—through the Federal Emergency Management Agency (FEMA). Through their efforts, FEMA has become far more cognizant of the significance of protecting the natural world for its economically quantifiable reduction in the risks of floods, wildfires and other hazards—and the consequent reduction in FEMA payments for foods and disasters.

For example, FEMA now recognizes that natural areas along the seacoast and inland waterways buffer communities from high tides, storm surge and riverine floods. By protecting those buffers, a community can save property owners a very significant amount of money by reducing their costs of federal flood insurance. Land conservation is credited in the Community Rating System that FEMA uses to set flood insurance rates.

Natural Resource-Based Markets are Important for Landscape Conservation

Private lands are a major part of the landscape conservation equation. Six out of every 10 acres in the United States are in private hands. East of the Mississippi, that number rises to nine out of every ten acres. Effective conservation at the landscape scale cannot happen without the help of private landowners.

New high-resolution data sets (see Chapter 3 for more information) are allowing practitioners to better analyze the conservation values of specific rangeland, farmland, and forestland. Practitioners can also look more closely at the markets that make those private

"Why would The Conservation Fund lend money to a farmers market in Boston? Because it creates a value chain that allows the protection of that ex-urban agricultural landscape. Without the farmers market to sell the products, you can't save the landscape."

—Joe Hankins, The Conservation Fund

Boston Public Market. Credit: Chuck Choi, courtesy of The Conservation Fund.

lands viable—markets that allow those lands to remain in the natural resource-based economy rather than be subdivided and developed. This in turn is influencing landscape conservation investment.

For example, at the National Forum, Joe Hankins of The Conservation Fund highlighted his organization's work to conserve agriculture in Southern New England through farmland acquisition loans—but also through investment in the new Boston Public Market that provides an important urban venue for the regional produce from these farms. As explained by Hankins, "Why would The Conservation Fund lend money to a farmers market in Boston? Because it creates a value chain that allows the protection of that ex-urban agricultural landscape. Without the farmers market to sell the products, you can't save the landscape."

Traditional Conservation Funding Mechanisms Remain Critically Important

Innovations in conservation finance are not a replacement for traditional conservation funding. Instead, they are an opportunity to further leverage those traditional sources and help bridge the considerable gap between conservation need and current funding availability.

This is important to remember as some important conservation funding programs in the U.S. are currently experiencing funding declines or increasing uncertainty, including the flagship Land and Water Conservation Fund.

On the other hand, some conservation programs have been gaining ground—both in dollar amounts and in legal protection. At the federal level, for example, the Readiness and Environmental Integration (REPI) program of the Department of Defense reached record levels of appropriations in the federal Fiscal Year 2018 budget. Among the states, some state constitutions have actually been modified to guarantee permanent or long-term protection to conservation funding accounts. For example, after years of depending on the uncertainties of required legislative and voter approval of occasional "green acres" general obligation bonds, New Jersey secured legislative and voter approval of a constitutional amendment that dedicates a substantial stream of revenue to the state's conservation programs.

Local Conservation Programs Enjoy Strong Bipartisan Support

Local conservation funding programs typically enjoy bipartisan support from legislators, and they have long been very popular with voters. According to The Trust for Public Land's LandVote database, more than 75% of all ballot measures asking voters to approve new taxes and government spending for land conservation have been successful. As noted by Ernest Cook at the National Forum, more than $12.5 billion dollars in local land conservation measures were approved by voters in 2016–2017 alone.

Tree planting in Rouge Park, Detroit. Credit: Ivan LaBianca, courtesy of The Conservation Fund.

Although local funding may not sound "landscape scale," unchecked local development patterns can account for considerable habitat fragmentation and connectivity loss, as well as eroding community vitality and sense of place. Moreover, the largest source of public funding for land conservation in America is actually local government. Since 2000, for example, Massachusetts has allowed local governments to adopt—provided voters approve it—a special property tax levy that is used in part for land conservation. Half of the state's cities and towns have now succeeded in securing this funding source, which has generated hundreds of millions of dollars for land conservation—far more than the state and federal government have spent. Every landscape conservation initiative strategy should include research into the potential for local government funding.

Private philanthropy from individuals and foundations also remains hugely important for landscape conservation and has the potential to grow significantly as funders increasingly recognize the myriad ecosystem benefits of our natural landscapes—including their pivotal role in both climate resilience and mitigation.

Funding Collaboration is Central to Landscape Conservation Success

Dynamic, community-grounded collaborative initiatives are increasingly driving the landscape conservation movement. As noted elsewhere in this report, this trend is significant and growing: the Network for Landscape Conservation's 2017 national survey of 132 initiatives found that 75% operate as voluntary collaborations, and that 90% of surveyed initiatives were founded since 1990.

What makes these partnerships succeed? In her keynote address, Joanne Marchetta identified backbone organizational support as a pivotal ingredient—having someone who wakes up every day focused on the partnership and provides the "glue" and momentum to move a group of busy people and the entire collaborative venture forward. Backbone support was first identified in 2011 by the Stanford Social Innovation Review as one of the five key elements of collective impact success:

> "Creating and managing collective impact requires a separate organization and staff with a very specific set of skills to serve as the backbone for the entire initiative. Coordination takes time, and none of the participating organizations has any to spare. The expectation that collaboration can occur without a supporting infrastructure is one of the most frequent reasons why it fails."

This has been confirmed elsewhere in the literature and across the field. Backbone organizational support is not only an indicator of survival and success; analyses suggest it can play a significant role in the time it takes for an initiative to build momentum and reach the land protection stage.

Despite the critical importance of this function, lack of funding for backbone support was identified at the National Forum and in the NLC Survey as one of the top challenges practitioners face (see the "Five Major Challenges" box in Chapter 1). A gap clearly exists here that if addressed could have a significant impact on the field.

An extraordinary, transformative moment in conservation is currently underway as people across the country are stepping forward to work together to achieve significant, holistic, and lasting conservation across the landscape. Supporting this momentum and the basic infrastructure necessary to help it succeed is essential. Conservation funding should evolve and expand to fit the moment at hand.

> "If we are going to move the needle forward, we need to look at the big bets and figure out how to make them work. I think about states like Missouri, Florida, Tennessee, with dedicated state funding for conservation. Every state should have dedicated state funding. That's a big bet. Getting bipartisan support for conservation funding in Congress. That's a big bet."
>
> —Jimmy Bullock, Resource Management Service, LLC

Grizzly Bear, Waterfall Creek, Chichagof Island, Alaska. Credit: Kelly Compton.

Five-Year Benchmarks

1. The monetary value of the myriad ecosystem services provided by our natural landscapes are widely recognized, particularly in the areas of climate, public health, avoided risk/disaster prevention, and long-term savings compared to built-infrastructure solutions.

2. Innovative market-based financial instruments based on ecosystem services are widely understood and utilized to achieve durable landscape conservation.

3. Increased funding at all levels of government is dedicated to conserving our landscapes and the ecological, cultural, and social values they provide, including their significant role in climate mitigation and adaptation.

4. Increased private philanthropy is dedicated to conserving our landscapes and the ecological, cultural, and social values they provide, including their significant role in climate mitigation and adaptation.

5. Increased public and private funding is invested in supporting and sustaining the collaborative processes central to landscape conservation success, including particularly "backbone" organizational support.

Chapter 5

Aligning Policy to Support Landscape Conservation

"How do we prioritize conservation, especially with limited resources–money and staff? How do we move from random acts to high priority results? The science to accomplish this has evolved, and we know now that the biggest bang for the buck is working collaboratively at the landscape scale. It is the most effective and efficient way to accomplish conservation. Part of the story is that we have evolved as agencies, and this approach simply makes the most sense."

Sarah Parker Pauley, Missouri Department of Conservation

Introduction

Government policies and programs are critical to conserving America's cultural and natural heritage, and there is a long and successful history of bipartisan support for conservation at the local, state, and federal levels of government in the United States.

However, the rich array of conservation policies and programs enacted to date is not sufficient to combat the escalating pressures on imperiled lands and waters—particularly at the landscape scale, or to address conservation in a manner that is less siloed and more integrated with the multiple values we care about as a society.

Most notably, traditional conservation has been conducted agency by agency, issue by issue, and ownership by ownership. As a recent National Academy of Sciences Report noted, "Implementing landscape approaches in the United States is challenging because of the multitude of federal, state, local, and tribal jurisdictions, as well as numerous private landholders and stakeholders."

With the shift to landscape conservation, agency policies and activities need to focus more on achieving goals collaboratively across ownerships, jurisdictions, and issues, and at multiple spatial scales over many years. Such a fundamental policy transition means both re-examining current policies and programs and creating new ones. At the National Forum, speakers and participants discussed these major public policy needs and challenges and offered specific principles and strategies for advancing conservation policy at the landscape scale.

This chapter focuses on the major landscape conservation policy principles highlighted at the National Forum, and offers five-year benchmarks for success organized by local, state, and federal/tribal policy.

Landscape Conservation Builds on Existing Conservation Programs

There are many effective land and cultural heritage conservation programs that should be defended, updated and/or better funded to meet landscape conservation needs. Such programs include environmental protection legislation such as the Clean Water Act and the Endangered Species Act, the Conservation Title of the Farm Bill, the Natural Heritage Areas Program, the North American Wetlands Conservation Act, the Land and Water Conservation Fund, and many others.

As one Forum speaker noted, "New creative approaches are needed, but let us not forget the many bedrock programs that have long advanced protection of land,

Moving Toward a National Landscape Conservation Policy

The first effort to address conservation science and planning at a coordinated national scale, knitting local, state, and federal efforts together, was the establishment of the Landscape Conservation Cooperative (LCC) Network by Department of the Interior Secretarial Order in 2009. Its mission was to ensure, "Landscapes capable of sustaining natural and cultural resources for current and future generations."

The Network was composed of 22 self-directed and non-regulatory cooperatives focused on providing science capacity and technical expertise for meeting shared natural and cultural resource priorities. Each LCC brought together federal, state, and local governments along with Tribes and First Nations, non-governmental organizations, universities, and interested public and private organizations to identify shared priorities, leverage resources, share scientific expertise, fill needed science gaps, identify best practices, and prevent duplication of efforts through coordinated conservation planning and design. In its 2016 review of the program, the National Academy of Sciences applauded this policy direction, noting:

> "The most significant conservation challenges faced in the United States need to be confronted at a large spatial scale that transcends administrative and geopolitical boundaries and engages a diversity of stakeholders across federal, state, local, and private land ownerships. . . . The Committee concludes that the nation needs to take a landscape approach to conservation."

As of this writing, the LCC Network has been discontinued, but U.S. Fish and Wildlife Service support and funding continue for the core mission of safeguarding America's natural heritage through conservation science and planning. Important efforts are underway by state fish and wildlife agencies with the U.S. Fish and Wildlife Service and other public and private partners to determine how to continue this pivotal work in the most inclusive and effective way possible.

water, biodiversity, recreation, and culture in this country."

Landscape Conservation Requires Reliable, Long-Term Sources of Funding

Landscape conservation takes a long time, as it is generally pieced together over decades. Reliable sources of funding for these efforts is a key ingredient for success. To the extent possible, funding should be predictable and flexible, allowing for the kind of creative, participatory long-term planning that is necessary to achieve conservation at the landscape scale.

The Land and Water Conservation Fund, if administered and funded in accordance with its original statutory intent, is an example of reliable funding at the federal level, although this promise has never been fully realized.

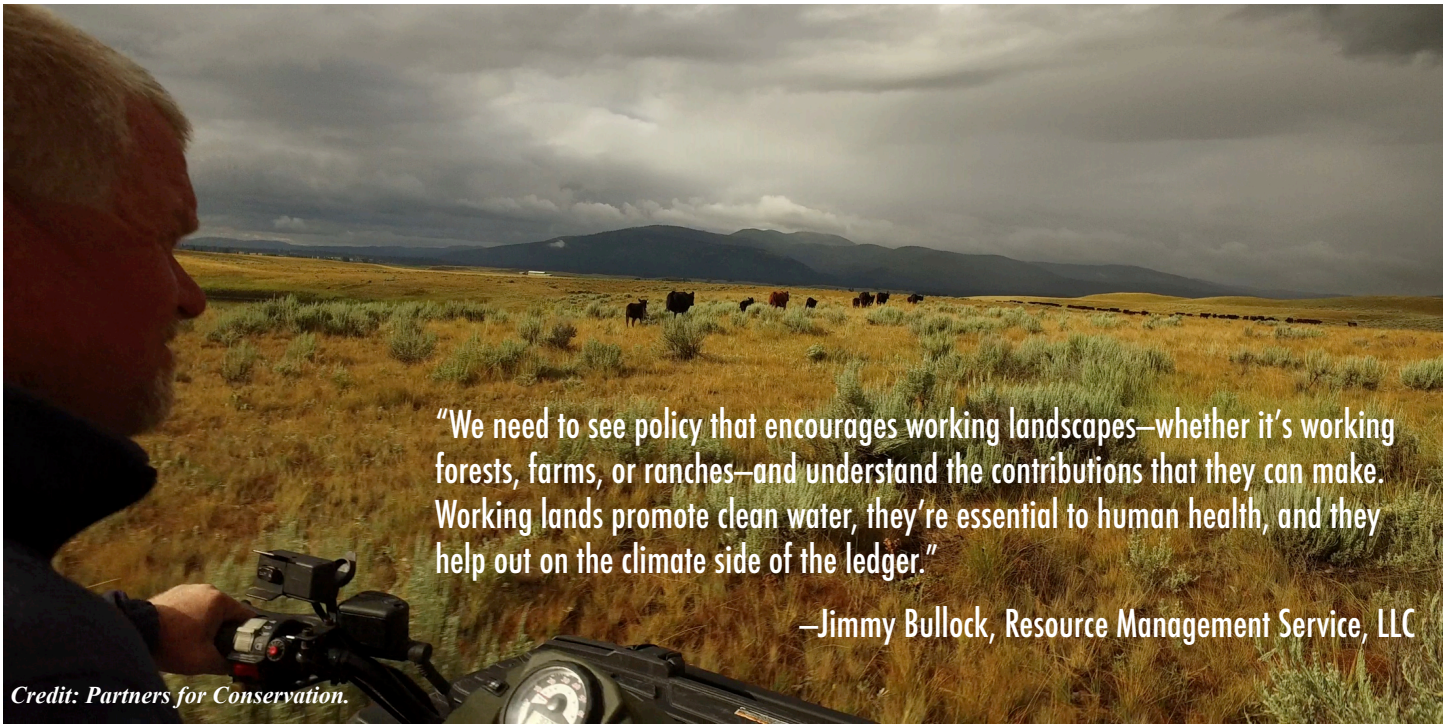
The need for reliable funding exists at the state and local levels as well. "Dedicated state funding and strong policies supporting landscape conservation are a must," noted one speaker in a sentiment echoed throughout the Forum. See more on landscape conservation funding in Chapter 4.

Landscape Conservation Depends on Research, Data, and Planning Tools at Scale

The collaborative approach to decision-making about landscapes requires that stakeholders share a common

"I describe this as a time of a lot of 'riches' when it comes to working collaboratively on landscapes. There are still huge opportunities to go further in sharing information, sharing expertise, and aiming higher for the types of changes and outcomes we want to see in our landscapes."

—Leslie Weldon, U.S. Forest Service



Credit: Partners for Conservation.

base of knowledge and also have the tools for developing joint strategies. Planning at multiple scales and addressing large-scale issues such as wildfire, floods, watersheds, cultural landscapes, migratory routes, and climate change is complex and requires cutting-edge conservation science and research to model alternative courses of action. Government policy affects how this science and research is produced and made available to practitioners, such as through the state fish and wildlife agencies or federal agencies including the U.S. Geological Survey, NASA, and the U.S. Fish and Wildlife Service.

States, local governments, and NGO and academic partners have made great strides in this arena, but progress has been uneven and funding is always a challenge. See box on moving towards a national landscape conservation policy.

Landscape Conservation Requires Extensive Collaboration

Some government programs and policies have been expressly created to encourage collaboration at the landscape or watershed scale, such as the National Estuary Program (NEP), Fish and Wildlife Joint Ventures, and the Regional Conservation Partnership Program (RCPP) in the U.S. Department of Agriculture. With modest funding, such programs provide the glue that make collaborations work. A significant aspect of some of these programs (such as RCPP) is competition for funding among landscapes, which can help bring stakeholders together.

At the Forum, speakers from state and federal agencies and the Tahoe Regional Planning Agency provided compelling examples of how evolving from siloed approaches to more collaborative approaches has helped agencies achieve their statutory mandates and reap tangible conservation benefits—including far more effective conservation with limited agency dollars and staff.

Private Lands Play an Important Role in Landscape Conservation

Well-managed private lands provide significant biodiversity, connectivity, water resources, cultural identity, and carbon storage benefits and are an important component of functionally connected landscapes. Policies that include incentives for restoration, improved management (to achieve specific benefits like carbon retention), and enduring conservation of these lands will achieve important public policy benefits.

As Jimmy Bullock, from the Resource Management Service, noted at the National Forum: "We need to see policy that encourages working landscapes—whether

it's working forests, farms, or ranches—and understand the contributions that they can make. Working lands promote clean water, they're essential to human health, and they help out on the climate side of the ledger."

The USDA Forest Legacy Program is an important example of a federal funding source that secures conservation easements on private, working forestlands. The Farm Bill also provides important funding for sound management and conservation of farmlands.

New Constituencies and Partners are Important for Landscape Conservation

There are many industries and agencies that are important to conservation and land use planning across the broader landscape, but that are not always associated with conservation planning because of the traditional protected areas focus. Forum participants emphasized the need to engage these constituencies regarding how, through collaboration, landscape conservation policy outcomes can be achieved.

As one Forum speaker noted, "Don't overlook landscapes that are too big, too everyday, too lived in." Conservation today is about weaving natural and cultural heritage and health into the entire, broader landscape. And that broader patchwork of landscapes is made up of many stakeholders, each one with a role to play in the future of conservation success. Policies for transportation, energy infrastructure, economic development, natural hazard protection, cultural heritage conservation, and local land use planning all affect landscape conservation. Agencies and interests involved in these sectors should be engaged and involved in developing policies that help meet long-term, integrated landscape conservation objectives.

Landscape Conservation, Restoration, and Management are Key Climate Strategies

The only proven "technology" for large-scale sequestration of greenhouse gases is the landscape of forests, wetlands, grasslands, farms, parks, urban trees, and other greenspace areas. Forum speakers and participants emphasized how policies to address the threat of climate change should support conservation of lands that sequester carbon; restoration of lands to increase their sequestration capacity; and management

Stories from the field

Cascade Crossroads: Partnering with the Transportation Sector

As practitioners grapple with the challenges of sustaining functional, connected ecosystems and wildlife populations in an increasingly fragmented world, cross-sector partnerships are emerging around roadway infrastructure improvement projects. *Cascade Crossroads*, a 30-minute documentary film, captures the powerful story of how innovative thinking in this realm is leading to the construction of North America's largest wildlife crossings project as part of a major infrastructure improvement along Interstate 90 at Snoqualmie Pass in Washington's Cascade Mountains. The potential to partner with the transportation sector in such substantive ways represents an enormous opportunity for improving connectivity across landscapes, and increasingly practitioners are working to advance policy through such work. For instance, the Center for Large Landscape Conservation and the Western Transportation Institute–Montana State University prepared a recent report, on behalf of the Federal Highway Administration and the Western Governors' Association, that captures best practices and opportunities for expanding the use of wildlife data during transportation planning and projects. Given that we as a nation travel more than eight billion miles in our cars every single day, transportation partnerships form an increasingly critical piece of the habitat connectivity puzzle.

of forests, farms and ranchlands to enhance their ability to absorb carbon and improve their productivity. As the impacts of climate change become more evident and popular pressure increases for an effective response, proponents of conservation should advance the benefits of landscape-scale action. Policy action at any level—federal, state or local—should include an analysis of the current carbon sequestration function of the landscape and a commitment to take action to avoid any loss of function, or better yet, to enhance that capacity.

Today we understand, better than ever before, the immense value of the landscapes that enrich every community and the country as a whole. And we know what we will lose—ecologically, economically, culturally, historically, spiritually, aesthetically, and health-wise—if we let our natural and cultural heritage slip away. Every level of government has an important role to play in stepping up efforts to enact and implement policies to conserve and connect our irreplaceable landscapes. The history of American environmental protection is bipartisan. Although political winds may create short-term gains and losses, overall the American electorate has been firmly on the side of conserving our natural and cultural resources and leaving our grandchildren the same precious heritage that our grandparents left to us.

"We cannot meet the Paris Accord climate goals without using land as part of the solution. That's an incredible opportunity. We can mitigate climate change, make our lands more resilient on a cost-effective basis, and put dollars back in landowner pockets."

–Sacha Spector, Doris Duke Charitable Foundation

Credit: Resource Management Service, LLC.

Ward Marsh Wildlife Management Area, Vermont. Credit: Dylan Oleary/The Nature Conservancy.

Five-Year Benchmarks

At Local and Municipal Government Levels

1. Community leaders understand and promote the practical importance of landscape conservation in producing tangible ecosystem services, including reduction of exposure to natural hazards.

2. County and municipal governments are aligned with appropriate state, federal and non-governmental programs to support landscape conservation, including not building in flood, fire, climate resilient, and habitat connectivity zones.

3. Associations of local government (for example, National Association of Counties, American Planning Association, regional planning and transportation agencies) are actively supporting landscape conservation and advancing model state legislation.

4. Municipal bonds for conservation are widely proposed and implemented as a key landscape conservation strategy.

5. Children of all backgrounds, as citizens and future policymakers, are educated in their urban or rural communities about the natural world around them and the many essential ecosystem services that broader landscapes provide.

Southwest Virginia Highlands. Credit: Greg Wathen.

At State Government Level

1. Landscape conservation objectives are incorporated into existing state policies and programs—in traditional conservation programs like State Wildlife Action Plans and in other key program areas such as transportation and energy—to both advance on-the-ground goals and improve collaboration across state agencies.

2. Prioritized state conservation strategies incorporate robust conservation science and planning tools to conserve ecosystem health and cultural heritage at multiple scales.

3. State policies and funding also support landscape conservation at the local level, including new incentives for local governments to work within and across their boundaries to achieve enduring conservation at the landscape scale.

4. States have significant dedicated funding for conservation through fees (e.g., license plate programs), taxes (e.g., real estate transfer tax), bonds, and other long-term sources of funding—the goal is all 50 states and U.S. territories.

5. States adopt policies that incentivize carbon retention through a price on carbon, no net loss policies, or other incentives—recognizing the critical value of our natural landscapes for both climate resilience and their ability to store carbon from the atmosphere and serve as a highly significant climate mitigation strategy.

Glacier National Park. Credit: National Park Service/Jacob W. Frank.

At Federal and Tribal Government Levels

1. Current land, air, water, and cultural protection and conservation statutes and funding are sustained and increased, and additional landscape conservation elements are incorporated into federal policies and programs—both within and across natural resource agencies and agencies such as Department of Transportation, Federal Emergency Management Agency (FEMA), Department of Defense (DOD), and Department of Housing and Urban Development (HUD).

2. Federal agencies have been directed to manage for ecological connectivity and also to use the mitigation hierarchy on federal lands and waters.

3. The collaborative approach to landscape conservation is expanded through federal incentives and programs that support people and organizations working together across boundaries (for example, through the National Estuary Program, Natural Heritage Areas Program, and Regional Conservation Partnership Program in the Farm Bill).

4. Private landowners (including large individual and corporate landholders) have more opportunities to participate in federal conservation programs that incentivize land management, restoration, and conservation to sustain or enhance ecosystem benefits and achieve durable landscape conservation.

5. Tribal and federal conservation programs are better coordinated and integrated, with shared data sets and increased use of Traditional Ecological Knowledge in landscape conservation planning, allowing for improved collaboration among Tribes and public and private partners.

Closing Thoughts

The National Forum was a remarkable gathering of landscape conservation practitioners across the country and continent. It reflected how far landscape conservation has come over the past few decades and even the past few years. The era of isolated innovation—of inventing landscape conservation from whole cloth in every instance—is behind us. People are increasingly connecting with one another across landscapes, sharing lessons learned, and harnessing those insights on behalf of their own communities and regions. It is our hope that this report captures the incredible energy of the Forum—and fosters further advances and innovations in the field as people work in their own way toward the Report's benchmarks and toward enduring conservation in the landscapes they call home.

Progress will continue to build from a broad range of practices and people in landscapes across North America. As Bob Bendick, Director of The Nature Conservancy's Gulf of Mexico Program and former Co-Chair of the Network for Landscape Conservation, concluded at the National Forum:

"The conservation and management of healthy, connected landscapes is an exciting but ambitious and complex enterprise. For such efforts to be successful, they need reliable sources of funding, broad collaboration, narratives that inspire people, supportive policies, and backbone leadership. If we can develop and use these tools effectively, you—and determined and persistent local leadership across the entire country—will make a profound difference in the fate of America's landscapes."

This is a transformative moment. Today, people hold in their hands the potential for a North American landscape with healthy connections across nature, culture, and community. Now it is up to individuals, local communities, and broader regions to seize the opportunity of landscape conservation and leave a proud and enduring heritage for future generations.

"The conservation and management of healthy, connected landscapes is an exciting but ambitious and complex enterprise. For such efforts to be successful, they need reliable sources of funding, broad collaboration, narratives that inspire people, supportive policies, and backbone leadership. If we can develop and use these tools effectively, you—and determined and persistent local leadership across the entire country—will make a profound difference in the fate of America's landscapes."

—Bob Bendick, The Nature Conservancy Gulf of Mexico Program

Mobile Bay, Alabama.

"On the Gulf Coast, in Mobile Bay, there are recurring swarms of fish and eels and crabs that cram together in a roiling, boiling mass. They call it a jubilee.

A Network for Landscape Conservation meeting has the elements of a jubilee. For the book I'm writing—50 by '50, about protecting half of North America by 2050 to stave off the kind of mass-extinction crisis that killed the dinosaurs—I've been to both the Network's inaugural National Workshop in Washington, DC in 2014 and its follow-up National Forum last fall in West Virginia. Both times I was swept up in the cheerful, urgent hubbub of people, many of whom have never met before, thinkers and do-ers both, all of whom have much to share about shoring up the future of the biosphere and not nearly enough time to say it all before the next session starts. City folk and those from deep in the back country and those from the places in between—and everyone looking for new partners because so much is at stake. The hum that pervades these conversations is the sound of minds stretching to solve problems that arc across a century and a continent.

In Mobile Bay people gather by the shore during a jubilee with buckets—the fishing's that easy. It's the same feeling a writer has at a Network gathering, so many inspiring sources in one spot. But this, like all jubilees, is temporary. What counts is what happens when everyone goes home, taking with them more of the sense that by acting together people around the continent are creating a new network, a lasting framework of landscapes with room enough for all species."

Tony Hiss, author

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Little Round Top, Gettysburg. Credit: Greg Wathen.

National Forum on Landscape Conservation, Shepherdstown, WV. Credit: Jonathan Peterson, Network for Landscape Conservation.

Keynote speakers at the National Forum on Landscape Conservation:

Robert Bendick, *Director, Gulf of Mexico Program, The Nature Conservancy*

Joanne Marchetta, *Executive Director, Tahoe Regional Planning Agency*

Sacha Spector, *Program Director for the Environment, Doris Duke Charitable Foundation*

Leslie Weldon, *Deputy Chief, National Forest System, U.S. Forest Service*

Plenary panel speakers and moderators at the National Forum on Landscape Conservation:

Mark Anderson, Director of Conservation Science: Eastern U.S., The Nature Conservancy
Dan Ashe, President & CEO, Association of Zoos and Aquariums
Brenda Barrett, Editor, Living Landscape Observer
Emily Bateson, Coordinator, Network for Landscape Conservation
Merrill Beyeler, Beyeler Ranch, Central Idaho Rangelands Network, and High Divide Collaborative
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Madison County, Virginia. Credit: Will Parson, Chesapeake Bay Program, courtesy of the Piedmont Environmental Council.

"The Network is not some small cadre of leaders meeting around a table, it's not a couple of organizations or agencies overseeing an agenda. It's a community, it's all of us. The Network is collective wisdom, it's the collective experience. You are the Network for Landscape Conservation; we all are. So let's–all of us together–dig in and push forward, to figure out where we as a community need to go and what we as a community can do to conserve and connect our irreplaceable landscapes while we still have the chance."

Network for Landscape
CONSERVATION