

# Land Management Restrictions and Options for Change in Perpetual Conservation Easements

Adena Rissman · Menka Bihari · Christopher Hamilton ·  
Christina Locke · David Lowenstein ·  
Melissa Motew · Jessica Price · Robert Smail

Received: 20 March 2012 / Accepted: 22 May 2013 / Published online: 20 June 2013  
© Springer Science+Business Media New York 2013

**Abstract** Conservation organizations rely on conservation easements for diverse purposes, including protection of species and natural communities, working forests, and open space. This research investigated how perpetual conservation easements incorporated property rights, responsibilities, and options for change over time in land management. We compared 34 conservation easements held by one federal, three state, and four nonprofit organizations in Wisconsin. They incorporated six mechanisms for ongoing land management decision-making: management plans (74 %), modifications to permitted landowner uses with discretionary consent (65 %), amendment clauses (53 %), easement holder rights to conduct land management (50 %), reference to laws or policies as compliance terms (47 %), and conditional use permits (12 %). Easements with purposes to protect species and natural communities had more ecological monitoring rights, organizational control over land management, and mechanisms for change than easements with general open space purposes. Forestry purposes were associated with mechanisms for change but not necessarily with ecological monitoring rights or organizational control over land management. The Natural Resources Conservation Service-Wetland Reserve Program had a particularly consistent approach with high control over land use and some discretion to modify uses through permits.

Conservation staff perceived a need to respond to changing social and ecological conditions but were divided on whether climate change was likely to negatively impact their conservation easements. Many conservation easements involved significant constraints on easement holders' options for altering land management to achieve conservation purposes over time. This study suggests the need for greater attention to easement drafting, monitoring, and ongoing decision processes to ensure the public benefits of land conservation in changing landscapes.

**Keywords** Ecosystem management · Environmental policy · Land trusts · Private land conservation · Working forests · Conservation easements

## Introduction

Conservation organizations create conservation easements to protect scenic open space, productive forests and rangelands, and plant and wildlife habitat on private lands. Unlike other land use controls like zoning and tax incentives, conservation easements are generally intended to protect land forever (Gustanski and Squires 2000; McLaughlin 2004). However, the perpetual nature of conservation easements raises challenges for land management, which may require ongoing decision-making in changing landscapes to achieve conservation goals (Merenlender and others 2004; Rissman 2010). This study examines how conservation easements held by government agencies and nonprofit land trusts incorporate different options for changing land management and whether organizational staff perceive the need for change on conservation easement properties.

A conservation easement is a voluntary, typically permanent legal agreement between a landowner and a land

---

Adena Rissman and Menka Bihari are joint first authors.

---

A. Rissman (✉) · M. Bihari · C. Hamilton · C. Locke  
Department of Forest and Wildlife Ecology, University  
of Wisconsin-Madison, 1630 Linden Drive, Madison,  
WI 53711, USA  
e-mail: arrissman@wisc.edu

D. Lowenstein · M. Motew · J. Price · R. Smail  
University of Wisconsin-Madison, Madison, WI, USA

trust or government agency easement holder. Conservation easements can be created to achieve diverse purposes within the bounds of state statutes and the Internal Revenue Code for tax deductions. According to the Land Trust Alliance (LTA), 3.57 million ha of land has been placed under conservation easements by 1,699 state and local land trusts, up from 937,000 ha in 2000 (LTA 2010). An additional 1.70 million ha of conservation easements were held by 14 national land trusts as of 2010. Land trust protection priorities include important natural areas and wildlife habitat (93 % of land trusts), water resources and wetlands (87 %), open space (77 %), working farms or ranchlands (61 %), and working forest lands (54 %) (LTA 2010). Considerable public funding supports conservation easements, including federal Farm Bill programs, voter-approved bond initiatives, and tax revenue. Yet, little research has been done to compare how diverse land trusts and federal and state government agencies draft and monitor conservation easements (Merenlender and others 2004).

Conservation easement terms usually include a statement of purposes, rights and obligations of each party, and restrictions on land use to achieve conservation purposes. Private landowners continue to own the property and may retain land use rights such as residential use, timber harvesting, farming, or scenic enjoyment. Conservation easements are often individually negotiated and therefore have a “limitless” diversity of permitted and restricted uses tailored to specific landowners and properties (Gustanski and Squires 2000). Once established, those terms are designed to remain fixed over time even when the property changes hands. The permanence of conservation easements has appealed to organizations concerned that zoning and other policies to prevent development can be easily overturned (Owley 2010; Serkin 2010). Moreover, federal law requires donated conservation easements to be perpetual to qualify for income tax reductions [IRC § 170(h)(2)(C) and (5)(A)].

Conservation easements embody a tension between conservation as fixed, permanent protection and conservation as an iterative process to accommodate change over time (Greene 2004). Conservation easements that aim to protect sensitive ecological features, or balance economic working land uses with conservation purposes, may be particularly vulnerable to changing landscape conditions and may require processes for changing land management restrictions (Merenlender and others 2004). Some scholars are concerned that perpetual conservation easements may constrain the adaptations needed to manage and conserve dynamic ecosystems (Richardson 2010; Owley 2011). In this study, adaptation is defined broadly as “change in a system in response to some force or perturbation” including response to actual or anticipated change in environmental or social conditions (Smithers and Smit 1997). For instance,

climate change may impact species, natural communities, disturbance regimes, economic productivity, and ecosystem processes with important ramifications for conservation strategies (Hannah and others 2002; Hughes 2000; Parry and others 2007). Changing social and economic conditions could affect whether conservation easements achieve their goals (Mahoney 2002; McLaughlin 2005; Korngold 2007). Socioeconomic and ecological changes may require conservation organizations to rethink their conservation easement terms, protected area locations, conservation tools, or conservation goals more broadly.

Organizations holding easements primarily influence land management through monitoring and enforcing conservation easement restrictions. Monitoring to inform future decisions is critical for ecosystem management but often under-funded (Lee and Lawrence 1986). Compliance monitoring is designed to detect violations of conservation easement terms. Ecological monitoring involves documenting characteristics and changes in natural resources, such as plant diversity, fire frequency, or spread of invasive species (Rissman and others 2007b). The United States Internal Revenue Service (IRS) expects land trusts to monitor donated properties for compliance at least once per year, but organizations may not have the legal right or the capacity to monitor ecological conditions beyond conservation easement compliance (Cheever 1996; Parker 2004). When monitoring reveals the need for changed management, conservation easements require mechanisms for altering land management terms.

Several mechanisms in conservation easements are available for changing land management decisions over time. Amendment of the conservation easement itself is widely debated within the conservation community, since it allows for change but raises concerns about private gain, donative value, and organizational discretion (Jay 2012). Organizations sometimes rely on administrative discretion to provide consent to modify permitted uses without amendments, which raises similar concerns about permanence and accountability. A management plan can be revised periodically without altering conservation easement terms. Easement restrictions that reference external laws, policies, or certification standards can be updated by legislatures, agencies, or certification bodies but these decisions are not controlled by the easement holder (Greene 2004). The need to change a conservation easement in the future is tied to what terms are initially included in it.

We investigated how perpetual conservation easements address land management to achieve diverse purposes over time. We are particularly interested in how land use rights and responsibilities, mechanisms for changing management, compliance and ecological monitoring, and perceptions of the need for future changes differ among organizations utilizing conservation easements for diverse purposes.

1. Land use rights and responsibilities. How have government agencies and land trusts structured land use rights and responsibilities in conservation easements? We expect all conservation easements to limit development and other incompatible land uses (Rissman and others 2007a), but to differ in timber harvesting and other land management rights based on the purpose of the easement. Given the importance of active management for species and habitat conservation, we expect conservation easements with purposes of protecting specific species and natural communities to give more land management control to the easement holder than those with broad open space conservation purposes or purposes focused on maintaining working landscapes.
2. Mechanisms for changing land management. How do conservation easements incorporate options for changing land management, and do easement holders change land management in practice? We expect conservation easements with purposes that are more sensitive to landscape change, like protection of species and natural communities and maintaining working landscapes, to include more specific mechanisms for changing land management than general open space easements. Given the focus on permanence, we expect to find few examples of change in practice and few comprehensive approaches to adaptive decision-making and planning processes. However, we expect high-capacity easement holders to respond to extreme events or extensive landscape changes.
3. Compliance and ecological monitoring. What rights do conservation easement holders have to conduct compliance and ecological monitoring, and how do they monitor conservation easements in practice? We expect conservation easements with purposes of protecting of species and natural communities to provide the easement holder with greater ecological monitoring rights, and to be monitored more frequently, compared to those with general open space purposes. We also expect that organizations with greater capacity will monitor their conservation easements more frequently.
4. Perceptions of the need for future changes. Do conservation easement holders perceive adaptation, including climate change adaptation, as necessary for permanent protection of conservation purposes? We expect active management and climate change adaptation to be perceived as more important by employees of organizations with ecological protection missions and easement purposes than by employees of organizations with general open space preservation purposes.

We investigated these questions in a comparative analysis of federal and state government and land trust

conservation easement holders in Wisconsin, a state with a long history of land protection through conservation easements.

## Methods

### Study Design

We examined conservation easements created for diverse conservation purposes by eight organizations. To include a wide range of conservation organizations and easements, we selected three major easement holders, including at least one state or federal government agency and one land trust, in each of three regions in Wisconsin (southwest, northern, and eastern). The regions were selected to represent a diversity of ecological landscapes, land uses, and landownership patterns. Spatial data provided by the US Protected Areas Dataset, Wisconsin Department of Natural Resources (DNR), and The Nature Conservancy (TNC), along with lists of local land trusts provided by Gathering Waters Conservancy, aided in the selection of major easement holders in each region. TNC was a prominent easement holder in two of the regions, making the total number of organizations eight rather than nine. The eight selected organizations and their easement programs included the federal Natural Resources Conservation Services-Wetland Reserve Program (NRCS-WRP); DNR divisions or bureaus of Endangered Resources, Fisheries, and Forestry; TNC; and three local land trusts (Table 1). We did not include municipal and county governments in the study. NRCS and DNR agencies were relatively high capacity organizations with hundreds of employees and annual budgets in the millions of dollars. TNC's Wisconsin chapter is a relatively high capacity land trust, with over 30 employees, while the three local land trusts each had between one and eight employees.

We selected four conservation easements from each organization: the oldest and newest easements, a middle easement from the median year between the oldest and newest easements, and the largest easement (by area) from the region. We selected these conservation easements to maximize the variation in easement terms within each organization. If the largest easement was also the oldest, middle, or the newest easement, then the second largest easement was selected. Two organizations held less than four easements in the region, resulting in a total sample size of 34 easements.

Public documents provided information on organization mission, capacity (number of employees, annual budget, assets) and number and size of conservation easements, and fee simple properties. For land trusts, data sources included official websites, annual reports, IRS tax form 990 obtained

**Table 1** Case study organizations and conservation easements

Conservation easement holder	Holder type	Organization or program mission	Number of conservation easements by purpose				
			OS	SNC	SNC & OS	FOR & OS	FOR&SNC & OS
USDA, NRCS-WRP	Gov't., Federal	To achieve the greatest wetland functions and values, along with optimum wildlife habitat, on every acre enrolled in the program			4		
DNR-Endangered Resources	Gov't., State	To identify, protect and manage native plants, animals and natural communities from the very common to critically endangered. We work with others to promote knowledge, appreciation and stewardship of Wisconsin's native species and ecosystems		4			
DNR-Fisheries	Gov't., State	To enhance and restore outstanding fisheries in Wisconsin's waters		2	2		
DNR-Forestry	Gov't., State	To work in partnership to protect and sustainably manage Wisconsin's forest ecosystems to supply a wide range of ecological, economic and social benefits for present and future generations	1			2	
TNC	NGO, National	To preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive			6		2
Driftless Area Land Conservancy	NGO, Local	To protect the rural landscape and quality of life in southwest Wisconsin—this includes protection of farms, forests, grasslands, wetlands, soils and the natural beauty of the area	2		1		
Door County Land Trust	NGO, Local	To protect the scenic beauty, rural character and ecological integrity of lands in Door County	1		3		
Northwoods Land Trust	NGO, Local	To promote conservation by private landowners of natural shorelands, woodlands, wetlands and other natural resources, as public benefits for present and future generations			2		2

*USDA* United States Department of Agriculture, *NRCS-WRP* Natural Resources Conservation Service-Wetlands Reserve Program, *DNR* Department of Natural Resources, *TNC* The Nature Conservancy, *NGO* nongovernmental organization, *OS* open space, *SNC* species or natural communities, *SNC&OS* species or natural communities and open space, *FOR&OS* commercial forestry and open space, *FOR&SNC&OS* commercial forestry and species or natural communities and open space

through GuideStar, conservation plans, and newsletters. For government agencies, data sources included official websites, reports, state and federal enabling legislation, and conservation plans. Organization employees provided information unavailable online, such as strategic plans. Information from documents and employee interviews was coded into analyzable formats with Qualtrics online surveys (Qualtrics Labs Inc., Provo, UT).

### Categorizing Conservation Easements

Each conservation easement document was categorized according to its purposes, land use rights and responsibilities, monitoring rights, and mechanisms for altering land management terms. Easement purposes generally reflected organization missions. We separated the conservation easements into five main purposes: open space (OS);

species or natural communities (SNC); a combination of species or natural communities and open space (SNC&OS); commercial forestry and open space (FOR&OS); and commercial forestry, species and natural communities, and open space (FOR&SNC&OS).

*OS: Open Space (n = 4)*

The easements in this category had purposes of preserving OS and did not mention commercial forestry or species and natural communities. These easements aimed to prevent development and protect the general natural or scenic values of a property. Three easements in this category held by local land trusts referenced relatively natural habitat, a purpose that qualifies for a federal tax reduction. One older, scenic DNR-Forestry easement fits in this category; it was only held by DNR-Forestry because it was located within a state forest boundary.

*SNC: Species and Natural Communities (n = 6)*

These easements had purposes designed to protect specific species or natural communities on the property with no mention of OS preservation. All four DNR-Endangered Resources easements were created to “preserve, manage and protect” natural values such as habitat for fish spawning, bird migration, and state or federally listed threatened and endangered species. The DNR-Endangered Resources easement stated that “natural processes of ecological change have given rise to this landscape and to these unique features. It is the intent of this dedication to provide for and encompass the continued action of such naturally occurring processes.” The remaining two easements in this category were from DNR-Fisheries and focused on maintaining fisheries for the benefit of the public.

*SNC&OS: Species and Natural Communities and Open Space (n = 18)*

Half the easements contained purposes to protect both specific species or natural communities and open space. Six of the eight TNC easements had these purposes along with six easements from local land trusts, all four easements from NRCS-WRP, and two from DNR-Fisheries.

*FOR&OS: Commercial Forestry and Open Space (n = 2)*

This category represented easements with commercial forestry or economically valuable timber production as a purpose, as well as OS. The two large DNR-Forestry easements in this category did not contain any purposes related to species or natural communities.

*FOR&SNC&OS: Commercial Forestry, Species and Natural Communities, and Open Space (n = 4)*

In contrast to the previous category, easements drafted by TNC and Northwoods Land Trust with forestry purposes and open space also had species and natural communities purposes.

We identified six easement terms that could enable changes in land management over time. These mechanisms provide pathways for ongoing land management decision-making. These six mechanisms included (1) requirement of a land management plan, (2) reference to laws or policies as compliance terms, (3) establishment of easement holder rights to conduct land management on the property, (4) modifications to permitted landowner uses with discretionary consent or (5) a conditional use permit from the easement holder, and (6) provision for amendment. The total number of mechanisms present in each easement was

summed, for a total of six possible mechanisms for change. Some mechanisms for change may be more useful or powerful than others for steering decision-making. Because of the limited sample size, we compared mechanisms for change by conservation easement purposes and types of organizations, but do not make claims about statistically significant differences.

**Interviews**

From each organization, we interviewed the staff person most knowledgeable about easement monitoring and management, such as a stewardship coordinator ( $n = 9$ ; TNC was examined in two of the three study regions, so a staff member was interviewed from two regional offices). In addition, ten context interviews were conducted with staff of environmental land trusts, state and federal agencies, and funders to understand the context for conservation easements in the state. Interviews were semistructured and ranged from 27 to 90 min. All interviews were audio recorded and conducted in person or over the phone. Responses were coded for reference to organizational mission and easement purposes, monitoring, changes in land management, and climate change adaptation.

**Results****Land Use Rights and Responsibilities**

Conservation easements were designed to prevent land uses considered incompatible with their purposes. As expected, conservation easements prevented waste dumping (34 of 34) and landscape and surface alteration (33 of 34). Irrespective of purpose, many but not all conservation easements prohibited new buildings (25 of 34) and subdivision of the property (19 of 34). Most interviewees stressed the role of easements as a means to prevent development. However, prevention of development is not recognized as a conservation easement purpose by IRS tax regulations or Wisconsin state statutes, which likely explains why it did not appear as an explicit easement purpose.

Easements differed in the restrictiveness of timber harvesting and other land management terms. NRCS-WRP and DNR-Endangered Resources easements, which had purposes of protecting individual species or natural communities, generally did not permit working land uses such as commercial forestry or grazing, and had the strictest restrictions on vegetation removal. Timber harvesting was permitted on all six easements with commercial forestry purposes (held by DNR-Forestry, TNC, and Northwoods Land Trust), as well as 16 of the easements with SNC and/or OS purposes. DNR-Forestry easements with commercial

forestry purposes were designed to ensure that timber harvesting would not be curtailed by the easement. For example, one stated that “commercial timber harvesting as generally conducted on the property by (the landowner) is consistent with the purposes of this easement.” A local land trust staffer explained that the organization was moving away from prescriptive forest management terms. One of their older easements “had some pretty strict forestry management and we didn’t want to follow that because we wanted our landowners to have the flexibility to manage their forests.” Organizations negotiated conservation easements while keeping in mind the balance of control shared with the landowner.

In most easements, basic “operation upkeep and maintenance” of properties was described as the landowner’s responsibility. Affirmative obligations on landowners, which are requirements rather than restrictions on action, were mentioned in ten easements. NRCS and TNC easements required active management from landowners in controlling pests and conducting sustainable timber harvests. DNR-Fisheries’ newest easement affirmatively required landowners to manage prairies to keep them clear of invasive brush or trees.

#### Mechanisms for Changing Land Management

Consistent with our expectations, easements with a forestry purpose (FOR&OS and FOR&SNC&OS) included the most mechanisms for change, followed by SNC and SNC&OS easements (Table 2). In some cases like DNR-Forestry easements, the landowner had significant control over land management, with many mechanisms for change through mutual agreement. In other instances, like NRCS-WRP easements, the easement holder had nearly all control over land management, with options for altering land use in their sole discretion. NRCS-WRP and TNC easements had the most mechanisms for change, while DNR and local land trust easements had the fewest.

#### Management Plans

Management plans provide a negotiated agreement between parties and were mentioned in 25 of 34 conservation easements with the majority requiring a forest, wetland or shoreline management plan. Nearly all easements that permitted timber harvest required a timber management plan. However, the two large DNR-Forestry FOR&OS easements did not require a management plan since the landowners were enrolled in the Managed Forest Law (MFL) or Forest Crop Law (FCL) tax program. These tax programs do not require industrial landowners to submit written management plans [NR 46.18(4)], nor do they

require DNR approval of detailed stand management plans. Across all easements, forestry management guidelines ranged from allowing landowners to opt into federal programs for managed forests to specific landowner obligations, such as improving biological and natural diversity of a designated Forest Zone. Most easements that required land management plans stipulated that they should be revised every 1–5 years. Exceptions to this were the NRCS-WRP easements that required wetland restoration plans, but did not require regular updates.

#### Reference to Outside Law or Policy as Compliance Terms

Some easements referenced laws or policies that could be updated over time through the policy making process. Six easements required that the property’s management plan meet the requirements of the DNR MFL or FCL forest tax programs. Two of these easements also required enrollment in the MFL or FCL if forestry practices were conducted on the property. Additionally, three TNC easements required adherence to Wisconsin’s Forest Management Guidelines and Best Management Practices for Water Quality, and one had an additional requirement of Forest Stewardship Council (FSC) certification.

#### Easement Holders’ Active Management Rights

Easement holders had the right to manage all or portions of the property in 20 of 34 easements. The majority of NRCS and DNR easements had these terms, compared with half of TNC easements and none of the local land trust easements. All easements that allowed ecological monitoring also granted certain land management rights to the easement holder. Examples of land management rights included permission to improve stream banks and fish habitat; restore, protect, enhance, or maintain wetlands; manage rare plants, animals, and natural communities; control invasive species; and maintain existing trails on the property.

#### Modification of Management Terms through Discretionary Consent

Some conservation easements anticipated the need to accommodate changes through discretionary consent. For example, one DNR-Endangered Resources easement stated that the landowner “shall neither introduce nor remove, destroy, damage, collect, chemically treat, burn, mow, cut, or trim trees, shrubs, or plants, including plant parts and seeds, on the premises without the prior written authorization of the Grantee (DNR) or as stipulated in the land management plan.”

**Table 2** Monitoring terms and options for changing land management

	Easement purpose									
	Easement holder					Easement purpose				
	Total (n = 34)	NRCS (n = 4)	TNC (n = 8)	DNR (n = 11)	Local LTs (n = 11)	OS (n = 4)	SNC (n = 6)	SNC&OS (n = 18)	FOR&OS (n = 2)	FOR&SNC &OS (n = 4)
Compliance monitoring	94 %	100 %	100 %	82 %	100 %	100 %	67 %	100 %	100 %	100 %
Ecological monitoring	38 %	100 %	50 %	46 %	0 %	0 %	67 %	50 %	0 %	0 %
1. Management plans	74 %	0 %	100 %	73 %	82 %	50 %	67 %	72 %	100 %	100 %
2. Reference to outside law or policy as compliance terms	47 %	0 %	75 %	27 %	64 %	50 %	0 %	44 %	100 %	100 %
3. Easement holder has active management rights	50 %	100 %	50 %	82 %	0 %	0 %	100 %	56 %	50 %	0 %
4. Mgmt. terms can be modified through discretionary consent	65 %	100 %	88 %	64 %	36 %	50 %	67 %	65 %	100 %	50 %
5. Mgmt. terms can be modified through compatible use authorizations or permits	12 %	100 %	0 %	0 %	0 %	0 %	0 %	22 %	0 %	0 %
6. Amendment clause	53 %	100 %	50 %	18 %	73 %	50 %	0 %	56 %	100 %	100 %
Mechanisms for change (mean per easement ± SE)	3.0 ± 0.2	4.0 ± 0.0	3.6 ± 0.2	2.6 ± 0.2	2.6 ± 0.4	2.0 ± 0.6	2.3 ± 0.4	3.2 ± 0.2	4.5 ± 0.5	3.5 ± 0.3

NRCS Natural Resources Conservation Service, TNC The Nature Conservancy, DNR Department of Natural Resources, LTs land trusts, OS open space, SNC species or natural communities, SNC&OS species or natural communities and open space, FOR&OS commercial forestry and open space, FOR&SNC&OS commercial forestry and species or natural communities and open space

*Modification of Management Terms through Compatible Use Authorizations or Permits*

NRCS-WRP easements provided the highest level of easement holder control over land management in wetlands. NRCS staff stated,

When we acquire a WRP easement, the federal government is basically almost acquiring all the bundle of rights... At any time in the future, whether it's climate change or natural disaster, if a weather related event or climate change happens we have the right and authority to go into the easement and restore the property back to its native condition or back to another condition that's conducive for wildlife habitat.

The NRCS-WRP had a unique approach by restricting all private landowner use rights, and then granting conditional use permits to the landowner at the discretion of the NRCS, within the guidelines of NRCS policy.

*Provision for Amendment*

Half the easements permitted amendment, cutting across easement purposes and organizational types. However, all easements held by DNR-Endangered Resources contained specific language prohibiting amendment of the easement terms. Termination of conservation easements was not included as a mechanism for changing land management decisions, since it does not provide an option for altering land management on a property. Easement termination could be used for non-conservation purposes, or to shift conservation investments from one property to another. Termination was mentioned in 22 of 34 easements, with many requiring a court process for termination.

*Compliance and Ecological Monitoring*

All conservation easements had specific provisions granting compliance monitoring rights to the holder, with the exception of 1960s to 1980s DNR-Fisheries easements where monitoring rights were implied but not stated. In contrast, ecological monitoring rights varied with easement purpose as well as organizational type and mission. Only 14 of 34 easements granted rights for ecological monitoring to the easement holder. Consistent with our expectations, the majority of SNC easements allowed ecological monitoring by the easement holder, while no OS or FOR easements, and no local land trust easements, specifically provided the easement holder with ecological monitoring rights. In some cases, these rights were defined broadly allowing for "the right of ingress and egress from and to the premises...to conduct scientific research." In other

cases, ecological monitoring terms specified what could be monitored and when. In addition to these stated rights, three DNR-Fisheries easements implied the right of ecological monitoring through a broad right of access to the property for fish management.

The frequency of monitoring in practice also varied across organizations, with five of eight respondents indicating that their organization monitored their easements at least annually (DNR-Forestry, NRCS, TNC, and two local land trusts); two indicating that they monitored every 2–5 years (DNR-Endangered Resources and one local land trust); and one reporting no formal plan for compliance monitoring (DNR-Fisheries). DNR-Fisheries relied primarily on complaint-based monitoring by fishermen, facilitated by widespread circulation of a citizen-produced map of the thousands of fishing access easements. DNR-Fisheries also suggested that although they had no formal monitoring schedule, staff were often on the properties for habitat management. A majority of the respondents (6 of 9) had a stewardship or endowment fund for monitoring and enforcement. However, DNR-Fisheries, DNR-Endangered Resources, and NRCS reported no monitoring and enforcement fund. Easement holders indicated diverse monitoring approaches, including site visits (8 of 8 organizations), GIS or remote sensing (4), environmental indicators (4), and photo-point monitoring (3).

#### Organizational Perspectives on Change

Changing conservation easement terms involved a tension between change driven by enhancing conservation purposes and change driven by landowner preferences. One local land trust staffer expressed reservation about changing easements, saying, “you don’t want to create a precedent for continually changing and tweaking your easements. It may give the impression to the landowners that ‘if you want a change just let us know, we’ll change this thing’ when it is meant to be permanent.” However, other interviewees felt easements would need to be altered for new conditions.

Government agency and land trust staff had varied perceptions of the importance of active management conducted by the easement holder, with staff from five of eight organizations indicating that active management was important for meeting their goals on the easement properties. Staff from the four government agencies believed that management was critical for maintaining fisheries and wildlife habitat, removing invasive species, and managing timber. Certain management activities were considered priorities, including invasive species removal by DNR-Endangered Resources and fisheries improvements by DNR-Fisheries. NRCS staff engaged in wetland habitat protection and coordination to enable active landowner management. DNR-Forestry’s active management focused on stabilizing public recreational trails through vegetation

removal or planting. Two interviewees felt that active land management was an important opportunity for promoting effective landowner involvement in the conservation easement.

Contrary to our expectations, TNC respondents indicated challenges related to active land management on easement properties despite the organization’s relatively high capacity and expertise in land management. One staff member from TNC indicated that they encourage private landowners to carry out land management activities to maintain and enhance conservation values. Another TNC respondent suggested that the easement purposes of conserving natural area qualities and maintaining connectivity did not necessitate active management. Additionally, TNC staff suggested that even if they wanted to pursue management, they lack the capacity to manage conservation easement properties and are not always able use grant funding for this purpose. Most local land trust staff also did not prioritize active management on easements and limited “taking a real active role in managing the properties except our own.” One local land trust staffer stated:

We don’t want to get involved in a lot of land management restrictions. The reason being is that if you write in any restrictions you are basically saying you will go to the mat to enforce those restrictions too, and trying to dictate to the landowner how that will be enforced or managed. It becomes a very large responsibility to monitor and enforce those actions. We feel conservation easements may not be the right tool to do a lot of direct land management with so we have tended to generalize our easement restrictions.

Respondents indicated a range of actions their organizations have taken in response to changing environmental conditions. In two instances organizations used, or planned to use, discretionary consent to modify land management restrictions. In response to growing problems with invasive species, TNC exercised discretionary consent to allow landowners to use herbicides to control invasive species even though it was previously prohibited by the easement. Similarly, DNR-Forestry foresaw giving discretionary consent to allow timber salvage in the wake of a maple scale outbreak that occurred on one of the working forest properties. Active land management by the easement holder can also be impacted by changing ecological conditions. One respondent indicated that stream bank management, which is vulnerable to extreme rain events, was being implemented less frequently.

#### Perceptions of Future Adaptation

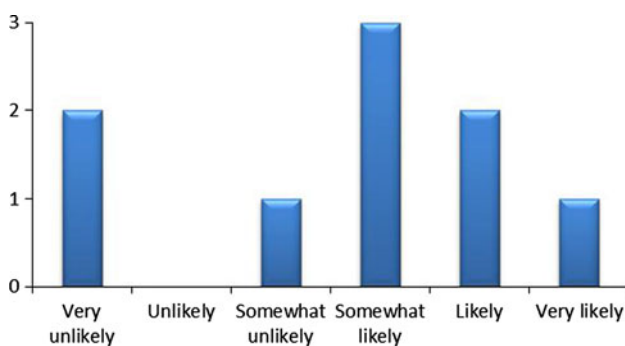
Most respondents (7 of 9) thought their easements provided sufficient flexibility to adapt to changing environmental



and climatic conditions. However, staff interpreted adaptation differently. Some suggested that the easements were adaptable because the conservation easement could persist in preventing development even if certain species or natural communities did not survive there. Others thought management options were flexible enough to reduce harm to specific conservation purposes because of specific rights and restrictions in the easement, the ability to alter management plans and amend the easement itself, or the generality of the easement purpose. One land trust and one DNR staffer thought their conservation easements might face impacts from environmental change like climate and invasives but they did not have a clear approach to adaptation or reducing these impacts.

All respondents agreed that climate change was a likely influence in their region. Most staff regarded climate change as likely or somewhat likely to negatively impact the conservation goals of their organization's easements (Fig. 1). Their reasons included changes in rainfall, hydrology, stochastic events (i.e., flood and drought), and changing species distributions. In contrast, one interviewee suggested that projected increases in rainfall might actually benefit trout by providing more groundwater and base flow for streams. However, climate change ranked lowest among changes perceived to be affecting organizations' conservation easements. The main perceived threats were from changes in surrounding land use and pressure from increased development.

Respondents had varied perspectives on long-range planning in the context of climate change uncertainties. One respondent indicated that TNC was developing monitoring plans to track changes in species' occurrences and community composition. Another respondent from TNC indicated that climate change was now considered a filter or major consideration for all easement purchases, stating, "With the big working forest easements we're not really trying to capture a certain condition...We're not that concerned that we lose northern hardwood hemlock. We're more concerned that we still have an intact landscape for



**Fig. 1** Number of respondents indicating the likelihood that climate change will negatively impact their organization's conservation easements

species to be able to move from place to place no matter what happens with climate." One DNR respondent indicated that, although the organization had not yet made changes, future changes were possible as the research community obtained sufficient knowledge to make recommendations. Two government and two local land trust respondents indicated that their organizations had not developed a plan or taken any action regarding climate change. As one agency staffer said, "Just like most other entities, we're grasping to figure out what impacts in the short term climate change is going to have. But right now we haven't fully grasped how we're going to address climate change relative to easements."

## Discussion

We found diverse approaches to land management and mechanisms for change among conservation organizations. Conservation easements are designed to protect land in perpetuity, but ongoing decision-making is necessary for land management. This analysis of government and land trust easements reveals that many conservation organizations have recognized the need for regular monitoring and a process for decision-making, even if few have a robust decision-making process in place.

Easements that protect specific species and natural communities included greater easement holder control over land management, more easement holder active management and ecological monitoring rights, and more mechanisms for changing management over time, compared to easements with general open space protection purposes. Simply mentioning relatively natural habitat as a purpose was less indicative of easement intent than whether the easement listed specific species or natural communities for protection. Easements with forestry purposes contained varied provisions to support commercial forestry activities, preserve open space, and provide for public access. Forestry purposes were associated with mechanisms for change but not necessarily with easement holder active management or ecological monitoring rights. The inclusion of mechanisms for change such as management plans for forestry is likely influenced by landowner negotiation for flexibility to remain economically viable under uncertain future conditions. Working forest easements also relied on existing institutions such as forest certification through FSC and management plans through DNR forest tax programs.

The federal NRCS-WRP, three state DNR programs, and four land trusts examined here suggest how differences in organizational mission, expertise, and capacity shape conservation easements. The NRCS-WRP had the greatest land use restrictions on protected wetlands, and also had the highest amount of administrative discretion to alter land use

through conditional use permits. Their specific wetland protection goal led to this combination of high control and high discretion. DNR-Forestry held large working forest easements that did not mention species and natural community purposes, and allowed enrollment in the state tax program in lieu of a management plan. In practice, DNR-Forestry staff work with landowners in responses to extraordinary events such as tornadoes and invasive insect outbreaks. DNR-Fisheries and Endangered Resources had smaller easements that also recognized the importance of active management. In contrast, fewer land trust staff identified ecological monitoring and active management as important. This was connected to local land trusts' broad purposes, limited land management expertise, lack of landowner support for active management, and lack of capacity or willingness to enforce specific restrictions.

Monitoring is critical for determining whether management changes are needed, but rights to conduct ecological monitoring were lacking in the majority of easements studied. Ecological monitoring rights may be particularly crucial for managing ecosystems in changed climate or land use conditions. While we expected that organizations with greater capacity would conduct more frequent compliance monitoring, we found that two relatively low capacity land trusts monitored for compliance every year, whereas one state agency rarely monitored.

An ongoing decision-making process may also be important in the context of changing social and ecological conditions (Tompkins and Adger 2004; Knoot and others 2010). Interviewees provided several examples of the need to respond to changes such as insect outbreaks or invasive species. This relates to a broader trend in environmental conservation away from a 'fix it and forget it' mindset in which acquisition of property rights was considered sufficient for conservation. Instead, ongoing land management may be necessary to achieve conservation objectives (Farrier 1995; West and others 2009). Conservation easements have appealed to public agencies and land trusts already overstretched with land management responsibilities. However, conservation easements provide less control over the property to organizations than fee simple ownership. This tradeoff involves an assessment of risk and the compatibility of potential future landowner goals with easement purposes. Landowner priorities and relationships will play an important role in negotiations over changing land management.

Many forestry, fisheries, soil, and wildlife conservation agencies have a long tradition of active management for conservation and sustainable resource management (Olsson and others 2004; Chiras and Reganold 2009). Management for biodiversity and endangered species can also include a role for active management (Lindenmayer and others 2006). In contrast, local land trusts emerged from a place-based, grassroots interest in conservation without a strong

role for science or active management (Fairfax and others 2005). These epistemic and disciplinary differences are evidenced in organizational missions, easement purposes, and easement terms. Institutional differences are likely to be amplified by the complex, dynamic, and unpredictable nature of ecosystem change (Moore and others 2009).

Our analysis reveals a concern that conservation easements may create structures that do not encourage, and may constrain, adaptive management. Adaptive management is widely promoted as an approach to environmental management (Haney and Power 1996). "Adaptive management is a formal, systematic, and rigorous program of learning from the outcomes of management actions, accommodating change and improving management" (Holling 1978) that entails "the integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn" (Salafsky and others 2001). However, the mechanisms for change in conservation easements pose barriers to integrating new information into land management decisions. Monitoring is critical for adaptive management but only 38 % of easements even permitted ecological monitoring and fewer actually had ecological monitoring. Goal conflict between landowners and conservation easement holders, or among multiple easement purposes, could also impede the adaptive management process (Bruch 2009; McLain and Lee 1996). Desire for certainty is fundamental to conservation easements and many other policy tools, but creates legal and institutional barriers to adaptive management (Stankey and others 2006).

The tension between flexibility and specificity deserves even greater attention in the context of climate change vulnerability and adaptation. All nine interviewees agreed that climate change could affect their region. The majority were optimistic that their easements were flexible enough to adapt to change but differed in what they meant by flexibility and adaptation. Some suggested that adaptation meant changing the goals to align with future conditions. For instance, they felt that easement purposes were not vulnerable to climate change because they were written broadly enough to protect some natural habitat even if species and natural communities are quite different in the future. Others anticipated resisting change through active management to achieve current goals.

Easements must be sufficiently broad to remain applicable and withstand court challenges based on 'changed conditions,' although it is unclear if the doctrine of changed conditions can be used to terminate conservation easements (McLaughlin 2006; Korngold 2007). However, by generalizing the easements away from particular goals, conservation organizations may not have the tools or authority to protect species, natural communities, or working land uses on private land. This is particularly problematic because vulnerable species and habitats may

need even greater attention in the face of change. A combined strategy of general easement purposes with specific conservation values or goals could provide a robust, persistent purpose with enough specificity to ensure important protections. Across the board, organizations suggested that fragmentation, land use change, and change in political and economic conditions were of more immediate concern than climate change. Land managers face a disconnect between the regional to global scale of climate change information and the specific conditions, trajectories, and needs of particular properties.

## Conclusions

A process for changing land management may be necessary for ensuring effective conservation of working landscapes and species and natural communities. Conservation easements are structured as partial property acquisitions with upfront payments to landowners followed by monitoring and enforcement of land use restrictions. However, environmental management requires ongoing land management decision-making. Conservation easements are framed as perpetual, and minimal attention has been paid to how they structure governance of land management. Mechanisms for change include management plans, links to dynamic policies, easement holder active management, discretionary consent, permits, and amendment. Challenges include organizational capacity for monitoring and enforcement, constraints on integrating monitoring results in future decisions, potential conflict over determining land use compatibility with easement purposes, public accountability for land management decisions, and prioritizing among multiple conservation purposes. The conservation organization's discretionary decision-making process is critical for negotiating these boundaries with private landowners. Conservation organizations perceive climate change as a less severe threat than development pressure or political change. They need information on site-specific climate change impacts and interactions with other drivers of change. These results point to the potential and the limits of conservation easements for land management. Greater attention to conservation easement drafting, monitoring, and ongoing decision-making is needed to produce conservation benefits in changing landscapes.

**Acknowledgments** Many thanks to the government and land trust staff who participated in this research. We thank the faculty from the Climate Change and Conservation Easements distributed graduate seminar, including Cinnamon Carlarne, Fred Cheever, Josh Eagle, Rob Fischman, Jessica Owley, Buzz Thompson, and Bill Weeks. Additional assistance in developing the Wisconsin cases was provided by graduate students Andrea Bachrach, Megan Pulver, and Marie Russo. Funding was generously provided by the Resources Legacy

Fund and the University of Wisconsin-Madison. The research complies with the current laws of the United States.

**Conflict of interest** The authors declare that they have no conflict of interest.

## References

- Bruch C (2009) Adaptive water management: strengthening laws and institutions to cope with uncertainty. In: Biswas AK, Tortajada C, Izquierdo R (eds) *Water management in 2020 and beyond*. Springer, Heidelberg, pp 89–113
- Cheever F (1996) Public good and private magic in the law of land trusts and conservation easements: a happy present and a troubled future. *Denver Univ Law Rev* 73:1077–1102
- Chiras DD, Reganold JP (2009) *Natural resource conservation: management for a sustainable future*, vol 10. Addison Wesley, Boston
- Fairfax SK, Gwin L, King MA, Raymond L, Watt LA (2005) *Buying nature: the limits of land acquisition as a conservation strategy, 1780–2004*. The MIT Press, Cambridge
- Farrier D (1995) Conserving biodiversity on private land: incentives for management or compensation for lost expectations? *Harv Environ Law* 19:303–408
- Greene DM (2004) Dynamic conservation easements: facing the problem of perpetuity in land conservation. *Seattle Univ Law Rev* 28:883–923
- Gustanski JA, Squires RH (2000) *Protecting the land: conservation easements past, present, and future*. Island Press, Washington, DC
- Haney A, Power RL (1996) Adaptive management for sound ecosystem management. *Environ Manag* 20(6):879–886
- Hannah L, Midgley GF, Lovejoy T, Bond WJ, Bush M, Lovett JC, Scott D, Woodward FI (2002) Conservation of biodiversity in a changing climate. *Conserv Biol* 16(1):264–268
- Holling CS (1978) *Adaptive environmental assessment and management*. Wiley, New York
- Hughes L (2000) Biological consequences of global warming: is the signal already apparent? *Trends Ecol Evol* 15:56–61
- Jay JE (2012) When perpetual is not forever: the challenge of changing conditions, amendment, and termination of perpetual conservation easements. *Harv Environ Law* 36:1–78
- Knoot TG, Schulte LA, Rickenbach M (2010) Oak conservation and restoration on private forestlands: negotiating a complex social-ecological landscape. *Environ Manag* 45:155–164
- Korngold G (2007) Solving the contentious issues of private conservation easements: promoting flexibility for the future and engaging the public land use process. *Utah Law Rev* 4:1039–1084
- Lee KN, Lawrence J (1986) Adaptive management: learning from the Columbia River basin fish and wildlife program. *Environ Law* 16:431–460
- Lindenmayer DB, Franklin JF, Fischer J (2006) General management principles and a checklist of strategies to guide forest biodiversity conservation. *Biol Conserv* 131(3):433–445
- LTA (Land Trust Alliance) (2010) *2010 Land Trust Alliance Census*. Land Trust Alliance, Washington, DC. <http://www.landtrustalliance.org/land-trusts/land-trust-census>. Accessed 14 Jan 2012
- Mahoney JD (2002) Perpetual restrictions on land and the problem of the future. *Va Law Rev* 88:739–787
- McLain RJ, Lee RG (1996) Adaptive management: promises and pitfalls. *Environ Manag* 20(4):437–448
- McLaughlin NA (2004) Increasing the tax incentives for conservation easement donations—a responsible approach. *Ecol Law Q* 31(1):1–115

- McLaughlin NA (2005) Rethinking the perpetual nature of conservation easements. *Harv Environ Law* 29:421–521
- McLaughlin NA (2006) Amending perpetual conservation easements: a case study of the Myrtle Grove controversy. *Univ Richmond Law Rev* 40:1072–1075
- Merenlender AM, Huntsinger L, Guthey G, Fairfax SK (2004) Land trusts and conservation easements: who is conserving what for whom? *Conserv Biol* 18:65–75
- Moore SA, Wallington TJ, Hobbs RJ, Ehrlich PR, Holling CS, Levin S, Lindenmayer D, Pahl-Wostl C, Possingham H, Turner MG, Westoby M (2009) Diversity in current ecological thinking: implications for environmental management. *Environ Manag* 43:17–27
- Olsson P, Folke C, Berkes F (2004) Adaptive co-management for building resilience in social-ecological systems. *Environ Manag* 34(1):75–90
- Owley J (2010) Use of conservation easements by local governments. In: Salkin P, Hirokawa K (eds) *Greening local governments*. A.B.A. Publishing, Chicago
- Owley J (2011) Conservation easements at the climate change crossroads. *Law Contemp Probl* 74:199–228
- Parker DP (2004) Land trusts and the choice to conserve land with conservation easements or full ownership. *Nat Area J* 44:483–518
- Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE (eds) *Climate change 2007: impacts, adaptation and vulnerability*. Contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change. Cambridge University Press, Cambridge
- Richardson JJ (2010) Conservation easements and adaptive management. *Sea Grant Law Policy J* 3(1):31–58
- Rissman AR (2010) Designing perpetual conservation agreements for land management. *Rangel Ecol Manag* 63:167–175
- Rissman AR, Comendant T, Lozier L, Kareiva P, Kiesecker JM, Shaw R, Merenlender AM (2007a) Conservation easements: private use and biodiversity protection. *Conserv Biol* 21(3):709–718
- Rissman AR, Reiner R, Merenlender AM (2007b) Monitoring natural resources on rangeland conservation easements. *Rangelands* 29:21–26
- Salafsky N, Margoluis R, Redford K (2001) *Adaptive management: a tool for conservation practitioners*. Biodiversity Support Program, Washington, DC
- Serkin C (2010) Entrenching environmentalism: private conservation easements over public land. *Univ Chic Law Rev* 77(1):341–366
- Smithers J, Smit B (1997) Human adaptation to climatic variability and change. *Glob Environ Change* 7(2):129–146
- Stankey GH, Clark RN, Bormann BT (eds) (2006) *Learning to manage a complex ecosystem: adaptive management and the Northwest Forest Plan*. US Forest Service PNW-RP-567, Portland
- Tompkins EL, Adger WN (2004) Does adaptive management of natural resources enhance resilience to climate change? *Ecol Soc* 9(2):10
- West JM, Julius SH, Kareiva P, Enquist C, Lawler JJ, Petersen B, Johnson AE, Shaw MR (2009) US natural resources and climate change: concepts and approaches for management adaptation. *Environ Manag* 44(6):1001–1021