What We've Learned:
State of the Climate Adaptation Fund

The Trust for Public Land received support from the Climate Adaptation Fund for a project in the White Mountains to Moosehead Lake corridor that forms the ecological crossroads for New England's 26 million-acre Northern Forest. Through this work, they are designing an ecological "resilience reserve" and creating a model conservation easement for adaptive management.

Photo: J.Monkman

SUMMARY

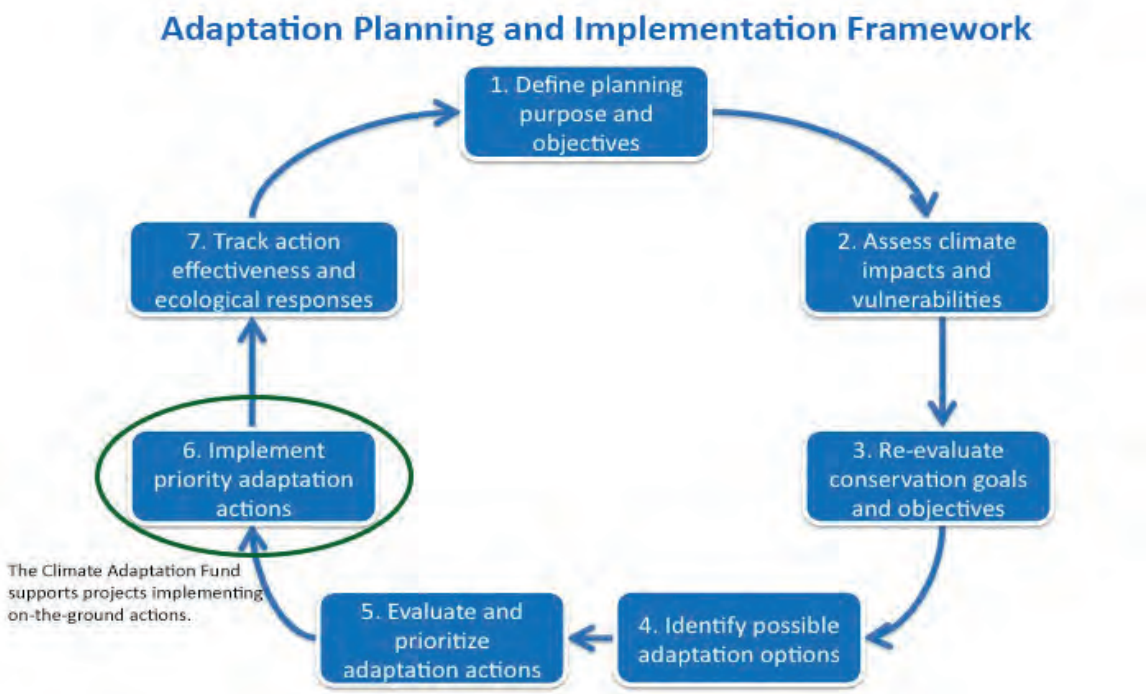
Conservation aimed at supporting the adaptation of wildlife to a changing climate is a relatively new field, but one that is currently undergoing swift growth. While more and more conservation practitioners are turning their attention towards the issue of climate change, the implementation of adaptation actions continues to lag (Stein et al. 2012). There is therefore a need to stimulate more efforts to achieve conservation goals in light of those impacts. Here we share some of the lessons that we have learned over the past two years administering the Climate Adaptation Fund, which supports applied conservation projects demonstrating effective interventions for wildlife adaptation to climate change.

BACKGROUND

There is a growing focus on climate change adaptation, as evidenced by a recent literature review which found five times as many adaptation papers published in 2010 than in 2007 (Glick et al 2011). While all sectors have experienced an increasing focus on climate change adaptation, biodiversity and ecosystem adaptation are less represented relative to other sectors (e.g., human systems) (Glick et al 2011). Nonetheless, the amount of attention paid to adaptation for biodiversity and ecosystems is on the rise. There is also a large and growing body of scientific research (e.g., models, experiments, observational studies) on the consequences of climate change to biodiversity and ecosystems (e.g., USGS 2012). As the availability of climate science has increased, there has also been an increase in the opportunities for organizations to engage in targeted climate change planning efforts. Workshops aimed at helping agencies and organizations examine relevant climate science and plan for the consequences of an uncertain future have occurred in landscapes across the United States (e.g., Cross et al. 2012, Weeks et al. 2011, Poiani et al. 2011, Halofsky et al. 2011).

While the science and planning for climate adaptation are rapidly advancing, there exist relatively few projects testing applied, on-the-ground management actions for climate change adaptation focused on biodiversity and ecosystems (Stein et al. 2012). To jumpstart new implementation efforts, the Wildlife Conservation Society (WCS), with the generous support of the Doris Duke Charitable Foundation, established the Climate Adaptation Fund in 2011, a national grantmaking program funding on-the-ground conservation actions that assist

wildlife in adapting to changing climate conditions. A primary goal of this program is to provide resources to conservation practitioners, allowing them to move from science and planning efforts to taking tangible actions that mitigate the impacts of climate change on ecosystems.



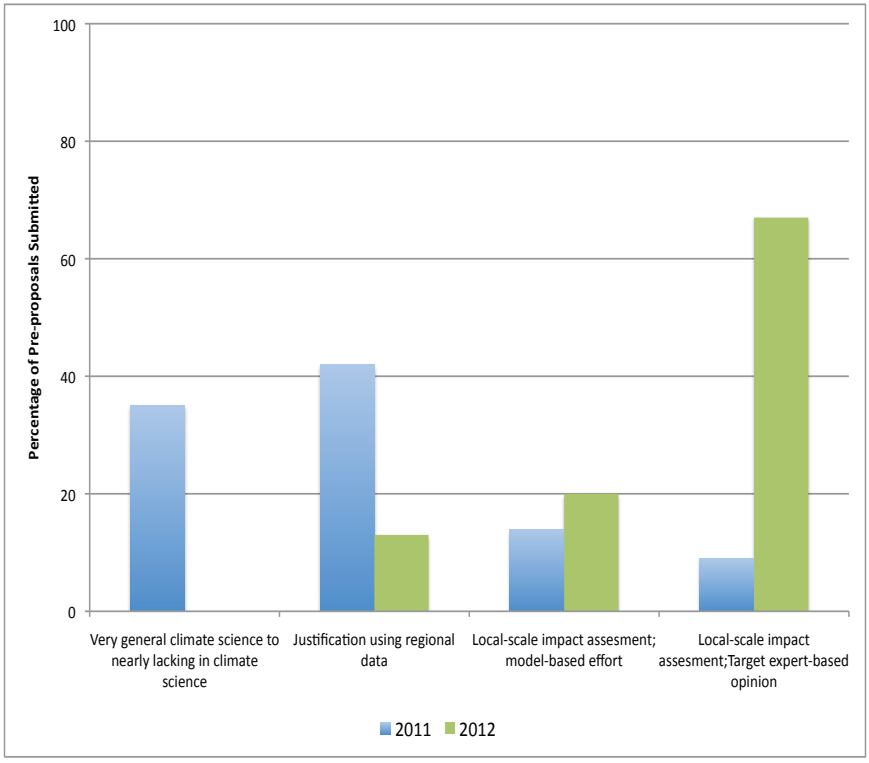
Recognizing that the field of climate adaptation for conservation is dynamic, with practitioners at various stages in the incorporation of climate change into their work, the Climate Adaptation Fund is designed to fill a specific niche that is illustrated through the Adaptation Planning and Implementation Framework developed by the National Wildlife Federation's (NWF) Climate-Smart Conservation Workgroup (NWF et al. in preparation). The Climate Adaptation Fund supports projects that are at the sixth stage of this framework – those that are ready to implement priority adaptation actions. A strong fit for the program is a project that is grounded in the latest climate science, focuses on ecosystems rather than individual species, and is designed for long-term conservation impact at a landscape scale. The program also seeks projects that provide proof of concept for new and innovative wildlife conservation practices that may serve as a model for future projects. Following two years of grantmaking in this specific niche of on-the-ground climate adaptation conservation, we have learned many lessons and noted several positive signs of growth in the rapidly evolving field of climate change adaptation.

LESSONS LEARNED

To examine the adaptation thinking and priorities of applicants to the Climate Adaptation Fund, we analyzed 274 pre-proposals that we received from non-profit organizations over the last two years. Considering the nascence of the climate adaptation field, we were surprised to receive such a large number of proposals from conservation organizations that were already beginning to incorporate climate adaptation considerations into their work. For purposes of this analysis we categorized the pre-proposals on the basis of: 1) the strength of climate science supporting proposed project activities, 2) the adaptation goals of the proposed work, and 3) the level of climate change adaptation "intentionality", a term coined by Dr. Bruce Stein at NWF to highlight conservation projects that are designed explicitly to address key climate impacts and challenges. Comparing how our pre-proposals changed in those characteristics over the two-year period gives us some insight into how the field of climate change adaptation for conservation is growing and evolving. However, we note that these proposals were prepared specifically to meet the stated priorities of the Climate Adaptation Fund. Since we described these priorities in program guidance documents and presented them publicly at national workshops and webinars, it is impossible to separate the effectiveness of our communication of those priorities from broader advances in on-the-ground climate adaptation work. With this caveat in mind, we note a few encouraging trends over the two years that illuminate the progress conservation practitioners are making in addressing this new, and at times daunting, challenge.

Strength of Climate Science

Our analysis of Climate Adaptation Fund pre-proposals supports the observation that adaptation-relevant climate science for biodiversity and ecosystems is becoming more available to practitioners, and that practitioners are increasingly utilizing that science as a foundation for their implementation projects. The strength of the climate science used to guide project activities and objectives in Climate Adaptation Fund pre-proposals has increased, with the percentage of proposals that provided specific local-scale, model-based science or targeted expert-based analysis more than doubling from 35% to 87% between 2011 and 2012. This significant improvement may be attributed to an increase in the accessibility of science relevant to practitioners' conservation activities. We received no proposals in 2012 that included only general adaptation principles or were nearly lacking in climate science, compared to 20% in 2011. This positive trend is very likely due to improved communication of Climate Adaptation Fund priorities in 2012.



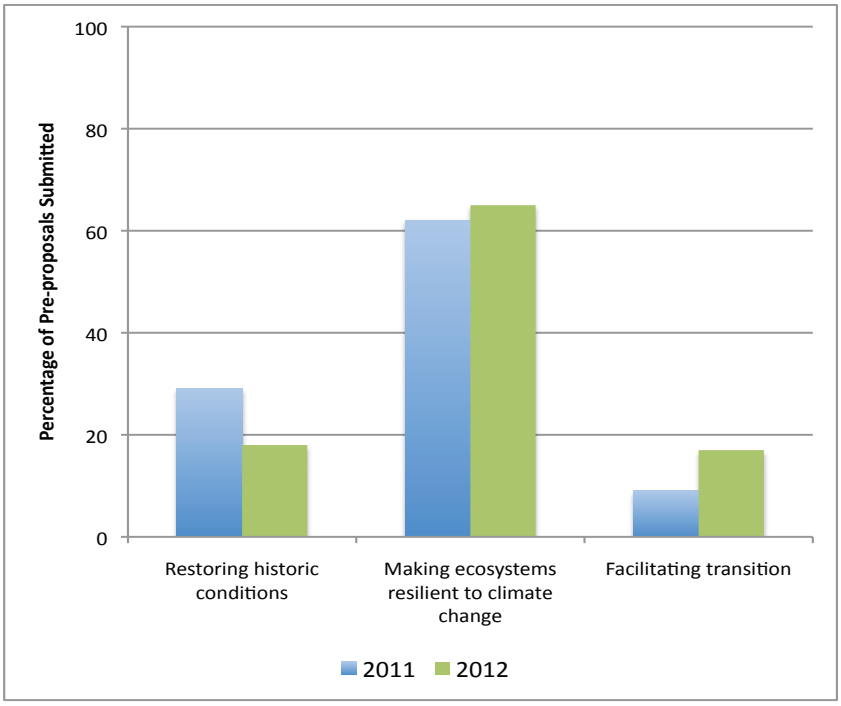
Practitioner at Work: Trout Unlimited


Photo: Trout Unlimited

A state-of-the-art coldwater habitat vulnerability assessment enabled Trout Unlimited to strategically target aquatic conservation efforts in Virginia and West Virginia towards catchments where coldwater habitat is expected to persist as climate changes, and catchments where climate change vulnerabilities can be reduced. Previous impact studies were based on relatively simplistic assumptions about the vulnerability of watersheds to climate change. More recent studies have taken a more sophisticated look at how finer scale population data, landscape metrics and relationships between air and water temperatures influences the vulnerability of coldwater habitat to climate change at population-relevant scales. These data reveal likely coldwater refugia under changing climate conditions and demonstrate that individual coldwater streams may respond differently to increased air temperatures. By coupling the vulnerability assessment with information on riparian canopy cover, resource managers were able to identify those coldwater catchments most likely to persist under altered climate conditions without intervention (e.g., low vulnerability and high canopy cover) and those where vulnerability can be reduced through conservation actions that improve riparian conditions (e.g., high vulnerability and low canopy cover). Actions taken to permanently protect future climate refugia and reduce climate change vulnerabilities will provide ecological benefits for a wide range of coldwater species, including eastern brook trout.

Adaptation Goal

The greatest number of proposals we received articulated the goal of the project as working toward making ecosystems resilient to climate change. This focus on building resistance and resilience to climate change rather than facilitating transitions is consistent with what Poiani et al. 2011 found when climate change was incorporated into the design of 20 different conservation projects around the globe. The Climate Adaptation Fund, however, has placed significant emphasis on supporting projects that focus more on facilitating or allowing transitions in response to climate change rather than resisting changes.



Over the two-year period, there was a 9% increase in the number of proposals we received that are working toward facilitating ecosystem transitions, and an 11% decline in the number of proposals that are aiming to restore historic ecological conditions. This suggests that more practitioners may be acknowledging that climate change may make it difficult or futile to restore historic conditions, a conservation approach that has been standard practice in degraded landscapes for many years. Improved program communications may also be contributing to the observed positive trends.

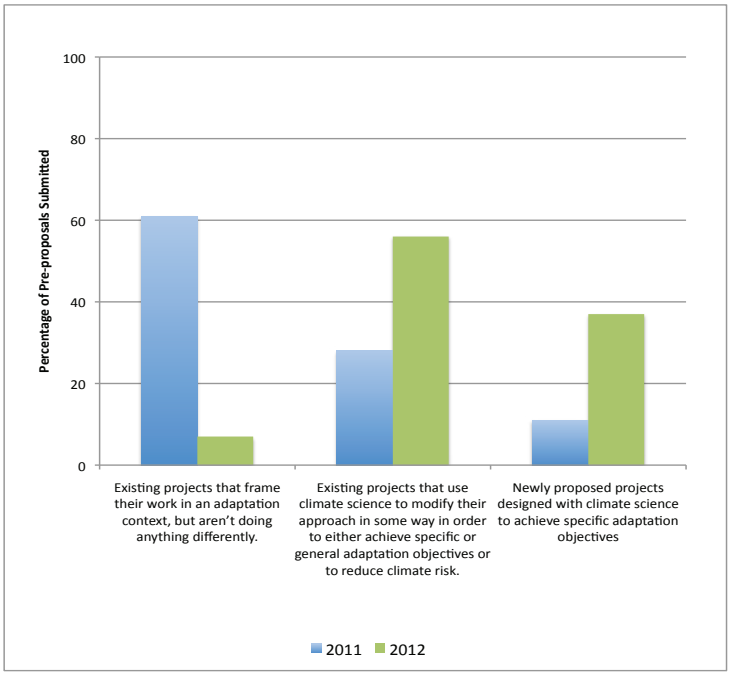
Practitioner at Work: The Nature Conservancy, Minnesota


Photo: TNC, Minnesota

The Nature Conservancy in northeastern Minnesota is taking a first step toward helping northern forests continue as critical habitat for wildlife species by enabling them to transition to what is likely to be a warmer, drier future. The management goals directing current forestry practices in the Great Lakes region are facing a number of challenges, such as the decline or loss of many northern tree species, which negatively affects the long-term viability of traditional commercial and ecological objectives. The Nature Conservancy is implementing a climate change adaptation strategy for forestry practices that may ultimately influence the adaptive capacity of forests across millions of acres in the Great Lakes region. The adaptation strategy is focused on developing "response diversity" in forests by maximizing a range of life history traits (e.g. tolerance of shade, drought, and fire) among a suite of tree species. A full spectrum of traits improves the ability of the forests to respond favorably to new climate conditions, thereby maintaining key ecosystem functions. Founded on the output of habitat models that identified tree species most likely to thrive under the projections for a warmer, drier climate in the region, many of the forest management practices chosen for implementation favor species well suited to these anticipated conditions. Native, but currently uncommon in these boreal-dominated forests, the expansion of these species is unlikely to keep pace with the rate of climate change and maintain forest function without management intervention.

Level of Adaptation Intentionality

There is some indication that the consideration of climate change science and adaptation planning by practitioners is leading to the reassessment of existing or the creation of new conservation projects. In our analysis the percentage of newly conceived projects to address climate change more than tripled, jumping from 11% in 2011 to 37% in 2012. The percentage of existing or on-going projects that have been reconsidered and modified on the basis of climate science doubled over the same time period, increasing from 28% to 56%. The number of existing projects that framed their work in an adaptation context, but were not altering their proposed actions because of climate science dipped from 61% to 7%. This drop may be attributable to our own efforts to better convey the programmatic priorities of the Climate Adaptation Fund.



Practitioner at Work: Conserve Wildlife Foundation of New Jersey


Photo: Dave Golden

Along the coast of New Jersey, vernal pools are critical habitat for amphibians, reptiles, invertebrates, and migratory waterfowl, raptors, and songbirds. Vernal pools are isolated, ephemeral wetlands with a seasonal hydrology that is dependent on annual precipitation levels and other local conditions. Changing climate is jeopardizing this important ecosystem on two fronts. Increasing temperatures and delayed rainfall are altering hydroperiod, while rising sea-level threatens to completely inundate and destroy habitat. These impacts are especially relevant to the state's endangered eastern tiger salamander and Cope's gray tree frog. In response, the Conserve Wildlife Foundation in New Jersey is creating a complex of new vernal pools on the Cape May Peninsula designed to increase the connectivity of vernal pool communities and assist the colonization of upland areas by suites of species with limited dispersal capabilities. Sites for pool creation were specifically selected because they are located on permanently protected lands that are above anticipated sea-level rise as identified by coastal elevation data. The long-term intent is to continue to align management with future shifts in climate, thereby developing a model for adaptive management of vernal pools, creating vernal pool "strongholds" and enabling the persistence of some dependent species in the face of climate change.

The Climate Adaptation Fund: Looking Ahead

Building on the momentum of our first two years of grantmaking, the Climate Adaptation Fund will award another $4 million through grant cycles in 2013 and 2014 to support national, regional and local conservation organizations in the implementation of on-the-ground interventions aimed at increasing the ability of wildlife to adapt to climate change and amplify ecosystem resilience. To further cultivate this emergent field within conservation, we will continue to build practitioners' understanding of the segment of climate adaptation efforts that align with the Climate Adaptation Fund Program, while contributing to the evolution of the adaptation field more broadly.

Ultimately, we expect that incorporating climate change considerations into wildlife conservation efforts and grounding these in the latest science and planning will become standard practice. Embedding these key components into on-the-ground work is an important step for safeguarding our vital ecosystems well into the future. Our goal with the WCS Climate Adaptation Fund is to serve as a catalyst in this process.

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