



taking action

Across the country, government agencies, partners and stakeholders are taking action to prepare for and respond to the impacts of a changing climate on the nation's valuable natural resources and the people who depend on them. The *National Fish, Wildlife and Plants Climate Adaptation Strategy* is a comprehensive, multi-partner framework for effective steps that can be taken over the next five to 10 years based on climate change projections for the next century. This *Taking Action* report describes 50 projects that demonstrate implementation of a variety of actions recommended by the Strategy. The diverse adaptation work highlighted in this report is part of a larger collective effort by a wide range of partners to safeguard the nation's fish, wildlife, plants, and the communities and economies that depend on them in a changing climate.



STRATEGY VISION

Ecological systems will sustain healthy, diverse, and abundant populations of fish, wildlife and plants. Those systems will continue to provide valuable cultural, economic and environmental benefits in a world impacted by global climate change.



TAKING ACTION

The intent of this report is to provide examples of how the Strategy is being implemented through collaborative adaptation projects on the ground; to demonstrate to both conservation practitioners and public decision makers the strong role they can play in adaptation; and to inspire and encourage stakeholders, managers, and the public to join the effort.



How is *Taking Action* structured?

The seven major goals identified by the Strategy to help fish, wildlife, plants and ecosystems cope with the impacts of climate change. These goals serve as the seven chapters of the *Taking Action* report.

Goal 1

Conserve habitat to support healthy fish, wildlife and plant populations and ecosystem functions in a changing climate.

Goal 2

Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate.

Goal 3

Enhance capacity for effective management in a changing climate.

Goal 4

Support adaptive management in a changing climate through integrated observation and monitoring and improved decision support tools.

Goal 5

Increase knowledge and information on impacts and responses of fish, wildlife and plants to a changing climate.

Goal 6

Increase awareness and motivate action to safeguard fish, wildlife and plants in a changing climate.

Goal 7

Reduce non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate.



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What are the case studies?

Taking Action features 50 case studies that illustrate actions recommended by the National Fish, Wildlife, and Plants Climate Adaptation Strategy. The example case study below appears in *Taking Action* as an example of managing a habitat to protect ecosystem function (Goal 2).

✓ Planting Future Forests in Northern Minnesota

Northern forests in the Great Lakes region are entering an era of compromised conditions due to climate change. Harvesting practices over the past century have converted the forests to more low diversity, even-aged stands of trees, leaving forests vulnerable to emerging stressors. Forest-dependent wildlife, most notably migratory songbirds, have experienced associated declines.

Traditionally, restoration goals have focused almost entirely on reintroducing historically abundant boreal conifers into the landscape. Recent research shows that warmer, drier conditions over the coming decades are likely to undermine these current restoration efforts. This project focuses on new climate informed strategies that favor diverse suites of tree species best suited to thrive under changing climate conditions through an adaptation forestry approach, or a combination of management and planting that increases complexity.

Adaptation forestry departs significantly from previous restoration efforts. The strategy is based on current and future modeled range maps for trees and emphasizes within-range plantings of tree species anticipated to thrive under warmer, drier conditions. Species of emphasis are all native, but are uncommon due to the legacy of past harvesting practices, past climate conditions, and dispersal limitations. Although suited to new conditions, without management intervention these species are unlikely to realize the full extent of their ranges as the rate of climate change outpaces their ability to disperse.



NANCY A. JOHNSON PHOTOGRAPHY

Forest Ecologist Mark White installs a mesh cage around a newly planted oak seedling to protect it from deer browsing.

In October 2012, partners began implementing adaptation forestry practices at 12 sites totaling 2,000 acres in north-eastern Minnesota. A total of 88,000 climate-adapted native trees are scheduled to be planted by November 2014, including red oak, bur oak, and white pine from two different seed sources. The performance of seedlings of different species and origin under different conditions created by contrasting silvicultural treatments will be compared across four distinct forest plant communities. The goal is to explicitly test the effectiveness of adaptation forestry for transition to future suites of climate-adapted species.

Partners

- » The Nature Conservancy
- » Conservation Partners Legacy Fund
- » Doris Duke Charitable Foundation
- » Lake County
- » Minnesota Department of Natural Resources
- » Minnesota Forest Resources Council
- » Northern Institute of Applied Climate Science
- » Sustainable Forests Education Cooperative
- » Saint Louis County
- » University of Minnesota, Duluth
- » University of Wisconsin, Madison
- » U.S. Forest Service
- » Wildlife Conservation Society

Please visit www.wildlifeadaptationstrategy.gov



NATIONAL *fish, wildlife & plants* CLIMATE ADAPTATION STRATEGY

Shared solutions
to protect
shared values

Case Studies Featured in *Taking Action*

taking action

Goal 1

Conserve habitat to support healthy fish, wildlife, and plant populations and ecosystem functions in a changing climate

Strategy 1.1

Yakima River Basin Integrated Plan
Central Appalachians Essential Forests and Key Connectors

Strategy 1.2

Landscape Scale Conservation in the White-Moose
Protecting Coldwater Fish in Minnesota

Strategy 1.3

Improving Salmon Habitat on the Upper Quinault River
Snapshot: Saving Hotter and Drier Ciénaga Habitat
Albemarle-Pamlico Adaptation Project
Snapshot: Partners for Fish and Wildlife Program in the Mountain Prairie Region

Strategy 1.4

Taunton Mill River Restoration
Snapshot: Promoting Aquatic Connectivity and Fish Passage
Restoring Access to Salmon Habitats

Goal 2

Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate

Strategy 2.1

Managing Yellowstone Cutthroat Trout under Climate Change

Strategy 2.2

Assessing Brook Trout Vulnerability to Inform Management in Wisconsin
Snapshot: Lower Keys Marsh Rabbit Adaptive Management

Planting Future Forests in Northern Minnesota

Snapshot: Climate Change and Assisted Migration

Strategy 2.3

Northwestern Tribal Forest Improvement
Snapshot: Sagebrush Conservation for Greater Sage-Grouse

Goal 3

Enhance capacity for effective management in a changing climate

Strategy 3.1

Online Climate Courses for Natural Resource Managers
Snapshot: Planning for Climate Change on the National Wildlife Refuge System
Snapshot: Interpreting Climate Change

Strategy 3.2

Landscape Conservation Cooperatives
Snapshot: Pacific Islands Climate Change Cooperative
Traditional Gathering Calendar
Snapshot: North Cascadia

Strategy 3.3

Executive Order 13653

Strategy 3.4

Climate Change and the State Wildlife Grants

Goal 4

Support adaptive management in a changing climate through integrated observation and monitoring and use of decision support tools.

Strategy 4.1

Developing Baseline Data to Respond to Coastal Change

Strategy 4.2

Gulf Coast Climate Vulnerability
Snapshot: Sea Turtle Vulnerability Assessment
Vulnerability Assessment of California Vegetative Communities
Alternative Futures for Florida Keys

Goal 5

Increase knowledge and information on impacts and responses of fish, wildlife, and plants to a changing climate

Strategy 5.1

Climate Science Centers and the NCCWSC
Regional Integrated Sciences and Assessments
USDA Regional Climate Hubs

Strategy 5.2

Studying Coral Adaptations

Strategy 5.3

Pacific Coast Sea-Level Rise Modeling
Modeling for Virginia's Wildlife Action Plan
Habitat Modeling for Wintering Black Ducks
Birds of the North Pacific

Goal 6

Increase awareness and motivate action to safeguard fish, wildlife, and plants in a changing climate

Strategy 6.1

Pacific Northwest Tribal Climate Change Project

Strategy 6.2

National Climate Change Wayside Project
Maine Fishermen's Climate Roundtable
Engaging Youth with Climate Change

Strategy 6.3

Snapshot: Climate-Smart Conservation

Goal 7

Reduce non-climate stressors to help fish, wildlife, plants, and ecosystems adapt to a changing climate

Strategy 7.1

Snapshot: Bureau of Land Management Regional Mitigation Strategy

Strategy 7.2

Promoting Healthy Watersheds

Strategy 7.3

Strengthening Resiliency in Sierra Nevada Meadows
Snapshot: Vessel Discharge Standards to Reduce Invasive Species

Heightened Awareness for Emerging Pathogens

Strategy 7.4

Snapshot: Bycatch Reduction Engineering Program (BREP)