

## Wildlife, Wetlands & Climate Change: YOUR LAND, YOUR PLAN



Many landowners have noticed visible impacts to their land with recent changes in our climate<sup>1</sup>. The functions of wetlands and riparian areas, such as storing and filtering water, are even more critical due to changes in land use. You may have also noticed impacts from a changing climate on your land and the wildlife there. Keeping your land suitable for wildlife can be challenged by loss of food or habitat, land fragmentation, and invasive species. The USDA Northern Forests Climate Hub and Northern Institute of Applied Climate Science have identified tools and approaches<sup>2</sup> to help landowners adapt to climate change and achieve their goals related to wildlife and wetland management. The conservation programs offered by the USDA Natural Resources Conservation Service (NRCS) can help private landowners achieve these goals through technical and financial assistance. Below are some examples of how you can employ adaptation strategies and NRCS programs to steward your land for wildlife and wetland resources and prepare for climate change impacts.

### How is climate change impacting my land?

#### Temperature Increases

Temperatures in the Northeast have risen by 2.4° F over the past century and are projected to increase by another 3.5-8.5° F in southern New England by the end of the century, with winters expected to warm more than other seasons. This affects snowpack depth and duration, rates of evaporation and evapotranspiration, length of growing season, and drought stress. These changes may impact wetlands through shifts in groundwater recharge and soil infiltration rates. Increased temperatures may impact wildlife through decreased snowpack, changes in timing and availability of food sources, and shifting migration dates.

#### Precipitation Changes

Heavy precipitation events have increased in number and severity in the Northeast since the mid-20th century, more so than anywhere else in the United States. This trend toward more frequent, heavier rainfall events is expected to continue, with longer periods of drought in between. By 2100, the entire Northeast is expected to receive 21 percent more rainfall events greater than 1 inch. Coastal areas of southern New England are expected to see the largest increases in heavy rainfall. Precipitation changes can have significant impacts on soil moisture, duration of vernal pools, frozen ground duration, flooding frequencies, and surface runoff. These things can affect nesting success of water-fowl and amphibians, food sources, and availability of water sources late in the season.

#### Deer Habitat

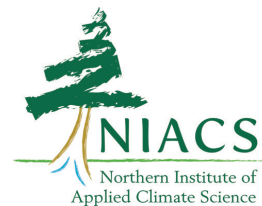
Warmer winters and reduced snow depth reduce energy requirements for deer and increase access to forage during winter months. As deer benefit from climate change over the 21st century, browsing pressure may increase on tree regeneration, making it more difficult to maintain diverse, functioning forests on our landscape.

For a full description of climate change impacts on your land, visit the Climate Explorer Tool at: [adaptationworkbook.org/explore-impacts](https://adaptationworkbook.org/explore-impacts)



Natural Resources Conservation Service

[nrcs.usda.gov/](https://nrcs.usda.gov/)



[niacs.org/](https://niacs.org/)



Climate Hubs

[climatehubs.usda.gov/](https://climatehubs.usda.gov/)

NRCS provides America's farmers and ranchers with financial and technical assistance to voluntarily put conservation on the ground, not only helping the environment but agricultural operations, too.

The Northern Institute of Applied Climate Science (NIACS) is a collaborative effort among the Forest Service, universities, conservation organizations, and forest industry that provides information on managing forests for climate change adaptation and enhanced carbon sequestration.

The USDA Climate Hubs develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers.

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# What can I do?

NRCS has programs that can provide technical and financial assistance to help you achieve your goals and objectives and implement climate change adaptation on your property.

## Conservation Stewardship Program (CSP)

The Conservation Stewardship Program helps landowners implement conservation practices which protect, restore, and enhance wetlands, grasslands, and working farms and ranches through conservation enhancements.

## Environmental Quality Incentives Program (EQIP)

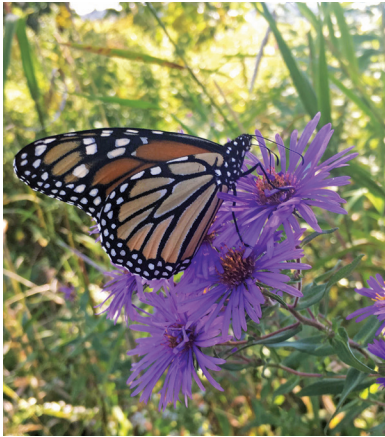
Through EQIP, landowners can receive technical and financial assistance to implement conservation practices that protect soil and water quality.

# Where do I start?

Contact your local USDA Service Center to get started. Discussing your resource concerns with an NRCS conservation planner will help you:

- Identify your GOALS and OBJECTIVES,
- consider how climate change will affect your land, and
- select adaptation strategies and conservation practices.

# Examples



## OBJECTIVE: Create and Enhance Food Sources and Nesting Sites

**ADAPTATION APPROACHES:** Enhance primary food sources for climate-sensitive species; Create new sources of food, water, and cover in anticipation of future conditions; Manage and create suitable microhabitats and microclimates

**CONSERVATION PRACTICES:** Pollinator/Beneficial Insect Habitat, Cover Crop, Conservation Cover, Tree/Shrub Establishment

Wildlife food and cover on your land can be resource concerns identified during the conservation planning process. These can be addressed through practices that establish or enhance native plants on your property, remove noxious or invasive species, introduce plant species better suited to climate change impacts, and/or convert edges of cropland to tallgrass prairie. Harvesting trees to encourage regeneration and a diversity of age classes can provide important habitat for grouse and woodcocks. You can provide nectar for pollinators, hard and soft mast for songbirds and large birds of prey, and grazing for wildlife, especially during times when food is not available in portions of the landscape, such as during crop season or at the end of the growing season.

## OBJECTIVE: Improve Wetland Hydrologic Function

**ADAPTATION APPROACHES:** Maintain and enhance infiltration and water storage; Restore stream channel form and function.

**CONSERVATION PRACTICES:** Wetland Restoration, Filter Strip, Wetland Wildlife Habitat Management, Stream Habitat Improvement and Management

Hydrologic function can range from intercepting precipitation and surface runoff to filtering pollutants and excess nutrients out of the water. Maintaining appropriate temperature and oxygen levels for fish and providing appropriate ponded water for waterbirds, amphibians, and reptiles to feed and nest are important considerations. Protecting existing vernal pools from sediments, road salts, and other runoff is of critical importance. The work involved to either create or restore these functions on your land can include creating appropriate micro-topography and vegetation, installing water control structures, or controlling erosion with structural treatments. The goal is to minimize land that offers little to no opportunities for rainwater infiltration or that accelerates the movement of water across the land. Removing legacy sediments, amending compacted soils, or providing structures that stabilize stream-banks and reconnect the floodplain to incised channels can decrease soil erosion and increase water quality.



## OBJECTIVE: Establish Wildlife Corridors

**ADAPTATION APPROACHES:** Establish corridors and minimize barriers to movement to new suitable habitats; Implement nonlethal behavioral control methods.

**CONSERVATION PRACTICES:** Wildlife Habitat Plantings, Field Border, Tree and Shrub Establishment, Riparian Herbaceous Cover, Riparian Forest Buffer

These strategies and practices provide passageways for wildlife to move from food, cover, and water sources to other places as needed in their life cycles. This can include the establishment of adapted vegetation, or the modification or removal of barriers that restrict or impede the movement of organisms. The goal is to reduce habitat fragmentation by creating vegetative links across the landscape. Plant species may also be selected to serve additional functions, such as controlling erosion, improving water quality, and storing carbon.

## OBJECTIVE: Facilitate Wildlife Use of Wetlands

**ADAPTATION APPROACHES:** Maintain and restore wetland structure; Enhance and maintain species diversity; Design and manage enhanced and created wetlands to accommodate changes in hydrologic variability.

**CONSERVATION PRACTICES:** Tree and Shrub Establishment, Wetland Wildlife Management, Wetland Creation, Wetland Restoration; Riparian Forest Buffer

Critical functions of wetlands and riparian areas include providing food, nesting, brood rearing, and water sources for terrestrial and aquatic organisms. By creating topographic variation on the site and encouraging an appropriate diversity of plant species, you can help improve water quality and wildlife habitat. Topographic variation (micro and macro) creates a diversity of water depths, from short-term ponding to seasonal and semi-permanent water conditions; this diversity allows for the germination, establishment and dispersal of a wider array of wetland plants, which provide food and cover for wildlife. Future changes in precipitation patterns are likely to impact water levels; when designing a new wetland, it may be useful to consider increasing the capacity for extreme precipitation events.

# Other Resources Available

Many wildlife and wetland conservation practices are available through the NRCS. Visit your local USDA Service Center or [www.nrcs.usda.gov](http://www.nrcs.usda.gov) for more information. See our other brochure for adapting to climate change impacts on forestry and carbon management. Visit the Climate Change Response Framework website at: [forestadaptation.org/focus/wildlife](http://forestadaptation.org/focus/wildlife)

# Citations

1. Janowiak, Maria K et al, 2018. New England and northern New York forest ecosystem vulnerability assessment and synthesis: a report from the New England Climate Change Response Framework project. Gen. Tech. Rep. NRS-173. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 234 p. <https://doi.org/10.2737/NRS-GTR-173>
2. Swanston et al, 2016. Forest Adaptation Resources: climate change tools and approaches for land managers, 2nd edition. <http://www.treeseearch.fs.fed.us/pubs/52760>.
3. Kunkel, K.E., et al., Regional climate trends and scenarios for the U.S. National Climate Assessment. Part 1. Climate of the Northeast U.S., 2013, US Department of Commerce, National Oceanic and Atmospheric Administration: Washington, DC. p. 87.