

# Habitat Conservation in the Era of Climate Change

Changing climate in Rhode Island may profoundly affect our environment in the coming decades. While the impacts are difficult to predict, we do know that changes in temperature directly affect many marine and terrestrial habitats; timing shifts will be seen in flowering plants as well as in breeding and migration of land and water species. Alterations in precipitation patterns can cause stress for numerous plants and animals, further affecting our ecosystems. Sea level rise results in salt marshes migrating upland with the potential to squeeze the salt marsh up against our highly developed shoreline.

## Why be Proactive and Adapt to Changing Climate?

- Help insure that your conservation and management successes endure in a changing environment.
- Planning ahead reduces environmental risks such as increased flooding, erosion, water quality decline, invasive species colonization, and habitat and species loss.
- Early adaptation planning allows for improved habitat resilience.
- Prevent and/or minimize damages caused by extreme weather conditions.
- Support community and citizen attitude changes needed to prepare for shifting climatic patterns.
- Help protect valuable ecosystem services that provide social and economic benefits to society.



## What Do We Need to Do?

Building upon your existing toolkit of management and protection, several steps can be taken:

- Determine which resources are vulnerable to changing conditions –both climate and non-climate.
- Prioritize preservation of critical habitats by enhancing explicit policy, regulations and enforcement.
- Evaluate physical attributes of habitats (ecological land units - ELU) as an indicator for current and future biodiversity.
- Complement existing management and protection initiatives with actions tailored to climate and non-climate stressors affecting different habitats.
- Formulate and carry out public education campaigns about the importance of these habitats, their benefits to society, and the actions necessary to conserve them in a changing environment.

### Resources

**Land Trust Alliance Tool Kit:** <http://www.landtrustalliance.org/climate-change-toolkit>

**Massachusetts Fish and Wildlife Climate Change Initiatives**

[http://www.mass.gov/dfwele/dfw/habitat/cwcs/cwcs\\_climate\\_change\\_reports.htm](http://www.mass.gov/dfwele/dfw/habitat/cwcs/cwcs_climate_change_reports.htm)

**Connecticut State Climate Change Adaptation Report**

<http://ctclimatechange.com/wp-content/uploads/2010/05/Impacts-of-Climate-Change-on-CT-Ag-Infr-Nat-Res-and-Pub-Health-April-2010.pdf>

**Rhode Island Sea Grant:** <http://seagrant.gso.uri.edu/climate>

**Environmental Data Center:** Ecological Land Units, <http://www.edc.uri.edu/elu/>

**Salt marshes** are extremely vulnerable to drowning caused by accelerated rates of sea level rise and to changes in precipitation and storminess affecting nutrient availability. As a result, we may see impacts to vital nursery habitat for many species, including important fisheries such as striped bass and flounder.

*Actions to consider:*

- Conserve adjacent uplands where the salt marsh can migrate inland.
- Support the CRMC policy prohibiting the placement of engineered structures around the inland edge of salt marshes so that they can migrate inland.



**Freshwater aquatic** habitats are vulnerable to increasing temperatures, shifting precipitation patterns, habitat loss, and flooding. As air temperatures rise, cool water streams and ponds will be threatened, causing stress to some cold-water dependent species, such as brook trout. Reduced resilience of native species may increase the dominance of unwanted invasive species.



*Actions to consider:*

- Identify and protect remaining cold water streams and ponds.
- Ensure water temperatures stay cool by protecting and restoring riparian zones.
- Remove barriers that currently prevent upstream migration, thus allowing those fish to reach cooler waters.

**Forested swamps and wetlands** are currently under pressure due to impaired hydrology, habitat loss, and non-native species. This will likely be exacerbated with increased summer temperatures, changes in precipitation patterns, and higher incidence of drought potential for the future.

*Actions to consider:*

- Monitor and control invasive species colonization in order to improve native habitat's resilience.
- Increased efforts to reduce alterations to hydrology; promote low impact development practices.

**Upland forests** are especially vulnerable to rising temperatures which will impact forest species composition and abundance. Some species that cannot tolerate warmer weather such as sugar maples will migrate northward, reducing the species diversity of the forest. Warmer temperatures will also leave forests susceptible to invasive southern pests, species, and diseases.

*Actions to consider:*

- Protect large unfragmented blocks of forest to preserve cohesive habitat tracts and maintain wildlife corridors.
- Active monitoring of pests; consider selective control of targeted invasive species
- Practice active forestry work such as selective cutting, thinning, and deer management.

