

# Incorporating Climate Change into Maine's State Wildlife Action Plan



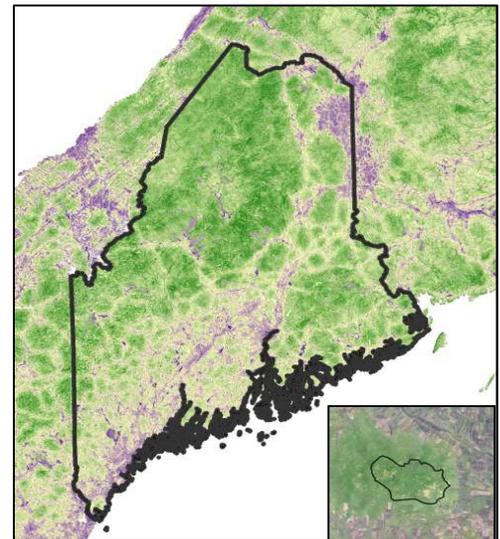
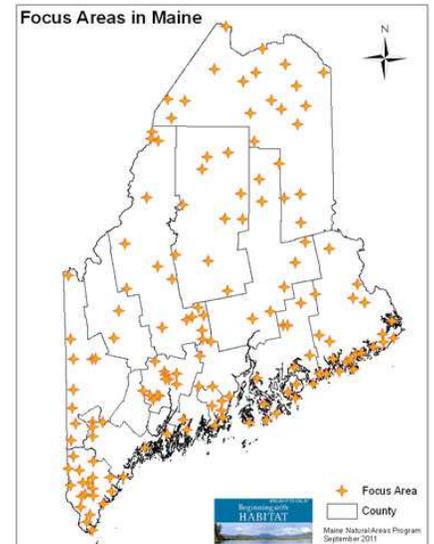
## Background and Need

Over the last decade, the Maine Department of Inland Fisheries and Wildlife worked with the Maine Department of Marine Resources, Maine Natural Areas Program, US Fish and Wildlife Service, and The Nature Conservancy to identify concentrations of Species of Greatest Conservation Need and high quality habitats across Maine. Using aerial photos and data from biological surveys, this effort resulted in mapping more than 100 Focus Areas of Statewide Ecological Significance (see map right). These Focus Areas are recognized in Maine's 2015 State Wildlife Action Plan as a non-regulatory planning tool for landowners, conservation entities, and towns (see <http://www.beginningwithhabitat.org>).

As a means of incorporating climate change concepts into the updated 2015 Wildlife Action Plan, Maine state agencies turned to TNC's resilience science as a useful tool because of its regional extent, broad applicability, and emphasis on 'enduring features' of the landscape. The Focus Areas were initially identified using current biotic features and landscape condition, and integration of TNC resilience science adds an important long-term perspective that incorporates climate change concepts. In 2015 funding from the Open Space Institute was directed towards this integration. In particular, the TNC resilience information emphasizes the roles of geology and landform (abiotic features) and habitat connectedness. Resilience is defined as a combination of *landscape connectedness* and *landscape complexity*. Landscape connectedness refers to the ability of a landscape to allow movement of wildlife from one place to another; it may also be viewed as a lack of habitat fragmentation. Landscape complexity is a combination of landform variety, elevation range, and wetland density (e.g., the juxtaposition of slopes, ridges, and flats).

## Key Questions

- Do Focus Areas have greater habitat *connectedness* than the region in which they occur?
- Are all *geologic types* in Maine represented within Focus Areas?
- Recognizing both habitat connectedness and geologic settings, are Focus Areas more *resilient* than the region in which they occur?



Most of Maine is highly resilient (green), and Focus Areas are generally more resilient than the surrounding landscape

## Results

- The overall network of Focus Areas exhibits strong *resilience* to climate change, reflecting high habitat connectedness and representing a diversity of geologic settings. In particular, Maine's Focus Areas generally have higher connectedness than the rest of Maine's landscape (and Maine's landscape is generally more connected than the rest of the Northeast U.S.). Habitat connectedness is highest in northern Maine, where the lack of development and paved roads means there are few barriers to wildlife movement.
- Nearly the full variety of Maine's *geophysical settings* is represented within Focus Areas. The "low-elevation calcareous" setting is the only type that is under-represented in both Maine's conservation lands and in Focus Areas. However, there are no clear opportunities for Focus Areas to capture this uncommon geologic type where it converges with other Focus Area values such as undeveloped blocks or at-risk species.
- Landscape *complexity* was not a driver for higher Focus Area resilience scores. In fact many Focus Areas are large wetland complexes that may have lower landscape complexity scores because they reflect comparatively flat, homogeneous landscapes.

## Lessons Learned

- TNC resilience science provides a useful framework for integrating biological data with enduring landscape features. However, while some resilience concepts (such as habitat connectedness) are intuitive and easy to visualize on maps, others (such as landscape complexity) require explanation and background for many stakeholders.
- Although statewide interpretation of climate resiliency science is useful for partners working at this scale (e.g., state agencies, statewide and regional conservation groups), many partner organizations and land managers are most interested in fine scale local and regional maps.
- Some locations of high complexity or under-represented geologic settings may not intersect with areas of high biological importance or intact landscape conditions. These cases require consideration of the importance or rarity of those complex landscapes or settings, as well as the potential for restoration of their condition.
- In areas where biological surveys or data (i.e., rare species locations) are lacking or incomplete, the variety of landforms, geologic settings, and wetland types, coupled with landscape condition and connectedness, may serve as a useful proxy for estimating biodiversity.
- TNC resilience data alone does not adequately address coastal issues such as sea level rise. LIDAR-derived data and sea level rise models can be useful tools for assessing vulnerable coastal areas as part of long-term planning.
- For aquatic systems, information on possible stream and river barriers (i.e., ineffective culverts, tide gates) may be useful for identifying candidate locations to restore aquatic connectivity.



*Spotted turtle, a rare species that prefers connected aquatic and terrestrial habitats*