

**The Climate Project Screening Tool Report for the  
Massachusetts Division of Fisheries and Wildlife's Southeast District**



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## Table of Contents

<b>Introduction</b>	<b>3</b>
<b>Methods</b>	<b>4</b>
Overview of the CPST	4
CPST Column Descriptions	5
<i>Project activities of focus for the discussion</i>	5
<i>General climate change trends and local impacts</i>	5
<i>Key questions for managers</i>	5
<i>Response narrative</i>	6
<i>Continue with project?</i>	6
<b>Results</b>	<b>11</b>
Overview	11
Interesting Findings	12
Climate Change Adaptation Techniques Already in Use	12
<b>Using the Climate Action Tool</b>	<b>12</b>
<b>Next Steps</b>	<b>13</b>
<b>Conclusions</b>	<b>14</b>
<b>Works Cited</b>	15
<b>Appendices</b>	<b>16</b>
Appendix 1: WMAs Not Discussed	16
Appendix 2: Additional Resources	16

## Table of Tables

<b>Table 1. Climate Project Screening Tool with responses from the Southeast District</b>	<b>7</b>
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## **Introduction**

As the influence of climate change increases, it is important to consider how adaptation techniques can be integrated into current natural resource management to reduce vulnerabilities to wildlife and their habitats over time. Climate change adaptation in the near term is essential because, owing to inherent time lags in climate impacts, the effects of increased atmospheric greenhouse gases will be felt for decades even if effective mitigation begins immediately (Melillo et al. 2014). However, climate science is a particularly challenging field given the level of technical expertise required, its high degree of uncertainty, and the lack of knowledge of climate change impacts at biologically relevant scales. Thus, climate change adaptation, although understood to be important to resource management, has not been explicitly incorporated into most wildlife management plans or actions.

Some decision-support tools have been developed to aid climate change planning and preparedness in response to the needs of resource managers (Climate Change Resource Center 2017). One such decision-support tool is the Climate Project Screening Tool (CPST) (Morelli et al. 2012), developed initially to aid national forests in the early stages of incorporating climate concerns into operational work and recently modified to aid fish and wildlife management in Massachusetts.

The CPST is a platform that natural resource managers can readily use to assess the potential impacts of climate change on projects and management goals. The CPST is a review and assessment tool that allows managers to explicitly and methodically consider current and impending projects and priorities through the lens of climate change. It provides space to assess whether a specific goal or project is appropriate in light of future climate trends. Through the

CPST process, some projects might be deemed inappropriate as originally designed and be recommended for comprehensive redesign or removal from activity lists.

The CPST is a broad tool that can be modified to accommodate many different working groups and management goals. For the Massachusetts Division of Fisheries and Wildlife (MassWildlife), the tool was modified to focus on projects within the Wildlife Management Areas (WMAs) owned by the agency. Within MassWildlife, there are 5 Districts (Central, Western, Connecticut Valley, Southeast, and Northeast), all with their own - and occasionally overlapping - WMAs for which they are responsible. Information about many of the WMAs, including key target species, can be found on the [MassWildlife Lands Viewer](#), although this information was not available at the time of these discussions.

This report focuses on the results of a meeting with the Southeast District's Management team using the CPST to facilitate a discussion of climate change activities on select WMAs. This report provides specific responses to the discussion and process questions as well as general findings and useful resources. Not all WMAs were discussed during the 3-hour meeting. Those not discussed can be analyzed using this Climate Project Screening Tool at a future date.

## **Methods**

### **Overview of the CPST**

The CPST is a table where the first column lists specific project or management activities of interest. Next, the tool provides a summary of climate change impacts relevant to the specific management activity, poses useful discussion and process questions, and provides space for response and record-keeping. Each management activity section concludes with a question of whether to continue with the specific activity or not, and if so, if any portion of the activity should be modified.

### CPST Column Descriptions

(See Table 1 for the CPST layout and specific responses by managers at the meeting)

#### *Project activities of focus for the discussion*

- An important first step is to identify the appropriate scale at which relevant activities will be evaluated. To this end, all management activity categories were identified from the Federal Aid report produced by MassWildlife. District managers were asked to fill out a spreadsheet identifying which activities were being considered or actively done on each WMA. This process allowed the CPST to be tailored to each District and provided a coherent and efficient structure for the meeting.

#### *General climate change trends and local impacts*

- Information about projected climate and ecosystem responses can be gathered from many sources and summarized for key indicators of relevance to the local environment. The scientific literature (including a report done specifically for the northeastern states, see Useful Resources) and experts at the Department of Interior Northeast Climate Science Center were the primary sources for local climate data for this report. The purpose of this summary is to give managers a broad sense of anticipated and ongoing changes in climate and related ecological responses throughout their District. The local impacts focus on effects at a scale that is relevant to project design and highlight appropriate changes to the project.

#### *Key questions for managers*

- The purpose of this column is to facilitate thinking about the potential impacts of climate

change on a specific project type. The questions used to guide the discussion were originally developed through meetings with US Forest Service resource specialists and then modified with MassWildlife staff. Additionally, information on some project activities was gathered from the MassWildlife website. After the questions were used in the first meeting (with the Central District), modifications were made to enhance relevance in future meetings.

#### *Response narrative*

- The response narrative in the fourth column is the centerpiece of the CPST, where managers or facilitators record their answers to the questions and thus their thinking about the interaction between climate change and the project. Users are encouraged to identify and document sources for their answers.

#### *Continue with project?*

- The last column is where the user concludes whether to proceed with, modify, or cancel the project given the response narrative. It is intended as a recommendation regarding whether or not climate change impacts are likely to be: 1) insignificant enough to proceed as originally designed, 2) substantial enough to require modification to the proposed activities, or 3) whether the project cannot be adequately modified given relevant climate change effects and thus should be withdrawn. Selection and documentation of one of the three recommendations can then become part of a public report on how resource managers considered climate change prior to project implementation.

**Table 1. Climate Project Screening Tool with responses from the Southeast District**

<b>Project Activity</b>	<b>Climate Change Trends and Local Impacts</b> (for more information: <a href="http://climateactiontool.org">climateactiontool.org</a> )	<b>Key Questions for Managers</b>	<b>Response Narrative</b> (please complete)	<b>Continue with Project?</b>
Stream Restoration & Culvert Removal	<p><b>Trends</b> – <a href="#">Reduced snowpack</a>, thus earlier winter-spring peak flows; wetter springs with more flooding; longer, drier summers, though with heavier <a href="#">rainfall</a> events and thus increased risk of <a href="#">flooding</a>, exacerbated by decreased imperviousness from drier soils</p> <p><b>Local Impacts</b> – Vegetation and wildlife species movement; reduced water storage in soils; changed hydrologic regimes</p>	<ul style="list-style-type: none"> <li>• Will the hydrologic system change from perennial to intermittent over time: e.g., what is the future range of flow?</li> <li>• Can this area (or project) withstand extreme weather events? Events more extreme than those currently experienced?</li> <li>• Are current plant/wildlife species viable in the future given changes in water temperatures?</li> <li>• Is the restoration area vulnerable to increased fire events and/or erosion?</li> <li>• Is this culvert a barrier to species tracking climate change?</li> </ul>	<ul style="list-style-type: none"> <li>• Intermittency is already a concern. If drought becomes an issue in the future this may need to be managed differently.</li> <li>• Fish kill is a serious concern.</li> </ul> <p>Burrage Pond WMA:</p> <ul style="list-style-type: none"> <li>• No, dikes are not designed to hold water for extended time. Can adjust water control structures if anticipating big flooding events.</li> <li>• Temperature is not as much of an issue as dissolved oxygen – that’s an issue. Blue green algae growth also can be a problem and already occasionally is.</li> <li>• Already have some erosion issues on down gradient side of dams and dikes – could potentially be a bigger problem with extreme weather events</li> <li>• ~65 culverts on the property, don’t think they’re barriers</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes, with modification:
Vegetation Control – mowing, hand cutting,	<p><b>Trends</b> – Increased fuel buildup and risk of wildfire; increased interannual variability in <a href="#">precipitation</a>,</p>	<ul style="list-style-type: none"> <li>• Will the activity be sufficient to control invasives that grow larger and more abundantly?</li> </ul>	<ul style="list-style-type: none"> <li>• Hand cutting, herbicide for purple loose-strife, invasive grasses, <i>Phragmites</i></li> <li>• Invasives are getting worse,</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes, with modification:

herbicide	<p>leading to fuels build up and causing additional forest stress; increased stress to forests during periodic multi-year <a href="#">droughts</a>;</p> <p><b>Local Impacts</b> –          Densification of vegetation; increased <a href="#">invasive</a> aquatic, plant, and forest pests; earlier and longer growing season</p>		<p><i>Phragmites</i> is a particular concern, (Some sites are well surveyed and treated for invasives like this one but other sites can't track)</p>	
		<ul style="list-style-type: none"> <li>Does the project area include anticipated future vulnerable areas (i.e. higher elevation sites, riparian areas, soil types or ecosystems not previously recorded as invaded)?</li> </ul>	<ul style="list-style-type: none"> <li>Cedar swamp maybe</li> </ul>	
		<ul style="list-style-type: none"> <li>Will the treatment season need to be adjusted for the earlier growing season?</li> </ul>	<ul style="list-style-type: none"> <li>Potentially. Already do a lot of work in the wintertime, convenient because ground is frozen and machines run better. Note that some amount of ice is necessary for some of the activities.</li> <li>Base most mowing on Aug 15 post-breeding date</li> </ul>	
		<ul style="list-style-type: none"> <li>Will additional invasives require more work hours to control?</li> </ul>	<ul style="list-style-type: none"> <li>Yes, will need to apply more person hours and probably contract out <i>Phragmites</i> removal (so more money as well)</li> </ul>	
Prescribed Burning	<p><b>Trends</b> –          Increased fuel buildup and risk of wildfire; increased interannual <a href="#">variability in precipitation</a>, leading to fuels build up and causing additional forest stress; increased stress to forests during periodic multi-year <a href="#">droughts</a>;</p>	<ul style="list-style-type: none"> <li>Are there techniques that can be used to effectively manage a burn considering increased fuel loads and droughty conditions?</li> </ul>	<ul style="list-style-type: none"> <li>Current prescription not in the hands of DFW</li> <li>Fires have ecological but also fuel reduction objectives</li> <li>Currently mostly prioritize sites based on ecological objectives</li> <li>Limitations based on available staff and days that allow burns</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes, with modification:



	<p><b>Local Impacts –</b> Increased risk for erratic fire behavior; decreased window of opportunity for prescribed fire conditions; flashier, drier fuels; decreased water storage in soils</p>	<ul style="list-style-type: none"> <li>• In what ways do the increased droughty conditions factor into a prescribed burn (or lack of one)?</li> </ul>	<p>Burrage Pond WMA:</p> <ul style="list-style-type: none"> <li>• n/a</li> </ul> <p>Francis A. Crane WMA:</p> <ul style="list-style-type: none"> <li>• It may become more and more difficult to find the right conditions to burn (as per the burn plan prescription).</li> </ul>	
		<ul style="list-style-type: none"> <li>• Will the timing of prescribed burns need to be adjusted given climate trends (arrival of migratory species, bud break, etc.)?</li> </ul>	<ul style="list-style-type: none"> <li>• yes</li> </ul>	
<p>Forest Thinning</p>	<p><b>Trends –</b> Increased fuel buildup and potential risk of wildfire; increased interannual variability in <a href="#">precipitation</a>, leading to fuels build up and causing additional forest stress; increased stress to forests during periodic multi-year <a href="#">droughts</a>; increased water <a href="#">temperatures</a> in rivers and streams and lower water levels in late summer; decrease in water quality from increased sedimentation and warmer waters</p> <p><b>Local Impacts –</b> Increased risk for erratic fire</p>	<ul style="list-style-type: none"> <li>• Will the projected density of the stand after it has been thinned be able to withstand stressors? Does the spacing between trees need to increase?</li> </ul>	<ul style="list-style-type: none"> <li>• Should be sufficient spacing</li> <li>• No comprehensive monitoring component to the project</li> <li>• most thinning is only complex, large-scale done with the state office because there aren't the resources – there is a feeling that there is a need for more thinning and cutting</li> </ul>	<p><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes, with modification:</p>
		<ul style="list-style-type: none"> <li>• Should stands be thinned at a more frequent interval to reduce forest stress or for changed growth patterns?</li> </ul>	<ul style="list-style-type: none"> <li>• Resources not available</li> </ul>	
		<ul style="list-style-type: none"> <li>• Does the project area include anticipated future vulnerable areas (i.e. higher elevation sites, or riparian areas, refugia)?</li> </ul>	<ul style="list-style-type: none"> <li>• n/a</li> </ul>	

	behavior; decreased window of opportunity for prescribed fire conditions; flashier, drier fuels; decreased water storage in soils	<ul style="list-style-type: none"> <li>• Will the season of harvesting need to change given the reduced snow pack and extreme flood events to reduce ground disturbance? Will it need to change given shortening and less reliable winters?</li> </ul>	<ul style="list-style-type: none"> <li>• Possibly in the future</li> </ul>	
Nesting Structures – Development and Maintenance	<p><b>Trends –</b> Reduced <a href="#">snowpack</a>; earlier green-up; longer, drier summers, general shifts in <a href="#">temperature</a> ranges; increased insect and disease</p> <p><b>Local Impacts –</b> Historical availability of food and water sources may be <a href="#">altered</a> geographically and temporally; suitable range of habitat may alter with changing forest stand structure and temperature and <a href="#">precipitation</a> regimes</p>	<ul style="list-style-type: none"> <li>• Are the plant/wildlife species viable in the future given changes in food and water availability, as well as the range of future habitat?</li> </ul>	<ul style="list-style-type: none"> <li>• Most species present and managed for are <a href="#">wood ducks</a>, and they are abundant.</li> <li>• Wood ducks use boxes as well as surrounding habitat (hollows in trees)</li> </ul>	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes, with modification:
		<ul style="list-style-type: none"> <li>• Are target species arriving earlier?</li> </ul>	<ul style="list-style-type: none"> <li>• Do see some interannual variation but don't have comprehensive records. Best information is held by H. Heusmann in Westborough</li> </ul>	
		<ul style="list-style-type: none"> <li>• Are target species using different habitats?</li> </ul>	<ul style="list-style-type: none"> <li>• Not from what is being observed</li> </ul>	
		<ul style="list-style-type: none"> <li>• Will the future habitat of the focus species still consist of the current location?</li> </ul>	<ul style="list-style-type: none"> <li>• Again, H. Heusmann the lead on the project</li> </ul>	

## **Results**

### Overview

The facilitator team met at the Southeast District office in Buzzards Bay, MA, with 3 Southeast District staff from Mass Wildlife: District Manager Jason Zimmer, Stewardship Specialist Aaron Best, Fisheries Biologist Steve Hurley, and Wildlife Biologist Steve Wright. Meetings centered around management activities that were identified for a given WMA. The purpose of this design was to encourage the discussion of multiple WMAs when thinking about a specific management activity as well as to ensure that each type of management activity occurring within the District was discussed at least once.

Conversation flowed from specific questions in the CPST to a broader discussion of issues related to climate change to other issues faced by the District, and then back to the tool questions in a cyclical pattern until all questions in the management activity section were asked. An interesting secondary result of this meeting was that other management issues were identified, such as bigger picture questions about the continued utility of wood duck boxes. This secondary result was an unintended but beneficial outcome of considering climate change impacts on Agency lands. Many of the comments, activities, and concerns faced by one District were echoed at other Districts as well. These similarities and overlaps are included in this report (see Table 2).

The CPST allows Districts to document that they are thinking about climate change when making management decisions, whether they then choose to modify current activities or not. Deciding that continuing with the current activities, or lack of activities, for now is sometimes the appropriate choice at the end of the process. The critical step is to take time to consider climate change - within daily activities and larger-scale plans.

### Interesting Findings

- The Cape is home to many cranberry bogs, most of which used to be owned by independent growers. Ocean Spray is now the only operator in the area and these smaller bogs come up as cheap land to acquire and convert to wetland-type habitat.
- Not much activity happening on WMAs located right by the coast. Many of these WMAs abut the Cape Cod National Seashore. WMAs that may be affected by sea level rise are Salt Marsh WMA and Sandwich Game Farm WMA.
- More of the big picture management and decision-making occurs at the District level at the Southeast District than at some of the other Districts in the Commonwealth.

### Climate Change Adaptation Techniques Already in Use

- At Burrage Pond WMA, water levels are an issue but are controlled through high dike walls and multiple wetland/bog areas. The Southeast district utilized a grant from the North American Wetlands Conservation Act (NAWCA) to transition some bogs into wetlands and seasonally try to maintain water in those areas. They maintain the area as an emergent wetland.
- Mowing open grasslands in the winter is becoming more of a realistic possibility given that snowfall happens less frequently, if at all. Mowing in cooler temperatures is better for the mower engines because it mitigates overheating.

### **Using the Climate Action Tool**

When faced with challenges to effective management as a result of climate change, the Massachusetts Wildlife Climate Action Tool (CAT, <https://climateactiontool.org>) can be particularly useful to District Managers. The CAT was developed in partnership by MassWildlife, the University of Massachusetts-Amherst, the Department of Interior's Northeast Climate Science Center, and the U.S. Geological Survey's Massachusetts Cooperative Fish and Wildlife Research Unit, so the information within is specifically geared towards the Commonwealth. The CAT includes information on climate impacts, vulnerability of species and habitats, and adaptation actions that can be taken. It was developed using a literature review of the most recent scientific findings as well as new expert input.

District staff can use the CAT to find species-specific information that can be relevant to management goals. For example, the Southeast District wants to adapt to sea level rise at their English Salt Marsh WMA with the goal of keeping the area functional for focal species. If a manager was interested in knowing how to achieve that goal while being mindful of the effects climate change may have on their activities, they could look at the CAT website to find information on sea level rise as well as adaptation strategies available.

A number of potential adaptation strategies and actions are included in the CAT that managers could refer to when considering forest management, coastal habitat restoration, or how to promote connectivity among WMAs. Linking natural and human-made barriers to act as a break for waves and planting coastal plant species to create space for additional storm waters to slow are both mentioned in the CAT. Please see Appendix 2: Additional Resources for more examples. Since the CAT is a place to showcase existing expertise and practices, it could be modified to include some of the actions being undertaken by District staff as examples.

## **Next Steps**

For the WMAs that were not discussed, the CPST can be used by District staff without facilitation for future projects and plans. A manager can complete it by him- or herself or with others on a team; we found great value in having multiple members of the staff present to share their input and often to spark and deepen the dialogue. This also creates buy-in for the implementation of actions. The versatility and simplicity of the CPST allows it to be useful in more than just a few select scenarios and times. A complete copy of the CPST developed for MassWildlife is available with this report.

Lastly, as its name indicates, the purpose of the CPST as a screening tool became apparent when the need for additional time to develop coherent climate change adaptation for some management activities and WMAs was identified. For projects such as these, the Climate Adaptation Workbook (see Appendix 2) was mentioned, and the Workbook passed around. The in-depth nature of the Workbook appealed to attendees and there is interest in planning a training day at the Headquarters office, to learn how to use and implement it. The CPST could be considered a first step and its completion can facilitate and enhance the use of the Adaptation Workbook for projects that would benefit from more in-depth discussion and detailed planning.

## **Conclusions**

Using the CPST to facilitate a discussion of climate change impacts on current and planned management activities highlighted multiple results. In many cases, management professionals did not initially identify any ways in which they were modifying their work because of climate change and, in some cases, they did not readily identify ways climate change was affecting their work. However, upon further discussion, it became clear that observations of climate change and modification of activities were occurring, just not explicitly labeled as such. Through the course of the discussion, it also became clear that agency-wide policies on climate change would be helpful or, if already in existence, these could be communicated to Districts in a more comprehensive way. As such, it would be particularly important to have both District and Division Headquarters staff present at the meeting.

Overall, the CPST meetings provided a block of time for on-the-ground managers to pause in an otherwise busy schedule and directly consider climate change as it relates to their daily projects. The goal of these meetings was to facilitate this examination and encourage

thoughtful planning for current and future management activities. In this way, work hours and physical resources can be used most effectively to protect and manage Massachusetts' lands and wildlife resources in a changing climate.

### **Works Cited**

- Climate Change Resource Center. 2017. United States Department of Agriculture – United States Forest Service. *Climate Change and Carbon Tools*. <https://www.fs.usda.gov/ccrc/tools>.
- Melillo, J.M., T.C. Richmond, & G.W. Yohe, Eds. 2014. *Climate Change Impacts in the United States: The Third National Climate Assessment*. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2.
- Morelli, T.L., S. Yeh, N.M. Smith, M.B. Hennessy, & C.I. Millar. 2012. *Climate Project Screening Tool: An Aid for Climate Change Adaptation*. United States Department of Agriculture, Forest Service. Research Paper PSW-RP-263. 40p.

## Appendices

### Appendix 1: WMAs Not Discussed

Bearse Pond WMA	Copicut WMA	Hartley Reservoir WMA	Mattapoissett River WMA	Poor Meadow Brook WMA	South Triangle Pond WMA
Black Brook WMA	Dartmoor Farm WMA	Haskell Swamp WMA	Meetinghouse Swamp WMA	Provincetown Corridor WMA	Taunton River WMA
Blueberry Pond WMA	Dennis Grassy Pond WMA	Head Of The Plains WMA	Miacomet Heath WMA	Purchade Brook WMA	Triangle Pond WMA
Brayton Point WMA	Eastham Salt Marsh WMA	Hockomock Swamp WMA	Noquochoke WMA	Quashnet River WMA	Wasque Point WMA
Camp Edwards WMA	English Salt Marsh WMA	Hog Ponds WMA	North Attleborough WMA	Quashnet Woods State Reservation & WMA	West Meadows WMA
Canoe River WMA	Erwin S. Wilder WMA	Hyannis Ponds WMA	Old Sandwich Game Farm WMA	Rocky Gutter WMA	Halfway Pond WMA
Chase Garden Creek WMA	Fisk Forestdale WMA	Katama Plains WMA	Olivers Pond WMA	Sandwich Hollows WMA	Mashpee River WMA
Clapps Pond WMA	Freetown Swamp WMA (Mill Brook Bogs WMA)	Maple Springs WMA	Peterson Swamp WMA	SE Pine Barrens WMA	Plymouth Grassy Pond WMA
Cooks Pond WMA	Gosnold WMA	Mashpee Pine Barrens WMA	Pickerel Cove WMA	Sly Pond WMA	South Shore Marshes WMA

### Appendix 2: Additional Resources

- Massachusetts Wildlife Climate Action Tool <http://climateactiontool.org> - For specific information on species and habitat vulnerability, climate trends in Massachusetts, and adaptation strategies and actions. Example pages below.
  - Species
    - Brook trout - <https://climateactiontool.org/species/brook-trout>
    - Moose - <https://climateactiontool.org/species/moose>
    - American Black duck - <https://climateactiontool.org/species/american-black-duck>



- Habitats
  - Vernal pools - <https://climateactiontool.org/ecogroup/freshwater-wetlands-vernal-pools>
  - Spruce Fir forest - <https://climateactiontool.org/ecogroup/forest-spruce-fir>
  - Coldwater fisheries streams - <https://climateactiontool.org/ecogroup/rivers-and-streams-coldwater-fisheries-resources-streams>
- Adaptation Actions
  - Culvert upgrades <https://climateactiontool.org/content/maintain-habitat-connectivity-retrofit-or-replace-culverts>
  - Riparian restoration for coldwater streams <https://climateactiontool.org/content/ensure-cool-water-temperatures-protect-and-restore-riparian-areas>
  - Promote species in the northern and middle edge of their range <https://climateactiontool.org/content/promote-drought-and-heat-tolerant-species-encourage-species-northern-and-middle-edge-range>
  - Living shorelines <https://climateactiontool.org/content/restore-and-protect-natural-shorelines-use-living-shoreline-techniques>
- Adaptation Workbook <https://adaptationworkbook.org> - A process to consider climate change impacts and design adaptation actions. Similar to this CPST, but for a deeper dive into climate change planning for a WMA.
- Vulnerability Assessment of MA Species of Greatest Conservation Need (2017) <https://necsc.umass.edu/projects/vulnerability-northeastern-wildlife-climate-change-using-decision-science-inform-manageme-0>
- North Atlantic Aquatic Connectivity Collaborative (NAACC) [streamcontinuity.org](http://streamcontinuity.org) – [Database](#) and background information on culvert assessment and prioritization.
- The Deerfield Stream Crossings Explorer [SCE.ecosheds.org](http://SCE.ecosheds.org) – Tool to locate and prioritize road-stream crossings. Include ecological data (aquatic connectivity from the NAACC, coldwater streams) and transportation vulnerability data (risk of failure and EMS delays) for Deerfield Watershed. Some of the data will be expanded to the entire state in the next few months.
- [Climate Change Resource Center](#) – Website run by the United States Forest Service containing general information about climate change. The website also has a section with specific tools that can be utilized when trying to make decisions in response to or monitor impacts of climate change. There is even a section which allows users to search for specific tools based on needs and geographic location.
- Northeast [Regional Invasive Species and Climate Change \(RISCC\) Management network](http://people.umass.edu/risc) <http://people.umass.edu/risc> - Northeast Climate Science Center initiative to address the question “How can we manage for upcoming biological invasions in the light of climate change?”

- [Integrating Climate Change into Northeast and Midwest State Wildlife Action Plans](https://necsc.umass.edu/projects/integrating-climate-change-state-wildlife-action-plans)  
<https://necsc.umass.edu/projects/integrating-climate-change-state-wildlife-action-plans>
- Climate Change Tree Atlas and Bird Atlas <http://www.fs.fed.us/nrs/atlas/> - Includes current and possible future distributions for over 100 tree and bird species in the Eastern US.