Conservation Commissions and Natural Resource Resilience

"Climate-resilient lands not only protect wildlife but also provide natural defenses against flood, drought and other risks to people." Open Space Institute[1]

The state of Connecticut is rich in natural resources and diverse wildlife, plants, and landscapes make the state an attractive place to live, work, and play. Climate change poses a threat to Connecticut, but through protection of natural areas, municipalities can enhance climate resilience. Conservation Commissions share the responsibility of guiding their municipalities in meeting open space goals as a resilient strategy. Conservation Commissions should consider the effect of climate change on natural resources and the solutions these resources provide when undertaking their duties of protecting and preserving biological diversity and natural resources.

Natural Resource Conservation and Climate Resilience

Natural resource conservation can be used as an adaptation strategy to slow the rate of climate change and its damaging effects by working to protect vulnerable areas that serve as natural buffers to climate impacts.[2] Conservation is the protection of natural resources for future generations. Conservation can include wildlife habitat restoration, deterring species extinction, enhancing resilient ecosystem services, and protecting biological diversity. Conservation Commissions can influence nature-based solutions and conservation methods to reinforce climate resilience. Blending natural features with built infrastructure through environmental management, planning, and design can foster climate change adaptation and resilience.[3]

What is a Conservation Commission?

Conservation Commissions are volunteer municipal government bodies that are authorized by Connecticut Statute to "conserve, develop, supervise and regulate natural resources (C.G.S. Ch. 97. Sec. 7-131a)." However, the charge of a Commission may vary by municipal ordinance. Commissions may manage open space, land and water resources within their jurisdictional limits. Commissions have the authority to advise other boards and agencies about conservation concerns within municipal projects and development. Conservation Commissions have a role in increasing resiliency by suggesting how climate change may further impact natural resources due to specific land management in vulnerable locations. Commissions can represent the significance of how natural features could be part of nature-based solutions to climate impacts such as flooding, excessive heat, erosion, shoreline stabilization, or poor water quality.

Coordination between municipal boards and commissions, non-governmental organizations, and even adjacent towns is imperative when addressing climate resiliency. Municipalities should utilize a Conservation Commission in finding solutions to site-specific concerns. For example, when considering flood solutions, combining best practice stormwater management with a conservation easement that protects open space and allows for natural stormwater infiltration, would be an effective use of a Conservation Commission authority and allow another level of monitoring and enforcement.

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Authority and Duties of a Conservation Commission

Establishment & Legal Authority

The statutory authority of a Conservation Commission derives from Chapter 97, Section 7-131a of the *Connecticut General Statutes*. Commissions are established by vote of the municipal legislature.

Membership

It is important to consider members with diverse interests and knowledge in resource conservation. Commission members serve in part to educate local citizens and officials on conservation issues and present practical and effective recommendations to land use boards and other commissions.

- *Minimum of 3 members; 11 members maximum.*
- *Maximum 3 alternate members; when seated, have all the powers and duties of a member of the commission.*
- *Members appointed, removed for cause, and vacancies filled by the Chief Executive of a given municipality.*
- *Terms served by members are designated by the legislative body establishing commission.*

Powers and Duties

Must do "Shall's":

- ✓ *Conduct research into the possible utilization of land areas within its municipality.*
- ✓ *Keep index of all open areas, publicly and privately owned, including open marshlands, swamps and other wetlands to obtain information on proper use of such land.*
  - *It may, from time to time, recommend to the planning commission or, if none, to the chief executive officer or the legislative body, plans and programs for the development and use of such areas.*
- ✓ *Keep records of its meetings and activities and shall make an annual report to the municipality.*
- ✓ *Administer gifts the same for such purposes subject to the terms of the gift.*

Permissible "May's":

- ✓ *Coordinate activities of unofficial bodies organized for similar purposes.*
- ✓ *Advertise, prepare and distribute books, maps, charts, plans, and pamphlets necessary for its purposes.*
- ✓ *Propose a Greenway plan for inclusion in conservation plan and development per Section 8-23.*
- ✓ *Inventory natural resources and formulate watershed/drought management plans.*
  - *Plans shall be consistent with water supply management plans per Section 25-32d.*
- ✓ *Make recommendations to planning, zoning, inland wetlands or other municipal commissions and agencies on proposed land use changes.*
- ✓ *With approval of municipal legislative body acquire land and easements in name of municipality and promulgate rules and regulations including but not limited to the establishment of reasonable charges for the use of land and easements for any of its purposes.*
- ✓ *Supervise/manage municipal owned open space or parks if authority delegated by entity responsible for such management*
- ✓ *Receive gifts in the name of the municipality for its purposes.*
- ✓ *Exchange information with the Department of Energy and Environmental Protection (DEEP).*
  - *Commissioner of DEEP may assign technical personnel to a commission, per request, for assistance in planning its overall program and for coordinating state and local conservation activities.*

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Natural Resources and Climate Change Impacts

Natural resources refer to living and non-living elements of the Earth system that humans rely on to survive and evolve.[4] Climate change threatens our natural resources, affects global food security and water supplies, and jeopardizes the livelihood of our public, local and national economies.[5] Local action by Conservation Commissions and their communities can enhance municipal resilience by preserving present and future natural resources and the ecosystem services they provide.

Climate Change Impacts on Natural Resources[6]

Increased Precipitation & Flooding

- Destroyed crops by silt and sediment threatening food supply
- Uprooted trees/Vegetation due to high-velocity water flow; negatively impacting the benefits of trees
- Contaminated runoff (pesticides, chemicals, sewer and debris) lead to poor water quality and endangered ecosystems
- Increased erosion and flood risks
- Altered landscape and collapsed riverbanks
- Damaged wildlife habitat

Increased Heat

- Migration of invasive pests and diseases harmful to the health of humans and the built environment
- Declined cold-water fish diversity I.e., bass and trout
- Transition of tree species from Maple/Birch to Oak/Hickory; affecting maple sap economies
- Increased toxic blue-green algae blooms in water bodies that affect public health, the environment and economies
- Shifted correlation between pollinator activity and honey production

Picture used with permission ©Guarantee Pest Elimination

Increased Drought Periods

- Failed food & crop yields; threatening food supplies and economies
- Declined drinking water resources
- Dropped wetlands; resulting in loss of habitat and carbon sequestration capabilities
- Increased freshwater salinity resulting in toxic marine algae environments for fish and ecosystems
- Adverse forest and agriculture conditions

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Resilient Environmental Conservation

Connecticut is abundant in forest, water and wildlife resources that are in need of preservation. Conservation Commissions can provide leadership on climate resiliency projects by utilizing science-based research in outreach to educate the public and planning officials. Conservation Commissions can advocate resilient measures in areas more susceptible to climate change impacts by identifying risks and recommending land use changes and nature-based solutions as mitigation strategies. When reviewing land use applications, Conservation Commissions can advocate for mitigation by use of strategies pertaining to the climate impact and site. For example, additional bioswales or limiting impervious pavement design may be an appropriate recommendation for site-specific flooding that brings risk to nearby crops.

Resilient actions such as land conservation allow ecosystems to naturally sequester carbon, reduce greenhouse gas emissions, increase plant and animal diversity and protect against climate change impacts that negatively affect our public health and infrastructure.[7] Conservation Commissions can advocate for the benefits of clustered development to protect open space and preserve crucial ecosystems and wildlife habitat. Commissions must first understand how climate change will affect the natural resources of their present and future communities and act accordingly within their authority. Below are conservation strategies that Commissions can use to improve the climate resilience of their community.

Land Conservation: Open Space Management

Conservation Easements

With approval of a legislative body, Conservation Commissions may acquire land and easements in the name of the municipality. A conservation easement is a voluntary legal agreement between a landowner and a land trust or government agency restricting the use of land to retain the "natural, scenic or open condition or in agricultural, farming, forest or open space" (C.G.S 47-42a). The landowner cedes the right to develop on a parcel yet retains ownership and the right to sell or pass property on to heirs. While some conservation easements may prohibit any land use to protect the benefits of the natural space, some may include the right to limited agricultural development depending on the agreement.[8]

Conservation easements can be a tool to expand municipal resilience through natural resource protection, but because conservation easements are permanent, special care should be taken to understand the effects of climate change on the protected parcel. The legal language creating the easement should include monitoring provisions and not preclude actions needed to adapt to an unpredictable climate. If appliable, easement amendments should incorporate changing land restrictions as climate change alters risks to land and its natural resources. For example, easements could include provisions for addressing future increased flood risk from sea level rise. Additionally, other strategies such as rolling, term-terminal and tradable easements may allow for flexibility within boundaries as climate change shifts the vulnerability and levels of resilience needed.[9]

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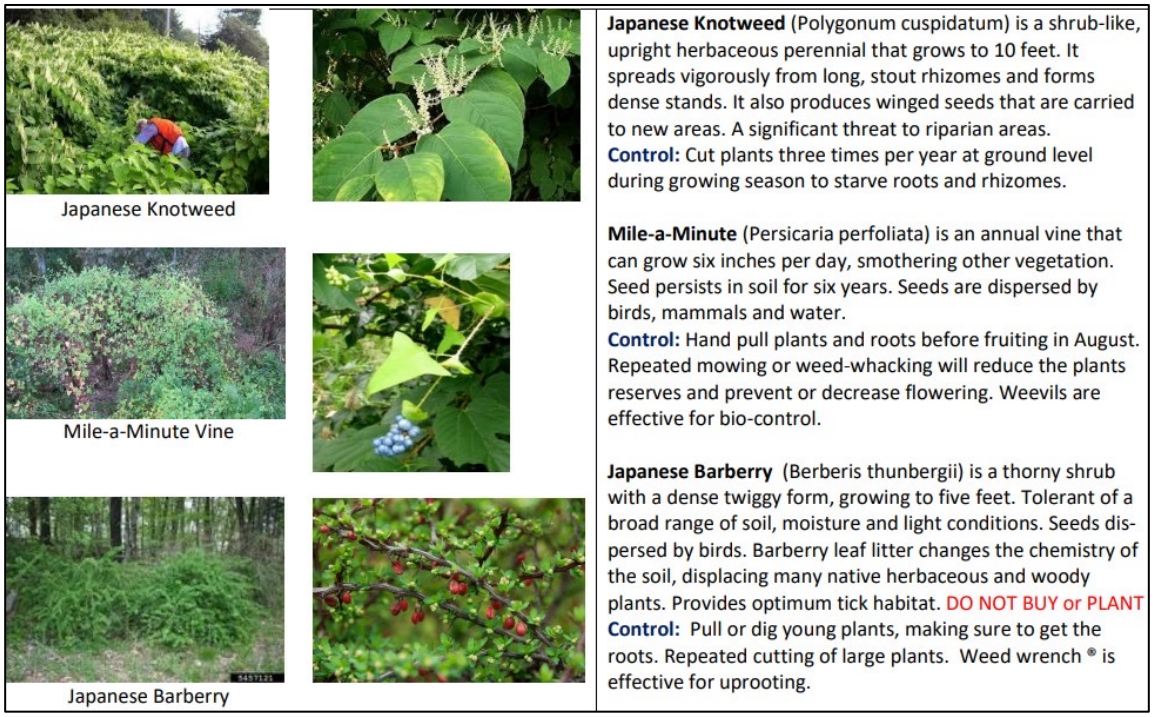
Invasive plant species removal

Native plant conservation is imperative to the sustainability of our ecosystems and climate resilience. Invasive plant species are nonnative species that may cause harm to the environment, human health and economies by displacing native species. As climate change influences higher average temperatures for Connecticut[10], it enables invasive plant and insect pest species to move in. Conservation Commissions can implement the protection and restoration of native plant populations with outreach materials on invasive species specific to their territory, best practices for removal and resources to assist with management within their communities. Commissions can host volunteer invasive species removal events to incorporate and educate their communities about ecology and the importance of invasives management.

Commissions may inventory natural resources and screen landscapes for invasive species and guide municipal management plans. Management of invasive species is community-based and relies on town wide acknowledgment and removal participation. Developing charts of native vegetation to restore will allow landowners to immediately support ecosystems and build climate resilient properties. Commissions in need of plant information of invasives found in Connecticut can visit the Connecticut Agricultural Experiment Station Field Guide. For more information on invasive species and statutes, visit The Department of Energy and Environmental Protection.

Commission Outreach

- Develop flyers, pamphlets, charts and books for public awareness of locally endangered natural resources with resilient conservation strategies that can provide hazard mitigation
- Organize seminars to educate municipal residents and other planning officials on up-to-date climate science and vulnerability assessments
- Educate on invasive plant species and the importance of town wide participation to remove them and restore native plants and trees



Text and photos used by permission from Pollinator-Pathway.org and *CT Invasive Plant Working Group (CIPWG). Connecticut Invasive Plants Council's List of 12 Invasive Plants that threaten our Environment, Economy, and Human Health. 2023.* https://www.pollinator-pathway.org/invasives

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Water Conservation

Section 8-23 of the CT General Statutes, amended by PA 15-95, requires each municipality to prepare or amend and adopt a Plan of Conservation and Development (POCD). Local Land Use Boards should be sure to include water resource planning in their municipal POCD. Conservation Commissions can suggest the:[11]

- Influence of amendments to include source water protection as climate change impacts water resources
- Inclusion of drought management in Hazard Mitigation Planning in regions that may experience more frequent periods of drought due to climate change
- Incorporation of source water protection into watershed management and open space plans
- Adoption of water ordinances for water conservation and drought planning
- Recommendation of the creation of a "Water Supply Chief/Team" to manage water resources
- Municipalities are following Emergency Supply Plans

Conservation commissions may inventory water resources and advise zoning boards to maintain critical water supply source areas as open space.[12] Commissions can advocate to homeowners the importance of water conservation in their bathrooms, kitchens and landscaping. For water efficiency ideas, visit Tips for Conserving Water.

Rainwater Harvesting

The state of Connecticut does not regulate the collection of rainwater and encourages homeowners to use rainwater for non-potable water needs. Rainwater harvesting is a great way to conserve natural resources, save money on utility bills, reduce energy used to pump water, and reduce stormwater runoff. Rainwater can be used to irrigate plants and landscapes, wash cars or home windows, but should never be used for human consumption. Conserving water resources by rainwater collection can be useful during drought periods to reduce pressure on potable water resources.[13] To learn more about the benefits and installation of rain barrels, visit A Resident's Guide to Rain Barrels in Connecticut.

Healthy Soil Practices/Soil Conservation

Water conservation can begin with healthy soil practices. Healthy soils can act as a sponge with the ability to absorb and hold its volume in water when it rains. Nature-based solutions can influence water conservation by healthy soils and its ability to capture and store much more water. Regions that experience periods of drought should seek healthy soil as it can deliver water to plants and crops in the most needed times. Organic matter and living organisms improve soil health and hydrologic function.[14] With a focus on healthy soils, less water can be irrigated for agricultural purposes which enhances the conservation and resiliency of water resources.

Conservation Commissions can provide resources about the negatives of tillage and plowing within applicable municipal agricultural lands and influence best practices such as growing cover crops and diversifying crop and animal rotations. Organic matter is then naturally created and will better harness and distribute water for increased crop yields. Healthy soil practices have the resilient benefits of carbon sequestration and decreasing drought risks to crops.[15]

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Forest and Tree Conservation

Trees are renewable resources that add to the quality of life by filtering pollutants from the air, boosting mental health, moderating temperatures and reducing urban heat, providing habitats for wildlife, providing shade, conserving heating and cooling energy, preventing soil erosion, slowing stormwater runoff, filtering drinking water and serving as carbon sinks by sequestering atmospheric carbon dioxide. The many benefits of trees allow ecosystems to be more resilient to climate change effects. The conservation and restoration of trees allows present and future generations to enjoy the benefits that trees bring to communities. Conservation Commissions can encourage landowners to plant native trees and perform tree maintenance on existing trees. Commissions may suggest to municipal Planning and Zoning boards to implement Tree Protection ordinances or other Street Tree Requirements to influence tree planting. Conservation Commissions may act as a Tree Commission if granted authority by the local legislative body and can develop action plans to protect the tree canopy. An example of a large city Tree Action Plan is the City of Hartford's plan to protect and expand their tree canopy with coinciding resilient benefits.

Tree Warden

When considering tree maintenance, Conservation Commissions may assist the municipal tree warden by bringing attention to damaged trees or trees that are hosts to invasive species, and regulate and enact tree maintenance. In collaboration with the tree warden, Commissions can further assist by removal or planting of trees and making recommendations for the preservation of trees within their jurisdictional limits. Per *Connecticut Statute Chapter 451 Section 23-59*, *"...care and control shall extend to such limbs, roots or parts of trees and shrubs as extend or overhang the limits of any such public road or grounds."* Although a base of a tree may lie on privately owned land, the "*care and control*" of a tree that "*extends into public road or grounds*" belongs to a municipal tree warden. Conservation Commissions can work with the tree warden to educate the public about the benefits of trees, and how to choose climate resilient and ecologically appropriate species for specific sites.

Forest Protection

Forests are natural landscapes that reduce and store carbon that lessen the effects of climate change. Conservation Commissions are integral in protecting local forests by advising on municipal policy for open space and park acquisition and management. Town Plans of Conservation and Development serve as a guide to town goals for forest and tree protections. In particular, core forests, those more than 300 feet from the forest boundary, are in acute need of protection statewide.[16] Additionally, if delegated by the body having such authority, Conservation Commissions can supervise or manage municipally owned parks or open space and promulgate rules and regulations for those properties, including setting specific time frames and reasonable fees for public use.

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Wildlife Conservation

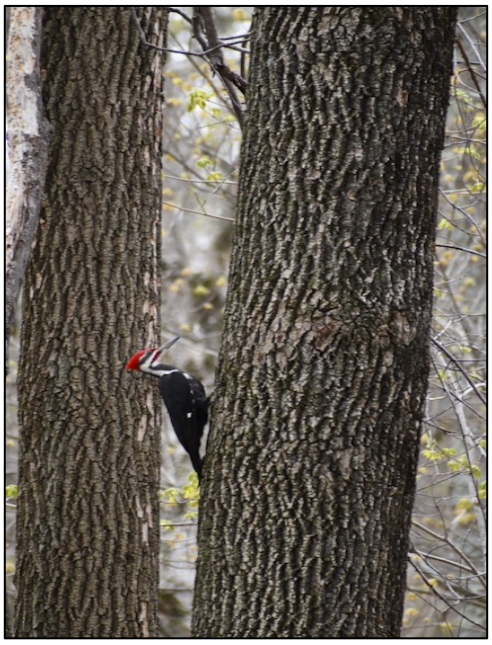
Wildlife conservation stimulates ecological stability, secures the food chain, and strengthens our food security. Working alongside local environmental non-governmental organizations like the Connecticut Audubon Society, Commissions can gain conservation knowledge on project initiatives concerning birds, wildlife and their habitats. With diverse expertise, Audubon staff can examine and assess wildlife habitats in specific locations and create plans to enhance conservation and resilience while considering ecology, wetlands management, soil science and more.[17] Commissions can create outreach materials for the public to recognize the importance of wildlife and provide ways to protect their diversity.

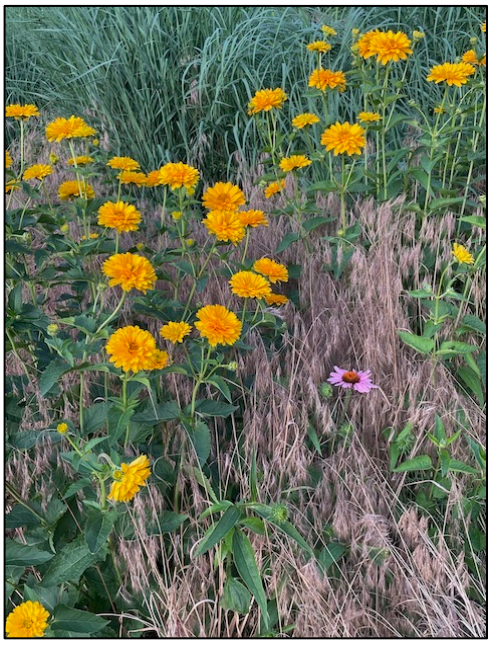
Pollinator Gardens

Human food supplies rely on the resilience of pollinator species, making their conservation, biodiversity and protection crucial. "Pollinators are responsible for 1 out of 3 bites of food we take each day,"[18] yet pollinator populations have declined drastically. Commissions can influence the creation of pollinator gardens within their communities. These gardens can generate or enlarge habitats benefiting bees, butterflies, birds and bats. Native trees and shrubs such as Flowering Dogwood, may be used to define the boundaries of a larger garden to provide nectar, pollen, fruit and host habitat.[19] Allocating ample nectar and pollen sources through pollinator gardens can enhance pollinator populations and provide resilience to human food supplies and other ecosystem services as climate change and development impacts our resources.

Nest boxes and Bat houses

Birds and Bats are crucial to climate resilience because they eat insects, pollinate flowers and are naturally responsible for growing plants and trees by spreading seeds. Bats consume a large volume of insects nightly, many that can cause harm to people, crops and forests. Encouraging bird and bat conservation and increasing their habitats can lower pest control costs.[20] As climate change brings warmer climates for Connecticut, more pests can affect crop yields. Birds and bats can help mitigate those effects by pest consumption and seed spreading. Conservation Commissions can educate about the use of nest boxes and bat houses to help protect bird and bat species and preserve their ecological role.





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Environmental Management: Influence Nature-based solutions

"Lands managed with the climate in mind also filter and protect water supplies, increase soil fertility and forest productivity, foster biodiversity and strengthen ecosystems' capacity to withstand drought and extreme weather – reducing flooding, runoff, and erosion."[21] The Federal Emergency Management Agency defines nature-based solutions as, "sustainable planning, design, environmental management and engineering practices that weave natural features or processes into the built environment to promote adaptation and resilience."[22] Nature-based solutions can be used to combat climate change, restore wetlands, reduce flood risks, reduce urban heat, add recreational opportunities and more.[23] Conservation Commissions can incorporate nature-based solutions into conservation strategies to further increase natural resource resilience and store carbon within landscapes such as forests and wetlands without intervention.

Wetland Conservation and Restoration

Conservation Commissions must "*keep index of all open areas, publicly and privately owned, including open marshlands, swamps and other wetlands to obtain information on proper use of such land.*" (C.G.S Chapter 97, Section 7-131a). They may recommend plans and programs for the development and use of such areas to municipal Planning and Zoning commissions and consult on development applications near or within wetlands that can alter the state of the natural resource. Wetlands are crucial natural resources because they provide habitat for diverse animal and plant species, buffer against natural flooding and storm surge, provide recreation, naturally filter water, and act as a carbon sink. Conservation and restoration of wetlands are imperative to coastal and inland wetlands in providing climate resilience to flood, drought, storm and erosion risks.

Green Infrastructure

Green roofs, rain gardens or engineered bioswales can influence climate resilience by absorbing stormwater, reducing the risks of infrastructure flooding and protecting rivers and streams from harmful pollutants and sediment. These nature-based solutions offer additional ecological benefits such as wildlife habitat that support biodiversity for birds and pollinators, promote stronger mental health[24], reduce urban heat, and reduce energy use and associated costs.[25] Conservation Commissions can investigate green infrastructure alternatives and make suggestions to zoning boards and landowners on resilient implementation.

Reforestation

Reforestation can mitigate the negative impacts of climate change. Commissions can seek to conserve and develop resources for their municipality. They can assist municipalities in applying for forestry grants such as CT DEEP's America the Beautiful and use funds to plant trees to advance urban forestry in collaboration with boards and selectmen. Suggesting and implementing reforestation within conservation easements on public and private land is a great way to secure tree resources that will enhance the resiliency of natural carbon sequestration, wildlife habitats and cleaner air supplies for future generations.

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Greenways

Per *CT General Statute § 8-23*, Conservation Commissions may "propose a Greenway plan for inclusion in conservation plan and development of the municipality." Connecticut Public Act 95-335 defines a greenway as a "corridor of open space that:

1. may protect natural resources, preserve scenic landscapes and historical resources or offer opportunities for recreation or non-motorized transportation;
2. may connect existing protected areas and provide access to the outdoors;
3. may be located along a defining natural feature, such as a waterway, along a man-made corridor, including an unused right of way, traditional trail routes or historic barge canals; or
4. may be a green space along a highway or around a village"[26]

Greenways can protect land and natural resources with the opportunity to restore wetlands, prairies, flood plains and habitats with the benefits of linking our communities together and influencing healthy lifestyles. Greenway projects can be submitted to the Greenways Council for resource protection and enhanced resilience consideration.[27]

How can CT DEEP help?

Commissions can request technical assistance from certified personnel to assist with in-depth planning that coordinates with state and local conservation efforts that may be outside of their capability. Check out the vast library of conservation related information and grant programs they offer by searching CT DEEP.

Conservation Commissions should support and enable climate awareness within their communities to enhance conservation and protection of natural resources, improve ecosystem services and sustain resilience to the impacts of a changing climate. Serving as a research body, keeping proper index of open space and wetlands, and recommending sustainable development in vulnerable areas, Conservation Commissions can use their authority to promote resilient conservation within their municipality.

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To learn more about CIRCA visit circa.uconn.edu and the Resilient Connecticut project for more climate resilience planning tools: resilientconnecticut.uconn.edu

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Funding & Other Resources

Per *Connecticut Statue, section 7-131a*, municipalities may appropriate funds to a Conservation Commission. Commissions can also pursue municipal, state and federal funding for conservation research, natural resource restoration and land protection projects. Check out these resources below to help fund conservation projects:

Federal

- FEMA Pre-Disaster Mitigation (PDM) Grant
- US Department of Interior Land and Water Conservation Fund
- FEMA Hazard Mitigation Assistance Grants
- US Fish & Wildlife Traditional Conservation Funds
- USDA: Environmental Quality Incentives Program
- CT DEEP Grants for Control of Aquatic Invasive Species

State

- State Wildlife Grants
- Open Space and Watershed Land Acquisition Grant Program
- Urban Green and Community Gardens Grant Program
- State Conservation Tax incentives

Other

- Wildlife Conservation Society: Climate Adaptation Fund
- Conservation Innovation Grants
- Connecticut Conservation Programs
- Connecticut Association of Conservation and Inland Wetlands Commissions (CACIWC)
- CT DEEP Natural Resources

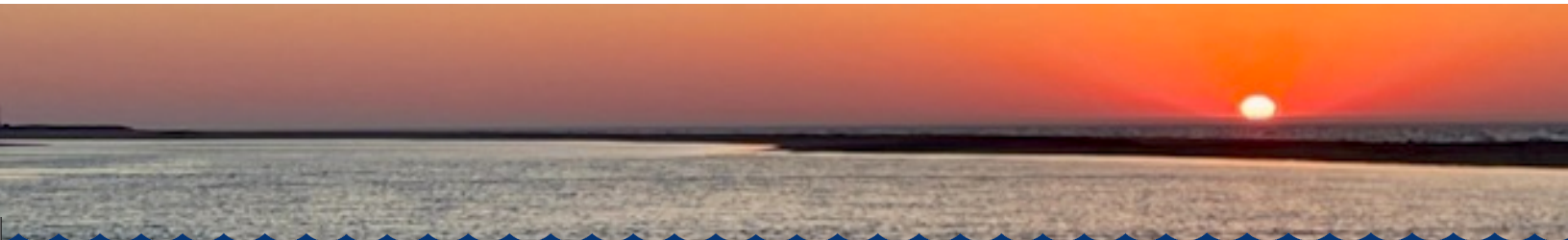
References

1. *Resilient landscapes funds*. Open Space Institute. Retrieved September 27, 2022, from https://www.openspaceinstitute.org/funds/resilient-landscapes-funds.
2. *Ecosystem-based adaptation briefing note series: Protecting nature to protect people*. UN Environment Programme. (6 October, 2022). Retrieved May 4, 2023, from https://www.unep.org/gan/news/editorial/ecosystem-based-adaptation-briefing-note-series-protecting-nature-protect-people.
3. *Nature-based solutions*. FEMA.gov. (21 December, 2022). Retrieved March 15, 2023, from https://www.fema.gov/emergency-managers /risk-management/nature-based-solutions.
4. Bansard, J. and M. Schröder, *The Sustainable Use of Natural Resources: The Governance Challenge*, Earth Negotiations Bulletin Brief 16, International Institute for Sustainable Development, (2021), https://www.iisd.org/articles/deep-dive/sustainable-use-natural-resources-governance-challenge.
5. Cho, R. (20 June, 2019). *How climate change impacts the economy*. State of the Planet. Retrieved May 4, 2023, from https://news.climate.columbia.edu/2019/06/20/climate-change-economy-impacts/.
6. USGCRP, 2018: *Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II* [Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp. doi: 10.7930/NCA4.2018; *See:* Anji Seth et al., *Connecticut Physical Climate Science Assessment Report (PCSAR): Observed trends and projections of temperature and precipitation*, (2019), https://circa.uconn.edu/wp-content/uploads/sites/1618/2019/11/CTPCSAR-Aug2019.pdf and NH Sea Grant and UNH Cooperative Extension, *What Conservation Commissions Can Do to Protect Natural Resources in a Changing Climate*, Retrieved September 26, 2022, from https://extension.unh.edu/sites/default/files/migrated_unmanaged_files/Resource007030_Rep10170.pdf.

Funding for this project is provided by the U.S. Department of Housing and Urban Development through the Community Development Block Grant National Disaster Recovery Program, as administered by the Connecticut Department of Housing.

References Continued

7. Rebecca L. Kihslinger & Jessica Wilkinson eds., Lasting Landscapes: Reflections on the Role of Conservation Science in Land Use Planning (Envtl. L. Inst. 2007).
8. *Conservation easements*. Town of Vernon. Retrieved October 12, 2022, from https://www.vernon-ct.gov/government/board-and-commissions/conservation-commission/conservation-easements.
9. *Can private land conservation efforts adapt to climate change?* Yale Environment Review. (2 May, 2017). Retrieved October 12, 2022, from https://environment-review.yale.edu/can-private-land-conservation-efforts-adapt-climate-change-0#:~:text=Climate%20change%20impacts%20will%20challenge,privately%20owned%20land%20in%20perpetuity.
10. Seth, *supra* note 6.
11. Denise Savageau, 29 Oct. 2022, Managing for water resources in a changing climate, presentation at 45th annual meeting of Connecticut Association of Conservation and Inland Wetlands Commissions.
12. CT Department of Energy and Environmental Protection. *Management*. CT.gov. Retrieved March 15, 2023, from https://portal.ct.gov/DEEP/Aquifer-Protection-and-Groundwater/Ground-Water/Understanding-Ground-Water/Management.
13. CT Department of Energy and Environmental Protection. Rainfall as a Resource: A Resident's Guide to Rain Barrels in Connecticut. Retrieved March 15, 2023 from https://portal.ct.gov/-/media/DEEP/water/watershed_management/wm_plans/LID/whatisarainbarrelpdf.pdf?la=en
14. *The importance of Good Soil Health*. TennGreen Land Conservancy. (2 December, 2021). Retrieved from https://tenngreen.org/celebrate-good-soil-health/#:~:text=Healthy%20soils%20with%20a%20variety,healthy%20soils%20also%20regulate%20temperature.
15. Nichols, R. (12 May, 2015). *A hedge against drought: Why healthy soil is 'water in the bank'*. USDA. Retrieved November 2, 2022, from https://www.usda.gov/media/blog/2015/05/12/hedge-against-drought-why-healthy-soil-water-bank#:~:text=While%20most%20look%20to%20the,in%20handy%20during%20dry%20spells.
16. CT Department of Energy and Environmental Protection Forestry Division, 2020, Connecticut's 2020 Forest Action Plan, https://portal.ct.gov/-/media/DEEP/forestry/2020-Approved-CT-Forest-Action-Plan.pdf .
17. Connecticut Audubon Society. (14 August, 2020). Retrieved November 10, 2022, from https://www.ctaudubon.org/.
18. *The importance of pollinators*. USDA. Retrieved November 9, 2022, from https://www.usda.gov/peoples-garden/pollinators#:~:text=Pollinators%20by%20Numbers,bees%20help%20increase%20crop%20yields.
19. *Deer Pond Farm - Bird & Pollinator Garden*. Connecticut Audubon Society. (16 September, 2022). Retrieved November 9, 2022, from https://www.ctaudubon.org/deer-pond-farm-bird-pollinator-garden/.
20. *Bats*. USDA. Retrieved November 10, 2022, from https://www.usda.gov/peoples-garden/pollinators/bats.
21. Land Trust Alliance, *Conservation in a Changing Climate: Natural Climate Solutions*, (18 December, 2019). Retrieved November 13, 2022, from https://climatechange.lta.org/natural-climate-solutions/.
22. FEMA, *Nature-Based Solutions*. (8 May, 2023). Retrieved May 16, 2023, from https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions.
23. *Supra* Land Trust Alliance, note 21.
24. World Wildlife Fund. (10 November, 2020). *What are nature-based solutions and how can they help us address the Climate Crisis?* WWF. Retrieved October 13, 2022, from https://www.worldwildlife.org/stories/what-are-nature-based-solutions-and-how-can-they-help-us-address-the-climate-crisis.
25. Office of Sustainability. (26 September, 2018). *Hartford's Green Infrastructure Project*. Green Infrastructure Handbook Best Management Practices in Hartford, Connecticut . Retrieved November 14, 2022, from https://circa.uconn.edu/2018/09/26/hartfords-green-infrastructure-project/.
26. Public act summary for 95-335. Retrieved November 14, 2022, from https://www.cga.ct.gov/ps95/sum/sum0335.htm.
27. *Establishing Greenways Criteria*. CT.gov. (17 November, 2014). Retrieved October 24, 2022, from https://portal.ct.gov/DEEP/Outdoor-Recreation/Greenways/Establishing-Greenways-Criteria.



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