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Strategy: Design transportation infrastructure for future conditions

ACTION	STEPS
Redesign for future precipitation/storm patterns	<i>None identified yet</i>
Planning for the impact of increased temperature/heat events	<i>None identified yet</i>





# Natural Resources and Working Lands

## GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS

Strategy: Reduce emissions by increasing protected open space, parks, and tree canopy (and assuring local food security)\*

ACTION	STEPS
Maintain and increase parks and open spaces	<ul style="list-style-type: none"> <li>■ Quantify carbon sequestration by forests and wetlands</li> <li>■ Work with towns and land trusts to increase protected open space</li> <li>■ Develop new sources of funding for open space and park land acquisitions and maintenance</li> </ul>
Urban reforestation. Plant trees or increase urban tree canopy	<ul style="list-style-type: none"> <li>■ Identify shade-starved areas and support tree planting programs</li> <li>■ Strategic planting of trees to provide building shading or cooling benefits</li> <li>■ Creation of parks and green spaces on abandoned or underutilized spaces</li> <li>■ Work with towns and land trusts to increase parks in activity centers</li> <li>■ Work with towns and non-profits to increase tree canopy in activity centers</li> <li>■ Integration of trees as part of LID or stormwater runoff projects</li> </ul>
Reforestation of disturbed areas	<ul style="list-style-type: none"> <li>■ Identify disturbed areas suitable for reforestation and support tree-planting programs</li> </ul>

Strategy: Avoid new conversion of land uses\*

ACTION	STEPS
Avoid forest conversion to non-forest land uses by preventing development sprawl	<ul style="list-style-type: none"> <li>■ TDR bylaws, other changes to zoning to enable this vision</li> <li>■ Promote compact mixed-use development downtown and in activity centers (where infrastructure can support it)</li> <li>■ Create incentives to build and infill in activity centers and away from natural areas</li> <li>■ Invest in infill development, support local and regional policies that make redevelopment more affordable than new development</li> </ul>



# Natural Resources and Working Lands

## GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

Strategy: Maintain ecosystem diversity, including landscape scale preservation of pine barrens mosaic

ACTION	STEPS
Limit ecosystem stressors by reducing threats such as habitat conversion and fragmentation (i.e. development), invasive species, and airborne and waterborne pollutants	<ul style="list-style-type: none"> <li>■ Prevent the introduction and establishment of invasive species and control existing damaging invasive species</li> <li>■ Increase monitoring for invasive species (especially at pathways for infestation - trailheads, roads)</li> <li>■ Control invasive species through physical or chemical treatments</li> <li>■ Clean equipment prior to activities</li> <li>■ Education on invasive species identification and notification protocols</li> </ul>
Protect ecosystems of sufficient size	<ul style="list-style-type: none"> <li>■ Expand the boundaries of existing open space</li> <li>■ ID opportunities to acquire/protect lands adjacent to existing open space</li> </ul>
Protect ecosystems across a range of environmental settings	<ul style="list-style-type: none"> <li>■ Inventory existing and potential protected open space to ID natural communities protected and any lacking protection</li> </ul>
Protect multiple example ecosystems to capture redundancy	<ul style="list-style-type: none"> <li>■ Inventory existing and potential protected open space to ID natural communities protected and those requiring additional examples protected</li> </ul>
Maintain large-scale ecosystem processes and prevent habitat isolation	<i>None identified yet</i>
Embrace adaptive management	<ul style="list-style-type: none"> <li>■ Preserve options for natural adaptation</li> <li>■ Expect and plan for species losses and gains (i.e. changes in species assemblages)</li> <li>■ Favor or restore native species that are expected to be adapted to future conditions</li> <li>■ Establish or encourage new mixes of native species that may be a suitable combination under future conditions</li> <li>■ Manage for species with wide moisture and temperature tolerances</li> <li>■ Prompt revegetation of sites following severe disturbance</li> <li>■ Allow for areas of natural regeneration to test for future-adapted species</li> <li>■ Support monitoring</li> <li>■ Public funding and progressive, flexible, and climate-responsive regulations</li> </ul>
Use nature-based adaptation solutions	<ul style="list-style-type: none"> <li>■ Consider soft engineering approaches as alternatives to hard engineering solutions during project planning, design, site plan review, and permitting</li> </ul>



# Natural Resources and Working Lands

## GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

Strategy: Maintain ecosystem diversity, including landscape scale preservation of pine barrens mosaic (cont.)

ACTION	STEPS
Develop a unified vision or regional plan for collaborative conservation of natural resources	<ul style="list-style-type: none"> <li>■ Use State Wildlife Action Plan, BioMap2, Pine Barrens Green Infrastructure Map, and Mass Wildlife Climate Action Tool as resources for protection and restoration</li> <li>■ Improved, better integrated, and increasingly coordinated monitoring systems would be helpful to detect, track, and attribute species and habitat shifts to climate change over spatiotemporal scale.</li> </ul>
Remove/reduce environmental review/permitting barriers to restoration projects	<ul style="list-style-type: none"> <li>■ Review/revise state and local regulations</li> <li>■ Funding coordination</li> <li>■ Increase technical support</li> <li>■ Expand public outreach and education</li> </ul>

Strategy: Support and promote protection, preservation, and restoration of wetlands and riparian areas

ACTION	STEPS
Protect, restore, and enhance riparian areas (river and associated wetland buffers)	<ul style="list-style-type: none"> <li>■ Restore native communities and ecosystem components (e.g. natural groundcover, litter layer, coarse woody debris) in riparian areas</li> <li>■ Plant/restore a diversity of tree and plant species</li> <li>■ Educate property owners on importance of natural buffers, native species</li> <li>■ Reclaim developed sites and restore or reforest riparian areas</li> </ul>
Protect, restore, and enhance freshwater wetlands, including ponds and lakes	<ul style="list-style-type: none"> <li>■ Update Ponds and Lakes Atlas</li> <li>■ Widen existing buffers to wetlands</li> <li>■ Protect/restore vegetation around ponds</li> <li>■ Avoid chemical/fertilizer use around waterbodies</li> <li>■ Avoid/reduce sources of land-based pollutant and nutrient loads</li> </ul>
Protect, restore, and enhance salt marshes	<ul style="list-style-type: none"> <li>■ ID salt marshes that have greatest landward migration potential and facilitate salt marsh migration</li> </ul>
Support continued operation of active cranberry bogs while also preparing for retirement of bogs	<ul style="list-style-type: none"> <li>■ ID bogs with wetland restoration potential and with high upland habitat connectivity value</li> <li>■ Reduce or eliminate agricultural drainage improvements near wetlands</li> </ul>



# Natural Resources and Working Lands

## GOAL: SUPPORT AND PROMOTE PROTECTION, PRESERVATION, AND RESTORATION OF NATURAL ECOSYSTEMS (CONT.)

Strategy: Support and promote protection, preservation, and restoration of habitat connectivity

ACTION	STEPS
Construct, retrofit, or replace crossing structures for wildlife passage	<ul style="list-style-type: none"> <li>■ ID key sites for connectivity improvements</li> <li>■ Plan, design and build for future conditions</li> </ul>
Reduce landscape fragmentation and maintain/create habitat corridors	<ul style="list-style-type: none"> <li>■ ID opportunities to connect existing open space parcels and acquire/protect these connections</li> </ul>

Strategy: Protect water quality and quantity

ACTION	STEPS
Restore natural hydrology	<ul style="list-style-type: none"> <li>■ Remove remnant hydrological modifications</li> </ul>
Incorporate natural or low impact development into designs	<ul style="list-style-type: none"> <li>■ Direct runoff into natural features</li> <li>■ Use low impact designs such as permeable paving</li> </ul>
Protect drinking water supply	<ul style="list-style-type: none"> <li>■ Protect/acquire lands in Zone IIs</li> <li>■ Limit development activities in Zone IIs</li> </ul>
Plan for and design "shovel-ready" projects that achieve restoration and water quality goals	<ul style="list-style-type: none"> <li>■ Align planning, design, permitting, and construction of water quality restoration projects</li> </ul>

## GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT

Strategy: Increase carbon storage and sequestration in soils

ACTION	STEPS
Improve soil management techniques	<ul style="list-style-type: none"> <li>■ Minimize soil disturbance by avoiding or reducing grading for development or tillage for planting, weed control, or other purposes</li> <li>■ Avoid/reduce fertilizer and pesticide use</li> <li>■ Use fertilizers, pesticides and other soil amendments more efficiently</li> <li>■ Use compost</li> <li>■ Use soil cover (mulch, cover crop) to conserve soil moisture and reduce soil temperatures</li> <li>■ Incorporate ruminant grazing</li> <li>■ Reduce topsoil erosion</li> </ul>



# Natural Resources and Working Lands

## GOAL: INCREASE CARBON SEQUESTRATION IN THE NATURAL ENVIRONMENT (CONT.)

### Strategy: Enhance carbon storage/sequestration in forests

ACTION	STEPS
Protect and restore trees and forests	<ul style="list-style-type: none"> <li>■ Maintain vegetation or revegetate disturbed areas</li> <li>■ Retain large diameter trees</li> <li>■ ID areas with high carbon stocks and prioritize protection of these</li> </ul>
Keep natural lands intact*	<ul style="list-style-type: none"> <li>■ Set high fees for conversion of intact landscapes</li> <li>■ Protect forested land through deed/conservation restrictions</li> <li>■ Prioritize large, unfragmented forest patches for avoidance of disturbance or protection</li> <li>■ ID and reforest lands that have been deforested</li> </ul>
Support forest management to protect healthy forests and reduce wildfire threat and severity	<ul style="list-style-type: none"> <li>■ Forest thinning</li> <li>■ Establish and maintain fuel breaks</li> <li>■ Prescribed fires</li> </ul>

### Strategy: Increase carbon storage in blue carbon ecosystems

ACTION	STEPS
Protect/restore wetlands (in particular salt marshes)*	<i>None identified yet</i>
Make room for salt marsh migration (landward)	<i>None identified yet</i>
Consider seaweed aquaculture as a decarbonization method	<i>None identified yet</i>



# Natural Resources and Working Lands

**GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT**

Strategy: Support sustainable and resilient working lands

ACTION	STEPS
Increase agriculture activities	<ul style="list-style-type: none"> <li>■ Incentivize local food production</li> <li>■ Address Community Supported Agriculture (CSAs) disappearing - labor challenges</li> <li>■ Update farmland current use taxation program (Ch61A) to further support agricultural activities</li> <li>■ Support local food production through infrastructure and policy (e.g. right to farm bylaws)</li> <li>■ ID areas/parcels with prime agriculture soil and encourage/zone it for agriculture</li> </ul>
Protect water quality and quantity from agricultural activities	<ul style="list-style-type: none"> <li>■ Reassess nutrient applications and ensure that use of organic materials, fertilizers, amendments, and all sources of nutrients is matched to changing climate conditions</li> <li>■ Reassess pesticide risk and ensure that all pesticide applications consider changing climate conditions</li> <li>■ Avoid/reduce irrigation or increase irrigation efficiencies</li> </ul>
Reduce crop stressors	<ul style="list-style-type: none"> <li>■ Enhance use of integrated pest management</li> <li>■ Use of varieties and species resistant to heat, drought, flash floods, pests, and diseases</li> <li>■ Altering crop rotations</li> <li>■ Monitor for and eradicate noxious weeds</li> </ul>
Reduce risks from warmer and drier conditions by adjusting agricultural practices	<ul style="list-style-type: none"> <li>■ Adjust timing of planting and other operations to account for longer growing season and altered conditions</li> </ul>
Manage farms and fields as part of a larger ecosystem, promoting biological diversity through the landscape	<ul style="list-style-type: none"> <li>■ Maintain or restore natural ecosystems</li> <li>■ Promote biological diversity across the landscape</li> <li>■ Enhance landscape connectivity</li> </ul>
Alter agriculture management to accommodate expected future conditions	<ul style="list-style-type: none"> <li>■ Diversification - add additional farming activities or new commodities</li> <li>■ Switch to commodities expected to be better suited to future conditions (e.g. new cultivars/species that match a changing climate, more water-efficient crops)</li> <li>■ Add and/or remove lands to agricultural production as lands become more or less suitable for agriculture</li> <li>■ Upgrade to more energy efficient equipment and/or integrate on-farm renewable energy generation</li> </ul>



# Natural Resources and Working Lands

## GOAL: PROTECT THE ABILITY OF WORKING LANDS AND WATERS TO PROVIDE ESSENTIAL SOCIAL AND ECONOMIC SERVICES WHILE PROTECTING THE ENVIRONMENT (CONT.)

Strategy: Support the fishing industry through transitions created by climate change

ACTION	STEPS
Increase the public's demand for "emerging" seafood varieties (e.g. dogfish, shellfish varieties)	<ul style="list-style-type: none"> <li>■ Assist with marketing and educating the public on alternative seafood products (e.g. dogfish, shellfish varieties)</li> </ul>
Expand research, data access, and forecasting of fisheries trends	<ul style="list-style-type: none"> <li>■ Support research into local ocean acidification trends</li> <li>■ Keep tabs on ocean acidification and impacts on shellfish</li> <li>■ Data access to support long-range planning and capital projects</li> </ul>
Restore native shellfishing areas	<i>None identified yet</i>
Protect harbor and fishing access infrastructure	<ul style="list-style-type: none"> <li>■ Zoning changes to protect maritime access and industries</li> </ul>

Strategy: Promote local and regional recognition of the importance of natural resources and working lands to mitigate the impacts of climate change

ACTION	STEPS
Adopt municipal statements or policies about the contribution of natural resources and working lands to mitigate the effects and causes of climate change	<i>None identified yet</i>

## GOAL: IMPROVE BROAD PUBLIC KNOWLEDGE AND UNDERSTANDING OF CLIMATE CHANGE IMPACTS AND PROGRAMS

Strategy: Increase education and communications about climate change mitigation options

ACTION	STEPS
Identify the legal framework that towns and other actors must work within (consider how to reach vulnerable populations)	<ul style="list-style-type: none"> <li>■ Identify how information flows through neighborhoods, how to reach vulnerable populations</li> </ul>
Provide guidance for communities that help prioritize actions to reduce greenhouse gas emissions	<i>None identified yet</i>
Improve communication between municipalities	<i>None identified yet</i>
Develop curriculum and hands-on programming for students of all ages to become informed about climate change and the actions available to address it*	<ul style="list-style-type: none"> <li>■ Engage students and faculty (high school and college) in the development of curriculum. Include department of education to change curriculum.</li> <li>■ Widely distribute the Climate Action Plan in print and other media; include town halls, libraries, bookstores, Chambers of Commerce, etc.</li> </ul>
Provide information about the impact that eating a plant-based diet can have on personal greenhouse gas emissions	<ul style="list-style-type: none"> <li>■ Vendor fairs, lectures, peer influence (climate influencers)</li> </ul>
Identify individual actions or lifestyle choices that individuals can take; provide that information as guidance	<ul style="list-style-type: none"> <li>■ Utilize the Climate Action Networks to distribute information</li> </ul>
Identify and distribute a GHG calculator to assess emissions associated with personal travel, consumption choices, etc.	<i>None identified yet</i>

Strategy: Increase education and communications about climate change adaptation options

ACTION	STEPS
<i>None identified yet</i>	<i>None identified yet</i>



## GOAL: ACCELERATE ADOPTION OF EMISSIONS REDUCTION STRATEGIES AND ACTIONS ACROSS REGIONAL AND LOCAL GOVERNMENTS

Strategy: Where suitable, identify and adopt regional goals and policies that help advance mitigation strategies and actions

ACTION	STEPS
Adopt a goal in the Regional Policy Plan (RPP) to advance the Commonwealth's greenhouse gas reduction goals	<i>None identified yet</i>
Adopt a new performance measure in the RPP that tracks progress on greenhouse gas emissions	<i>None identified yet</i>
Adopt objectives in the RPP to promote low carbon transportation alternatives, low carbon technologies for building heating and cooling, to promote carbon sequestration through land use practices, and to promote low carbon energy generation	<i>None identified yet</i>
Amend existing technical guidance to advance net or near zero construction methods and elements, including solar considerations*	<i>None identified yet</i>
Develop technical guidance to support the new RPP goal and objectives	<ul style="list-style-type: none"> <li>■ Develop technical guidance on Net or Near- Zero construction; alternate fuel sources and HVAC systems; Electric vehicles including transit; bike and pedestrian networks; means for preventing the reduction of, and promoting new carbon sequestration</li> </ul>

Strategy: Create mandates for municipal mitigation actions

ACTION	STEPS
<i>None identified yet</i>	<i>None identified yet</i>

Strategy: Increase capacity within municipal staffs; provide outside technical assistance

ACTION	STEPS
Increase technical assistance capacity within regional organizations to support local governments (develop model bylaws, regulations, and policies)	<ul style="list-style-type: none"> <li>■ Develop model bylaws, regulations, and policies to assist local governments</li> </ul>
Create and fund new staff positions within municipal government to advance climate change actions	<i>None identified yet</i>
Provide grant-writing assistance	<i>None identified yet</i>

## GOAL: INCREASE DATA COLLECTION AND ACCESS

Strategy: Identify more granular, town-specific data of GHG emissions

ACTION	STEPS
Request legislative change to mandate provision of fuel use data at municipal level	<i>None identified yet</i>

## GOAL: ENSURE THE HEALTH, SAFETY, AND EQUITABILITY OF MITIGATION AND ADAPTATION SOLUTIONS

Strategy: Assess opportunities for green economy to create jobs with livable wages

ACTION	STEPS
<i>None identified yet</i>	<i>None identified yet</i>

**GOAL: ESTABLISH STRATEGIC PARTNERSHIPS TO ADVANCE SHARED GOALS**

Strategy: Foster collaborations between levels of government

ACTION	STEPS
Look at opportunities to combine road retrofits with new utility installations (e.g. wastewater when addressing sea level rise or flooding)	<i>None identified yet</i>

Strategy: Foster collaborations between the public and private sectors\*

ACTION	STEPS
Identify opportunities for strategic partnerships to advance common goals or objectives	<i>None identified yet</i>