

# Support sustainable and resilient working lands

## ZONING, REGULATION, AND LAND MANAGEMENT FOR AGRICULTURAL LAND PRESERVATION AND SUSTAINABLE PRACTICES

**Description and purpose of strategy:** Making working lands sustainable and resilient can reduce greenhouse gas (GHG) emissions by reducing transportation of food, providing for compatible solar electricity generation, and reducing land management needs.

**Content of fact sheet:** Overview of actions municipalities can take to support agricultural land preservation and sustainable management practices, including zoning to preserve and promote agricultural use of land with prime agricultural soils and dual use of agricultural land for solar electricity generation, support for right to farm bylaws, engagement in efforts to preserve land in agricultural use, adoption of sustainable land management practices on town owned land, and support for local agriculture.

**Implementation support:** This fact sheet expands upon strategies and actions from the Climate Actions Database, which can be found at: [capecodcommission.org/climate](https://capecodcommission.org/climate).

### BENEFITS

- Greenhouse gas (GHG) emissions reductions or sequestration
- Health improvement from reduced pollutants
- Increased recreation
- Lower maintenance/operational costs
- Environmental enhancement/protection
- Less damage to infrastructure
- Higher property values
- Increased resilience
- Job and economic growth

### COSTS

- Higher capital costs
- Higher maintenance costs
- Higher operational costs
- Additional time for municipal staff to implement

## KEY FINDINGS



**Equity:** Workers may benefit from the creation of more sustainable jobs. Minimized fertilizer use and reduced emissions may benefit vulnerable communities, which tend to be most affected by watershed and air pollution.



**Financial benefits:** Municipalities can save on provision of community services by preserving farmland as an alternative to residential development. Adoption of dual-use "agrivoltaics" can provide significant financial benefits to producers through available incentives.



**Non-market benefits:** Solar electricity generation on agricultural land provides health benefits through reduced emissions of CO<sub>2</sub> and criteria pollutants.



**GHG reductions:** Agricultural land preservation, dual-use "agrivoltaics," sustainable land management practices, and supporting local agriculture can all help reduce CO<sub>2</sub> emissions.



**Ease of implementation:** Successful implementation of sustainable and resilient working lands actions requires an understanding of the characteristics of the land base and alignment with potential public and private partners.

## BENEFIT COST ANALYSIS

### Zoning

Municipalities can support the preservation, potential expansion, and sustainable use of productive agricultural lands through zoning to achieve two goals: preserve land with prime agricultural soils and facilitate adoption of dual-use agricultural production and electricity production from solar photovoltaic panels occurring together on the same piece of land that allows the continued use of the land for agriculture.

Land with prime agricultural soils can be zoned to discourage alternative uses, especially residential development, and the benefits of keeping land out of development would include lower costs of community services, increased property values for neighboring properties related to proximity to open space, and if converted to active and sustainable agricultural use, reduced chemical inputs and emissions related to transportation of food, and employment benefits of the farming operation.

The benefits of zoning for dual-use “agrivoltaics” include cost savings for the producer, reduced GHG emissions, reduced criteria pollutant emissions, and associated health benefits. By making agricultural operations more viable, adoption of agrivoltaics can preserve the already limited farmland on the Cape. The table below presents the value of health benefits from reduced pollutants, total project cost, and the value of incentives from the SMART program for a 10,000-watt photovoltaic system (approximately 440–475 square feet) over 20 years.

**BENEFITS AND COSTS OF 10,000-WATT PHOTOVOLTAIC SYSTEM**

BENEFIT/COST CATEGORY	AMOUNT
Reduced NO <sub>x</sub> , SO <sub>x</sub> and VOCs	\$1,820–\$4,120
Reduced CO <sub>2</sub>	\$11,974
Total project cost	(\$30,600)
Incentives	\$63,008
<b>Total</b>	<b>\$46,202–\$48,502</b>

The range of values for reduced criteria pollutants reflects low and high estimates in [EPA’s Co-Benefits Risk Assessment \(COBRA\)](#) tool.

### Right to Farm

Right to farm bylaws protect and encourage the growth and development of farm-related businesses by protecting farmers and farm operators against nuisance lawsuits related to complaints about odor, flies, dust, noise from field work, spraying of farm chemicals, and slow-moving farm machinery on local roads. The benefits are similar to agricultural zoning protections if land is converted to active agricultural use.

### Agricultural Land Preservation

Government farmland preservation programs and private land trusts work to ensure that land currently in agricultural use continues to be available for farming. In addition to zoning, municipalities may play a role in facilitating agricultural land preservation in partnership with federal, state, and private efforts to purchase development easements, transfer development rights, or outright purchase parcels identified as important to retaining a community’s agricultural heritage. Agricultural lands can remove carbon dioxide from the atmosphere if managed with appropriate practices.

## Stewardship of Town-Owned Land

Towns can lead by example by adopting management strategies that reduce GHG emissions and increase resilience on town-owned land. Strategies include integrated pest management, adoption of stress-tolerant plant varieties, and noxious weed eradication on town-owned land. Integrated pest management can decrease management time and chemical use by diversifying pest control practices, and carefully selecting and timing the use of pesticides to maximize their impact. Judicious use of fertilizer can reduce potential impacts on water resources. Using stress-tolerant (e.g., drought-resistant) plant varieties can also reduce management time, need for inputs, and the need to reestablish plantings that suffer during extreme weather events. Identifying and eradicating noxious weeds can limit damage to public health, agriculture, recreation, wildlife, or property. For example, noxious weeds may displace or slow canopy development of native pine species if uncontrolled.

## Supporting Local Agriculture

Towns can also support local agriculture by making town-owned land available for farming and hosting farmers markets and community-supported agriculture (CSA) pickup locations. All of these actions can help foster the local agricultural economy, reducing food transportation and associated GHG emissions.

## EQUITY

The potential equity-related benefits of supporting sustainable and resilient working lands include:

- **Employment.** Promoting local agriculture can help protect (through farmland preservation and more sustainable farmland practices) and generate jobs and economic opportunities for farm workers at various levels. Changes in farming practices and farmland preservation could help create local and sustainable job opportunities.
- **Food security.** More sustainable and regenerative agriculture practices could help increase food and nutritional security for local communities.
- **Improved health and safety.** The use of regenerative farming practices could improve the health and safety of local communities and workers by reducing exposure to chemicals and pesticides.
- **Reduced pollution.** Minimized fertilizer use could help decrease watershed and air pollution, which tend to disproportionately affect vulnerable communities.

## Optimizing Equity During Implementation

- There will be a need to consider who benefits most from any implemented strategies. For example, if farm owners benefit from strategies that help their farms are workers also benefiting?
- Will zoning changes to protect farmland create any burdens for low-income populations through indirect means such as increased property taxes or housing costs? If so, municipalities should consider solutions to address the increased financial burden.

## STATE OF PRACTICE

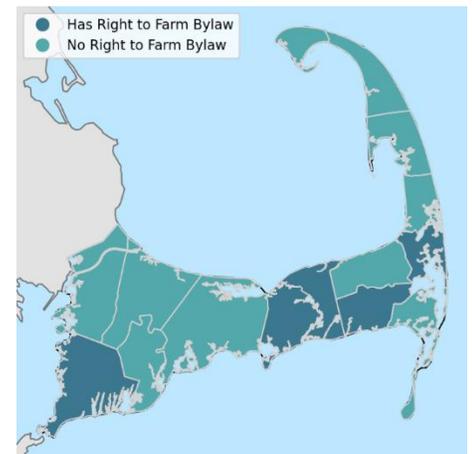
### General State of Practice

Right to farm laws were developed in the 1970s in response to rapid suburbanization of agricultural areas. Massachusetts passed one of the first right to farm laws in the country in 1979. Towns can strengthen the protections of the state law by passing right to farm bylaws; as of 2017, 140 Massachusetts towns had adopted such bylaws.

While not a new concept, dual-use solar is expanding rapidly. The U.S. Department of Energy's InSPIRE project tracks adoption of agrivoltaics, showing [325 projects](#) across 32 states in the U.S. as of early 2023. In Massachusetts, there are eight projects encompassing almost 19 acres of solar arrays. Specific location details were unavailable.

### Cape Cod Context

Agriculture is a relatively small industry on the Cape—with 6,564 acres in farms in 2017—but it is a significant part of the area's history and cultural feel. Cranberries are the number one crop in terms of area, and nurseries and greenhouses lead total sales. Efforts to protect and support local agriculture are well established on the Cape. As of 2017, five Cape Cod towns had right to farm bylaws: Dennis, Falmouth, Harwich, Orleans, and Yarmouth. These bylaws recognize the value of agriculture and outline expectations for living near a farm (noise, odors, dust, and fumes). Several [farmers markets](#) run regularly during the summer months across the Cape, and four [CSA farms](#) are located on the Cape. In addition, many Cape towns have community gardens.



### CASE STUDY: TONY ANDREWS FARM, FALMOUTH, MA

In 2018, the Town of Falmouth and The 300 Committee Land Trust acquired Tony Andrews Farm and adjacent lands overlooking the Coonamessett River in order to continue the century-old farming tradition. The acquisition was the result of a coordinated effort involving the Falmouth Community Preservation Committee, the Falmouth Conservation Commission, the Compact of Cape Cod Conservation Trusts, and the Massachusetts Land and Conservation Partnership grant programs. The 46-acre farm is now protected in perpetuity and will continue to be a working farm, growing strawberries, sweet corn, vegetables, and flowers.

Photo: Courtesy of Tony Andrews Farm



## LEADING BY EXAMPLE TO REDUCE RESIDENTIAL USE OF PESTICIDES AND FERTILIZER

The largest user category for both pesticide and fertilizer products on Cape Cod is residential use, accounting for 81% of pesticide use and 69% of fertilizer use, applied either by property owners or commercial applicators. Cape towns can lead by example by adopting best management practices (BMPs) that residential land owners can also follow. The Cape Cod Commission has supported the development of residential BMPs for reducing pesticides and fertilizers that include:

- Knowledge development
- Limiting the size of managed areas
- Alternative landscapes and native species selection
- Smart grass selection
- Smart soil preparation and management
- Smart mowing
- Smart waste management and composting
- Pest identification
- Monitoring pests
- Mechanical pest controls
- Biological pest controls
- Chemical control

These BMPs provide guidance for municipal maintenance managers seeking to transition to more sustainable land management practices.

## IMPLEMENTATION

The following steps can help guide municipalities that wish to pursue actions to support sustainable and resilient working lands.

- **Locate prime farmland.** Use MassMapper below to evaluate the suitability of zoning in relation to the presence of prime farmland soils.
- **Identify opportunities.** Using the results of mapping, identify opportunities for agricultural zoning, potential preservation through easements or acquisition (considering proximity to socially vulnerable communities), and agrivoltaics.
- **Adopt a right to farm bylaw.** Review the *Model Right to Farm By-Law* as an example for potential adoption.
- **Protect farmland.** Engage potential partners to consider options for agricultural land preservation through government or privately supported programs.
- **Incorporate sustainable practices into land management.** Develop a plan for adopting sustainable land management practices on town-owned land.
- **Facilitate local agriculture markets.** Contact local farmers and farmer organizations to gauge interest in cultivating town-owned land, establishing a new farmers market, or coordinating a CSA pickup location.

### REQUIRED EXPERTISE

**Internal:** Town planner, maintenance managers, agricultural commission, community preservation committee, open space committee

**External:** Land trusts, private donors

Resources that may assist with implementation of sustainable and resilient working lands actions are provided below.

## FINANCIAL AND TECHNICAL SUPPORT

[Model Right to Farm By-Law](#)

Encourages the pursuit of agriculture, promotes agriculture-based economic opportunities, and protects farmlands within a town by allowing agricultural uses and related activities to function with minimal conflict with abutters and town agencies.

<a href="#">Agricultural Preservation Restriction (APR) Program Details</a>	Provides information about requirements, resources, policies, and guidelines from the Massachusetts Department of Agricultural Resources' APR program.
<a href="#">Agricultural Conservation Easement Program (ACEP)</a>	Helps landowners, land trusts, and other entities protect, restore, and enhance wetlands or protect working farms and ranches through conservation easements.
<a href="#">Division of Conservation Services Grant Programs</a>	Offers grant programs to cities and towns for the acquisition of conservation and recreation land, as well as the development and renovation of parks.
<a href="#">Solar Massachusetts Renewable Target (SMART)</a>	Offers incentives for residential and commercial solar projects throughout Massachusetts.
ADDITIONAL INFORMATION	
<a href="#">MassMapper</a>	An interactive map for Massachusetts that can be used to identify land with prime agricultural soils.
<a href="#">Dual-Use: Agriculture and Solar Photovoltaics</a>	UMass Clean Energy Extension fact sheet designed to help farmers navigate the SMART program.
<a href="#">American Farmland Trust-New England Regional Office</a>	Resources to help farmers protect their land, produce a healthier environment, and build successful communities.
<a href="#">Invasive Plants</a>	Overview of invasive plants in Massachusetts, with links to additional resources on identifying and managing invasives.
<a href="#">Cape Cod Cooperative Extension</a>	Hosts a variety of programs to improve the health and well-being of youth, families, and communities; conserve and enhance natural and marine resources, and strengthen agriculture and food systems on Cape Cod.
<a href="#">UMass Extension Integrated Pest Management</a>	Source of regional management guides and newsletters that help farmers, horticulturalists, green industry professionals, and home gardeners manage pests using integrated pest management principles.
<a href="#">Massachusetts Farmland Action Plan</a>	Addresses the farmland needs and goals of the Commonwealth including but not limited to increasing farmland conservation, addressing farmland access (including urban farmland), food security, and the long-term economic and environmental viability of farms across all regions of the Commonwealth of Massachusetts.
<a href="#">Resilient Lands Initiative</a>	An initiative whose vision is to protect and improve the quality of life for residents of every Massachusetts community through land conservation and stewardship initiatives that conserve and enhance the health of the forests, farms, and soils.
<a href="#">Healthy Soils Action Plan</a>	A plan to protect, restore, and better steward soils across the Commonwealth.

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Additional climate change information and resources can be found at [capecodcommission.org/climate](https://capecodcommission.org/climate).