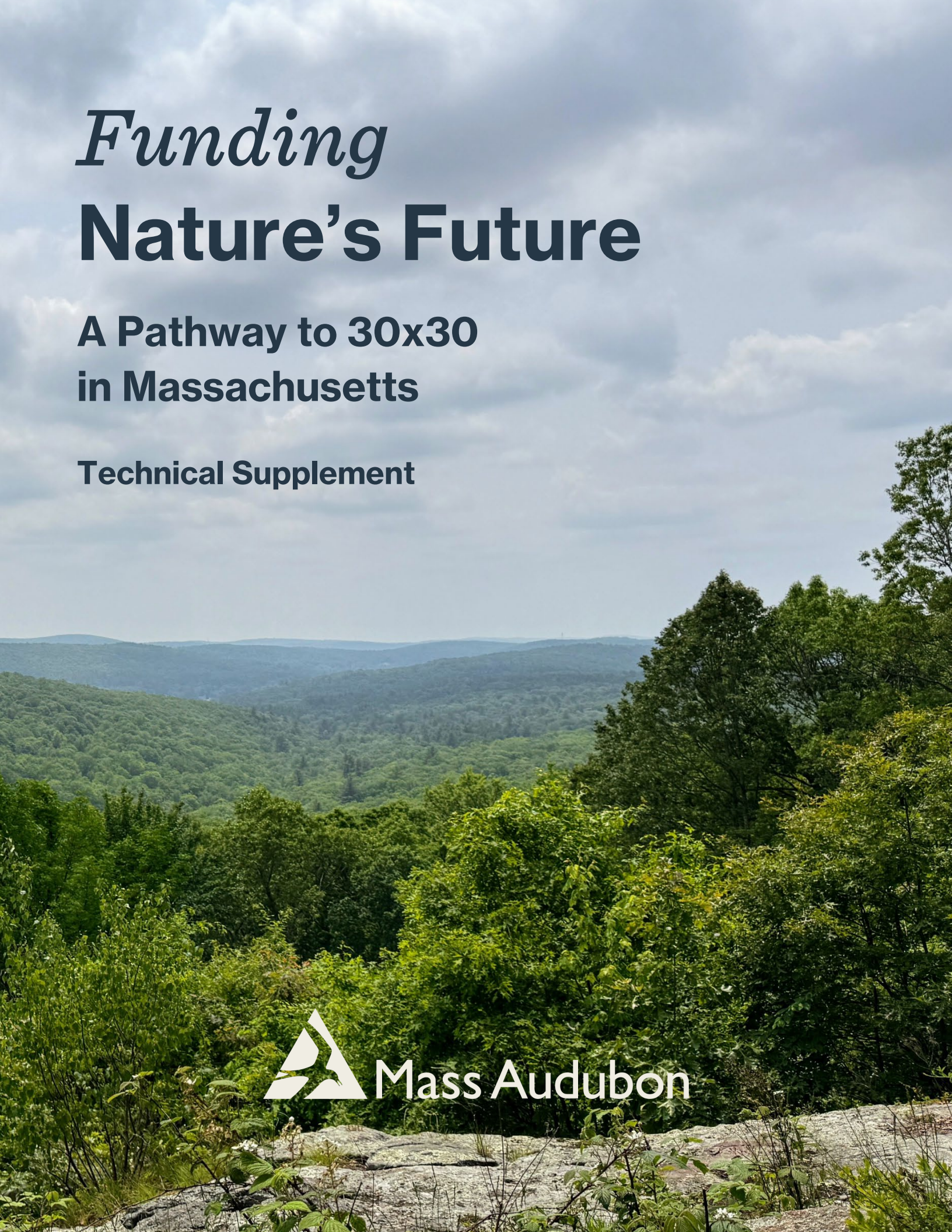
Funding Nature's Future

A Pathway to 30x30 in Massachusetts

Technical Supplement



Mass Audubon

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Introduction

This technical supplement provides information on the data and methodology followed to assess the total potential additional funding that will be required in Massachusetts to achieve the 30x30 and 40x50 land conservation goals. It is important to note that actual land conservation costs will depend on the timing, location, and project-specific details of land conservation transactions over time. In the context of this uncertainty, this analysis makes certain analytical assumptions within the methodology presented below to estimate a range of potential costs for the Commonwealth's land conservation goals, which may under- or overestimate actual land conservation costs that transpire.

The following steps are detailed:

1. The estimation of the cost of getting to 30x30 (from 2025-2030) and 40x50 (from 2030-2050)—the total funding needed to achieve the 30x30 and 40x50 goals. We estimate low-, medium-, and high-cost scenarios given the large range of land values across the state and uncertainty of where land will be conserved. Costs reflect acquiring land at its fair market value (FMV), with adjustments to account for some Conservation Restriction (CR) acquisition, and do not include costs associated with outreach, capacity and capacity-building, and other such aspects of successfully completing land transactions.
2. The estimation of current levels of funding from public (local, state, and federal) sources.
3. The estimation of the gap in funding across the low, medium, and high land cost scenarios assuming current levels of public funding remain consistent from 2025-2030 and from 2030-2050.

Land in the Commonwealth is conserved through a dynamic combination of local, state, federal, and private funding. This report provides estimates on local, state, and federal funding for land conservation in the Commonwealth. Effort was made to include all sources that fund land conservation consistently over time, but the list is not exhaustive. For example, we have excluded one-time funding infusions such as those made available by the American Rescue Plan Act (ARPA), which has funded some state land conservation programs (e.g., cranberry bogs), and recent awards made by NRCS's RCPP program.

Funding for land conservation is also supported by the private sector in the Commonwealth through land donations to conservation nonprofits and local and state governments, and through fundraising conducted by large and small nonprofit conservation organizations and regional and local land trusts.[1]

However, we do not include private and philanthropic funding in our estimate of spending on land conservation in this report. Data on private sources for land conservation is not systematically collected or available publicly, and a comprehensive survey of private donors and organizations funding land conservation in the state was beyond the scope of this analysis.[2] Further, private spending may have limitations such as geographic or thematic focus for land conservation and capacity limitations[3], and cannot be assumed as consistent or reliable to meet the 30x30 and 40x50 land conservation goals as private spending will vary based on individual preferences and broader economic conditions. While private spending on land conservation will likely increase to leverage and match additional deployment of public funds, it cannot reliably fill the funding gap to meet statewide land conservation goals.

Note: All land acquisition costs presented in this analysis are in $2025.

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[1] At least 147 land trusts are active in every community in the Commonwealth; most work in a single town, fewer work at the regional level, and only a very small percentage work statewide or in a larger geographic area. As of 2020, land trusts in the Commonwealth had protected over 460,000 acres of land, representing a 35% increase from the level of land protection ten years earlier. Acres conserved varied from larger land trusts such as Mass Audubon (39,000 acres protected) and The Trustees of Reservations (74,500 acres protected) to smaller land trusts protecting a much smaller area, such as the Rehoboth Land Trust (125 acres protected) and the Pascommuck Conservation Trust (203 acres protected). Data from Land Trust Alliance. (2024). *Gaining Ground.* https://landtrustalliance.org/land-trusts/gaining-ground/massachusetts. Accessed September 2024.

[2] A survey of private spending was conducted and reported in a 2009 report covering acres protected from 1998-2007. These estimates suggested that around $18 million per year was spent on land conservation in that period. Source: Alford, M., et al. (2009). *Land Conservation Spending in Massachusetts in Relation to the State Wildlife Conservation Strategy.* National Council for Science and the Environment. https://defenders.org/sites/default/files/publications/land_conservation_spending_in_massachusetts_in_relation_to_the_state_wildlife_conservation_strategy.pdf

[3] For example, larger, regional land trusts tend to be well staffed and have technical and community engagement expertise while smaller land trusts may have only one staff member, or an all-volunteer staff and Board. Land trusts rely on public funding for their work, which is additive to the private land donations and fundraising for land conservation they are engaged in. However, because many land trusts in the Commonwealth are completing conservation work with volunteer staff, organizational sustainability has been noted as a concern. Data from: Massachusetts Land Trust Coalition, 2020 Survey of Massachusetts Land Trusts, https://massland.org/sites/default/files/documents/2020_masslandtrust_survey_summary.pdf.

Land Conservation Costs

The total cost of getting to 30x30 and to 40x50 is a function of the number of acres of additional land protection required to achieve 30% and 40% of the state protected, and the cost of conserving those acres. This section describes how the total acres required to get to 30x30 and 40x50 have been estimated and the scenarios used to develop a range of acquisition costs for these acres.

Estimating Acres to 30x30 and 40x50

Table 1 summarizes the acres analysis, estimating that Massachusetts will require an additional 108,641 acres of conserved land to reach the state's 30x30 goal and an additional 517,000 acres to meet the 40x50 land conservation goal after the 30x30 goal is met.

Ongoing and robust discussion surrounds whether inland waters—open water—should be included in the state's estimate of 30x30 and 40x50. While open water provides important ecosystem services that are a part of the land conservation goals and other state goals such as the Biodiversity Executive Order—e.g., clean water provision, flood mitigation, access to recreation opportunities—the data suffers from certain inconsistencies. For example, some open water areas that are protected do not appear as protected in the Open Space data, and some areas classified as open water belong to other protected land categories such as wetlands.[4] For the purposes of this analysis, we chose to include open water in our estimate of acres required to get to 30x30 and 40x50 due to the conservation value of open water and because open water features in many of the conservation acquisitions Mass Audubon and other conservation organizations complete. We note that this estimate differs from the Commonwealth's climate-related planning, where open water is not included in current land protection estimates.

Table 1: Estimated Acres to Reach 30x30 and 40x50 Land Protection Goals

Upland and Water Open Space Protected	Acres	% of MA Protected
Total area of MA (upland + open water)	**5,169,398**	
Current land protection (open water added) [1]	1,442,178	27.9%
2030 30% Protection Goal	1,550,819	30%
Additional acres for 30x30	**108,641**	
Annual acre goal ('25-'30)	21,728	
2050 40% Protection Goal	2,067,759	40%
Additional acres for 40x50	625,581	
Additional acres for 40x50 once 30x30 goal is achieved	**516,940**	
Annual acre goal ('30-'50)	25,847	

Notes:
[1] Protected Open Space totals from MassGIS (8/24) + DEP open water added by GIS + approx. area of Quabbin and Wachusett reservoirs added manually. Work completed by Jessica Dietrich and Andy Finton at TNC Massachusetts in October 2024. Estimate calculated with the best available data; however, these data may have inaccuracies because water bodies have been inconsistently categorized in open space protection data. For this reason, results represent a false level of precision but a reasonable estimate using best available data.

Sources:
Total area of MA: MASS GIS Municipal Boundaries.
Current land protection: Current Protected Open Space data from MassGIS

[4] A quick comparison of the DEP wetlands GIS layer (https://www.mass.gov/info-details/massgis-data-massdep-wetlands-2005) and the Protected Open Space GIS layer (https://www.mass.gov/info-details/massgis-data-protected-and-recreational-openspace) shows that some acres classified as open water in the DEP wetlands file appear as Protected Open Space.

Location of Acres

The exact location of additional future conserved acres is a function of the location and timing of willing sellers across the state's many ecosystems. Given the spectrum of relative land values across the state and the changing value of land driven by factors such as rising real estate values, the potential costs associated with reaching this conservation goal will vary depending on where these parcels are located and the time at which a sale occurs. Further, the state has not yet articulated specific conservation goals across ecosystem types so assumptions are required to chart where future conservation may happen.

In the absence of known locations or criteria for what will ultimately be counted for the 30x30 and 40x50 land protection goals, we use recent trends of the land cover types that have been conserved across major land cover categories in the state (Table 2) to assume the potential kinds of future conserved acres. In this analysis, the MassGIS Protected and Recreational OpenSpace data layer (July 2023) was used to identify acres of permanently protected land, including land in fee or other legal interests, between fiscal years 2011 and 2021.[5] A total of 5,053 records resulted, totaling 138,229 acres. We used this data source as it was readily available and did not require additional GIS analysis. Future analyses could refine the estimates using location-specific recent trends in land conservation.

These acres were overlaid with the 2016 Land Cover/Land Use dataset (May 2019) to determine the types of land cover classes that were protected.[6] Table 2 shows the percentage of aggregate land cover types that were protected from 2011-2021, including the 2016 Land Cover/Land Use dataset categories that were combined to arrive at the aggregate land cover categories.

Table 2: Recent Trends in Land Conservation

Aggregate Land Cover Types	Acres Conserved 2011-2021 [1]	% of Conserved Area from 2011-2021	2016 Land Cover/Land Use Dataset Categories Included in Aggregate Land Cover Type
Bare land	496	0.36%	Bare land
Agricultural	9,268	6.71%	Cultivated and pasture/hay
Forest	114,002	82.49%	Deciduous forest, estuarine forested wetland, evergreen forest, and palustrine forested wetland
Grassland	3,957	2.86%	Developed open space and grassland
Water/submerged land	1,992	1.44%	Estuarine and palustrine aquatic bed, unconsolidated shore, and water
Wetland	4,891	3.54%	Estuarine and palustrine emergent wetland
Scrub/shrub	3,323	2.40%	Estuarine and palustrine scrub/shrub and scrub/shrub
Impervious	278	0.20%	Impervious
Total	**138,207**	**100%**	

Source: DCR Land Protection Program, Forests as Climate Solutions Initiative.

The proportions of aggregate land cover categories conserved in the period 2011-2021 are applied to the total acres required to achieve the 30x30 and 40x50 land conservation goals to estimate the acres in each land cover category that may be conserved (Table 3). This assumes that recent trends in land conservation are carried forward to meet the

[5] In OpenSpace data layer, protection in perpetuity is defined as: "Legally protected in perpetuity and recorded as such in a deed or other official document. Land is considered protected in perpetuity if it is owned by the town's conservation commission or, sometimes, by the water department; if a town has a conservation restriction on the property in perpetuity; if it is owned by one of the state's conservation agencies (thereby covered by article 97); if it is owned by a non-profit land trust; or if the town received federal or state assistance for the purchase or improvement of the property." Additionally, for this analysis, "other legal interest" means Conservation Restriction, Agricultural Preservation Restriction, or Watershed Preservation Restriction, and the CAL_DATE_R field was used to determine the date the deed was recorded (>6/30/2010 and <7/1/2021).

[6] When this intersect between the two data layers was done, there was a data gap of 21.44 acres—the input being 138,229 and the output being 138,208. The latter was used as the total denominator when estimating the proportion of each land cover type that was protected.

future land conservation goals and may under- or overestimate the types of land that are actually conserved. Table 3 shows that using this methodology, this analysis assumes that the vast majority of future conserved land will be forestland, followed by agricultural land and wetlands.

Table 3: Acres in Land Cover Categories Required for Land Conservation Goals

Land Cover Category	Acres Requiring Protection to 2030 (2025-2030)	Acres Requiring Protection to 2050 (2030-2050)
Bare land	390	1,857
Agricultural	7,285	34,664
Forest	89,614	426,404
Grassland	3,111	14,802
Water/submerged land	1,566	7,451
Wetland	3,844	18,292
Scrub/shrub	2,612	12,430
Impervious	219	1,040
Total acres to reach goal	**108,641**	**516,940**

Land Conservation Cost Estimates

To estimate the potential costs of land acquisition, we rely on fair market value (FMV) data for vacant land prices from the PLACES database, a high-resolution mapping tool for land values in the US developed by the PLACES lab at Boston University.[7] The FMV values are based on tax assessor parcel data from property sales in the Zillow Transaction and Assessment Database (ZTRAX, version: 9 October 2019) and are provided online at a 480-meter resolution.[8] FMV is defined as "the value that a buyer would be willing to pay for a property on the open market with no undue influence."[9] Sales price data in the database was inflated by the database developers to US $2017 using the monthly unadjusted Consumer Price Index for urban consumers.[10] We escalate the US $2017 values to US $2025 using an annual escalation value of 4.5% for meeting 30x30 and 40x50. This estimate is based on the MA Department of Revenue's 2024 report for the state auditor's PILOT analysis.[11] We then applied the US $2025 values to the 30x30 (2025-2030) and 40x50 (2030-2050) cost analyses; we did not escalate costs further over the future period.

Research based on the PLACES database has indicated that land value proxies may underestimate the costs of conserving land by meaningful factors.[12] This is particularly true for more expensive properties. The greater predictive power of land values in this study is evident within counties in the US, especially in counties that have more expensive urban areas and low market value land types such as desert and/or wetland. Previous county-level proxy values may not account for expensive parcels close to urban areas, which may be important target areas for achieving conservation goals aligned with public access, equity and environmental justice, and other goals.

[7]PLACES data is explained at https://placeslab.org/data/. High resolution vacant land value data (FMV) downloaded from https://datadryad.org/dataset/doi:10.5061/dryad.np5hqbzq9 in March 2025.

[8] Nolte, C. (2020), High-resolution land value maps reveal underestimation of conservation costs in the United States, *Proceedings of the National Academy of Sciences 117 (47)* 29577-29583, https://www.pnas.org/doi/10.1073/pnas.2012865117#sec-3. Data accessed at https://placeslab.org/fmv-usa/.

[9] Nolte, C. (2020).

[10] Nolte, C. (2020).

[11] To escalate costs from US $2017 to US $2025, we use the Massachusetts Department of Revenue's 2024 report for the state auditor's PILOT analysis (https://www.mass.gov/doc/pursuing-equitable-state-owned-land-reimbursements-for-municipalities/download). This report estimated an increase in the value of state-owned property of 25% from 2020-2024, or roughly 4.5% annually. We think this is a reasonable proxy to apply for the types of land that will dominate the total acreage in absolute terms to reach the Commonwealth's land conservation goals because the majority of state-owned property by volume is state forest land and DFG wildlife management land. We do not escalate land values beyond US $2025 for the 2025-2030 and 2030-2050 time periods given uncertainty about future land value escalation.

[12] The authors note that the factor of underestimation in policy budgets based on reliance on cost proxies was up to 37.5. Property tax assessment data, another potential source of parcel value data, underperformed the predictive value of this dataset and tended to underestimate conservation cost by a factor of 2.1 or more. See Nolte, C. (2020).

To identify land values for parcels likely to be conservation targets, we use data from PLACES for vacant land sales only. Vacant land sales in the database are defined as "sales without a building footprint, without a land use code indicating the presence of a building…and without a positive assessment value or FMV for buildings in the tax assessor data."[13] The database also distinguishes between conserved and unconserved parcels (for Massachusetts, using the New England Protected Open Space database[14])—we use FMV for unconserved parcels as these would be future conservation targets for the state to meet its land conservation goals. We overlay the PLACES data for Massachusetts with the 2016 Land Cover/Land Use dataset to estimate the average FMV for each land cover type in each county in the Commonwealth.[15] A detailed description of this spatial analysis is provided in the next section.

We developed the following three cost scenarios using these average FMV estimates. We use weighted averages of FMV for the land cover categories in each county, with the weight assigned to each county being the proportion of unconserved acres in the county as compared to the total unconserved acres across all counties included in the scenario.

- **Low-cost scenario:** The FMVs for each land cover category reflect the weighted average FMV estimates for the five western counties (Berkshire, Franklin, Hampden, Hampshire, Worcester) in Massachusetts, which have relatively lower FMVs than other counties.
- **Middle-cost scenario:** the weighted average of the average FMV in counties excluding Barnstable, Dukes, Suffolk, and Nantucket, which are outliers in terms of FMV as compared with other counties.
- **High-cost scenario:** the weighted average of the average FMV in all counties in Massachusetts.

Table 4 summarizes the low-, medium-, and high-cost scenario estimates across land cover categories. As shown, there is a range of potential costs of land conservation depending on the geographic location and land cover category of land that is conserved. For example, our estimates for forestland—the largest category conserved in recent history in the state—range from about $18,000 per acre in the low-cost scenario (reflecting conservation in the western counties) to $40,000 per acre in the high-cost scenario. Wetland acres range from about $20,000 per acre in the low-cost scenario to nearly $60,000 per acre in the high-cost scenario.

The FMV estimates in Table 4 reflect the potential costs of land acquisition. However, a certain proportion of land conservation in the Commonwealth will occur via Conservation Restrictions (CRs). To account for this, we have assumed that 25% of the future conserved acreage is protected through the imposition of CRs (75% through land acquisition), including Agricultural Preservation Restrictions (APRs), Watershed Protection Restrictions (WPRs), and Conservation Restrictions (CRs). This is consistent with general trends in land protection across both agency and NGO projects.[16] Further, we assume that, on average, restrictions create a 50% diminution in value. The "value" of a restriction is determined by the extent to which the easement diminishes the value of the underlying property. For highly buildable land the reduction in value can be as high as 90%, while for more highly constrained land it will be much lower. On balance, we think it is reasonable to assume that half the value is being eliminated. For the proportion of future conserved acreage via CRs, we apply a FMV of 50% of the values in Table 4.

Using these scenarios, a range of potential costs of achieving the 30x30 (Table 5) and 40x50 (Table 6) land conservation goals is estimated. In total, we estimate that the total cost of achieving the 30x30 land conservation goal may range from $1.8 billion to nearly $4 billion, or $350 million to almost $800 million annually. For the 40x50 land conservation goal, we estimate a potential total cost ranging from $8 billion to nearly $20 billion, or around $400 million to nearly $1 billion annually. The average cost per acre of reaching both goals (across all land cover categories) ranges from approximately $16,000/acre in the low-cost scenario to nearly $40,000/acre in the high-cost scenario.[17]

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[13]Nolte, C. (2020), High-resolution land value maps reveal underestimation of conservation costs in the United States, *Proceedings of the National Academy of Sciences 117 (47)* 29577-29583, https://www.pnas.org/doi/10.1073/pnas.2012865117#sec-3.

[14] Harvard Forest. (2020). *New England protected open space.* https://zenodo.org/record/3606763#.X4ys0dR7mM8/. Accessed 16 October 2020.

[15] Detailed spreadsheet of FMV estimates is available from Mass Audubon by request.

[16] A recent report estimates that roughly 15% of conservation in the Commonwealth is in easement. Estimate from Appalachian Mountain Club. (2023) *State-level progress towards the 30x30 land conservation goal.* https://cdn.outdoors.org/wp-content/uploads/2023/08/16084508/30-x-30-Report_June-2023.pdf. **We use a higher estimate of 25% based on land conservation trends across agency and NGO projects, and to account for the possibility that more land may be conserved via CR moving forward.**

[17]A 2009 report estimated that from 1998 to 2007, Massachusetts spent more than $360 million and conserved around 100,000 acres of land using state bond funds and appropriations. This report estimates that from 1998-2007, a total of $892 million across Massachusetts state funding sources and local, private, and federal sources conserved about 144,000 acres. This yields an average cost per acre of about $6,000, which is in the range of our average cost per acre in the low-cost scenario. It is likely lower than our estimate in part because our estimate includes more recent and higher land values. Source: Alford, M., et al. (2009). *Land Conservation Spending in Massachusetts in Relation to the State Wildlife Conservation Strategy.* National Council for Science and the Environment.
https://defenders.org/sites/default/files/publications/land_conservation_spending_in_massachusetts_in_relation_to_the_state_wildlife_conservation_strategy.pdf

Table 4: FMV Values for Land Conservation Scenarios ($2025)

Scenario FMV Estimates	Low	Medium	High
Land Cover Category	**Average FMV of Five Western Counties (Berkshire, Franklin, Hampden, Hampshire, Worcester)**	**Weighted Average of Average FMV in Counties Excluding Barnstable, Dukes, Suffolk, and Nantucket**	**Weighted Average of Average FMV in All Counties**
Bare land	$28,293	$61,769	$102,972
Agricultural	$21,479	$32,269	$33,908
Forest	$18,035	$36,783	$41,477
Grassland	$25,696	$67,276	$79,992
Water/submerged land [1]	N/A	N/A	N/A
Wetland	$21,078	$50,388	$55,692
Scrub/shrub	$21,617	$33,110	$97,603
Impervious	$43,622	$132,820	$167,360

Notes:
[1] We do not estimate the FMV of open water because of the incompleteness and inaccuracy of these data in our datasets.

Table 5: Estimated Costs of Achieving 30x30 ($2025)

Land Cover Category	Acres Requiring Protection to 2030	Total Cost to 2030 (2025-2030)			Annual Cost (2025-2030)		
		Low	Medium	High	Low	Medium	High
Bare land	390	$9,660,632	$21,090,988	$35,160,119	$1,932,126	$4,218,198	$7,032,024
Agricultural	7,285	$136,918,588	$205,693,754	$216,147,291	$27,383,718	$41,138,751	$43,229,458
Forest	89,614	$1,414,134,689	$2,884,264,514	$3,252,298,345	$282,826,938	$576,852,903	$650,459,669
Grassland	3,111	$69,944,030	$183,122,173	$217,732,776	$13,988,806	$36,624,435	$43,546,555
Water/ submerged land [1]	1,566	N/A	N/A	N/A	N/A	N/A	N/A
Wetland	3,844	$70,901,440	$169,493,943	$187,334,300	$14,180,288	$33,898,789	$37,466,860
Scrub/ shrub	2,612	$49,413,655	$75,683,526	$223,103,771	$9,882,731	$15,136,705	$44,620,754
Impervious	219	$8,341,924	$25,399,642	$32,004,843	$1,668,385	$5,079,928	$6,400,969
Total [2]	**108,641**	**$1,759,314,958**	**$3,564,748,540**	**$4,163,781,445**	**$351,862,992**	**$712,949,709**	**$832,756,289**

Notes:
[1] The potential costs of conserving open water areas are not estimated due to lack of accurate data for this land cover category.
[2] Totals may not sum due to rounding.

Table 6: Estimated Costs of Achieving 40x50 ($2025)

Land Cover Category	Acres Requiring Protection to 2050	Total Cost to 2050 (2030-2050)			Annual Cost (2030-2050)		
		Low	Medium	High	Low	Medium	High
Bare land	1,857	$45,967,421	$100,355,582	$167,299,622	$2,298,371	$5,017,779	$8,364,981
Agricultural	34,664	$651,488,913	$978,736,358	$1,028,476,597	$32,574,446	$48,936,818	$51,423,830
Forest	426,404	$6,728,765,491	$13,723,968,219	$15,475,154,556	$336,438,275	$686,198,411	$773,757,728
Grassland	14,802	$332,809,156	$871,335,785	$1,036,020,683	$16,640,458	$43,566,789	$51,801,034
Water/ submerged land [1]	7,451	N/A	N/A	N/A	N/A	N/A	N/A
Wetland	18,292	$337,364,726	$806,489,655	$891,378,014	$16,868,236	$40,324,483	$44,568,901
Scrub/shrub	12,430	$235,121,096	$360,118,948	$1,061,577,069	$11,756,055	$18,005,947	$53,078,853
Impervious	1,040	$39,692,720	$120,857,114	$152,286,117	$1,984,636	$6,042,856	$7,614,306
Total [2]	**516,940**	**$8,371,209,523**	**$16,961,861,661**	**$19,812,192,658**	**$418,560,477**	**$848,093,083**	**$990,609,633**

Notes:
[1] The potential costs of conserving open water areas are not estimated due to lack of accurate data for this land cover category.
[2] Totals may not sum due to rounding.

Spatial Analysis Methodology

The information below details the spatial analysis we conducted to generate FMV costs for vacant, unconserved land across land cover categories in the Commonwealth.

Data Used in Analysis:

- 2016 National Land Cover Database - Land Use Land Cover (LULC): https://www.mass.gov/info-details/massgis-data-2016-land-coverland-use
- High-resolution vacant land value data (FMV): https://datadryad.org/dataset/doi:10.5061/dryad.np5hqbzq9
- Protected and Recreational Open Space (Open Space): https://www.mass.gov/info-details/massgis-data-protected-and-recreational-openspace
- Massachusetts counties: https://www.mass.gov/info-details/massgis-data-counties

Methodology:

- We clipped LULC and FMV data to the State of Massachusetts.
- We converted the single value FMV raster/pixel data to cost/hectare using a natural log function.
- We converted the LULC and FMV data to a polygon dataset (initially in Raster).
- We clipped Open Spaces out of the FMV and LULC data.
- We created a union layer with FMV and LULC retaining applicable attributes, then performed a union that combined FMV/LULC data with the county data.
- We summed LULC areas by county and also averaged all the FMVs within LULC categories.

LULC categories in the LULC database were merged as follows to align with the state's approach to these categories:

- Open Water - not included, see notes below.
- Impervious
  - 22 - Developed, Low Intensity
  - 23 - Developed, Medium Intensity
  - 24 - Developed, High Intensity
- Bare Land
  - 31 - Barren Land (Rock/Sand/Clay)
- Forest
  - 41 - Deciduous Forest
  - 42 - Evergreen Forest
  - 43 - Mixed Forest
- Scrub/Shrub
  - 52 - Shrub/Scrub
- Grassland
  - 21 - Developed, Open Space
  - 71 - Grassland/Herbaceous
- Agricultural
  - 81 - Pasture/Hay
  - 82 - Cultivated Crops
- Wetlands
  - 90 - Woody Wetlands
  - 95 - Emergent Herbaceous Wetlands

Notes on the Data and Methodology:

- Open Water: There were many "holes" or "no data" in the FMV data over open water areas. Therefore, we decided not to include the Open Water category with the LULC data because it would be incomplete and highly inaccurate.
- Transforming data from raster to polygon formats inherently creates accuracy issues, but they should be minimal and not affect the total outcome of the results for the project.
- The FMV data was originally in raster format and the "pixels" do not exactly correspond to highly complex land areas, especially along the coast, islands, and other complex land boundaries/areas.
- The results of this analysis are not meant to be exact—there are inherent inaccuracies in the data. However, if the intent is to utilize this data for a general understanding of vacant, unconserved land costs over general land use/cover areas, the results should be a good guide to approximate costs of land acquisition for conservation purposes.

Caveats and Potential Impact on Estimates

The assumptions used to estimate the potential costs of the 30x30 and 40x50 land conservation goals yield important caveats to the estimates. Table 7 summarizes caveats and the potential impact on the estimates presented.

Table 7: Caveats and Potential Impacts on Estimates

Caveat	Potential Impact on Estimates
Cost data reflects the average FMV for each land cover category	Land conservation costs presented are a rough estimate of what reaching the land conservation goals may cost the Commonwealth. Actual land conservation transactions may result in the estimates presented being under- or overestimated.
Land cover data is from 2016	Actual movement of acres in and out of categories since 2016 may impact the estimate of acres conserved for the land conservation goals.
Fair market values are presented in $2025	Property values have risen precipitously in Massachusetts in recent history and continue to rise and change from trends such as solar development. This could lead our estimates to be an underestimate if the value escalation trend continues.
Costs reflect acquisition of land or CR only, not transaction costs	FMV data reflects the costs of acquiring land and does not reflect costs associated with identifying and completing land transactions. These costs may reflect underestimates of the total costs of bringing unconserved parcels of land to conserved status.

Existing Public Conservation Funding in MA

To estimate the gap in conservation funding required to reach the 30x30 and 40x50 land conservation goals in Massachusetts, we subtract from this total potential cost estimated existing sources of funding from the public sector. Existing sources of funding have been compiled from various data sources as described below. Table 8 summarizes total average annual conservation funding to date and estimated available funding from public sources to 2030 and 2050. As shown, we estimate public spending of around $50 million per year on land conservation, yielding a total projected amount of roughly $280 million by 2030 and $1.4 billion by 2050.

Table 8: Summary of Major Public Sources of Conservation Funding in Massachusetts

Funding Source	Funding Program	Total Annual Estimated Funding	Historic Period of Data Used to Estimate Annual Average Funding	Estimated Funding to 2030 (2025-2030)	Estimated Funding to 2050 (2025-2050)
Local/State	Community Preservation Act (CPA)	$22,560,778	2001-2023	$112,803,889	$564,019,443
State	Bond-Funded Capital Plan Investment Allocations for Land Conservation	$20,166,846	2013-2025	$100,834,230	$504,171,152
State	Conservation Land Tax Credit (CLTC)	$2,000,000	N/A - CLTC cap used as average	$10,000,000	$50,000,000
State	Municipal Vulnerability Preparedness (MVP) Program	$1,423,347	2019-2025	$7,116,733	$35,583,666
State	Box Turtle Mitigation Fund	$231,654	2010-2024	$1,158,270	$5,791,352
State	In-Lieu Fee Program	$44,849	2014-2024	$224,243	$1,121,217
Federal	LWCF Stateside	$6,191,642	2021-2024	$30,958,209	$154,791,044
Federal	USDA ACEP	$2,000,000	Personal communication with NRCS office in MA	$14,000,000	$70,000,000
Federal	NAWCA	$342,243	2012-2023	$1,711,213	$8,556,063
Total		**$54,961,359**		**$278,806,787**	**$1,394,033,937**

Local Funding

Community Preservation Act (CPA)

Local funding for land conservation is enabled by the state's Community Preservation Act (CPA) and results in municipalities being an important locus of land conservation in the state. Enacted in 2000, the CPA allows Massachusetts municipalities that adopt the program to levy a surcharge of up to 3% on local property taxes to generate a restricted revenue source for the following areas: open space conservation, outdoor recreation, historic preservation, and affordable housing. Funding across these categories varies according to the priorities of the individual municipalities, but all CPA communities are required to dedicate at least 10% of their annual CPA revenue toward open space and/or outdoor recreation (as well as 10% toward historic preservation and 10% toward affordable housing). The state also provides annual matching funds to CPA municipalities to supplement their local revenue through a statewide CPA Trust Fund—the revenue for this trust fund is generated primarily through a document recording fee at the state's registries of deeds. In 2023, roughly $50 million was distributed to eligible CPA municipalities. As the number of communities that have adopted the CPA has increased, the base match percentage

that the CPA Trust Fund has been able to support has decreased. In 2002, the CPA Trust Fund was able to support a 100% match against the local revenue generated by the 34 eligible communities—whereas by 2023, 189 communities had adopted CPA, and the trust fund was able to support a base match of 21% of what each community raised at the local level.[18]

Data concerning the appropriation of CPA funding by Massachusetts municipalities was obtained for the years 2001 to 2023 (Table 9). Total CPA appropriations made by municipalities for the purposes of open space and recreation land acquisitions (including bonded amounts through the program over this time) amounted to roughly $515 million.[19] The total number of acres acquired using CPA funding in this period was more than 36,000, including roughly 1,000 acres of land used for recreational purposes.

To estimate the projected contribution of CPA funding annually for land conservation, annual funding for open space conservation across all municipalities in the period 2001-2023 is averaged and added to annual average recreation funding and annual average bonded amounts for both open space and recreation acquisitions. The recreation category of CPA also includes but is not limited to open space preservation. For recreation funding, we average annual funding and then apply an assumption that 50% of spending in the recreation category reflects open space preservation.[20] Using this methodology, we estimate average annual spending by CPA at $23 million.

[18] Statewide CPA Trust Fund distribution history available at: https://www.communitypreservation.org/trustfund, accessed September 18, 2024.

[19] The CPA statute defines **"open space"** as including but not limited to "land to protect existing and future well fields, aquifers and recharge areas, watershed land, agricultural land, grasslands, fields, forest land, fresh and salt water marshes and other wetlands, ocean, river, stream, lake and pond frontage, beaches, dunes and other coastal lands, lands to protect scenic vistas, land for wildlife or nature preserve **and land for recreational use**". **Recreational use** is defined as "active or passive recreational use including, but not limited to, the use of land for community gardens, trails, and noncommercial youth and adult sports, and the use of land as a park, playground or athletic field. 'Recreational use' shall not include horse or dog racing or the use of land for a stadium, gymnasium or similar structure." CPA Statute, Massachusetts General Laws, Chapter 44B, https://malegislature.gov/Laws/GeneralLaws/PartI/TitleVII/Chapter44B.

[20] We take a percentage of total funding because some portion of the funding is allocated to recreational land improvements and does not reflect acquisition. However, we include the total recreation acres acquired as counting towards 30x30.

Table 9: Annual and Total CPA Spending (2001-2023)

Approval Year	CPA Open Space Acquisition Funds (Conservation or Agriculture) [1]	CPA Recreation Land Acquisition Funds [2]	CPA Bonded Amount for Open Space and Recreation Acquisitions [3]	Open Space Acres Acquired	Recreation Acres Acquired [4]
2001	$1,230,000	$0	$2,250,000	309	0
2002	$3,783,813	$0	$7,467,000	799.81	10
2003	$4,673,637	$250,750	$6,441,725	1,117.40	7.87
2004	$7,080,987	$1,785,898	$12,632,695	1,578.50	111.37
2005	$8,564,092	$115,000	$19,983,000	1,684.71	0.29
2006	$21,086,307	$37,362	$24,140,733	2,836.54	44.58
2007	$19,580,759	$1,315,575	$12,574,000	1,128.45	53.93
2008	$19,819,182	$3,090,002	$11,660,000	1,731.81	71.59
2009	$12,338,154	$768,079	$7,722,000	1,762.49	244.63
2010	$19,352,069	$738,458	$15,182,360	2,259.15	34.52
2011	$15,497,960	$3,298,000	$8,815,000	2,052.61	28.65
2012	$23,774,199	$2,082,300	$5,113,500	2,396.36	84.44
2013	$9,436,717	$865,164	$395,000	1,196.06	5
2014	$22,557,318	$1,431,645	$6,948,491	2,316.76	76
2015	$15,927,148	$2,088,549	$12,990,000	1,858.01	69.56
2016	$15,236,702	$471,409	$12,300,000	2,365.51	25.47
2017	$11,473,406	$1,248,609	$1,725,000	1,303.86	9.8
2018	$11,459,471	$2,697,500	$5,246,000	1,204.64	34.18
2019	$9,985,205	$110,074	$21,469,525	1,090.93	4.45
2020	$9,769,138	$171,379	$3,140,000	957.31	40.52
2021	$12,814,972	$0	$2,500,000	869.91	0
2022	$14,627,963	$375,000	$2,700,000	1,540.09	6.5
2023	$13,107,619	$529,328	$590,000	1,301.28	23.6
Total	**$303,176,818**	**$23,470,081**	**$203,986,029**	**35,661.19**	**986.95**
Average Annual	**$13,181,601**	**$1,020,438**	**$8,868,958**	**1,550.49**	**42.91**

Notes:
[1] CPA Open Space and Recreation Funding levels are inclusive of the state match provided to communities.
[2] CPA recreation funds can be spent on acquiring and/or improving trails, parks, athletic fields, playgrounds, and community gardens. We estimate that roughly 50% of this spending reflects land acquisition and consider all recreation acres acquired as counting for 30x30 given the inclusion of recreation acres in the MassGIS Open Space database.
[3] CPA bonded amounts reflect the total bonds approved for open space and/or recreation projects in each year. The value bonded for open space vs. recreation is not available. Communities report bonded amounts to the state as the full bond amount and not the annual debt service payments.
[4] We assume all recreation acres acquired will count toward 30x30.
Source: CPA Databank, available at https://www.communitypreservation.org/databank/home. Data presented here is recent as of September 2024. These data are compiled from data from the state's CP-3 report database.

State Funding

The land acquisition and stewardship programs implemented by the Department of Conservation & Recreation (DCR) and the Department of Fish & Game (DFG); land acquisition grant programs implemented by the Executive Office of Energy and Environmental Affairs (EEA); the Agricultural Preservation Restriction (APR) Program, a state development rights purchase program; and open space conservation through municipalities: The additional conservation required to reach the Commonwealth's land conservation goals will flow through many of the programs administered by these departments. For example:

- **DFG's work to conserve fish and wildlife in the state includes both conservation and restoration activities.** DFG has conserved 234,000 acres and manages 238 wildlife management areas and 13 wildlife sanctuaries. DFG's recently released five-year strategic plan will guide department activities from 2025-2030 and includes a goal of doubling its pace of land conservation in this period from an average of 3,000 acres/year to 6,000 acres/year. The plan also includes a goal for the department to designate 10-15% of the department's upland forests as forest reserves.[21]
- **DCR manages the state park system, overseeing more than 450,000 acres across the Commonwealth.** Land acquisition is implemented through the Division of MassParks and the Division of Water Supply Protection.
- **EEA administers a broad range of land acquisition grant programs through the Division of Conservation Services (DCS)**.[22] These include the Landscape Partnership Grant Program for larger, landscape-scale projects and the Parkland Acquisitions and Renovations for Communities (PARC) grant program, which spends most of the funding in environmental justice communities. EEA also administers the Municipal Vulnerability Preparedness (MVP) Program, which provides grants for climate change adaptation and resilience work and includes land conservation as an eligible expense.

Bond-Funded Capital Plan Allocations

Massachusetts has authorized bonds for capital spending, including for environmental purposes, roughly every five years for the past few decades.[23] The state was the first to use a green bond for $100 million. Land and conservation restrictions are considered capital assets that can be funded by bond bills and are expended through EEA's six agencies across a variety of land acquisition and grant programs. Another Environment and Climate Bond Bill is expected in 2025.

Bond funding for conservation is spent through EEA's six agencies across a variety of land acquisition and grant programs. Table 10 summarizes land conservation components of the 2018 Environmental & Climate Bond, which authorized roughly $400 million for land conservation activities in the state across various state agencies. To control the state's debt, there is an administrative limit ("bond cap") to the amount of bond-funded capital expenditures per year, which is allocated across the various bonds (environment, economic development, housing, transportation, etc.). Bond authorizations do not equate to actual expenditures—they are rather the theoretical upper bound of permissible spending by the state agencies.

[21] Massachusetts Department of Fish and Game. (2024). *Strategic Plan 2025-2030.* Massachusetts Executive Office of Energy and Environmental Affairs. Commonwealth of Massachusetts. https://www.mass.gov/info-details/department-of-fish-game-strategic-plan-2025-2030.
[22] For more information, see https://www.mass.gov/grant-programs-offered-by-the-division-of-conservation-services.

[23] MA environmental bond authorizations have occurred in 2014 and 2018. The 2018 bond text is available at: https://malegislature.gov/Laws/SessionLaws/Acts/2018/Chapter209.

Table 10: 2018 MA Environmental & Climate Bond Authorizations Primarily Dedicated for Land Conservation

2018 Environmental & Climate Bond		
Bond Line Item [1]	**Summary**	**2018 Bond Authorization**
2800-1121	DCR Land Acquisition	$40,000,000
2300-0421	DFG Land Acquisition	$30,000,000
2511-0122	MDAR Agricultural Preservation Restrictions (APRs)	$20,000,000
2000-7075	EEA Land Acquisition	$32,000,000
2000-7072	Community Investment Grants (*e.g.*, conservation partnership, drinking water supply, landscape partnership, LAND, PARC)	$225,000,000
2000-7077	Urban and Suburban Parks	$60,000,000
	TOTAL	**$407,000,000**

Notes:
[1] Bond line items included in this table reflect bond authorizations primarily dedicated to land conservation. Other authorizations may include land conservation in the context of another action, such as trail development, and funding for the Municipal Vulnerability Program (MVP), which is not primarily focused on land conservation.
Source: 2018 Environment & Climate Bond bill as analyzed by Emily Myron (TNC MA), https://malegislature.gov/Laws/SessionLaws/Acts/2018/Chapter209.

Actual investment decisions using bond funding are reflected in the state's capital budget plan, which includes allocations for land protection programs (Table 11).[24] These data show annual capital investment plan allocations for land conservation across state agencies have varied over the past decade, ranging from $21 million to $38 million. Not all the funding is allocated to land conservation—specifically, EO44 funds PARC and Gateway City Parks, programs that fund park improvements for active recreation and not conservation. While these funds are discretionary and could be used for conservation, they have generally been used for park improvement for around $12 million annually.[25]

After subtracting spending on park improvements, we take the average annual state bond-related allocations for land conservation (including the cost of land and land transaction due diligence costs) across the state agency programs listed, a value of $20 million per year. We note that this does not necessarily reflect actual annual expenditures on land conservation but is rather the maximum funding allocated to these programs.[26] However, conversation with EEA suggests that the allocated money is expended in full.[27]

[24] For example, the most recent (June 13, 2024) Five Year Capital Investment Plan (2025-2029) is available at: https://budget.digital.mass.gov/capital/fy25/static/90cd6e3d3d243127ce8abd4617b4ce07/fy25capitalplanma.pdf.

[25] Personal communication with Kurt Gaertner, Massachusetts EEA on January 30,2025.

[26] Each bond authorizes continuation of past line items that were not spent, leading to potential carryforward on some line items. Actual expenditures may differ from maximum funding allocations.

[27] Personal communication with Kurt Gaertner, Massachusetts EEA, on January 30, 2025.

Table 11: State Capital Investment Plan Allocations for the Primary Land Conservation Programs and Grants (FY13-25)

State Capital Plan Year ($Millions)															
Plan Item	**Project Name**	**FY25**	**FY24**	**FY23**	**FY22**	**FY21**	**FY20**	**FY19**	**FY18**	**FY17**	**FY16**	**FY15**	**FY14**	**FY13**	**Description of Funding**
E043	Land Protection Grant Programs	$2.75	$2.75	$2.75	$3.45	$2.75	$2.75	$2.75	$2.5	$3.5	$2.5	$3.0	$2.5	$4.7	Consolidated funding program administered by the Executive Office of Energy and Environmental Affairs for grants to cities, towns, and other partners for the purpose of protecting open space. EEA Conservation Partnership and Landscape Partnership Programs.
E044	Community Investment Grant Programs	$21	$21	$8	$18	$18	$18	$18	$17.2	$16	$22.9	$16.5	$16	$15.3	Funds a portfolio of municipal grant programs including Parkland Acquisitions and Renovations for Communities (PARC), Local Acquisitions for Natural Diversity (LAND), Gateway City Parks, and Municipal Drinking Water Protection.
E045	Agency Land Protection Programs	$12.2	$6.9	$11	$11	$11	$11	$8	$10.5	$13	$13	$15.5	$13.5	$17.0	Funding program administered by the Secretary of Energy and Environmental Affairs for land acquisition and protection activities at the Department of Conservation and Recreation, Department of Fish and Game, and Department of Agricultural Resources.
Total Annual Funding (Land conservation + park improvements)		$36	$30.6	$21.8	$32.5	$31.8	$31.8	$28.8	$30.2	$32.5	$38.4	$35.0	$32.0	$37.0	Includes spending on land conservation and park improvements to recreational facilities.
Annual funding for park improvement (from EO44)		$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	$12	Estimate from Kurt Gaertner, EEA. These estimates will be updated if more detailed spending data are available.
Total Annual Funding for Land Conservation		***$23.95***	***$18.65***	***$9.75***	***$20.45***	***$19.75***	***$19.75***	***$16.75***	***$18.2***	***$20.5***	***$26.4***	***$23.0***	***$20.0***	***$25.0***	
Source: MA State Five-Year Capital Investment Plan Reports, available at https://www.mass.gov/lists/budget-archives. Data compiled by Emily Myron, TNC MA, in August 2024.															

State Conservation Land Tax Credit (CLTC)

The Conservation Land Tax Credit (CLTC) program provides tax credits to landowners for the donation of land or CRs for lands that have "sufficient natural resources in the public interest"—such as land that provides for drinking water supply, wildlife habitat and biodiversity, agriculture and forestry production, recreation, and scenic and cultural values.[28] Donated lands must be permanently protected. Land donors receive a tax credit of 50% of the donation value, up to a maximum of $75,000. The tax credit reduces the tax burden of the land donor in equal proportion.

The CLTC program is capped at $2 million per year and is paid for via the state's general fund. For this reason, CLTC expenditures do not appear in the capital plan and are included as a separate state spending fund. Table 12 below shows actual spending from the CLTC program in MA since its inception. As shown, the CLTC is close to the cap level each year. What these data do not reflect is the demand for CLTC dollars that exceeds the cap, leading to a yearslong waitlist. In February 2023, there were 61 projects on the waitlist, totaling more than 1,700 acres of potential conservation.[29] Some landowners cannot wait years to get off the waitlist and may decide to sell valuable conservation properties for other purposes.

Table 12: CLTC Program Annual Tax Credits Awarded (2011-2023)

Conservation Land Tax Credits Awarded			
Calendar Year	**Projects Completed**	**Acres Protected**	**Tax Credits Awarded**
2011	22	915.70	$975,725
2012	43	2,566.70	$1,755,794
2013	44	1,625.70	$1,967,250
2014	51	2,521.00	$1,990,770
2015	36	1,305.50	$2,000,000
2016	32	1,409.60	$2,000,000
2017	30	820.60	$1,930,000
2018	31	859.00	$2,000,000
2019	29	650.25	$1,760,500
2020	32	1,153.45	$2,000,000
2021	30	1,023.65	$1,938,000
2022	25	635.67	$1,637,675
2023	29	557.74	$1,905,500
Total	**434**	**16,044.56**	**$23,861,214**

Source: Statistics from EEA's Department of Conservation Services.

We assume a level of $2 million annually in spending on conservation through this program but note that this number is insufficient to meet current demand and could increase if efforts to increase this cap are successful.

[28] Massachusetts Executive Office of Energy and Environmental Affairs. *Commonwealth Conservation Land Tax Credit (CLTC).* Commonwealth of Massachusetts. https://www.mass.gov/info-details/commonwealth-conservation-land-tax-credit-cltc#:~:text=The%20Conservation%20Land%20Tax%20Credit,is%20in%20the%20public's%20interest.

[29] Massachusetts Land Trust Coalition. (2024). *Please support the Conservation Land Tax Credit Amendment #770 to the FY24 Senate Ways & Means Budget.* https://massland.org/sites/default/files/documents/cltc_swm_fy24_budget_amendment_770.pdf.

State Municipal Vulnerability Preparedness (MVP) Program

The Municipal Vulnerability Preparedness grant program (MVP) is a state program to support and encourage municipalities to understand climate change impacts, complete planning that identifies activities that can reduce vulnerability to these impacts and implement identified activities.[30] The MVP program offers both Planning Grants and Action Grants. MVP Action Grants fund a variety of projects, including those constructing green infrastructure, conducting outreach and community engagement, and developing detailed vulnerability assessments. Land conservation is one type of activity MVP Action Grants can fund, but for some projects it may be one of several components. Specific funding for land conservation activities is therefore difficult to identify precisely, but a reasonable estimate can be determined through querying the database for land conservation-specific terms.

In the latest round of funding, the state provided 71 grants for projects that had a heavy focus on restoration, nature-based solutions, resilience, and planning and implementation prioritized through the MVP planning process or similar climate change vulnerability assessments and action plans. In this latest round of funding, land conservation was evident in some projects, for example $3 million to Bridgewater for the purchase of Hanson Farm Conservation Restriction and $1.6 million to purchase the Correira Bogs in Kingston.[31]

We downloaded the MVP Action Grants data from the EEA's Climate Grant Viewer application.[32] There were a total of 458 action grants for the years FY2018-FY2025 in the downloaded database, reflecting a total of approximately $170 million over this time. To estimate funding from the state's MVP, we queried the MVP database for keyword "Land Acquisition" and project type "Construction" and "On-the-Ground Implementation." A total of 17 projects fit these criteria, including 10 completed projects and seven projects in progress—reflecting a total award amount of $24,197,000 and $1,423,000 on average per year from FY2019-FY2025 (Table 13). This equals roughly 16% of total MVP funding over this time. We assume that the program will continue to provide roughly $1.5 million per year for land acquisition in Massachusetts. We also note that this program leverages additional funding, but the match has been reduced from 25% to 10%.

We caveat this estimate as potentially an under- or overestimate because the keyword "Land Acquisition" that is tracked in the database and used to identify projects to include in this cost assessment may not include all conservation projects, and where the tag is used, only a portion of total funding may be used for the acquisition/conservation portion of the project.

[30] Massachusetts Executive Office of Energy and Environmental Affairs. *Municipal Vulnerability Preparedness (MVP) Program.* Commonwealth of Massachusetts. https://www.mass.gov/municipal-vulnerability-preparedness-mvp-program.

[31] Executive Office of Energy and Environmental Affairs. (2024, August 1). *Healey-Driscoll Administration awards $52 million in climate resiliency funding to communities.* Commonwealth of Massachusetts. https://www.mass.gov/news/healey-driscoll-administration-awards-52-million-in-climate-resiliency-funding-to-communities.

[32] The MVP Action Grants are viewable through the EEA Climate Grant Viewer here: https://experience.arcgis.com/experience/fd26505b82bc49b1bac525dc95a2a50a/page/MVP-Grant-Programs/?views=Action-Grants-View. We downloaded the data in September 2024.

Table 13: MVP Funding for Land Acquisition, FY 2019-FY 2025

Project Title	MVP Region	Grantee	Grantee Type	Award Fiscal Year	Award Amount
Cuttyhunk Land Conservation Project	Southeast	Gosnold	Municipality	FY 2020	$1,400,000.00
Watershed Protection for Climate Resiliency—Brown's Woods Acquisition	Northeast	Littleton	Municipality	FY 2021	$763,050.00
Pine Island Watershed Lands Project	Southeast	Mattapoisett	Municipality	FY 2019	$960,000.00
Richardson Green Conservation Acquisition	Northeast	Lynnfield	Municipality	FY 2022	$1,638,750.00
Horseshoe Pond Acquisition Project	Central	Berlin	Municipality	FY 2023	$874,268.00
Mattapoisett River Valley Water Supply Resilience Project	Southeast	Mattapoisett	Municipality	FY 2023	$4,500,000.00
Picone Farm Preservation for Climate Resiliency, Flood Storage, Water Quality & Food Security	Southeast	Middleborough	Municipality	FY 2023	$1,364,325.00
Stow Acres North Acquisition and Climate Resilience Master Plan	Northeast	Stow	Municipality	FY 2023	$1,135,000.00
Briggsville Water District Land Acquisition and Tank Engineering for Flood and Drought Resilience	Berkshires & Hilltowns	Briggsville Water District	Municipal Department	FY 2024	$48,150.00
Protection of a Climate Resilient Tri-City Open Space Cluster in MetroWest	Greater Boston	Framingham	Municipality	FY 2024	$215,000.00
Harvard Littleton County Road Land Protection	Central	Harvard	Municipality	FY 2024	$401,250.00
Fenn Farm—Monument Mountain Acquisition Project	Berkshires & Hilltowns	Stockbridge-Munsee Band of Mohicans (Stockbridge-Munsee Community)	Tribe	FY 2024	$2,257,990.00
549 Main Street Water Supply & Open Space Preservation Acquisition	Northeast	Water Supply District of Acton	Municipal Department	FY 2024	$1,501,610.00
Hanson Farm Conservation Restriction Purchase	Southeast	Bridgewater	Municipality	FY 2025	$3,000,000.00
Red River Valley Preserve Watershed Resiliency Project	Southeast	Harwich	Municipality	FY 2025	$1,800,000.00
Purchasing the Correira Bogs in Kingston, MA	Southeast	Kingston	Municipality	FY 2025	$1,620,000.00
27 Aquinnah Circle Land Improvements	Southeast	Wampanoag Tribe of Gay Head (Aquinnah)	Tribe	FY 2025	$717,500.00
				TOTAL	**$24,196,893**
				Average annual	**$1,423,347**

Box Turtle Mitigation Fund

The Eastern Box Turtle (*Terrapene carolina*) is listed as a Species of Special Concern under the Massachusetts Endangered Species Act (MESA), making it illegal to kill, harass, collect, or possess the turtle. The Eastern Box Turtle has a wide range in Massachusetts and is especially concentrated in the densely developed southeastern area of the state.[33] In certain circumstances, the MESA allows DFW to allow take of protected species with the issuance of a Conservation and Management Permit that provides long-term net benefit mitigation requirements for conservation of the species. In these cases, offsite mitigation in the form of payment to a mitigation fund may be allowed in the context of a Conservation and Management Permit.

In 2010, the Box Turtle Enhanced Offsite Mitigation Fund was established; once developers make the payment and comply with any other mitigation requirements, their mitigation requirements for box turtle impacts are satisfied.[34] Funds are to be used strictly for land acquisition of the highest-quality Eastern Box Turtle habitats essential for long-term conservation; the Natural Heritage Program within DFW has identified high-quality habitat eligible for consideration for acquisition. Both in-fee and CR acquisitions are eligible. The Nature Conservancy's Massachusetts chapter manages the fund as a partner to the state and works with partners to complete land acquisition transactions.

The fund has received roughly $3.2 million in mitigation payments from 2010-2024. Accordingly, we estimate the annual average funding as $230,000.

In-Lieu Fee Program

DFG administers the state's in-lieu fee (ILF) program—established in 2014—on behalf of the US Army Corps of Engineers for compensatory requirements for impacts to waters of the US under the Clean Water Act (CWA).[35] The acquisition or permanent protection of land is an eligible expense under the ILF, but the program prefers ecological restoration over conservation-only projects. While the program has funded conservation in the past, moving forward most funds are likely to be spent on restoration, with limited instances of the project also including the conveyance of a CR or acquisition of adjacent land that will either be a part of the restored area or buffer the restored area, because ILF project sites require long-term site protection. However, most restoration projects in the past have already been on conserved land.

Over the lifetime of the ILF program to date, 96 Corps permittees have deposited payments in the ILF program, totaling just over $8 million ($8,072,764) for 119 Corps-permitted projects. These payments reflect compensatory mitigation for roughly 12 wetland acres and 1,200 linear feet of rivers and streams.[36]

The ILF program allows up to 10% of fees collected to be used on land protection at project sites. The program staff noted that many potential project sites are already protected. We assume that half of the 10% of fees allowed for land protection might be spent on land protection. We divided the $8,072,764 spent over the nine-year life of the ILF program to obtain annual spending of roughly $896,974. Ten percent of this is $89,697, and 50% of this is $44,849. Annual funding for conservation from the ILF program is therefore estimated at $44,849.

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[33] MassWildlife's Natural Heritage & Endangered Species Program. *Eastern Box Turtle.* Division of Fisheries and Wildlife. Commonwealth of Massachusetts. https://www.mass.gov/info-details/eastern-box-turtle#:~:text=The%20eastern%20box%20turtle%20is,and%20need%20to%20be%20conserved.

[34] Permits for take may also require avoidance and minimization of impacts to species on-site, including conservation and restoration activities on-site, and monitoring and research plans and activities. See an example permit here: https://www.massnationalguard.org/ERC/publications/MPMG-FNSI/cons-mgmt-permit.pdf.

[35] Department of Fish and Game. *Learn about DFG's In-Lieu Fee Program for Massachusetts.* Commonwealth of Massachusetts. https://www.mass.gov/info-details/learn-about-dfgs-in-lieu-fee-program-for-massachusetts

[36] Department of Fish and Game. (2023). *In-Lieu Fee Program 2023 Annual Report.* Commonwealth of Massachusetts. https://www.mass.gov/doc/2023-department-of-fish-and-game-in-lieu-fee-program-annual-report/download

Federal Funding

Federal funding for land conservation in Massachusetts is a relatively smaller piece of the funding pie than local and state funding.

Federal programs that fund land conservation in Massachusetts can be separated into three types: 1) federal funding programs coordinated directly by state agencies in which the state agency makes funding decisions for specific projects; 2) federal funding programs coordinated by the federal agency in collaboration with state agencies where the federal agency is involved in specific project funding decisions; and 3) federal funding programs with no state involvement, but that yield acquisitions for conservation on the ground in states.

Land and Water Conservation Fund (LWCF)

The Land and Water Conservation Fund (LWCF) is funded by a portion of offshore oil & gas lease revenues and is now funded permanently through the Great American Outdoors Act (GAOA) at $900 million per year. It is one of the federal government's most important tools for land conservation. States can receive LWCF funding through different vehicles: 1) federal land acquisition programs—for fee acquisition and easement purchases for inholdings and lands adjacent to federal land units such as national parks and forests; 2) Forest Legacy Program for working forests; 3) the Outdoor Recreation Legacy Partnership (ORLP) Program; and 4) LWCF Stateside, delivered to states based on an allocation formula. Table 14 summarizes total funding for Massachusetts over the past 60 years across these programs, which has averaged about $10 million per year. **In projecting annual average LWCF spending in Massachusetts going forward, however, we only include the Stateside allocation (~$6 million annually)** for the following reasons:

- LWCF federal land acquisition program funding data is not available for some projects funded in 2021 or 2022 (project data is only available for projects that closed by 2022) and therefore will miss potentially higher funding levels after the passage of the Great America Outdoors Act (GAOA) in 2020. GAOA funded LWCF up to $900 million starting in FY21. Further, prior to 2020, LWCF annual appropriations varied greatly due to changing program priorities and congressional appropriations, and post-GAOA Congress is still able to change program allocations. Finally, the LWCF structure of federal funding means that program awards to states are based on a state's choosing to put forward a particular project or projects and then being awarded funding through a nationally competitive process. The number of variables that can impact success reduces the accuracy of an average annual estimate.
- Forest Legacy and ORLP are also nationally competitive programs that vary by year and success and are similarly dependent on many variables. In particular, the Commonwealth has not received many ORLP grants in the past.

Table 14: LWCF Funding in Massachusetts (60 years)

LWCF Program	Total Spending	Years	Estimated Annual Average	Source
Federal Land Acquisition Programs	$114,876,606	60	$1,914,610	LWCF Coalition Fact Sheet. Funding reflects projects that closed from 1965 to 2022. Total not included in projected spending.
State Programs				
Forest Legacy Program (FLP)	$34,000,000	30	$971,429	Communication with the state program administrator. Total reflects grants received, completed, and closed out. Total not included in projected spending.
Outdoor Recreation Legacy Partnership (ORLP) Program	$3,232,434	7	$461,776	ORLP annual factsheets on past funded projects: https://lwcfcoalition.org/orlp. Total not included in projected spending.
Stateside Program	$143,593,705	60	$6,191,642	Annual estimate from communication with the state program administrator. Annual estimate reflects average of 2021-2024 after full funding of LWCF.
Total	**$294,702,745**		**$9,539,457**	

LWCF Federal Land Acquisition Program

The Federal Land Acquisition Program under LWCF provides funding for federal government agencies to acquire land in fee or conservation easements from willing sellers of private land that is inside ("inholdings") or adjacent to the boundaries of federal land units, including national parks and forests, national recreation areas, and national wildlife refuges. The purpose of these acquisitions is to provide public access to recreation and/or the protection of cultural or natural resources. Funding is provided directly to federal agencies, which identify needs and prioritize projects based on individual agency (e.g., Forest Service, Fish & Wildlife Service, Bureau of Land Management) processes and procedures. Agencies provide prioritized rankings for the president's budget proposal to Congress each federal fiscal year; Congress then determines the level of LWCF appropriations for each federal agency, delivering funding to the agencies, which then proceed to implement prioritized land acquisitions. Federal units in Massachusetts that have received LWCF funding over the past 60 years are:

- Adams NHP
- Appalachian NST
- Boston NHP
- Boston Harbor Islands NRA
- Cape Cod NS
- Frederick Law Olmsted NHS
- Great Meadows NWR
- Lowell NHP
- Mashpee NWR
- Massasoit NWR
- Minute Man NHP
- Monomoy NWR
- Oxbow NWR
- Parker River NWR
- Salem Maritime NHS
- Saugus Iron Works NHS
- Silvio Conte NFWR

These units have received a total of more than $114 million over the past 60 years or an estimated $1.9 million per year.[37]

[37] Total funding estimate from Land and Water Conservation Fund. (2022). *Massachusetts State Factsheet.* https://lwcfcoalition.org/s/Massachusetts-Fact-Sheet-22725.pdf. Factsheet data are taken from the LWCF Map, which is updated as of June 2022. Data reflects closed projects only; funded projects before 2022 that closed after June 2022 are not reflected.

LWCF State Programs

Outside of the federal acquisition program, LWCF provides money to states to fund land conservation through the Forest Legacy Program, the Outdoor Recreation Legacy Partnership (ORLP) Program, and the State and Local Assistance Program (LWCF Stateside).

Forest Legacy Program (FLP)

The Forest Legacy Program (FLP) is a competitive grant program that seeks to permanently protect forest properties through making grants to states for conservation easements or in fee purchase of working forests.[38] The United States Forest Service (USFS) administers the program. FLP funds can only be spent in Forest Legacy Areas within the state. The FLP operates in 53 states and territories and has funded protection of nearly 3 million acres since its establishment in 1990.[39]

The FLP has spent $34 million in Massachusetts over the 30-year life of the program.[40] Using these data, we estimate an average of $1.1 million in funding per year.

Table 15: Annual ORLP Funding in Massachusetts

Year	Funded Amount in Massachusetts
FY21	$1,500,000
FY 19/20	$1,000,000
FY17	$732,434
FY15/16	0
FY14	0
TOTAL	**$3,232,434**
Source: ORLP factsheets available at https://lwcfcoalition.org/orlp	

Outdoor Recreation Legacy Partnership (ORLP) Program

The Outdoor Recreation Legacy Partnership (ORLP) Program was established by Congress in 2014 and is administered by the National Park Service (NPS). ORLP is a competitive national grant program that funds outdoor recreation projects in urban areas, with priority given to economically disadvantaged areas. The program has awarded more than $118 million in grants since its inception.[41]

ORLP annual factsheets show a total of $3.2 million in funding over a seven-year period of funding (Table 15).[42] Using these data, we estimate an annual average of $462,000 from this program for land conservation in Massachusetts.

LWCF State and Local Assistance Program (LWCF Stateside)

LWCF Stateside allocates annual funding in the form of matching grants to all US states and territories according to a population-based formula. Funding is used for a wide spectrum of activities ranging from upgrading existing recreation facilities to conserving new parks and recreation areas. Funding is received into the LWCF Stateside program from annual Congressional appropriations and from a 12.5% take of revenues from Offshore Continental Shelf (OCS) leasing in the Gulf of Mexico (GOMESA funding).

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[38] US Forest Service. *Forest Legacy*. US Department of Agriculture. https://www.fs.usda.gov/managing-land/private-land/forest-legacy

[39] Land and Water Conservation Fund. *Forest Legacy Program*. https://lwcfcoalition.org/forest-legacy-program

[40] Communication with Lindsay Nystrom, state administrator in Massachusetts on January 17, 2025.

[41] Land and Water Conservation Fund. *Outdoor Recreation Legacy Partnership Program (ORLP).* https://lwcfcoalition.org/orlp

[42] ORLP factsheets available at: https://lwcfcoalition.org/orlp

We obtained data on annual LWCF Stateside apportionment for Massachusetts from the Division of Conservation and Recreation at EEA. We show data from 2017-2024 in Table 16. To estimate the average annual spending on conservation from this program, we use the average of spending from 2021-2024 ($6.2 million per year) after full funding of LWCF.

Table 16: Annual LWCF Stateside Apportionment for Massachusetts (2017-2024)

Year [1]	Apportionment for Massachusetts
2017	$2,001,040
2018	$2,122,220
2019	$3,623,566
2020	$4,671,930
2021	$6,219,386
2022	$5,758,425
2023	$6,091,269
2024	$6,697,487
Average (2021-2024)	**$6,191,642**

Notes:
[1] Apportionment by Federal Fiscal Year: October 1 through September 30.
Source: Personal communication with Melissa Cryan, DCR, EEA, Government of Massachusetts.

United States Department of Agriculture (USDA) Programs

The United States Department of Agriculture (USDA) funds numerous conservation activities on agricultural lands that range from easements for permanent protection to shorter-term conservation activities with shorter contract times, such as planting cover crops. These programs include two agricultural conservation easement programs for agriculture and wetlands funded through the Farm Bill: ACEP-ALE and ACEP-WRE (Agricultural Conservation Easement Program for Agricultural Land Easements and for Wetlands Reserve Easements, respectively). These programs reflect more permanent land conservation activities that would likely count under 30x30 and 40x50. Other programs include the Conservation Reserve Program (CRP), the Conservation Stewardship Program (CSP), the Environmental Quality Incentives Program (EQIP), and the Regional Conservation Partnership Program (RCPP). We only include ACEP-ALE and ACEP-WRE in our total calculation of spending on conservation in Massachusetts. They receive approximately $2.8 million on average per year ($2 million for ACEP-ALE and $800,000 for ACEP-WRE).[43]

North American Wetlands Conservation Act (NAWCA)

The North American Wetlands Conservation Act (NAWCA) provides for competitive matching grants to support public-private partnerships working on the protection, restoration, and enhancement of wetlands and upland habitats that benefit migratory birds.[44]

Average annual spending in Massachusetts by NAWCA was estimated through annual grant award data available from the US Fish & Wildlife Service (FWS) website (Table 17).[45] Data for grants was taken from 2012-2023. The grant awards

[43] Personal communication with the USDA NRCS office in Massachusetts confirmed the average annual receipt of roughly $2.8 million for the ACEP-ALE and ACEP-WRE programs, though in different amounts (approximately $2 million for ACEP-ALE and $800,000 for ACEP-WRE). Large but temporary increases in these programs from the IRA are not included in our estimates because they do not reflect likely spending over a longer period.

[44] US Fish & Wildlife Service. *North American Wetlands Conservation Act (NAWCA) US Small Grants.* https://www.fws.gov/service/north-american-wetlands-conservation-act-nawca-us-small-grants

[45] Data downloaded from https://www.fws.gov/grantsum/gsQuery in October 2024.

do not include grantee matches that were part of the projects listed; a 1:1 nonfederal match is required of grantees. A total of $7.5 million has been granted to Massachusetts from 2012-2023, with an annual average of $342,000.

Table 17: NAWCA Annual Grant Awards, 2012-2023

Project Name	Approval Date	Grant Award
Snell Creek	2023	$100,000
Great South Meadow Cedar Swamp	2022	$100,000
Herring River Restoration & Protection I	2022	$2,000,000
Mattapoisett Valley Wetlands	2021	$1,000,000
Wildlife & Saltmarsh Sparrow	2021	$951,650
Cuttyhunk Island	2020	$100,000
Massachusetts Wetlands	2020	$1,267,685
Great Marsh	2019	$100,000
Walnut Plain Cedar Swamp	2018	$80,000
Tidmarsh West Wetland Restoration	2018	$100,000
Broad Marsh	2018	$60,000
Richmond Pond Wildlife Sanctuary	2017	$100,000
Gardner & Winchendon Wetlands Protection Project	2017	$100,000
Allens Pond-Ocean View	2017	$100,000
Mattapoisett River Valley	2016	$75,000
Shorebird Conservation in Brazil & Delaware	2015	$200,000
Lower Angeline Brook	2015	$75,000
Eagle Reserve Recreation Area	2015	$75,000
Great Marsh II	2015	$720,000
Brandt Island Cove	2013	$75,000
Upper Great Marsh Tidal Restoration Project Phase III	2013	$75,000
Rocky Gutter	2012	$75,000
	Total (2012-2023)	$7,529,335
Annual Average		**$342,243**
Source: Data downloaded from https://www.fws.gov/grantsum/gsQuery in October 2024.		

Estimated Gap in Funding

The estimated gap in funding for Massachusetts to reach the 30x30 and 40x50 land conservation goals is estimated as the difference between projected levels of public spending and the total cost of acquiring the additional acres to reach the land conservation goals.

Tables 18 and 19 summarize the estimated gap in funding for Massachusetts to reach the 30x30 and 40x50 land conservation goals, assuming another ~100,000 acres of conserved land are required for the 30x30 goal and another ~500,000 acres for the 40x50 goal when the 30x30 goal is subtracted. Estimated existing public funding to meet these goals is a projection of past funding levels across public sources and is held consistent across the scenarios. The cost to reach the land conservation goals varies across the scenarios according to type of land conserved and potential geographic location of that land.

After current levels of public funding are accounted for, the Commonwealth may require at least an additional $300 million per year and up to roughly $800 million per year to reach the state's 30x30 land conservation goal (Table 18). Once the 30x30 goal is reached, the Commonwealth may require at least an additional $350 million per year and up to more than $900 million per year (2030-2050) to reach the state's 40x50 land conservation goal (Table 19).

Table 18: Estimated Gap in Funding (2025-2030) for 30x30 in Massachusetts ($2025)

Gap in Funding to 30x30 ($2025)				
Scenario	**Total Cost**	**Estimated Existing Public Funding to 2030 (2025-2030) [1]**	**Gap (2025-2030)**	**Annual Gap**
Low	$1,759,314,957	$278,806,787	$(1,480,508,170)	$(296,101,634)
Medium	$3,564,748,540	$278,806,787	$(3,285,941,753)	$(657,188,351)
High	$4,163,781,445	$278,806,787	$(3,884,974,658)	$(776,994,932)
Notes: [1] Public funding to 2030 assumes a consistent annual public funding amount of $55 million each year from 2025-2030.				

Table 19: Estimated Gap in Funding (2030-2050) for 40x50 in Massachusetts ($2025)

Gap in Funding to 40x50 ($2025)				
Scenario	**Total Cost**	**Estimated Existing Public Funding to 2050 (2030-2050) [1]**	**Gap (2030-2050)**	**Annual Gap**
Low	$8,371,209,522	$1,115,227,149	$(7,255,982,373)	$(362,799,119)
Medium	$16,961,861,661	$1,115,227,149	$(15,846,634,512)	$(792,331,726)
High	$19,812,192,658	$1,115,227,149	$(18,696,965,509)	$(934,848,275)
Notes: [1] Public funding to 2050 assumes a consistent annual public funding amount of $55 million each year from 2030-2050.				