

A Natural Resources Assessment of the Tennessee Gas Pipeline Company's Proposed Northeast Energy Direct Project's Pipeline Route Within Massachusetts

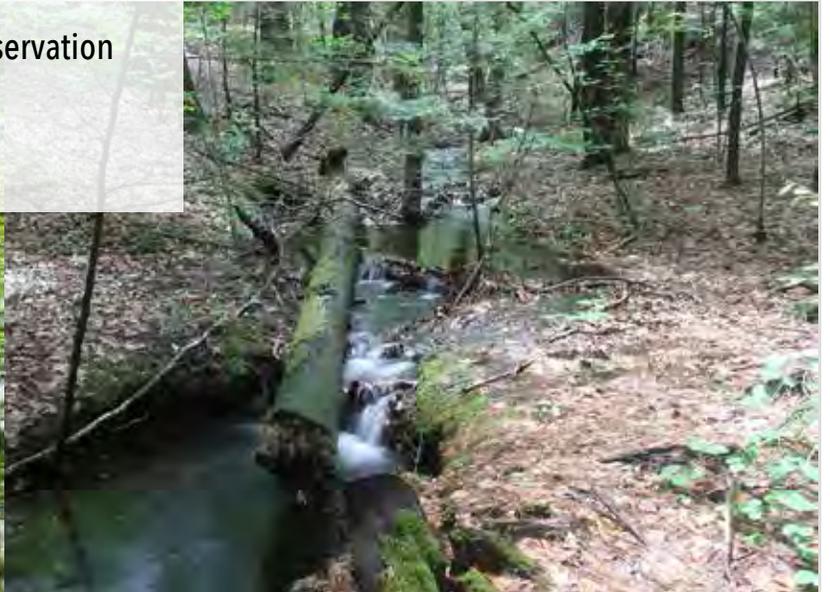
Volume One: The Mainline

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Second Edition, May 2015

Executive Summary

The UMass Center for Agriculture, Food and the Environment conducted an assessment of natural resources within the proposed route of the Tennessee Gas Pipeline Company's Northeast Energy Direct Project. This volume contains the assessment of the mainline pipeline.

Approach

To create this assessment, the researchers utilized a compilation of twenty available inventories of natural resources and environmental resources in Massachusetts, from state and UMass Amherst sources. These inventories were mapped against the mainline route of the proposed pipeline and then the proportion of affected resources was compared to the availability of the particular resource in each county and statewide. This method resulted in identification of key resources most likely to be disproportionately impacted by the pipeline.

Key Findings

Findings from each of the twenty inventories are detailed later in this document. In general, the researchers found that for many of the mapped layers with information related to conservation and recreation resources, the proposed pipeline does not overlap a disproportionate amount of state or county resources. However, there are several notable exceptions, summarized below for fourteen of the inventories.

Biomap2 Core Habitat: At the state level, the pipeline overlaps 29.1% of Core Habitat areas, identified as critical for the long-term persistence of "Species of Conservation Concern," while only 23.6% of the state is designated as Core Habitat. The pipeline also overlaps a disproportionate amount of Core Habitat in Franklin County and Middlesex County.

At the state level the pipeline disproportionately overlaps **BioMap2 Critical Natural Landscape** (41.5 vs. 34.0% available) and **Coldwater Fisheries Resources** (0.13% vs. 0.09% available) although the percent overlap is less at the county level than the percent available in each county.

Index of Ecological Integrity: Ecological integrity is based on a landscape model developed at UMass Amherst via the Conservation Assessment and Prioritization System (CAPS). At the state level, the pipeline

overlaps a strongly disproportionate amount of lands with high ecological integrity, roughly twice as much as available. At the county level, overlap is proportionate and this finding is due to the large amount of intact landscapes in western Massachusetts, which constitutes the majority of the pipeline route.

Protected and Recreational Open Space: When measured at the state level, the pipeline overlaps a proportionate amount of open space lands protected in perpetuity. However, in both Berkshire and Hampshire Counties the pipeline overlaps disproportionately more preserved agricultural and conservation land.

Farmland of Statewide Importance: The pipeline overlaps a disproportionate amount of Farmland of Statewide Importance at both the state level (16.9% overlap vs. 14.1% available) and in Berkshire and Franklin Counties.

Scenic Landscapes: At the state level, the pipeline overlaps a disproportionate amount of scenic landscapes (18.8% overlap vs. 10.6% available). The bulk of the scenic landscapes overlapping the pipeline are in Franklin County and include the Taconic Section, Berkshire Hills and Connecticut Valley.

Emergency Surface Water Watersheds: At the state level, the pipeline overlaps a disproportionate amount of these watersheds (4.2% overlap vs. 3.3% available). This is true also for Berkshire and Franklin Counties where the pipeline overlaps disproportionately more Emergency Surface Water watersheds than are available in each county.

For several resources, although at the state level and in the other counties the amount of overlap was not disproportionately higher than the percentage available statewide or within those counties, the overlap was disproportionate for one county. In Franklin County this was true for three categories of habitat designated by the Natural Heritage and Endangered Species Program: **Priority Habitat of Rare Species** (24.1 vs. 15.8%), **Estimated Habitat of Wetlands Wildlife** (19.5% vs. 13.5%) and **Natural Communities** (4.2% vs. 1.2%). In Berkshire County this was the case for three categories of natural resources related to public drinking water: **Outstanding Resource Waters** (18.4% vs. 13.6%), **Surface Water Watersheds** (11.2% vs. 9.2%), and **Water Supply Protection Zone C** (10.8% vs. 7.2%).

Preface

Introduction

At the request of Massachusetts Senate President Stanley Rosenberg, we conducted an assessment of natural resources within the proposed route of the Tennessee Gas Pipeline Company’s Northeast Energy Direct for publication by the University’s Center for Agriculture, Food and the Environment. The goal of this assessment was to quantify, based on available Geographic Information System (GIS) data, the natural resources that occur along the route. We did not attempt to assess the impacts of the proposed pipeline on those natural resources.

The GIS layers utilized for this assessment are available through MassGIS or from the University of Massachusetts Amherst’s Conservation Assessment Prioritization System (CAPS). MassGIS is the Commonwealth’s Office of Geographic Information, within the Massachusetts Office of Information Technology. Through MassGIS, the Commonwealth has created a comprehensive, statewide database of geospatial information. CAPS is a software program and an approach to prioritizing land for conservation based on the assessment of ecological integrity for various ecological communities in an area.

Each of the following sections details findings from the particular inventories studied. In general, the introductory text preceding findings in each section was taken from the web pages of the particular inventory. URLs of those web pages are also included for additional information.

General Approach

The researchers overlaid the pipeline ‘preferred alternative route’ on conservation/recreation GIS layers. For each conservation/recreation layer, we calculated the percentage of pipeline overlap and compared it to the total percentage of the conservation/recreation layer within the state. For example, “Biomap2 Core Habitat” makes up 1.2 million of the 5.01 million acres

of Massachusetts for a percent cover of approximately 24%. Along the pipeline route, 29.9 km of the total length of 102.6 km overlaps Biomap2 Core Habitat, for a percent overlap of 29%. This approach allows us to directly compare measures of area (statewide or county-wide coverage) with measures of distance (percent of pipeline overlap). Because western Massachusetts counties tend to have disproportionately more conservation priorities, we also compared percentages at the county level.

Basic Information

The Northeast Energy Direct pipeline project consists of a mainline along with spurs off of that line. A later volume of this assessment will cover the spurs in Massachusetts. According to our assessment, approximately 62 miles (102.6 km) of mainline pipeline are proposed for Massachusetts, crossing through portions of four counties: Berkshire, Franklin, Hampshire (Town of Plainfield) and Middlesex (Town of Dracut) Counties.



Proposed Mainline Pipeline



Proposed Mainline Pipeline

Table 1. Total pipeline length by county for the proposed ‘preferred alternative route.’

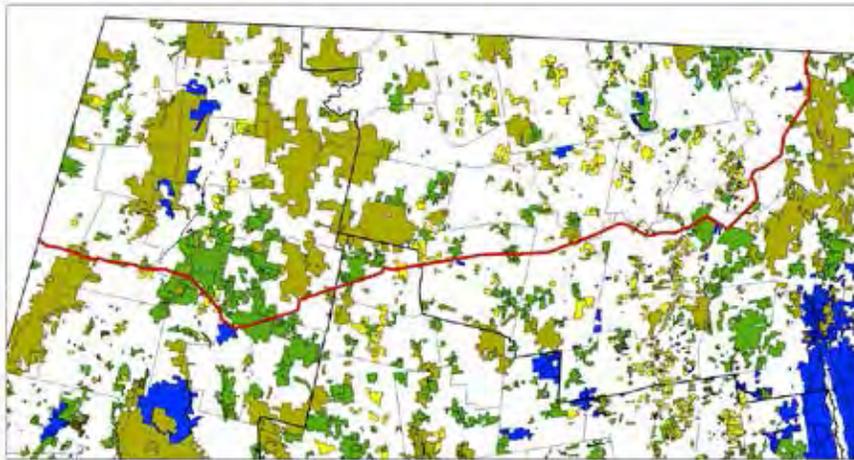
Location	Pipeline Length (km)
BERKSHIRE	34.5
FRANKLIN	54.7
HAMPSHIRE	9.0
MIDDLESEX	4.5
STATE	102.6

Open Space and Biodiversity

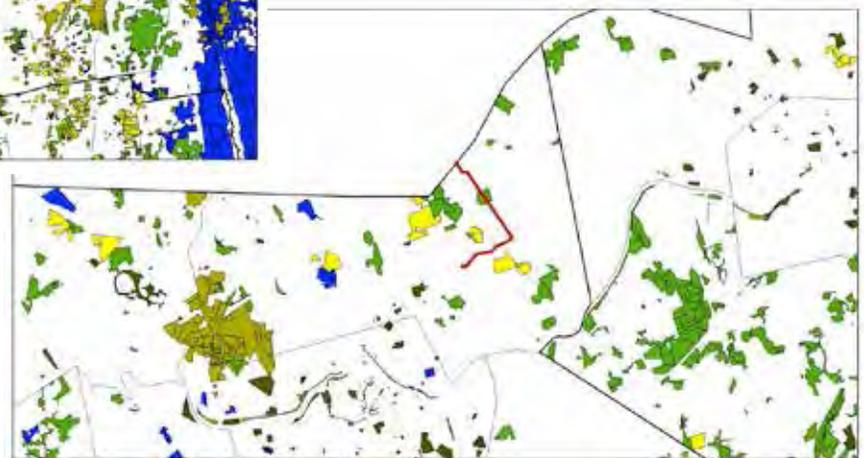
Protected and Recreational Open Space

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/OSP.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/osp.html)

The MassGIS data layer for Protected and Recreational Open Space contains the boundaries of conservation



lands and outdoor recreational facilities in Massachusetts. Conservation and outdoor recreational facilities owned by federal, state, county, municipal, and nonprofit enterprises are included in this data layer.



Agriculture
 Conservation
 Recreation

Recreation & Conservation
 Water Supply Protection

Data on protected and recreational open space primarily came from MassGIS (January 2015). These data were updated and supplemented with information provided by the Berkshire Regional Planning Commission. We focused our analysis on land with a “level of protection” listed as “in perpetuity” and broke out the results by “primary purpose.”

Compared to statewide coverages the proposed pipeline will affect a higher percentage of protected open space dedicated to agriculture and conservation, and a smaller percentage of land protected for watershed conservation. In Berkshire and Hampshire counties the pipeline also overlaps a disproportionate amount of open space used primarily for agriculture and conservation.

Table 2. Open Space protected in perpetuity broken out by Primary Purpose.

COUNTY	Primary Purpose	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Open Space
BERKSHIRE	Agricultural	3	0.80	2.3%	1.6%
BERKSHIRE	Recreation & Conservation	7	4.41	12.8%	19.0%
BERKSHIRE	Conservation	9	6.54	19.0%	10.8%
BERKSHIRE	Watershed Conservation	1	1.13	3.3%	1.9%

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BERKSHIRE	Unknown	1	0.72	2.1%	0.6%
FRANKLIN	Agricultural	4	1.58	2.9%	3.7%
FRANKLIN	Recreation & Conservation	2	0.98	1.8%	12.0%
FRANKLIN	Conservation	6	2.70	4.9%	9.2%
FRANKLIN	Watershed Conservation	1	0.31	0.6%	6.8%
FRANKLIN	Unknown	--	--	--	0.0%
HAMPSHIRE	Agricultural	1	0.91	10.2%	3.6%
HAMPSHIRE	Recreation & Conservation	--	--	--	7.0%
HAMPSHIRE	Conservation	3	1.54	17.2%	9.9%
HAMPSHIRE	Watershed Conservation	--	--	--	6.6%
HAMPSHIRE	Unknown	--	--	--	0.0%
MIDDLESEX	Agricultural	--	--	--	0.5%
MIDDLESEX	Recreation & Conservation	--	--	--	4.7%
MIDDLESEX	Conservation	1	0.31	6.9%	11.8%
MIDDLESEX	Watershed Conservation	--	--	--	1.7%
MIDDLESEX	Unknown	--	--	--	0.3%
STATE	Agricultural	8	3.30	3.2%	1.4%
STATE	Recreation & Conservation	9	5.39	5.3%	7.6%
STATE	Conservation	19	11.09	10.8%	10.7%
STATE	Watershed Conservation	2	1.44	1.4%	4.2%

BioMap2

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/BIOMAP2.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/biomap2.html)

The Massachusetts Natural Heritage and Endangered Species Program and The Nature Conservancy's Massachusetts Program developed BioMap2 in 2010 as a conservation plan to protect the state's biodiversity. BioMap2 was designed to guide strategic biodiversity conservation in Massachusetts over the following decade by focusing land protection and stewardship on the areas that are most critical for ensuring the long-term persistence of rare and other native species and their habitats, exemplary natural communities, and a diversity of ecosystems.

Spatial data utilized here were developed as part of the Biomap2 project and were acquired from the MassGIS web site (February 2011).

Biomap2 Core Habitat

BioMap2 Core Habitat identifies specific areas necessary to promote the long-term persistence of Species of Conservation Concern (those listed under the Massachusetts Endangered Species Act as well as additional species identified in the State Wildlife Action Plan), exemplary natural communities, and intact ecosystems.

The proposed pipeline route crosses a total of 29.9 km of BioMap2 Core Habitat. Twenty nine percent of the total pipeline length is in Core Habitat, compared to 24% of the state as a whole (Table 3). The pipeline route crosses disproportionately more Core Habitat in Franklin County (33% of pipeline vs. 27% of overall land area), where a large portion of the pipeline length is proposed. In Middlesex County--which has only 17% of its land area designated as Core Habitat--over 50% of the pipeline route crosses

Core Habitat. Proportionally less Core Habitat is crossed in Berkshire and Hampshire Counties when compared to county-wide coverages.



Table 3. Biomap2 Core Habitat (All Components)

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	6	7.7	22.5%	33.4%
FRANKLIN	3	18.2	33.4%	26.6%
HAMPSHIRE	2	1.7	18.4%	25.9%
MIDDLESEX	1	2.3	50.4%	17.4%
STATE	12	29.9	29.1%	23.6%

The majority of pipeline overlap within Biomap2 Core Habitat occurs in landscapes designated as 'Species of Conservation Concern' (19 km) and 'Forest Core' (10 km; Table 4). Further details for each Core Habitat Component are listed below (Tables 5-10).

Table 4. Biomap2 Core Habitat components

Core Habitat Component	Pipeline length (km)
Aquatic Core	1.23
Wetlands	0.04
Forest Core	10.13
Priority Natural Community	1.46
Species of Conservation Concern	18.81
Vernal Pool Core	0.26

Considered from both county and statewide perspectives the proposed pipeline will affect proportionally less Aquatic Core and Wetlands Core Habitat than is available throughout the landscape (Tables 5 and 6).

Table 5. Biomap2 Aquatic Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	3	0.31	0.9%	4.5%
FRANKLIN	2	0.79	1.4%	4.9%
HAMPSHIRE	1	0.12	1.4%	4.0%
MIDDLESEX	--	--	--	2.2%
STATE	5	1.23	2.7%	4.2%

Only those sections of the proposed pipeline that occur in Hampshire County will affect Vernal Pool Core Habitat. In that county a larger percentage of the the pipeline (2.9%) is classified as Vernal Pool Core Habitat than occurs in the county as a whole (0.7%, Table 7). From a statewide

perspective the amount of Vernal Pool Core Habitat along the pipeline route is proportionally smaller than the statewide coverage for this habitat type.



Table 6. Biomap2 Wetlands Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	--	--	--	2.4%
FRANKLIN	1	0.04	0.1%	1.0%
HAMPSHIRE	--	--	--	0.8%
MIDDLESEX	--	--	--	1.5%
STATE	1	0.04	0.1%	2.1%

The amount of Natural Community Core Habitat overlapped by the proposed pipeline is over-represented in Franklin County (2.7%) compare to the county-wide coverage (1.2%, Table 9). From a state-wide perspective and in the other counties the amount of this habitat type along the pipeline

The amount of Forest Core Habitat along the pipeline route is marginally higher for Franklin County and lower for the other counties when compared to county-wide coverages. However, much of the Forest Core Habitat in the state is located in Western Massachusetts. As a result the percentage of Forest Core Habitat affected by the pipeline (9.9%) is proportionally higher than for the state as a whole (6.3%, Table 8).

route is proportionally less than county-wide and statewide coverages (Table 9).

Compared to county-wide coverages the amount of Species of Conservation Concern Core Habitat on the pipeline route is higher in Franklin (19.9% versus 15.2%) and Hampshire (23.1% versus 17.4%) counties, and substantially higher in Middlesex County (50.5% versus 14.9%, Table 10). Statewide, the percent of this habitat along the pipeline route (18.3%) is only marginally higher than for the state as a whole (17.6%).

Table 7. Biomap2 Vernal Pool Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	--	--	--	0.3%
FRANKLIN	--	--	--	0.2%
HAMPSHIRE	1	0.26	2.9%	0.7%
MIDDLESEX	--	--	--	1.0%
STATE	1	0.26	0.2%	0.7%

Table 8. Biomap2 Forest Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	1	3.85	11.2%	19.1%
FRANKLIN	2	6.28	11.5%	9.6%
HAMPSHIRE	--	--	--	9.1%
MIDDLESEX	--	--	--	2.6%
STATE	3	10.13	9.9%	6.3%

Table 9. Biomap2 Priority Natural Community Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	--	--	--	1.0%
FRANKLIN	1	1.46	2.7%	1.2%
HAMPSHIRE	--	--	--	0.3%
MIDDLESEX	--	--	--	0.1%
STATE	1	1.46	1.4%	1.8%

Table 10. Biomap2 Species of Conservation Concern Core Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 Core
BERKSHIRE	4	3.60	10.4%	16.8%
FRANKLIN	4	10.86	19.9%	15.2%
HAMPSHIRE	2	2.08	23.1%	17.4%
MIDDLESEX	1	2.27	50.5%	14.9%
STATE	11	18.81	18.3%	17.6%



Biomap2 Critical Natural Landscape

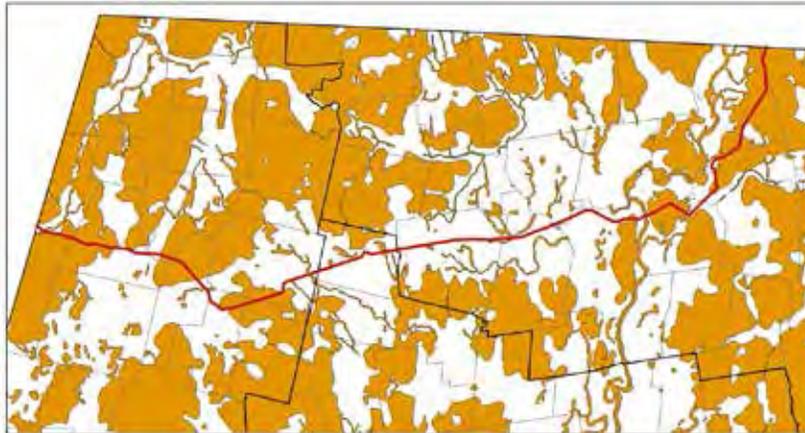
BioMap2 Critical Natural Landscape was created to identify and prioritize intact landscapes in Massachusetts that are better able to support ecological processes and disturbance regimes, and a wide array of species and habitats over long time frames. The pipeline route crosses a total of 42.6 km of 'Critical Natural Landscape' (NHESP/TNC, 2010).

The pipeline route crosses proportionately less than the available land area of Critical Natural Landscape in all counties (Table 11). However, it is worth noting that Berkshire and Franklin Counties rank first and second in terms of total land area of intact Critical Natural Landscape. Because the pipeline length is primarily within these two counties, the total pipeline length encounters disproportionately more Critical Natural Landscape relative to the state total. Forty two percent of the total pipeline length is a Critical Natural Landscape, compared to 34% of the state as a whole (Table 11).

The majority of Critical Natural Landscape is defined as 'Landscape Blocks' (Table 12). Landscape blocks and Aquatic Buffers overlap considerably,

which is why the components appear to sum to a length longer than 42.6. Further details on the Critical Natural Landscapes Components are below (Tables 13-15).

The results for Critical Natural Landscapes - Landscape Blocks are similar to those for Critical Natural Landscapes as a whole (Table 13). County-wide, the amount of this habitat type on the pipeline route is less than the county-wide coverages. However, from a state-wide perspective the



 Biomap2 Critical Natural Landscape

pipeline would cross disproportionately more of this habitat (38.6%) than is available statewide (28.4%) owing to the large amount of Landscape Block habitat in Berkshire and Franklin Counties.

Table 11. Critical Natural Landscape (all categories) from Biomap2

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 CNL
BERKSHIRE	4	19.8	57.6%	62.1%
FRANKLIN	3	22.2	40.6%	53.4%
HAMPSHIRE	1	0.6	6.5%	41.5%
MIDDLESEX	--	--	--	10.9%
STATE	8	42.6	41.5%	34.0%

Table 12. Biomap2 Critical Natural Landscapes Components

CNL Component	Pipeline length (km)
Landscape Blocks	39.58
Wetland Buffer	1.09
Aquatic Buffer	7.28

The proposed pipeline route would not affect any Critical Natural Landscape - Wetland Buffer in Berkshire, Hampshire and Middlesex Counties. In Franklin County the percentage of the pipeline route designated as Wetland Buffer habitat is proportionally less (2.0%) than for the county as a whole (2.3%). Likewise, the amount of the entire pipeline route affecting this habitat type (1.1%) is less than the statewide coverage (4.6%).

Table 13. Biomap2 Critical Natural Landscapes - Landscape Blocks

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 CNL
BERKSHIRE	3	18.85	54.6%	57.1%
FRANKLIN	3	20.73	37.9%	47.8%
HAMPSHIRE	--	--	--	35.7%
MIDDLESEX	--	--	--	6.8%
STATE	6	39.58	38.6%	28.4%

The amount of Critical Natural Landscapes - Aquatic Buffer along the pipeline route (7.1%) is comparable to the statewide coverage (7.2%). In Berkshire and Hampshire Counties the amount of this habitat affected by the pipeline is disproportionately smaller than county-wide coverages and none of this habitat in Middlesex County will be affected (Table 15).

Table 14. Biomap2 Critical Natural Landscapes - Wetland Buffer

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 CNL
BERKSHIRE	--	--	--	5.9%
FRANKLIN	1	1.09	2.0%	2.3%
HAMPSHIRE	--	--	--	2.7%
MIDDLESEX	--	--	--	3.0%
STATE	1	1.09	1.1%	4.6%

Table 15. Biomap2 Critical Natural Landscapes - Aquatic Buffer

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Biomap2 CNL
BERKSHIRE	6	0.99	2.9%	9.0%
FRANKLIN	4	5.71	10.4%	10.5%
HAMPSHIRE	1	0.58	6.5	8.9%
MIDDLESEX	--	--	--	3.1%
STATE	10	7.28	7.1%	7.2%

Conservation Assessment and Prioritization System (CAPS)

[HTTP://UMASSCAPS.ORG/DATA_MAPS/DATA.HTML](http://UMASSCAPS.ORG/DATA_MAPS/DATA.HTML)

[HTTP://JAMBA.PROVOST.ADS.UMASS.EDU/WEB/CAPS2011/ARCZIPS/RESULTS.ZIP](http://JAMBA.PROVOST.ADS.UMASS.EDU/WEB/CAPS2011/ARCZIPS/RESULTS.ZIP)

The Conservation Assessment and Prioritization System (CAPS) is a landscape-based model developed at the University of Massachusetts Amherst and an approach to evaluating ecological integrity for undeveloped land in Massachusetts. The output of CAPS is the Index of Ecological Integrity (IEI) which ranges from 0 (worst) to 1 (best). Several versions of CAPS IEI are available based on the geographic extent of the rescaling of IEI scores. We use IEI scores from the statewide rescaling. Data are from the 2011 statewide run of CAPS and were obtained from the UMassCAPS.org web site.

Similar to the Biomap2 analysis, when considered at the state level the pipeline overlaps a disproportionate amount of land with high ecological integrity (Table 16). A large proportion of Berkshire, Franklin and Hampshire Counties is of high ecological integrity relative to the state. However, when summarized at the county scale, the pipeline affects a proportional or lower amount of high integrity lands with the exception of Hampshire County. In Hampshire County, the pipeline overlaps considerably more lands with high integrity than expected.

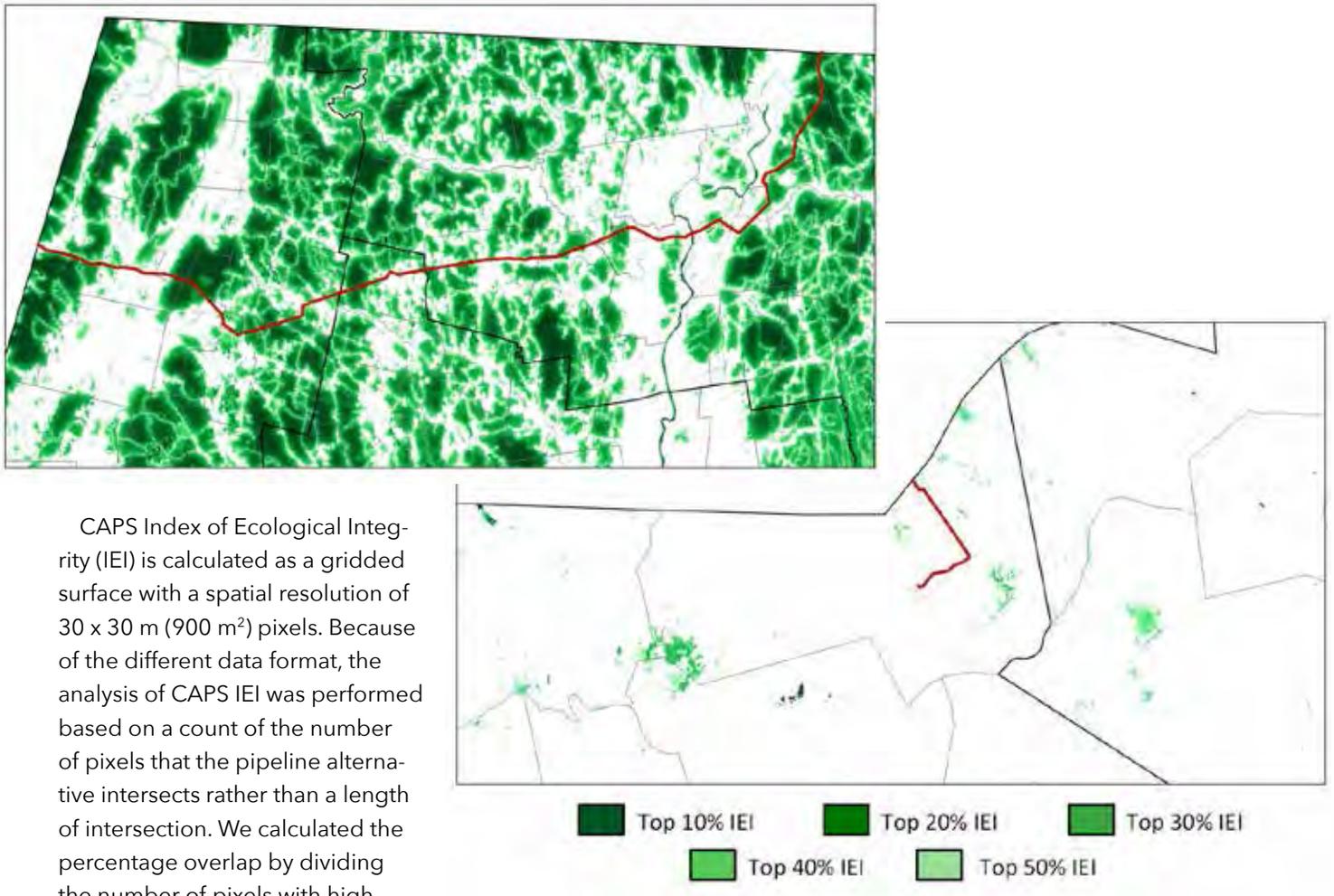
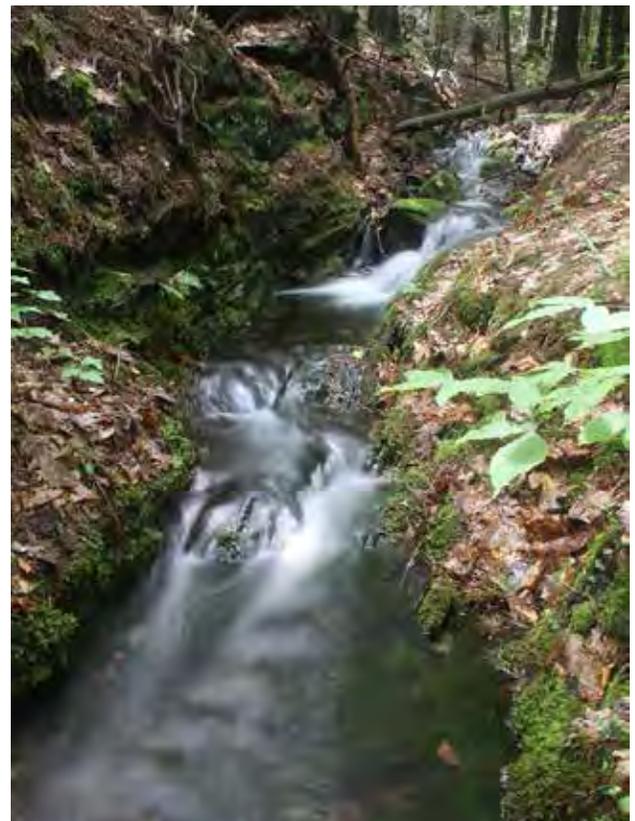


Table 16. Statewide Index of Ecological Integrity (IEI)

<i>CAPS IEI Greater than or equal to 0.9 (top 10%)</i>		
Location	Pct of pipeline	Pct of county/state
BERKSHIRE	14.7%	21.8%
FRANKLIN	12.5%	15.6%
HAMPSHIRE	12.1%	11.2%
MIDDLESEX	0.0%	0.5%
State	12.6%	6.7%
<i>CAPS IEI Greater than or equal to 0.8 (top 20%)</i>		
Location	Pct of pipeline	Pct of county/state
BERKSHIRE	30.7%	36.3%
FRANKLIN	29.2%	32.5%
HAMPSHIRE	31.0%	23.8%
MIDDLESEX	0.0%	1.7%
State	28.5%	13.9%
<i>CAPS IEI Greater than or equal to 0.7 (top 30%)</i>		
Location	Pct of pipeline	Pct of county/state
BERKSHIRE	45.2%	47.4%
FRANKLIN	44.1%	46.2%
HAMPSHIRE	42.6%	34.3%
MIDDLESEX	0.0%	3.5%
State	42.2%	20.9%

<i>CAPS IEI Greater than or equal to 0.6 (top 40%)</i>		
Location	Pct of pipeline	Pct of county/state
BERKSHIRE	59.3%	56.5%
FRANKLIN	54.7%	57.4%
HAMPSHIRE	60.1%	43.4%
MIDDLESEX	0.0%	6.3%
State	54.1%	27.8%
<i>CAPS IEI Greater than or equal to 0.5 (top 50%)</i>		
Location	Pct of pipeline	Pct of county/state
BERKSHIRE	70.4%	63.8%
FRANKLIN	65.5%	66.1%
HAMPSHIRE	69.5%	51.5%
MIDDLESEX	4.4%	10.1%
State	64.6%	34.6%

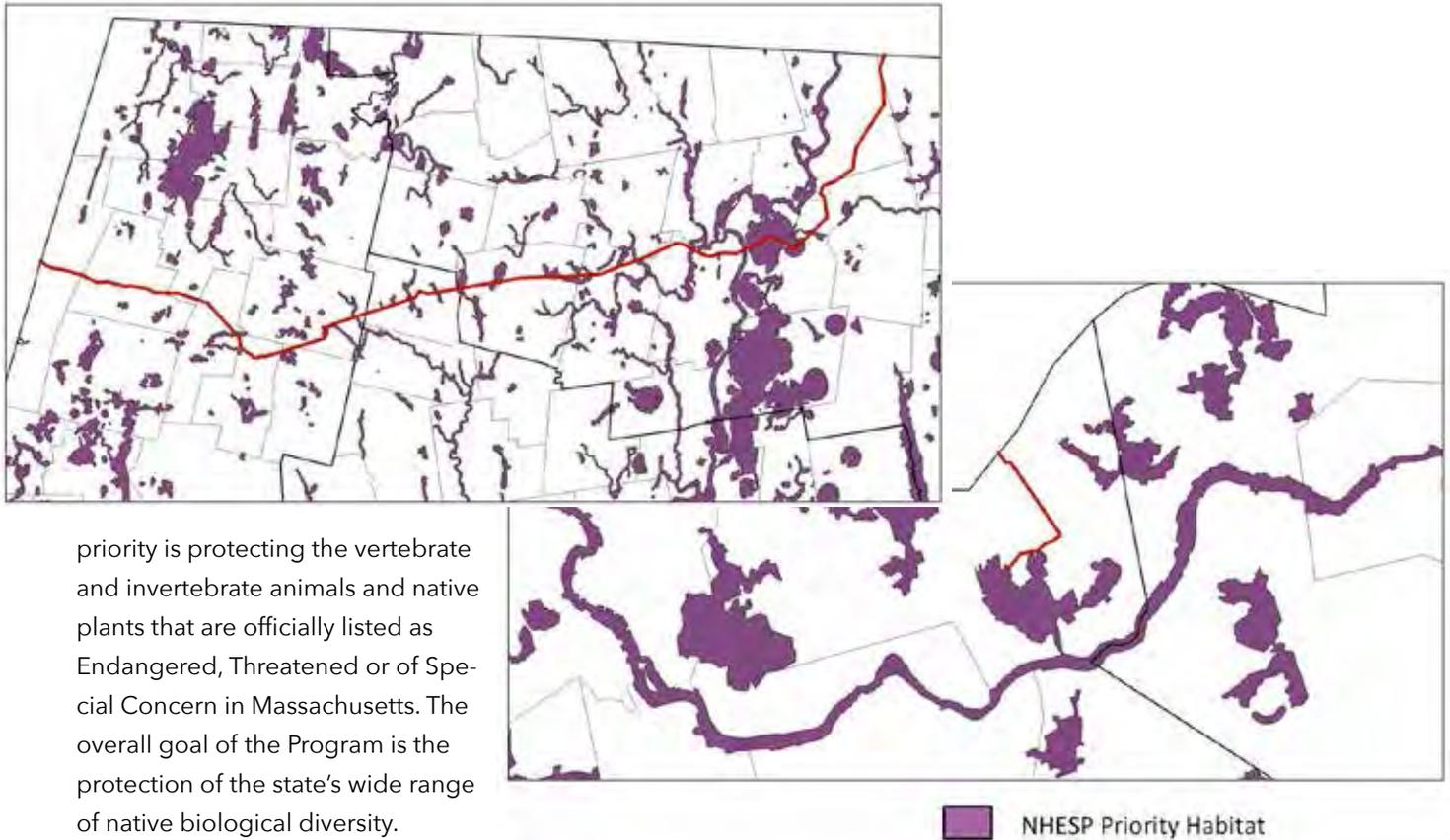


Natural Heritage & Endangered Species Designated Habitats

The Natural Heritage & Endangered Species Program (NHESP), part of the Massachusetts Division of Fisheries and Wildlife, is one of the programs forming the Natural Heritage network. NHESP is responsible for the conservation and protection of hundreds of species that are not hunted, fished, trapped, or commercially harvested in the state. The Program's highest

data (October 2008) were obtained from the MassGIS web site.

The pipeline route intersects proportionately less Priority Habitat at the state level and within most counties with the exception of Franklin County (Table 17). Franklin County contains 15.8% NHESP Priority Habitat, while 24.2% of the pipeline in that county intersects Priority Habitat.



priority is protecting the vertebrate and invertebrate animals and native plants that are officially listed as Endangered, Threatened or of Special Concern in Massachusetts. The overall goal of the Program is the protection of the state's wide range of native biological diversity.

NHESP Priority Habitats of Rare Species

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/PRIHAB.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/prihab.html)

Priority Habitats of Rare Species (Priority Habitat) is a data layer developed by the Natural Heritage and Endangered Species Program (NHESP) that depicts the extent of habitat for state-listed rare species in Massachusetts for purposes of implementing the Mass. Endangered Species Act (MESA). The

Table 17. Priority Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state PRIHAB
BERKSHIRE	3	2.8	8.0%	14.8%
FRANKLIN	5	13.3	24.2%	15.8%
HAMPSHIRE	4	1.2	13.8%	17.0%
MIDDLESEX	1	0.1	2.1%	15.1%
State	13	17.4	16.9%	18.3%

NHESP Estimated Habitats of Rare Wildlife

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/NHESP-ESTIMATED-HABITATS-OF-RARE-WILDLIFE-.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/nhesp-estimated-habitats-of-rare-wildlife.html)

A subset of Priority Habitat, Estimated Habitat contains polygons for rare wetlands wildlife for purposes of implementing the wildlife habitat provisions of the Mass. Wetlands Protection Act. Data on Estimated Habitat (October 2008) were obtained from the MassGIS web site.

Similar to NHESP Priority Habitat, the pipeline alternative intersects proportionately less Estimated Habitat at the state level and within most counties with the exception of Franklin County (Table 18). Franklin County contains 13.5% NHESP Estimated Habitat, while 19.5% of the pipeline within that county intersects Estimated Habitat.

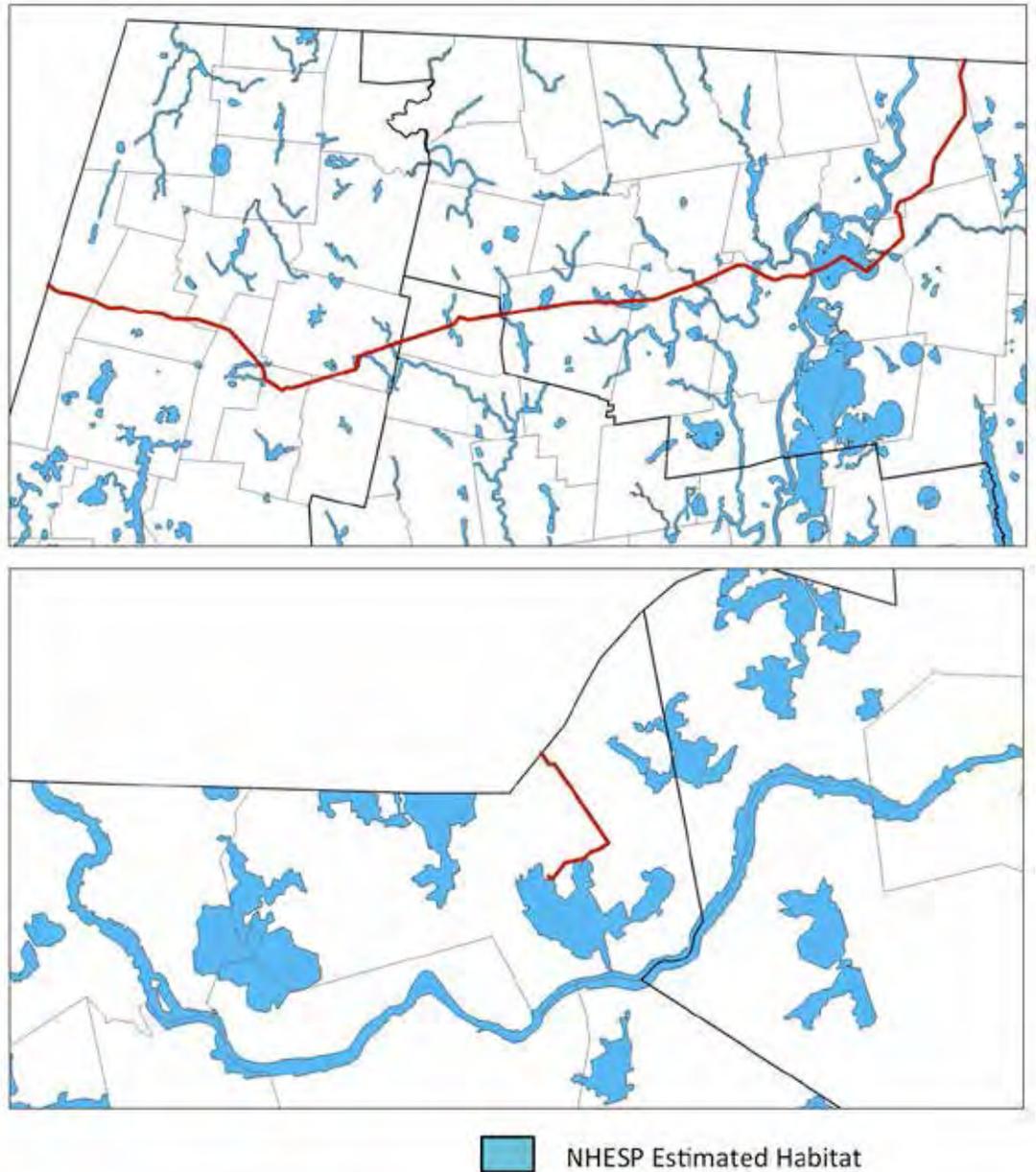


Table 18. Estimated Habitat

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state ESTHAB
BERKSHIRE	2	2.6	7.4%	9.8%
FRANKLIN	5	10.6	19.5%	13.5%
HAMPSHIRE	2	0.7	7.5%	14.6%
MIDDLESEX	1	0.1	2.1%	14.0%
State	10	14.0	13.6%	15.7%



NHESP Natural Communities

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/NATCOMM.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/natcomm.html)

The Natural Communities data layer developed by the Natural Heritage & Endangered Species Program depicts the geographic extent of various natural communities that are of particular importance for protecting biodiversity in Massachusetts. These data (November 2011) were obtained from the MassGIS web site.

Only one 1.5 km segment of the pipeline alternative route intersects NHESP Natural Communities, all of it in Franklin County. This is an area of Pitch Pine-Scrub Oak in Montague. Similar to NHESP Priority and Estimated Habitat, the pipeline disproportionately affects Natural Communities in Franklin County. 4.2% of the pipeline length in the county overlaps Natural Communities, while only 1.2% of the county is designated as Natural Community (Table 19).

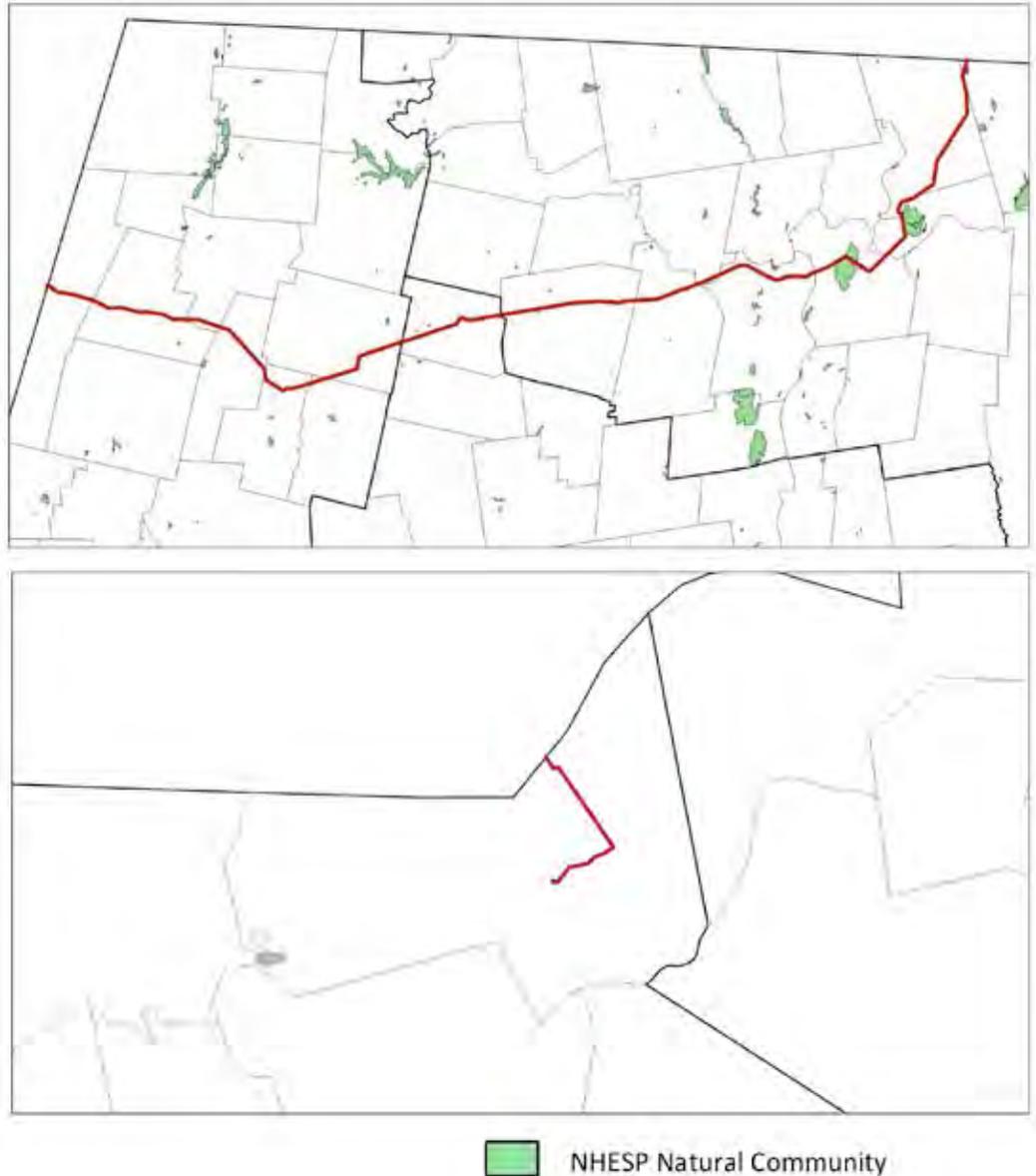


Table 19. Natural Communities

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state NATCOMM
BERKSHIRE	--	--	--	1.1%
FRANKLIN	1	1.5	4.2%	1.2%
HAMPSHIRE	--	--	--	0.6%
MIDDLESEX	--	--	--	0.1%
State	1	1.5	1.46%	1.9%

NHESP Potential and Certified Vernal Pools

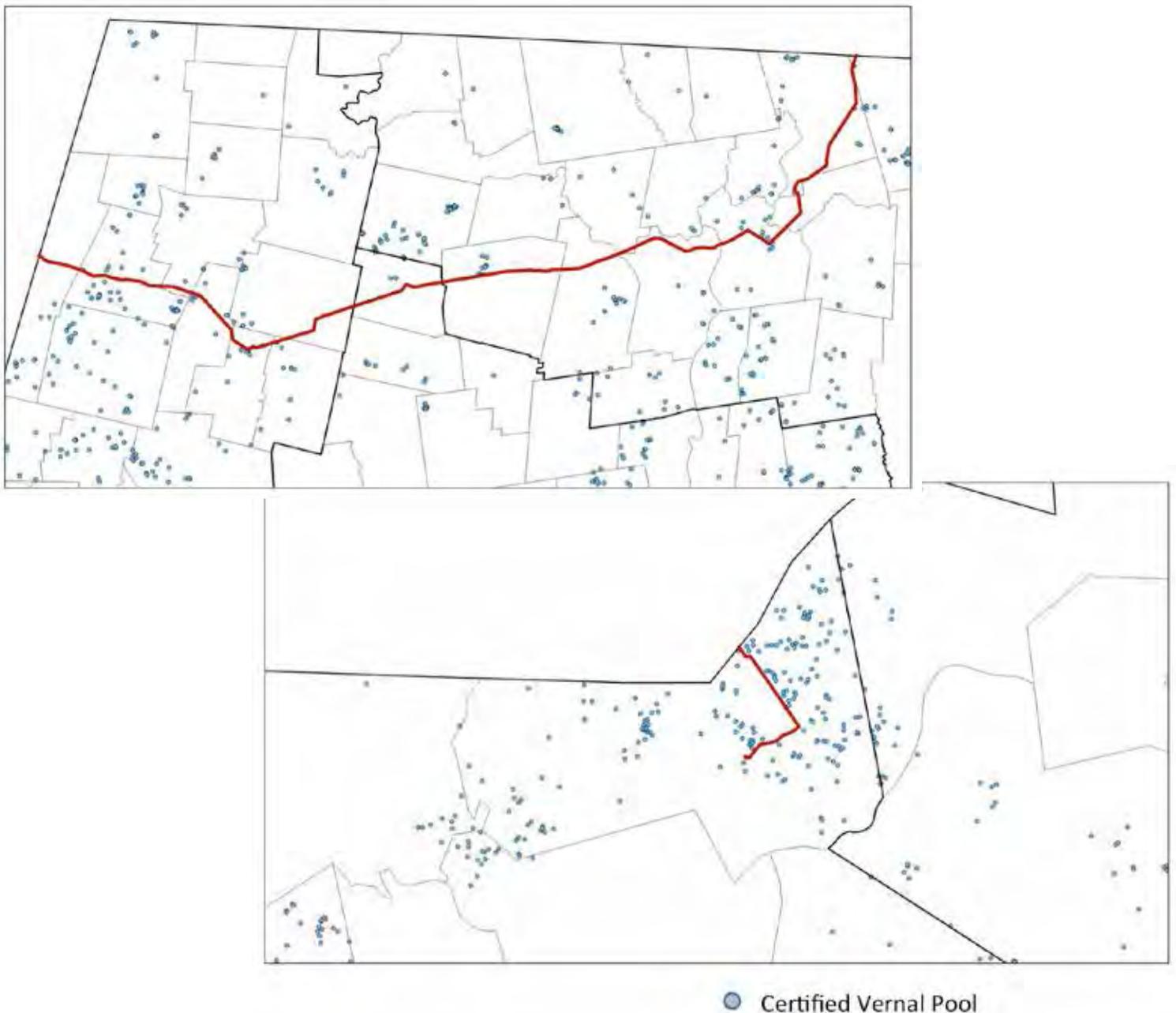
[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/CVP.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/cvp.html)

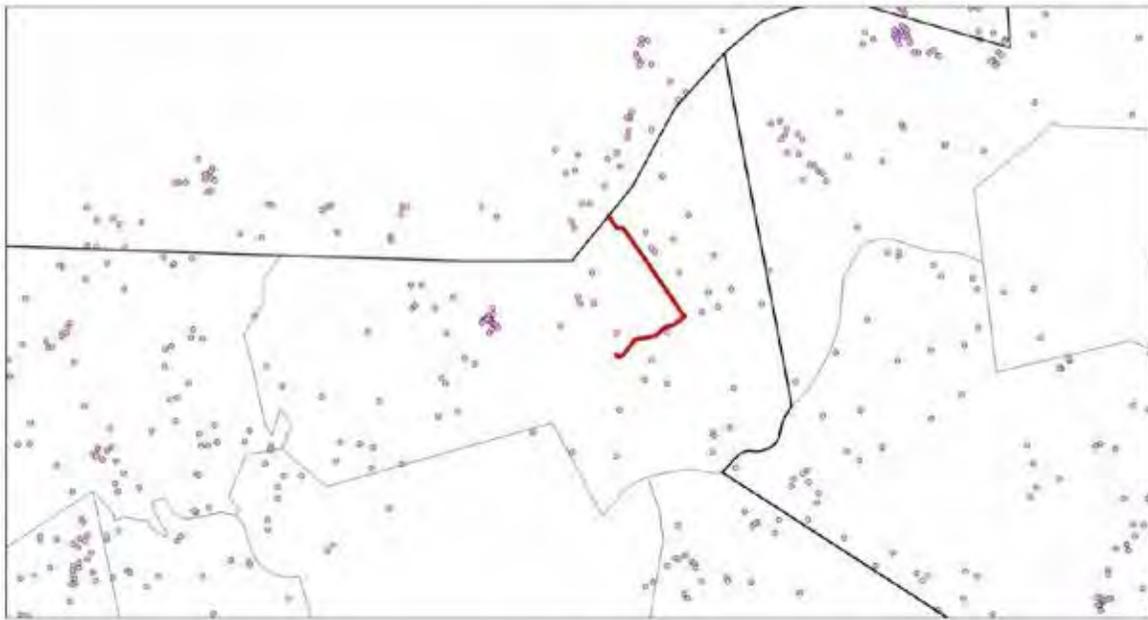
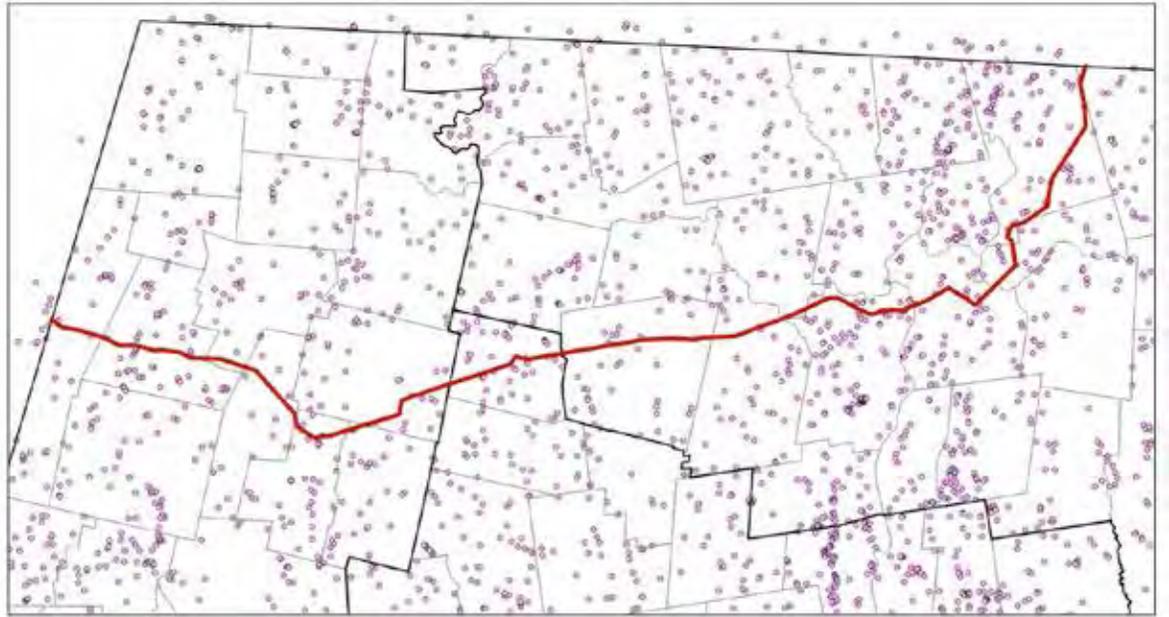
[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/PVP.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/pvp.html)

The Potential Vernal Pools data layer (December 2000) developed by the Natural Heritage and Endangered Species Program contains locations of potential vernal pool habitat as identified by aerial photogrammetry. These sites have not been verified as vernal

pool habitat. Certified Vernal Pools are areas that meet the definition of vernal pool habitat and have been certified by the NHESP through a process that involves the collection and submission of evidence collected in the field. Vernal pool data were obtained from the MassGIS web site.

The pipeline does not intersect any certified or potential vernal pools. There are three certified vernal pools within 1 km of the proposed pipeline, all located in Middlesex County in the town of Dracut. There are three potential vernal pools within 35m of the proposed pipeline and many others within 1 km.





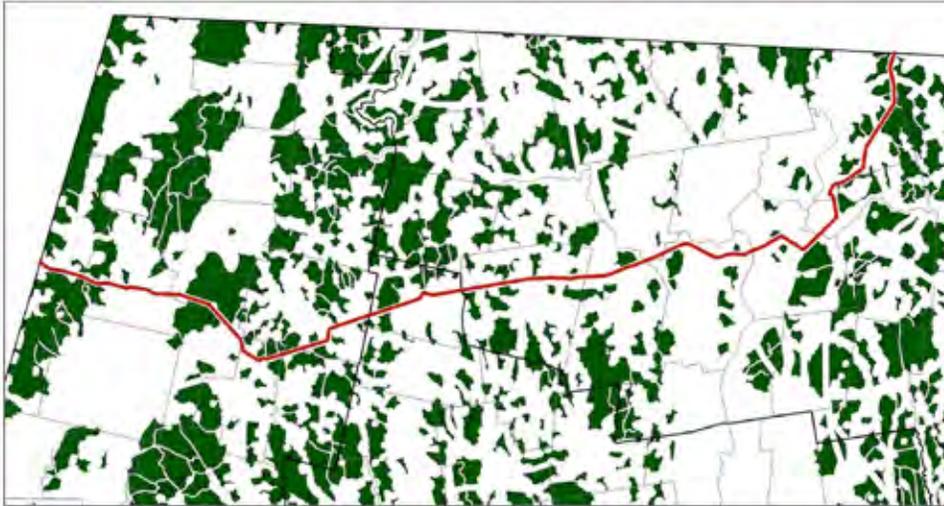
● Potential Vernal Pool



Interior Forest

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/INTFOREST.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/intforest.html)

The Massachusetts Division of Fisheries and Wildlife developed the Interior Forest dataset (October 2009) to identify areas of Massachusetts where forest cover



is relatively unfragmented by human development. Data on Interior Forests were obtained from the MassGIS web site. The proposed pipeline route does not intersect any Interior Forests because much of it is co-located along existing utility rights-of-way.



 Interior Forest



Coldwater Fisheries Resources

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/DFWCFR.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/dfwcfcr.html)

These data (March 2015) were developed by the Massachusetts Division of Fisheries and Wildlife to depict important habitat for a number of cold water fish species. Data were obtained from the MassGIS web site. Because both the pipeline and the streams delineated as Coldwater Fisheries Resources are represented as lines in GIS we buffered the streams to create 10-foot

wide polygons and then used these to calculate the data in the table below.

For each of the four counties the amount of Coldwater Fisheries habitat affected by the proposed pipeline is proportionally less than the county-wide coverages. However, most of the Cold Water Fisheries streams occur in Western Massachusetts and as a result the percentage of these habitats within the entire pipeline route (0.13%) is greater than for the state as a whole (0.09%).

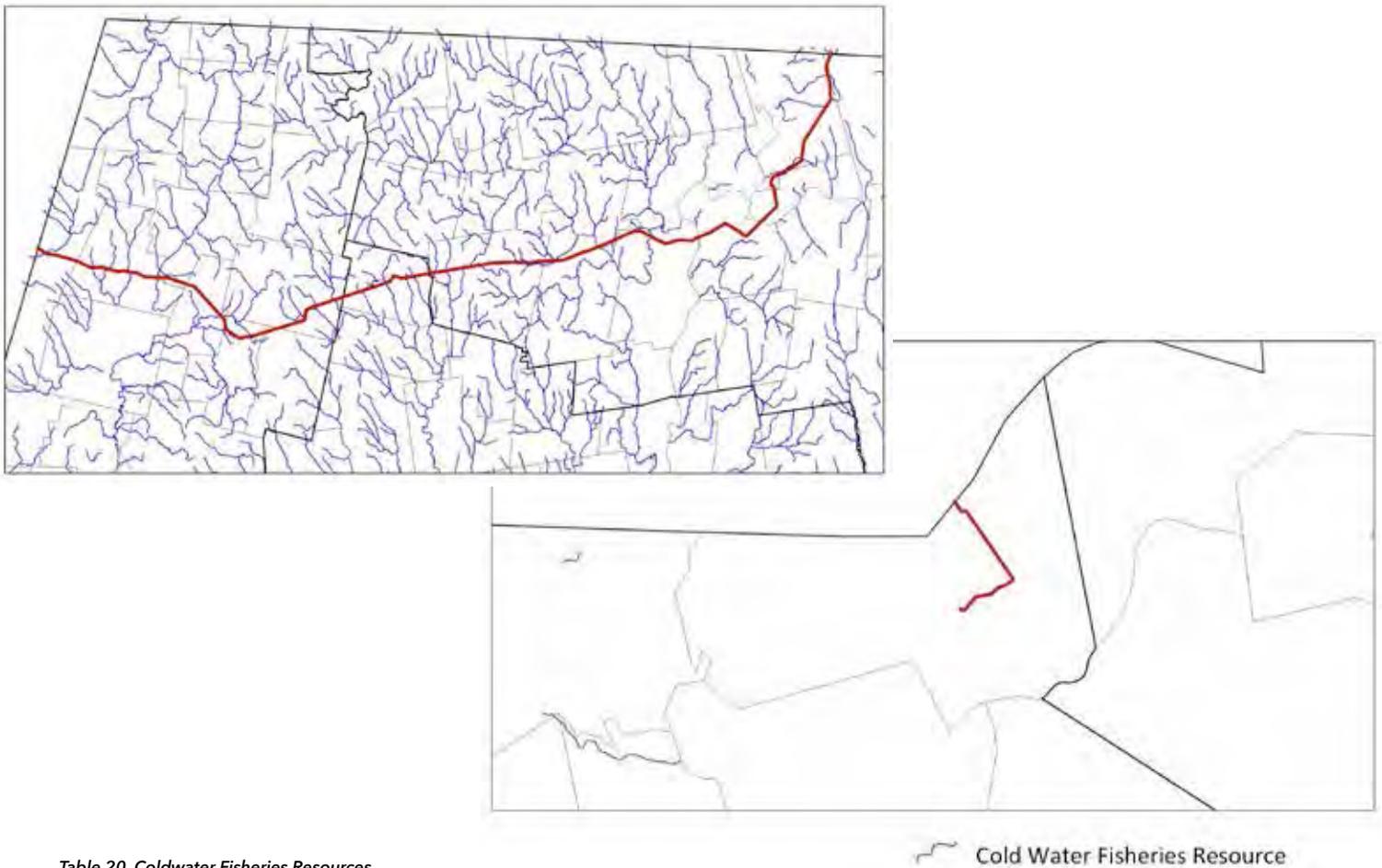


Table 20. Coldwater Fisheries Resources

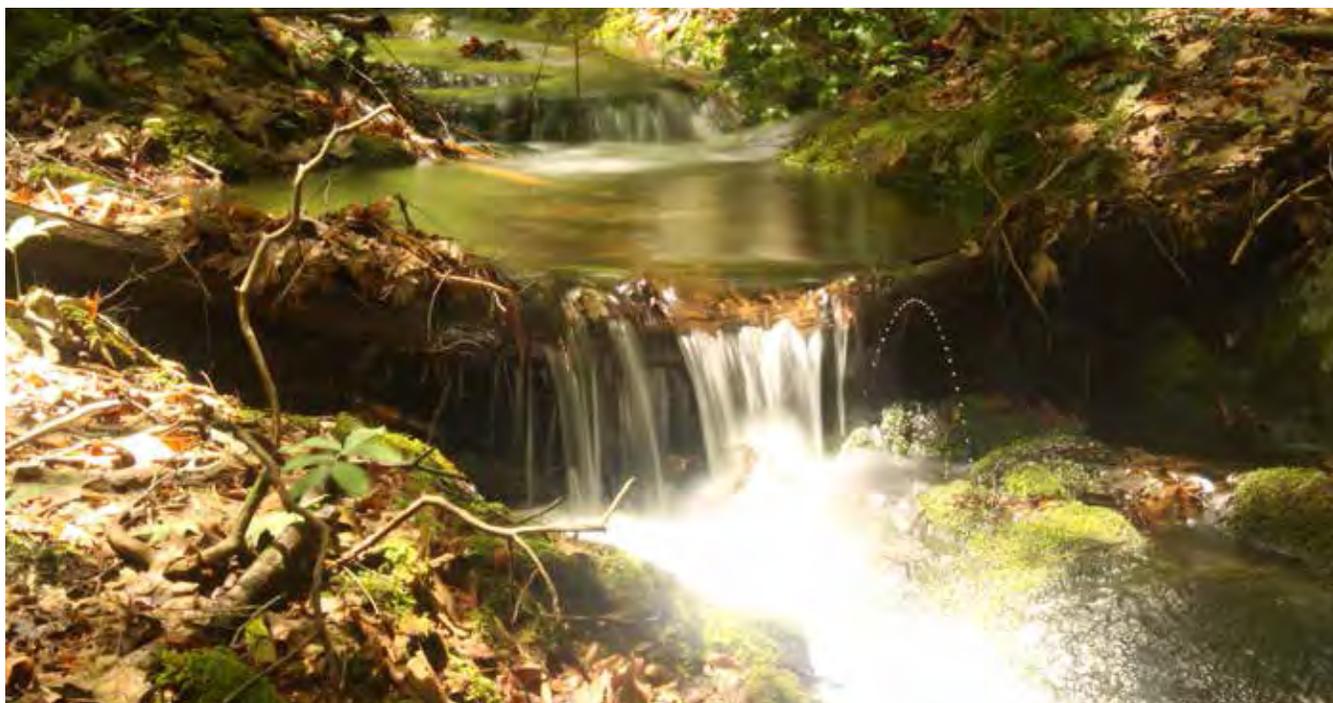
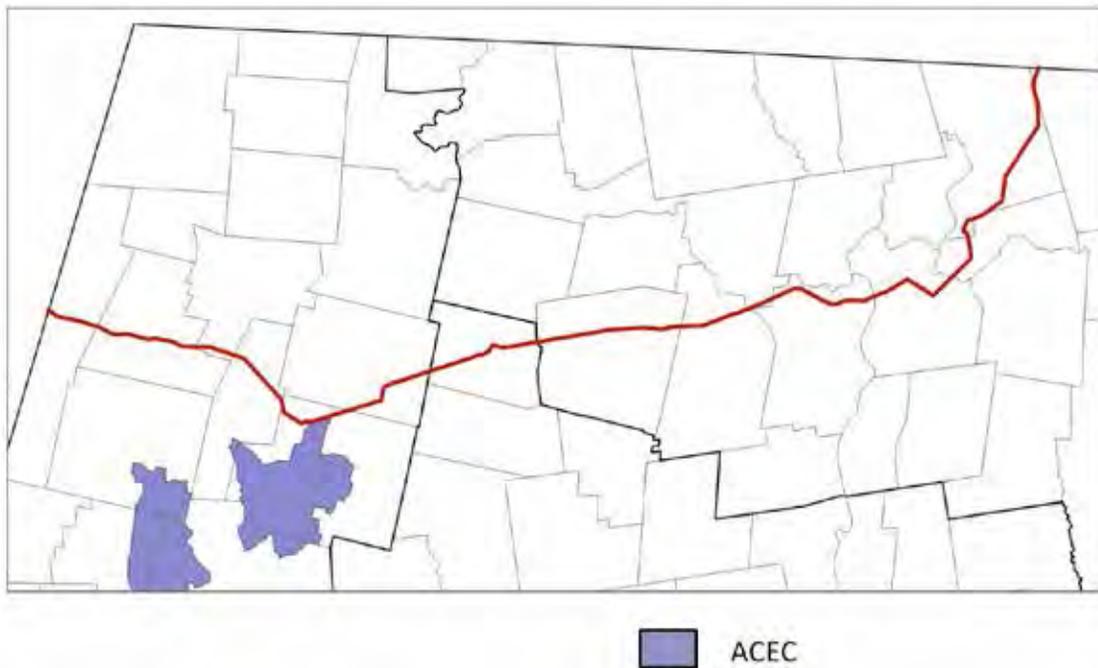
Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Coldwater fisheries
BERKSHIRE	12	0.05	0.14%	0.20%
FRANKLIN	11	0.07	0.13%	0.20%
HAMPSHIRE	3	0.01	0.11%	0.15%
MIDDLESEX	--	--	--	0.05%
STATE	26	0.13	0.13%	0.09%

Areas of Critical Environmental Concern

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/ACECS.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/acecs.html)

Areas of Critical Environmental Concern (ACECs) are designated by the Massachusetts Secretary of Energy and Environmental Affairs (EEA) as areas of significant natural and cultural resources. This designation provides stricter environmental review of certain types of development and creates a structure for stewardship of critical natural and cultural resources. Data on ACECs (April 2009) were obtained from the MassGIS web site.

The proposed pipeline alternative route does not intersect any Areas of Critical Environmental Concern. It does pass adjacent to the northern border of the Hinsdale Flats Watershed ACEC for approximately 1.5 km.



MassDEP Wetlands

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/DEPWETLANDS112000.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/depwetlands112000.html)

The MassDEP Wetlands dataset includes polygons for wetlands that have been mapped and categorized

From a statewide perspective the amount of shrub swamp intersected by the proposed pipeline is marginally less (1.3%) than the percent coverage statewide (1.5%). However, the percentage of shrub swamp affected by the pipeline in Middlesex County is marginally higher and in Hampshire County substantially higher than county-wide coverages (Table 25).



via aerial photogrammetry. The photography was interpreted by staff at UMass Amherst and field checked by the Massachusetts Department of Environmental Protection's Wetlands Conservancy Program. Data (January 2009) were obtained from the MassGIS web site.

The proposed pipeline route intersects proportionately less freshwater wetlands at both the county and state levels. This is true for all wetland types with the exception of shrub swamp. The proposed mainline pipeline route does not intersect any mapped bogs. Details on the other freshwater wetland types can be found below (Tables 22-27).

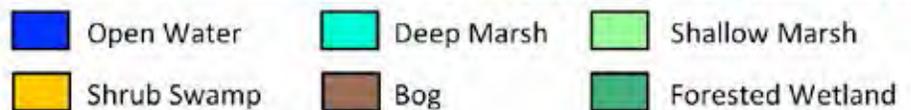
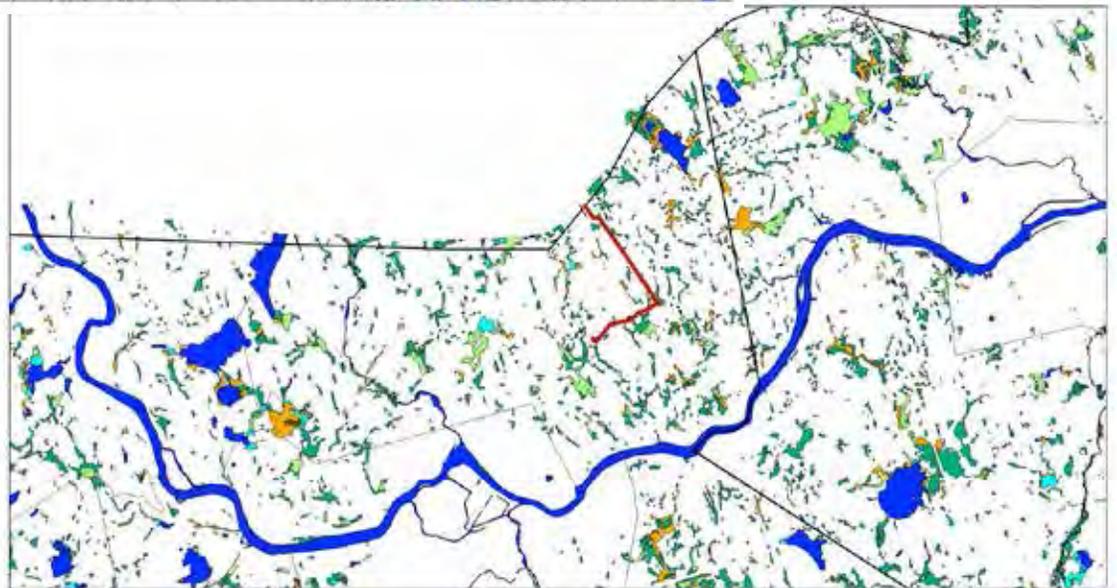


Table 21. All Freshwater Wetlands

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Freshwater Wetlands
BERKSHIRE	32	1.89	5.5%	10.5%
FRANKLIN	32	1.31	2.4%	10.0%
HAMPSHIRE	5	0.22	2.4%	6.8%
MIDDLESEX	7	0.37	8.2%	14.6%
STATE	76	3.8	3.7%	14.0%

Table 22. Open Water

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Open Water
BERKSHIRE	4	0.66	1.9%	3.8%
FRANKLIN	2	0.17	0.3%	6.4%
HAMPSHIRE	--	--	--	0.9%
MIDDLESEX	--	--	--	3.1%
STATE	6	1	1.0%	3.6%

Table 23. Deep Marsh

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Deep Marsh
BERKSHIRE	1	0.05	0.2%	0.5%
FRANKLIN	3	0.10	0.2%	0.4%
HAMPSHIRE	--	--	--	0.5%
MIDDLESEX	--	--	--	0.8%
STATE	4	0.15	0.2%	0.7%

Table 24. Shallow Marsh, Meadow or Fen

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Shallow marsh, meadow or fen
BERKSHIRE	4	0.16	0.5%	0.8%
FRANKLIN	4	0.20	0.4%	0.5%
HAMPSHIRE	--	--	--	0.8%
MIDDLESEX	--	--	--	1.5%
STATE	8	0.36	0.4%	0.9%

Table 25. Shrub Swamp

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Shrub swamp
BERKSHIRE	10	0.46	1.3%	1.8%
FRANKLIN	18	0.58	1.1%	0.9%
HAMPSHIRE	4	0.21	2.3%	1.2%
MIDDLESEX	1	0.10	2.2%	1.8%
STATE	33	1.35	1.3%	1.5%

Table 26. Wooded Swamp Deciduous

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Wood swamp deciduous
BERKSHIRE	7	0.33	1.0%	1.5%
FRANKLIN	1	0.02	0.04%	0.8%
HAMPSHIRE	--	--	--	2.6%
MIDDLESEX	6	0.27	6.0%	6.5%
STATE	14	0.62	0.6%	3.8%

Table 27. Wooded Swamp Coniferous

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Wood swamp coniferous
BERKSHIRE	4	0.15	0.4%	1.0%
FRANKLIN	1	0.09	0.2%	0.5%
HAMPSHIRE	1	0.01	0.1%	0.3%
MIDDLESEX	--	--	--	0.2%
STATE	6	0.25	0.2%	0.5%

Table 28. Wooded Swamp Mixed Trees

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Wooded swamp mixed
BERKSHIRE	2	0.08	0.2%	0.9%
FRANKLIN	3	0.16	0.3%	0.4%
HAMPSHIRE	--	--	--	0.6%
MIDDLESEX	--	--	--	0.9%
STATE	5	0.24	0.2%	1.3%

Water Resources

Outstanding Resource Waters (ORWS)

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/ORW.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/orw.html)

Outstanding Resource Waters (ORWs) are designated by the Massachusetts Department of Environmental Protection under the Mass. Surface Water Quality Standards. Among the categories of ORW that could potentially be intersected by the proposed pipeline route are: 1) Areas of Critical Environmental Concern (ACEC), 2) Public Water Supply Watershed, 3) Scenic/Protected River, and 4) Wildlife Refuge; the other two

several categories of ORW the proposed pipeline will not affect any ORWs in the categories ACEC, Scenic/protected, or Wildlife Refuge. All intersected ORWs are in the category Public Water Supply.

The percentages of proposed pipeline falling within designated ORWs for Public Water Supply are the same as those for All ORWs. The county-wide and statewide references are different because the coverages are only for Public Water Supply ORWs (Table 30) rather than for all categories of ORW (Table 29).

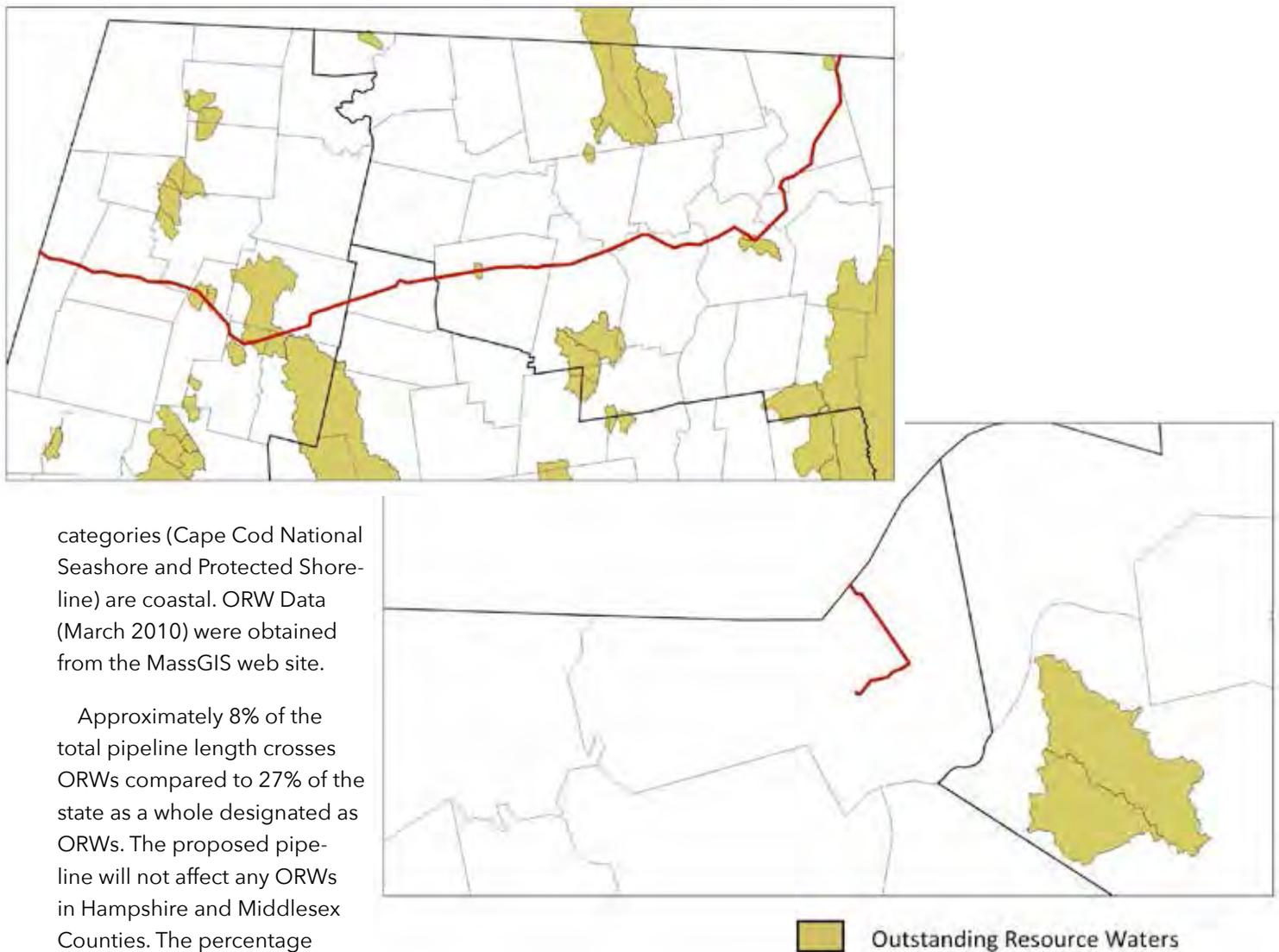


Table 29. All Outstanding Resource Waters (ORWs)

Location	Pipeline Alt Segments	Length (km)	Pct of pipeline length	Pct county/state with All ORWs
BERKSHIRE	3	6.35	18.4%	13.6%
FRANKLIN	4	2.10	3.8%	17.3%
HAMPSHIRE	--	--	--	26.9%
MIDDLESEX	--	--	--	18.2%
STATE	7	8.45	8.2%	26.7%

Table 30. ORW - Public Water Supply

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with ORW-Public Water Supply
BERKSHIRE	3	6.35	18.4%	11.5%
FRANKLIN	4	2.10	3.8%	17.3%
HAMPSHIRE	--	--	--	26.7%
MIDDLESEX	--	--	--	10.5%
STATE	7	8.45	8.2%	23.5%



Surface Water Supply Watersheds

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/SWPWATERSHEDS.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/swpwatersheds.html)

Surface Water Supply Watersheds are delineated by the Massachusetts Department of Environmental Protection (MassDEP) and include areas that contribute to public surface water supplies. There are three categories of Surface Water Supply Watersheds: Surface Water, Emergency Surface Water, and Rhode Island Source. Data on Surface Water Supply Watersheds (October 2013) were obtained from the MassGIS web site. The proposed pipeline route does not intersect any Rhode Island Source watersheds.



Surface Water Watersheds make up substantially less of the proposed pipeline route than its percent coverage at both the county and statewide level except for Berkshire County (Table 31). In Berkshire County the percentage of pipeline overlap (11.2%) is higher than the county-wide coverage (9.2%) for Surface Water Watersheds.



Surface Water Watershed Emergency Surface Water Watershed

The percentage of the proposed pipeline route that is designated as Emergency Surface Water Watershed is proportionally higher compared to the statewide percent coverage. This is true also at the county level for Berkshire

Table 31. Surface Water (active or inactive) Watersheds

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Surface water watershed
BERKSHIRE	1	6.35	11.2%	9.2%
FRANKLIN	1	2.10	0.5%	16.7%
HAMPSHIRE	--	--	--	22.8%
MIDDLESEX	--	--	--	7.8%
STATE	2	8.45	8.2%	25.8%

Table 32. Emergency Surface Water Watershed

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Emergency surface water
BERKSHIRE	2	2.50	7.2%	4.0%
FRANKLIN	3	1.83	3.4%	0.8%
HAMPSHIRE	--	--	--	8.3%
MIDDLESEX	--	--	--	2.8%
STATE	5	4.33	4.2%	3.3%

Surface Water Supply Protection Areas

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/SWP.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/swp.html)

Surface Water Supply Protection Areas (Zones A, B, C) are delineated by MassDEP under the Mass. Drinking Water Regulations. Data (October 2013) were ob-

Berkshire County. The amount of pipeline within this designation is proportionally less than both county-wide and statewide coverages (Table 33).

Areas of designated Zone C are intersected by the proposed pipeline in Berkshire and Franklin Counties. In Franklin County, as in the state as a whole, the proportion of the pipeline overlapping Zone C is much less than the county-wide and statewide coverages. In Berkshire County the proportion of the pipeline (10.8%) that falls within Zone C is higher than for the county overall (7.2%).



tained from the MassGIS web site. The proposed pipeline does intersect areas designated as Zones A and C, but not Zone B. Definitions of these zones are available at the website listed above.

The proposed pipeline will intersect with Surface Water Supply Protection Zone A only in

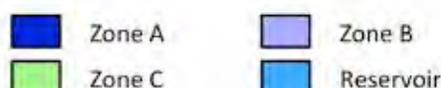
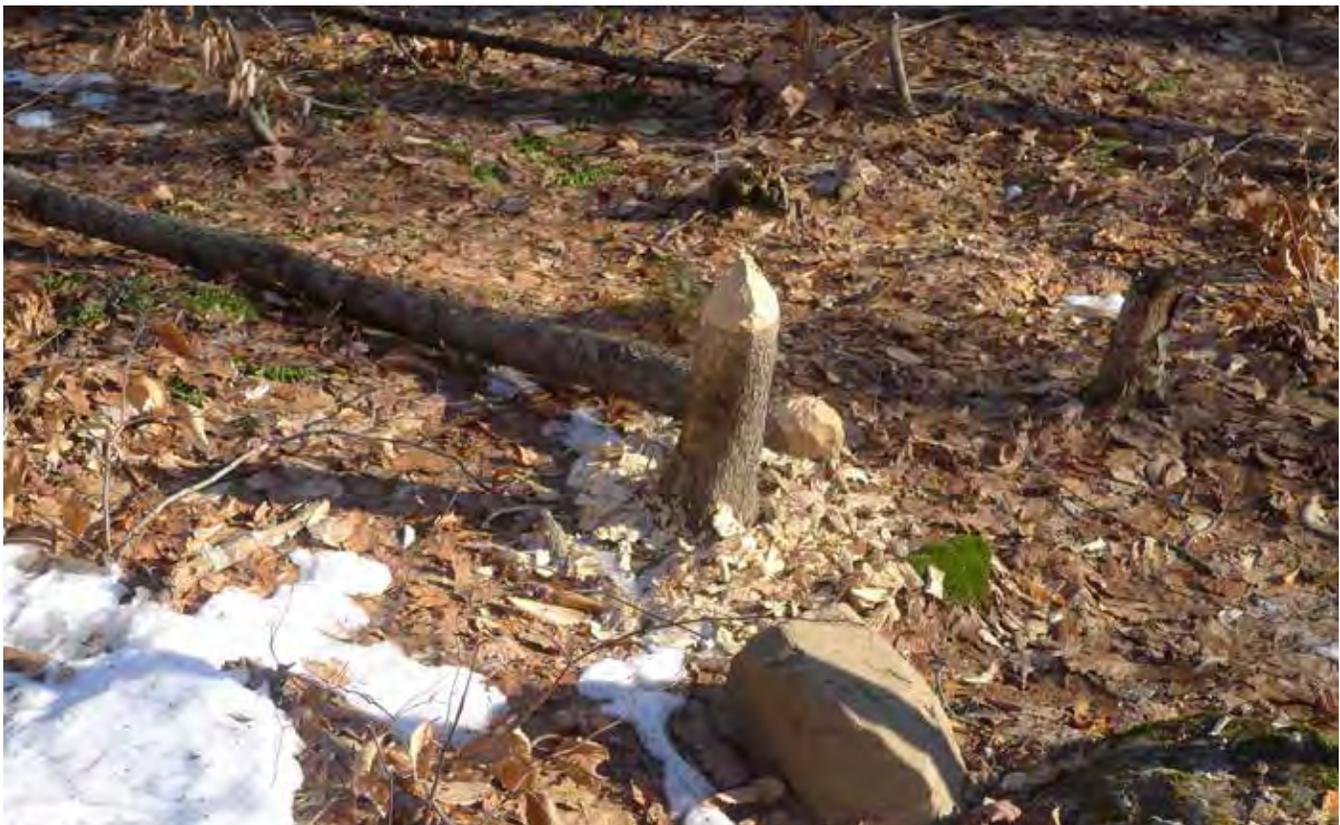


Table 33. Zone A

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Zone A
BERKSHIRE	1	0.13	0.4%	1.0%
FRANKLIN	--	--	--	3.3%
HAMPSHIRE	--	--	--	3.4%
MIDDLESEX	--	--	--	2.3%
STATE	1	0.13	0.1%	5.6%

Table 34. Zone C

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Zone C
BERKSHIRE	1	3.72	10.8%	7.2%
FRANKLIN	1	0.27	0.5%	9.1%
HAMPSHIRE	--	--	--	15.7%
MIDDLESEX	--	--	--	2.6%
STATE	2	3.99	3.9%	11.0%



MassDEP Wellhead Protection Areas

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/DEP-WELLHEAD-PROTECTION-AREAS-ZONE-II-IWPA.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/dep-wellhead-protection-areas-zone-ii-iwpa.html)

MassDEP Wellhead Protection Areas include designated Zone IIs and Interim Wellhead Protection

(July 2014) were obtained from the MassGIS web site.

Areas of designated Zone IIs or IWPA's are intersected by the proposed pipeline in Berkshire and Franklin Counties. The proportion of the pipeline route (3.6%) that intersects these Wellhead Protection Areas is greater in Franklin County than for the county as a

whole (2.8%). For Berkshire County and the state as a whole the proportion of these areas overlapping the pipeline route is lower than for county-wide and statewide coverages (Table 35).



Areas (IWPA's). A Zone II is an area of aquifer that contributes water to a public water supply well that has been delineated by hydro-geologic modeling and approved by MassDEP's Drinking Water Program. Interim Wellhead Protection Areas are areas delineated by a formula related to the pumping rate of the public water supply in the absence of an approved Zone II. Data on MassDEP Wellhead Protection Areas



 Zone II and IWPA

Table 35. Zone II and IWPA

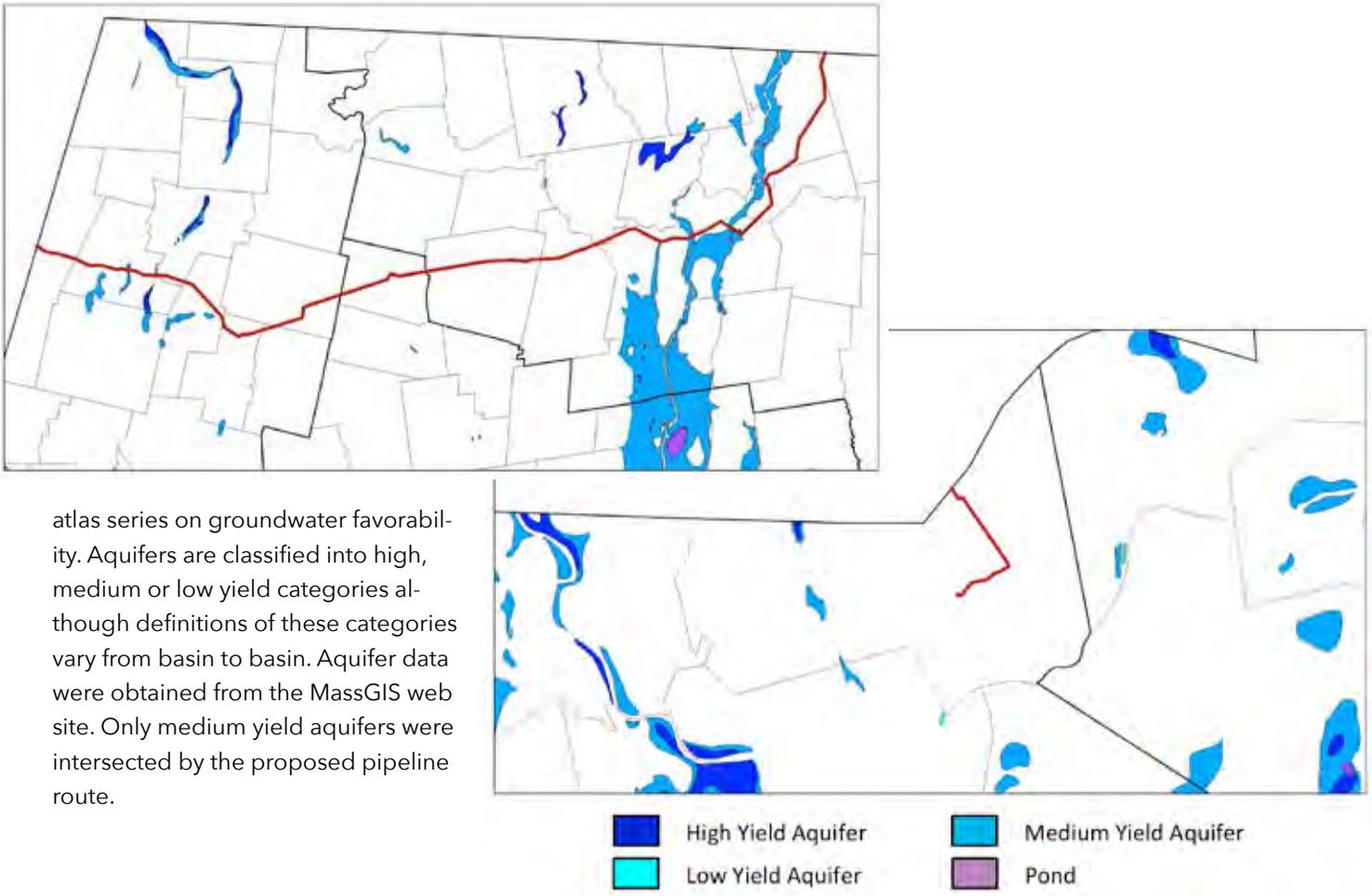
Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Zone II and IWPA
BERKSHIRE	2	0.42	1.2%	4.5%
FRANKLIN	4	1.99	3.6%	2.8%
HAMPSHIRE	--	--	--	10.6%
MIDDLESEX	--	--	--	16.2%
STATE	6	2.41	2.3%	12.7%

Aquifers

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/AQUIFERS-.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/aquifers-.html)

The Aquifers data layer (July 2007) was produced from the U.S. Geological Survey (USGS) hydrologic

Medium yield aquifers were intersected by the proposed pipeline in Berkshire and Franklin Counties. At both the county and statewide levels the proportion of the pipeline that intersects medium yield aquifers is lower than county-wide and statewide coverages for this resource type.



atlas series on groundwater favorability. Aquifers are classified into high, medium or low yield categories although definitions of these categories vary from basin to basin. Aquifer data were obtained from the MassGIS web site. Only medium yield aquifers were intersected by the proposed pipeline route.

Table 36. Medium Yield Aquifers

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Medium yield aquifer
BERKSHIRE	1	0.23	0.7%	1.4%
FRANKLIN	3	1.68	3.1%	5.1%
HAMPSHIRE	--	--	--	14.2%
MIDDLESEX	--	--	--	8.7%
STATE	4	1.91	1.9%	6.9%

EPA Designated Sole Source Aquifers

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/EPA-DESIGNATED-SOLE-SOURCE-AQUIFERS-.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/epa-designated-sole-source-aquifers-.html)

Sole Source Aquifers are designed by the U.S. Environmental Protection Agency (EPA) as aquifers that supply 50% or more of the drinking water for an area and for which there is no reasonably available alternate source. Data on EPA Designated Sole Source Aquifers (May 1996) were obtained from the MassGIS web site. The proposed pipeline does not intersect any EPA sole source aquifers.

Other Resources

Prime Farmland Soils From NRCS SSURGO-Certified Soils

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/SOL.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/sol.html)

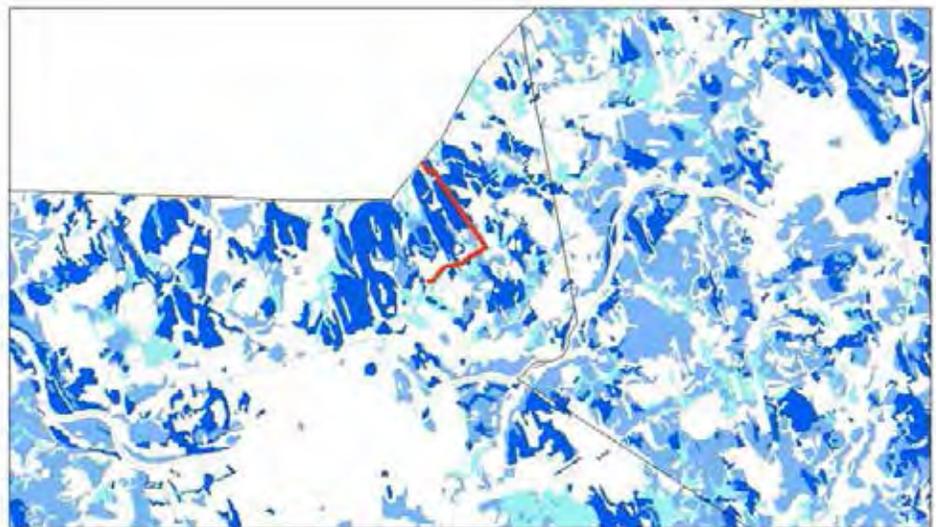
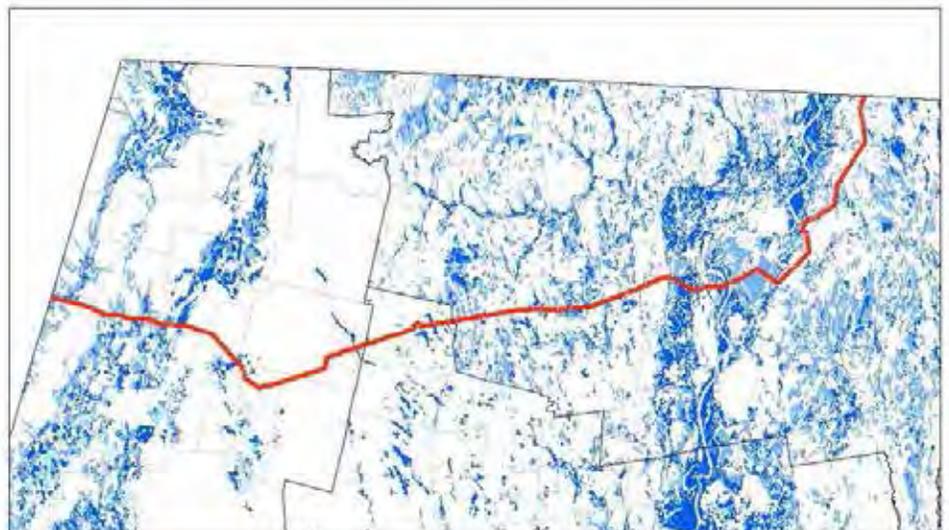
The Soils data layer (November 2012) is compiled from USDA-NRCS soil surveys by the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA-NRCS). Prime Farmland Soils include three classifications: 1) Prime Farmland, 2) Farmland of Unique Importance, and 3) Farmland of Statewide Importance. Data on Prime Farmland Soils were obtained from the MassGIS web site.

For the state as a whole and for Berkshire, Franklin and Hampshire Counties the proportion of the proposed pipeline classified as Prime Farmland is marginally lower than for county-wide and statewide coverages. In Middlesex County however the proportion of the pipeline route in Prime Farmland is substantially higher (42.2%) than the percentage of Prime Farmland county-wide (11.4%).

The proposed pipeline intersects Farmland of Unique Importance only in Berkshire and Middlesex Counties

where the proportion on the pipeline route in this designation is lower than the proportion of this resource county-wide (Table 38). Taken as a whole the proposed pipeline overlaps substantially less Farmland of Unique Importance (0.5%) than the statewide coverage for this resource type (5.3%).

The proportion of the proposed pipeline route that encounters Farmland of Statewide Importance is higher (16.9%) than for the state as a whole (14.1%). This is the case also for Berkshire (10.8% versus 8.7%) and Franklin (23.1% versus 20.0%) Counties. The pipeline intersects proportionally less Farmland of Statewide Importance in Hampshire and Middlesex Counties when compared to county-wide coverages (Table 39).



■ All areas are prime farmland
■ Farmland of statewide importance
■ Farmland of unique importance

Table 37. Prime Farmland

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Prime farmland
BERKSHIRE	13	1.81	5.2%	7.2%
FRANKLIN	44	6.52	11.9%	12.0%
HAMPSHIRE	6	0.98	10.9%	12.8%
MIDDLESEX	5	1.90	42.2%	11.4%
STATE	68	11.21	10.9%	11.8%

Table 38. Farmland of Unique Importance

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state with Farmland of unique importance
BERKSHIRE	3	0.22	0.6%	1.1%
FRANKLIN	--	--	--	0.0%
HAMPSHIRE	--	--	--	1.6%
MIDDLESEX	2	0.33	7.3%	8.9%
STATE	5	0.55	0.5%	5.3%

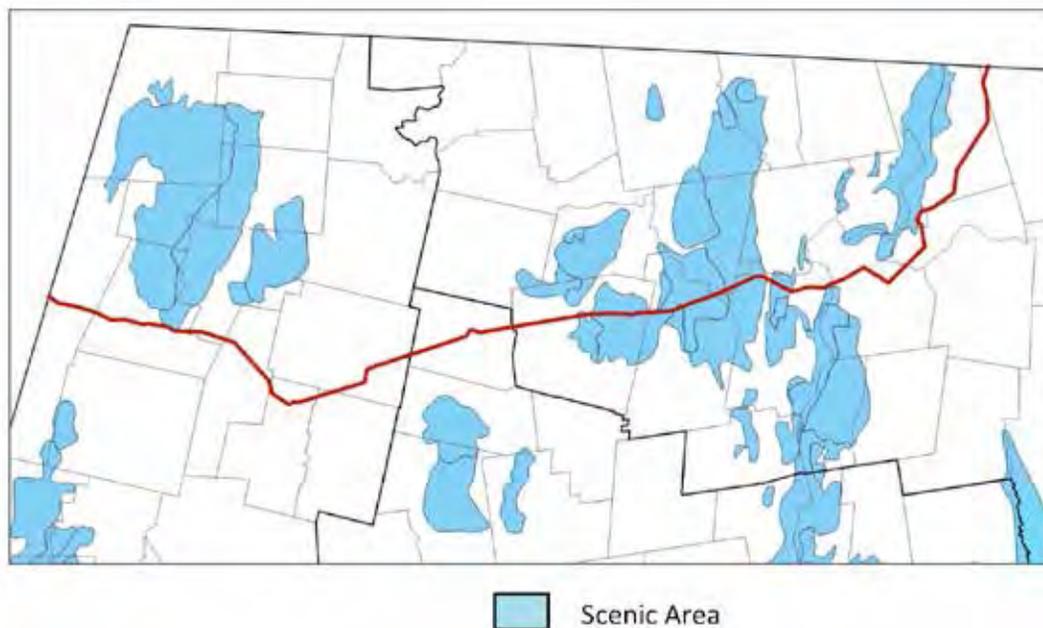
Table 39. Farmland of Statewide Importance

Location	Pipeline Segments	Length (km)	Pct of pipeline length*	Pct county/state with Farmland of statewide importance
BERKSHIRE	15	3.71	10.8%	8.7%
FRANKLIN	60	12.66	23.1%	20.0%
HAMPSHIRE	2	0.37	4.1%	11.0%
MIDDLESEX	3	0.60	13.3%	14.7%
STATE	80	17.34	16.9%	14.1%

The Scenic Landscape Inventory

[HTTP://WWW.MASS.GOV/ANF/RESEARCH-AND-TECH/IT-SERV-AND-SUPPORT/APPLICATION-SERV/OFFICE-OF-GEOGRAPHIC-INFORMATION-MASSGIS/DATALAYERS/SCENINV.HTML](http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/datalayers/sceninv.html)

The Scenic Landscapes data layer (June 2012) contains information about scenic areas as compiled by the Massachusetts Landscape Inventory Project (1982). Data were obtained from the MassGIS web site.



The pipeline alternative passes through a total of 19.3 km identified as noteworthy or distinctive in Berkshire and Franklin counties. The regions include Taconic Section (1.3 km), Berkshire Hills (15 km) and Connecticut Valley (2.9 km). The pipeline alternative passes through a disproportionate amount of scenic landscape relative to the state as well as Franklin County.

Table 40. Scenic Areas

Location	Pipeline Segments	Length (km)	Pct of pipeline length	Pct county/state Scenic
BERKSHIRE	1	1.3	3.8%	18.9%
FRANKLIN	6	18.0	32.9%	22.7%
HAMPSHIRE	--	--	--	13.0%
MIDDLESEX	--	--	--	8.9%
State	7	19.3	18.8%	10.6%

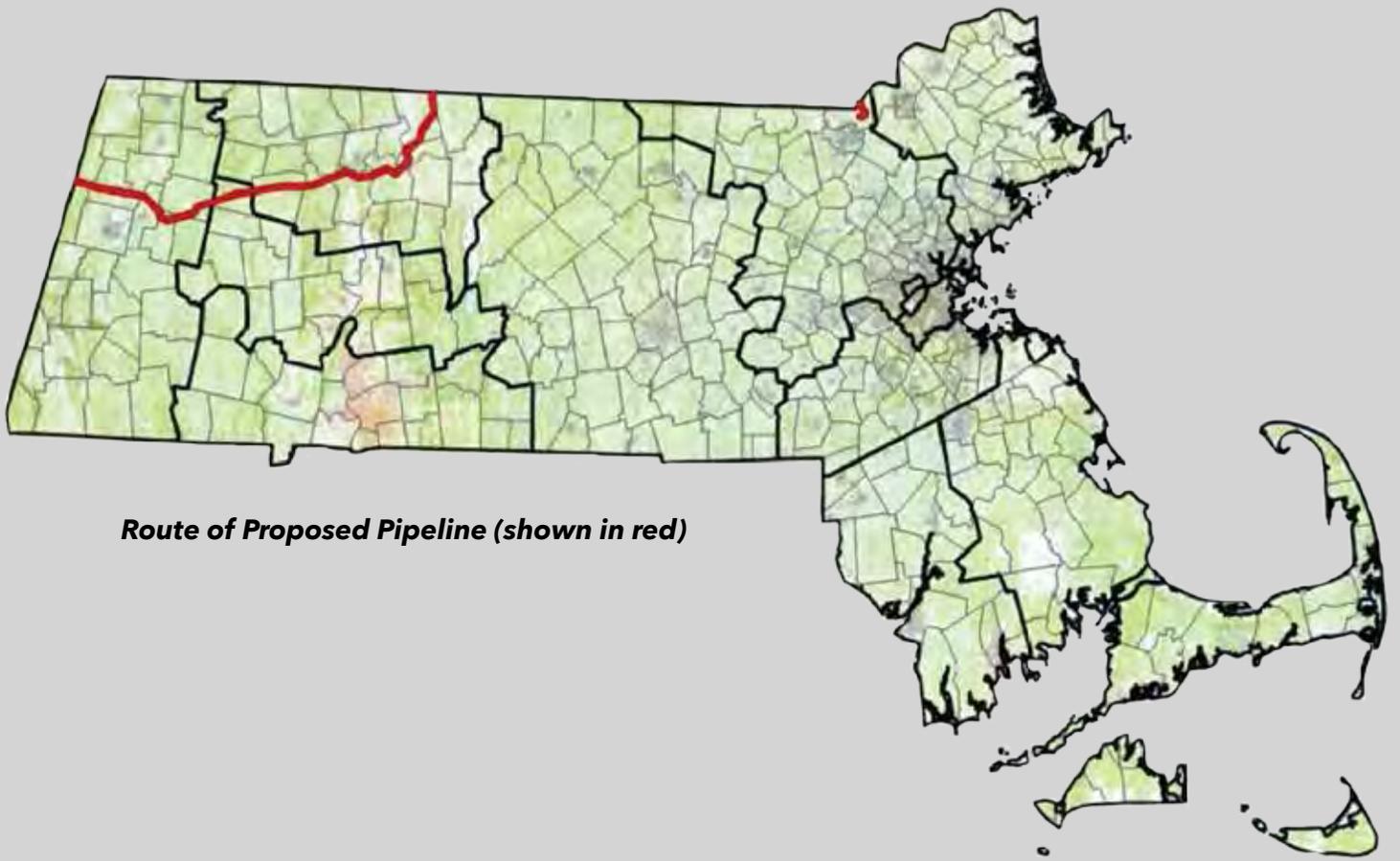
About the Authors

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Thomas Cairns is a graduate student at the University of Massachusetts studying Environmental Conservation and Human Dimensions. He has worked as a research assistant on the “Boston Metro Area Urban Long-Term Research Area” project as well as various land use classification projects. Outside of UMass Tom works as a GIS Specialist at the Farm Service Agency under the United States Department of Agriculture.





Route of Proposed Pipeline (shown in red)