dcr
Massachusetts

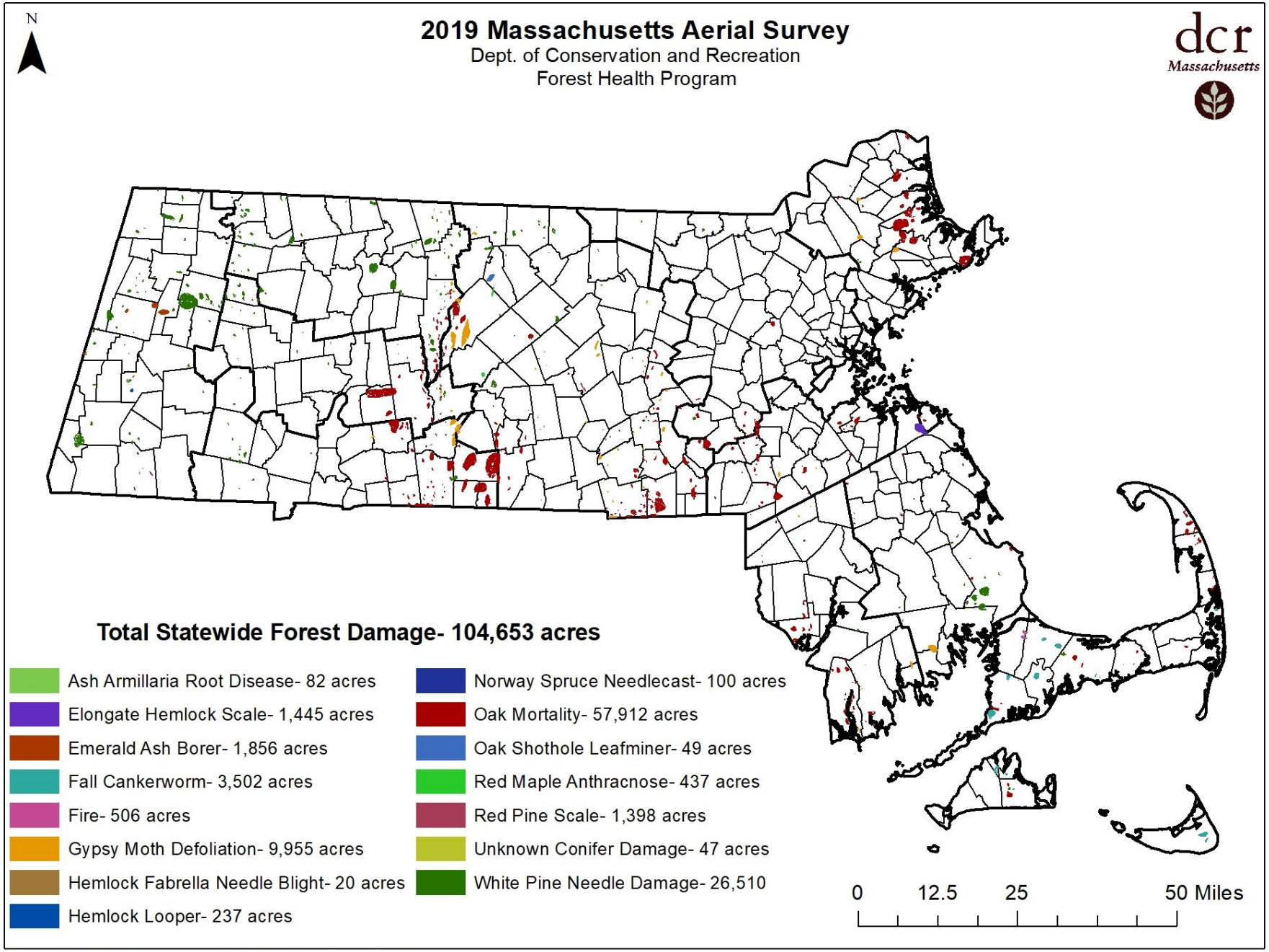
MASSACHUSETTS OAK DECLINE AND MORTALITY

DEPT. OF CONSERVATION AND RECREATION
FOREST HEALTH PROGRAM

AERIAL SURVEY RESULTS 2019

Approximately 104,600 acres of forest damage state-wide

- 57,900 acres of oak mortality
- 1,800 acres of ash mortality caused by emerald ash borer



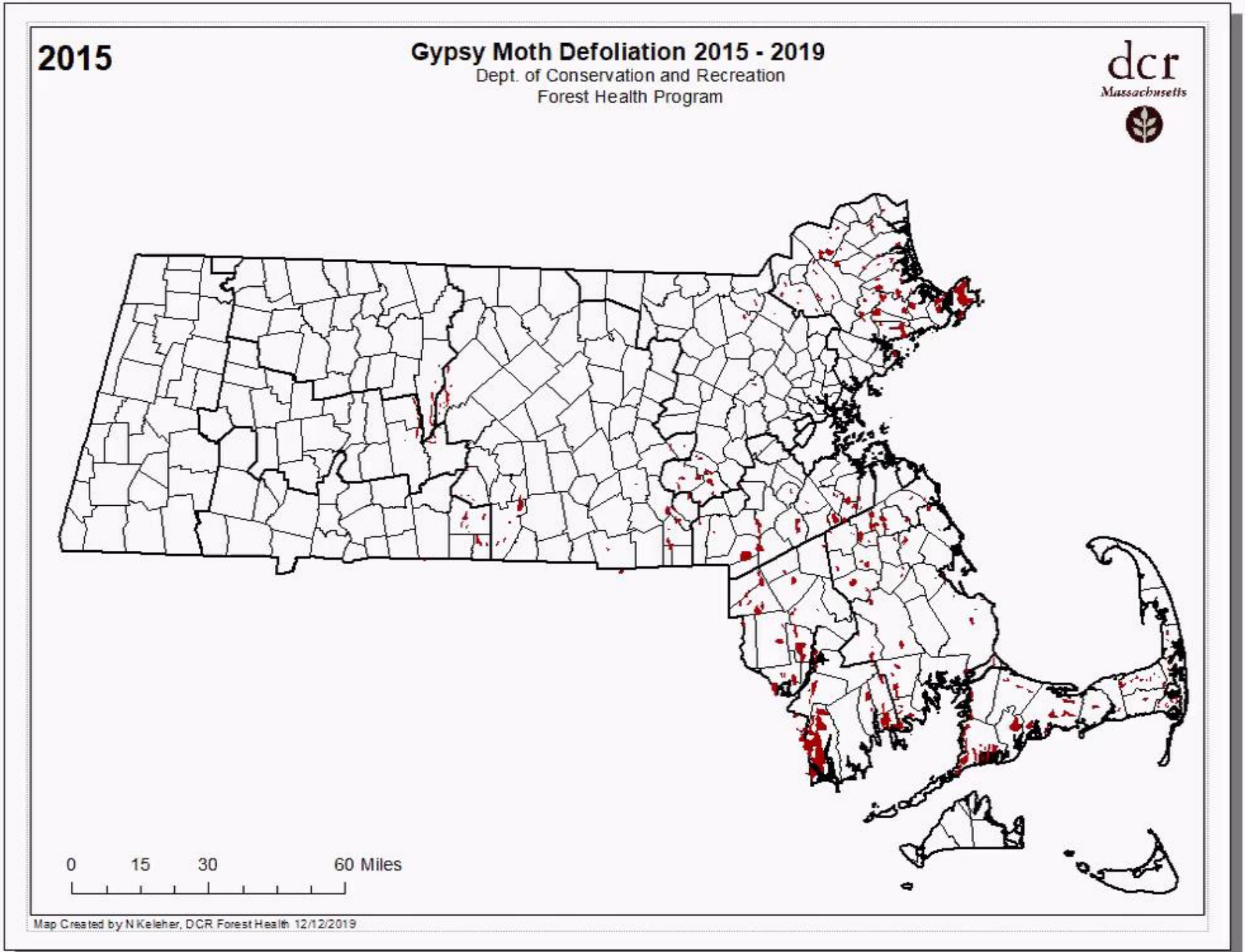
Map created by N Keleher, DCR Forest Health 9/30/2019

GYPSY MOTH OUTBREAK

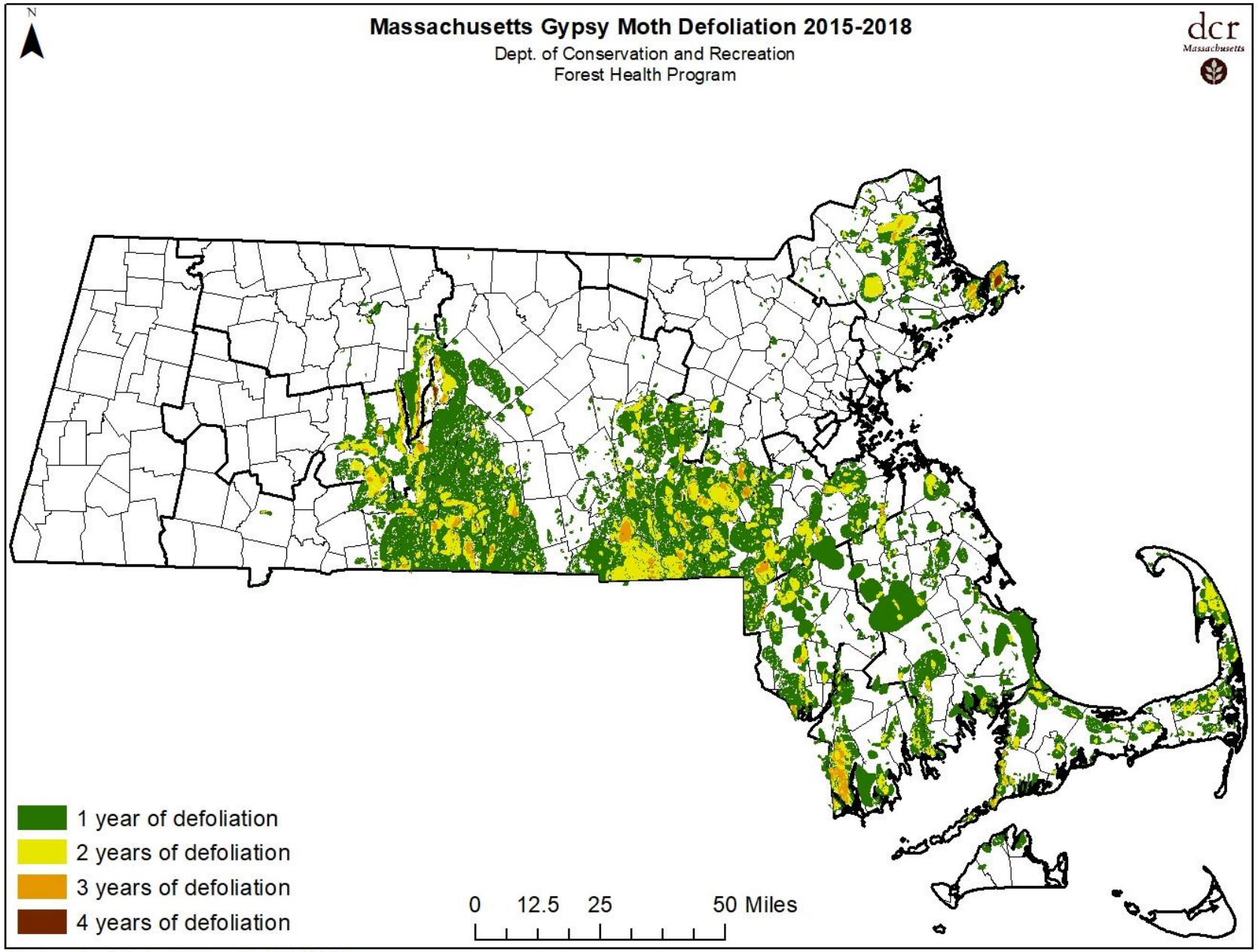
Compounding stressors have lead to the decline and mortality of hardwoods across Massachusetts. Oaks species have been particularly impacted from the gypsy moth outbreak cycle.

CURRENT OUTBREAK

- Detectable defoliation began in 2015
- Population built and caused significant impact in 12 counties
- Population peaked in 2017 with over 923,000 acres
- 9,955 acres of defoliation in 2019



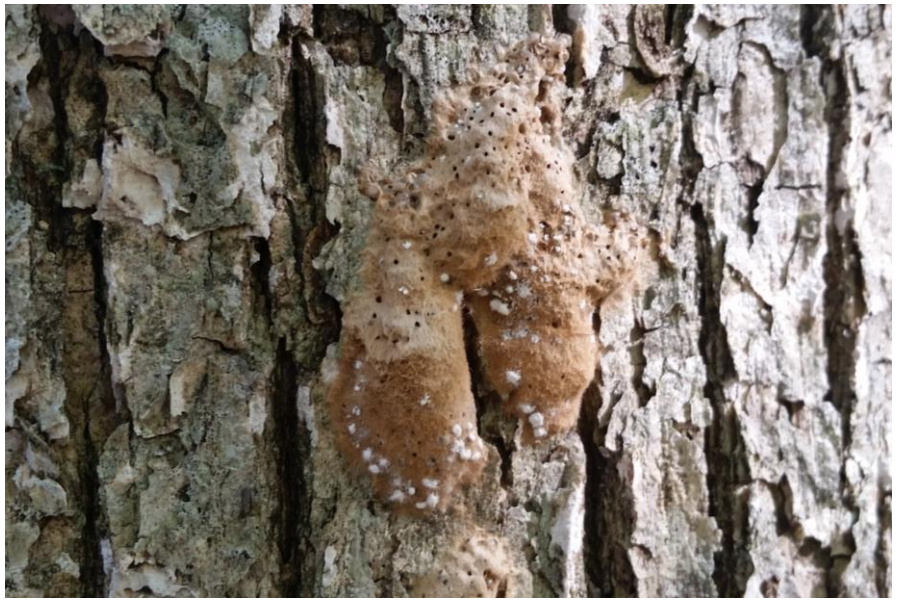
IMPACT OF MULTIPLE YEARS OF DEFOLIATION



	Gypsy Moth Defoliation	*Total Oak Mortality*
2015	38,175	545
2016	349,866	6,536
2017	923,186	122
2018	159,705	23,602
2019	9,955	57,912

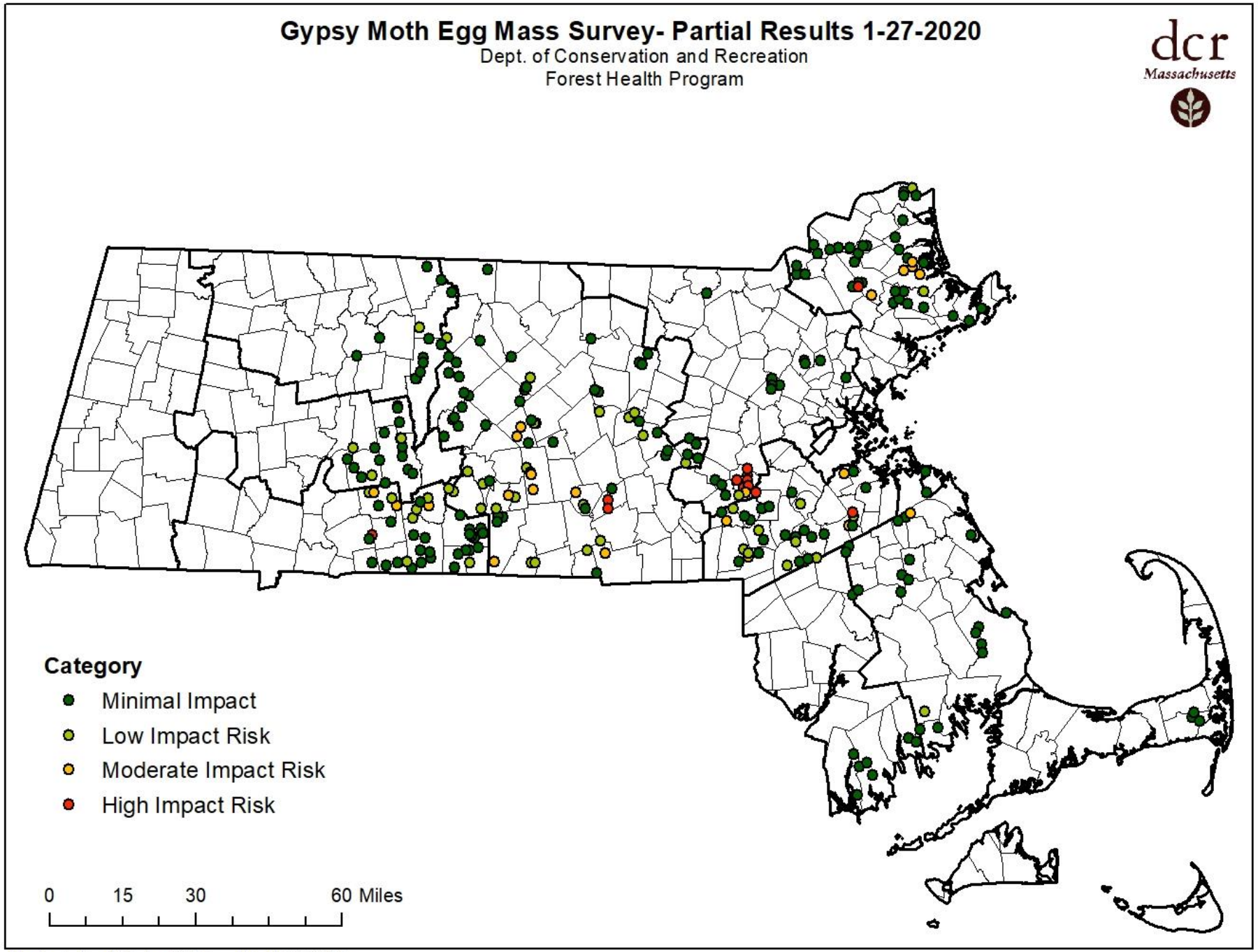
FACTORS OF GYPSY MOTH POPULATIONS DENSITIES

- Lack of *Entomophaga maimaiga* infection lead to population increase in 2015 and 2016
- High levels of EM and NPV infection rates in 2017
- Minimal caterpillar mortality in 2018
- Concerning egg mass densities going into 2019



2020 EXPECTATIONS

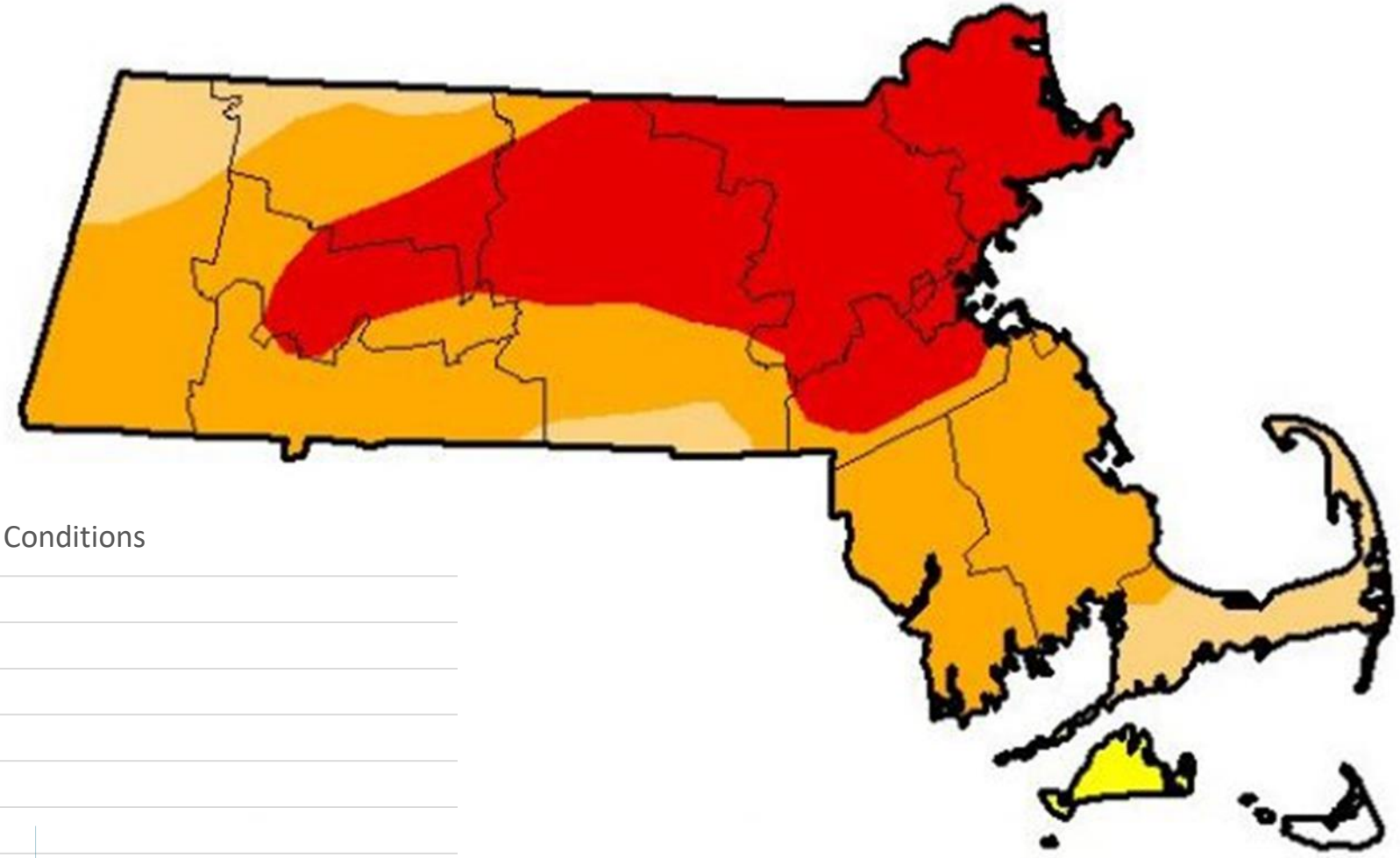
High rates of caterpillar mortality seen in 2019. Dramatic reduction in defoliation indicates the end of the outbreak cycle.

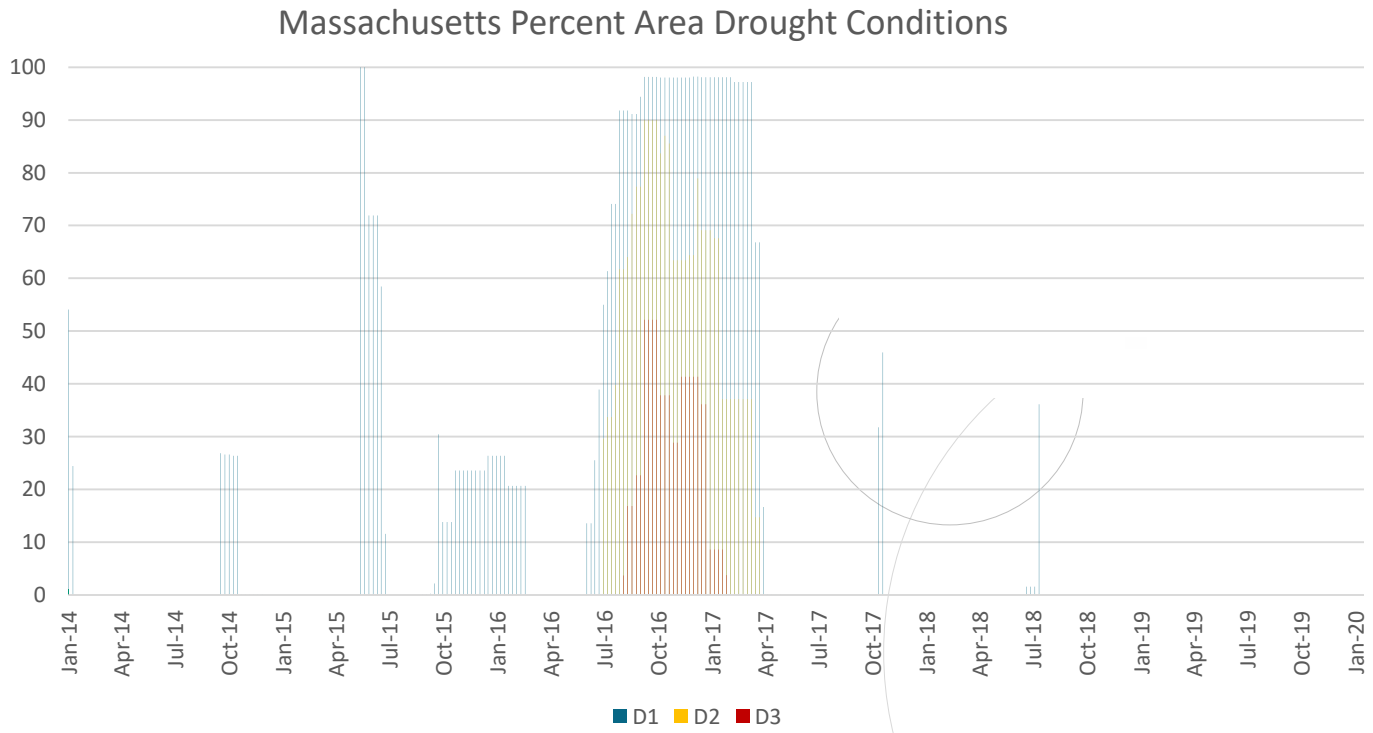

Gypsy Moth Egg Mass Survey- Partial Results 1-27-2020
Dept. of Conservation and Recreation
Forest Health Program
dcr
Massachusetts
Category
Minimal Impact
Low Impact Risk
Moderate Impact Risk
High Impact Risk
0
15
30
60 Miles
Map Created by N Keleher, DCR Forest Health 1/27/2020

ADDITIONAL FOREST STRESSORS

Concurrent and prior insect damage, as well as, atypical weather conditions caused additional strain to Massachusetts forests. There was regional variability in the stressors and their combined impact to our oak resources.

2016 DROUGHT



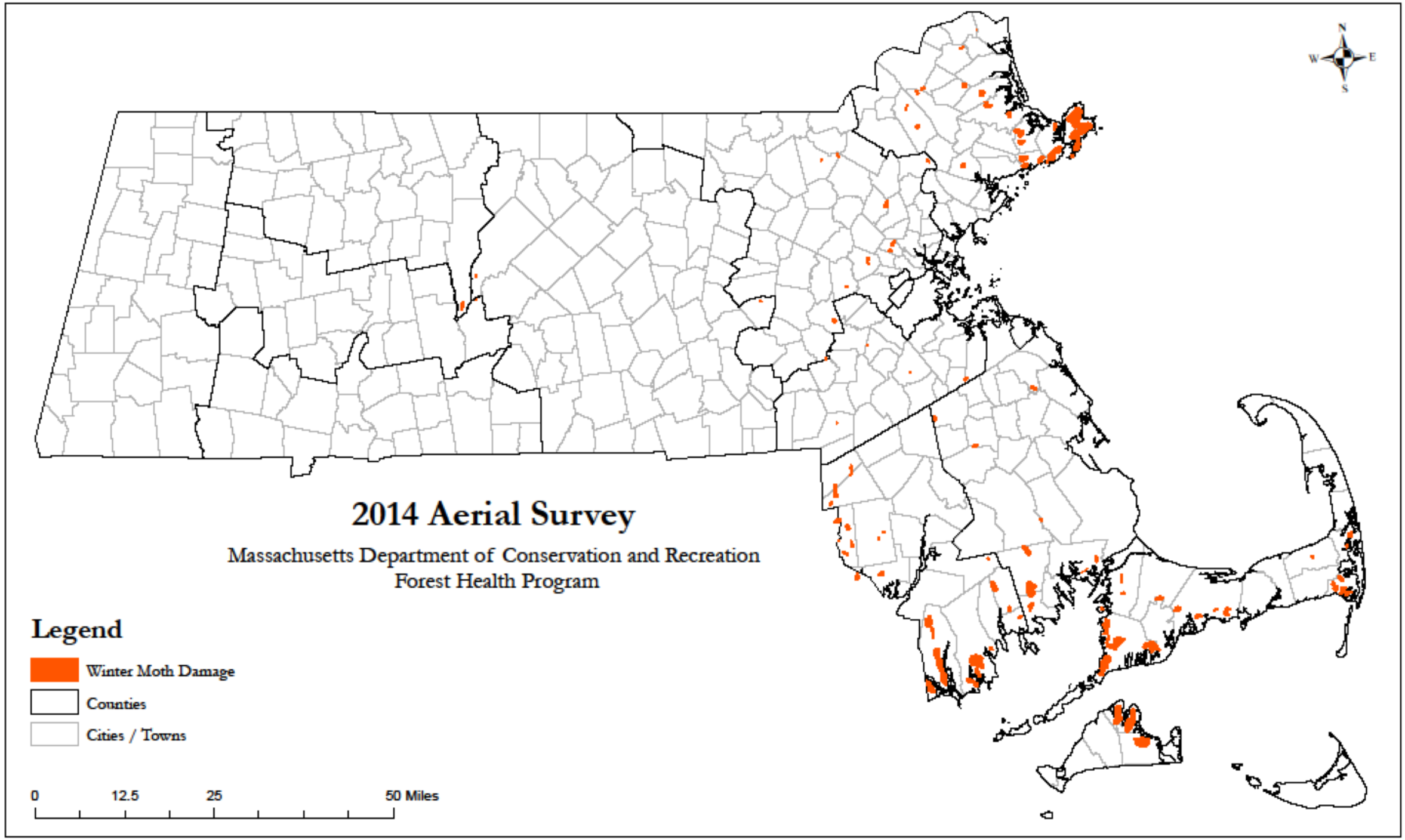


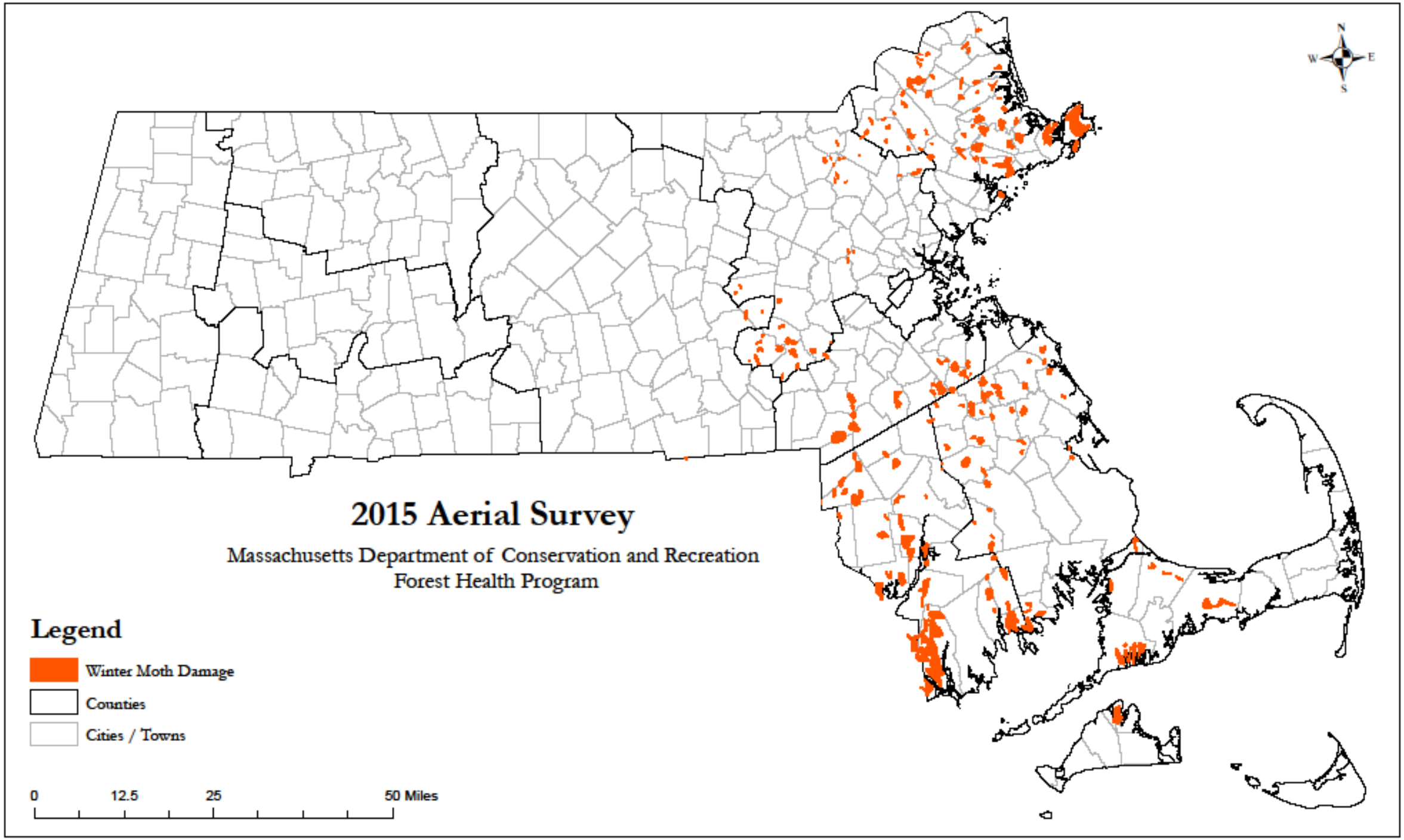
BLACK OAK GALL WASP

ZAPATELLA DAVISAE

WINTER MOTH

OPEROPHTERA BRUMATA


N
W
E
S
2014 Aerial Survey
Massachusetts Department of Conservation and Recreation
Forest Health Program
Legend
Winter Moth Damage
Counties
Cities / Towns
0
12.5
25
50 Miles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SECONDARY PESTS AND PATHOGENS

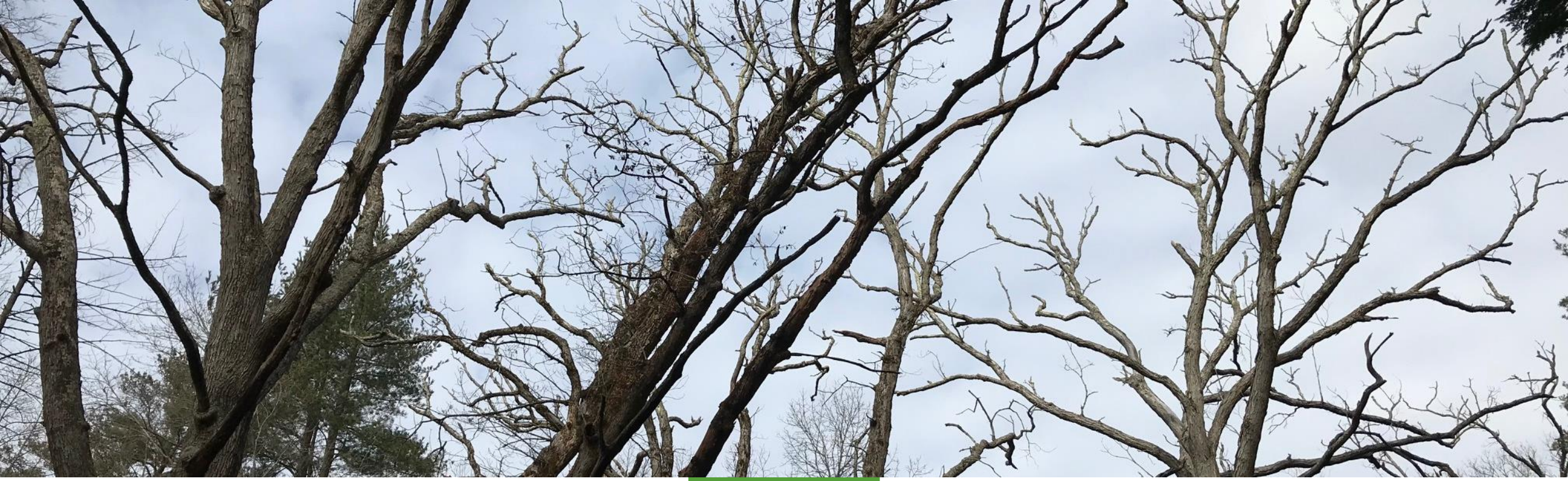
Native insects and fungal pathogens have invaded the weakened oak trees, accelerating decline and increasing the rate of morality throughout the commonwealth.

NATIVE BORERS

ARMILLARIA AND FUNGAL PATHOGENS

ONGOING FOREST STRESSORS

FALL CANKERWORM



HAZARDOUS TREES IN THE LANDSCAPE

ECONOMIC IMPACT

POST MORTALITY FOREST MANAGEMENT OPTIONS


FIRE ROAD

IMPORTANCE OF OUTREACH

Quabbin Reservoir

QUESTIONS?

DCR Forest Health Program

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https://www.mass.gov/service-details/forest-health-program