



 MAINE AUDUBON

Wildlife Road Watch

Citizen Scientist Observations
2010-2014

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Table of Contents

Project Summary	1
Wildlife Observations	2
Statewide Overview of Roads Analyzed	3
Interstates & Highways	4 - 20
Endangered Species Road Watch	21
Endangered Species Road Watch Routes	22 - 34
Author & Acknowledgements	35



Maine Audubon Wildlife Road Watch Project Summary

Maine Audubon Wildlife Road Watch (WRW) is a citizen science project developed in partnership with Maine Department of Inland Fisheries and Wildlife, Maine Department of Transportation, and University of California, Davis Road Ecology Center. Volunteers record their observations of wildlife crossing roads — both dead and alive — on the WRW website (wildlifecrossing.net/maine/).

Wildlife need to move across the landscape to find food and water and areas to rest, breed, and raise their young. Roads and traffic can make it difficult or impossible for animals to move safely. Wildlife populations can be reduced or even go locally extinct due to collisions, as well as, the inability to move to necessary habitats. Wildlife movement has become even more important for

population survival as habitats shift due to climate change and animals must adapt by moving to find more suitable habitat. Wildlife-vehicle collisions are also a serious safety issue for drivers.

Understanding and identifying where animals are moving both successfully and unsuccessfully across roads can help wildlife and road managers, at both the Maine Department of Transportation and local town level, know where to implement wildlife crossings and road enhancements to help animals cross roads safely and protect driver safety. This can include wildlife crossing underpasses, overpasses, fencing and signs. See “Conserving Wildlife On and Around Maine’s Roads” for more information. (maineaudubon.org/publications-resources/)

Wildlife Road Watch Results Interactive Web Map

To view an interactive map of all identified High Density and Hotspot locations and to see the surrounding landscape characteristics, go to: [**maineaudubon.org/roadwatch**](http://maineaudubon.org/roadwatch)

Wildlife Observations Summary

Between July 2010 and December 31, 2014, over 460 volunteers have recorded over 4800 observations which includes 6000 individual animals recorded. Sixty percent of the observations were dead animals and 40% live animals. Volunteers identified 153 different species.

Animal groups observed

Mammals 57% (77% Dead, 23% Live)

Birds 27% (19% Dead, 81% Live)

Amphibians 10% (82% Dead, 18% Live)

Reptiles 4% (77 % Dead, 23% Live)

Most common species observed

#	Species
943	Wild Turkey
688	Porcupine
591	Gray Squirrel
414	Raccoon
315	Striped Skunk
293	White-tailed Deer
207	Woodchuck
164	Red Fox
129	Red Squirrel
114	Common Snapping Turtle
96	Wood Frog
93	Northern Spring Peeper
93 -	Painted Turtle

Data Analysis

The observations were used in a geographic information system (GIS) to find stretches of road where wildlife road-crossing attempts occur more frequently (*high density locations*) and places where there are statistically-significant clusters of wildlife road-crossing attempts

(*hotspots*). Both *high density locations* and *hotspots* are important for understanding and planning for wildlife movement. Places where high density locations and hotspots overlap are especially important.

Hotspot and *high density locations* were commonly found in places with the following landscape characteristics:

- Interstate on/off ramp intersections with wetlands, streams and rivers
- Where the road bisects large wetland and stream complexes
- At road stream crossings
- Where the road runs parallel to rivers, lakes or large wetlands
- Highways with large (several hundred foot wide) wooded medians
- Where more than one of the above road and surrounding landscape characteristics occur in the same place

Interstate and State Highway Maps

The following Maine Interstate and highway sections were analyzed:

I-95 South (N. Scarborough to S. Falmouth)	Route 17/126 Route 139/202/100A Route 127
I-95 North of I-295 to Alton	Route 128
I-295	Route 116
Route 4/16	Route 1
Route 27/9	

The maps show one mile long *high density locations* (red) (highway segments with ≥ 10 individuals observed/mile) and *hotspots* (black) of varying lengths. The numbers of animals observed (from 0 to 5 and over) per $\frac{1}{4}$ mile road segment are shown in different colored segments along the entire route analyzed.

Statewide Overview of Roads Analyzed



I-95

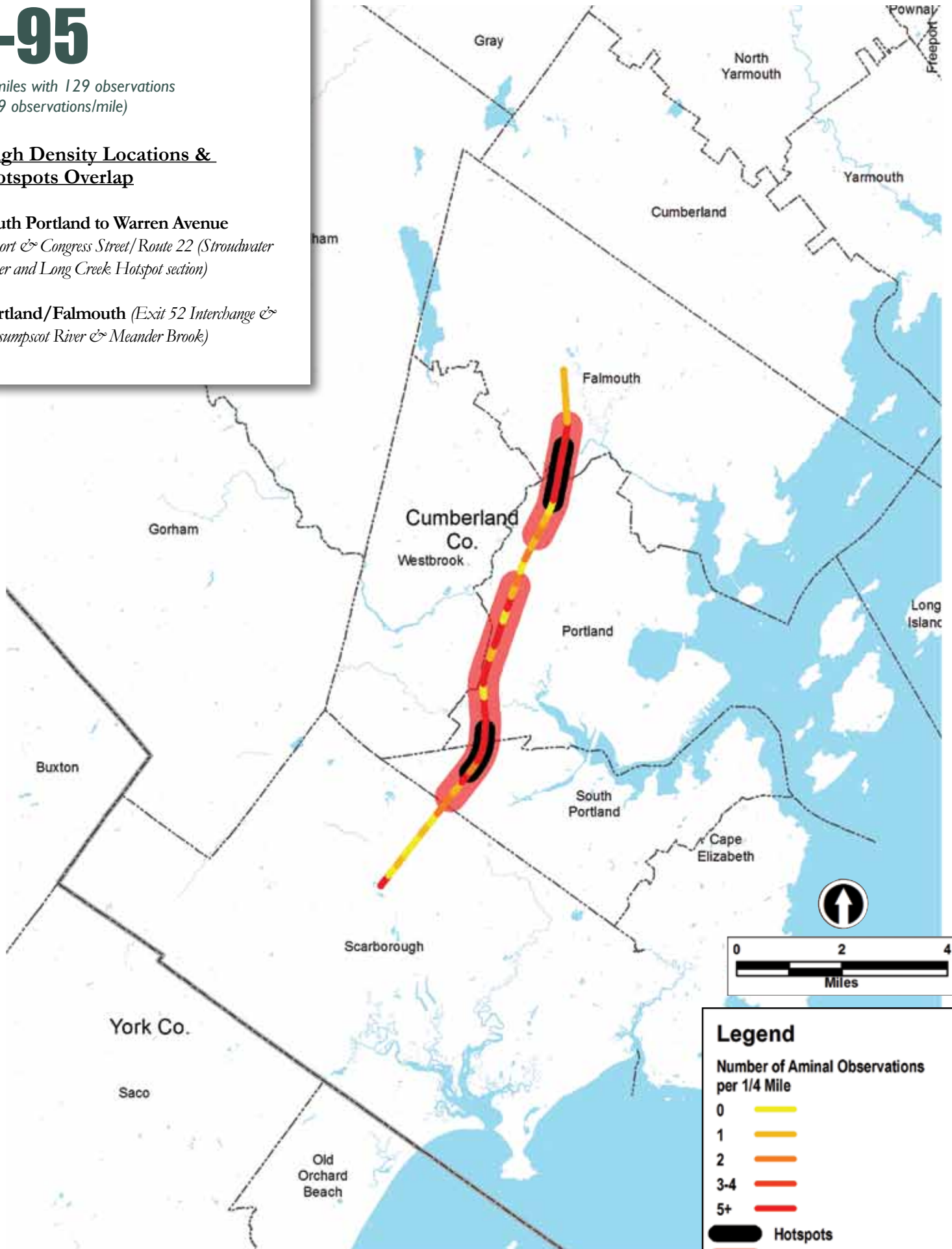
10 miles with 129 observations
(12.9 observations/mile)

High Density Locations & Hotspots Overlap

South Portland to Warren Avenue

Jetport & Congress Street/Route 22 (Stroudwater River and Long Creek Hotspot section)

Portland/Falmouth (Exit 52 Interchange & Presumpscot River & Meander Brook)



Legend

Number of Animal Observations per 1/4 Mile

- 0
- 1
- 2
- 3-4
- 5+

Hotspots

1 Mile High Density Locations

I-95

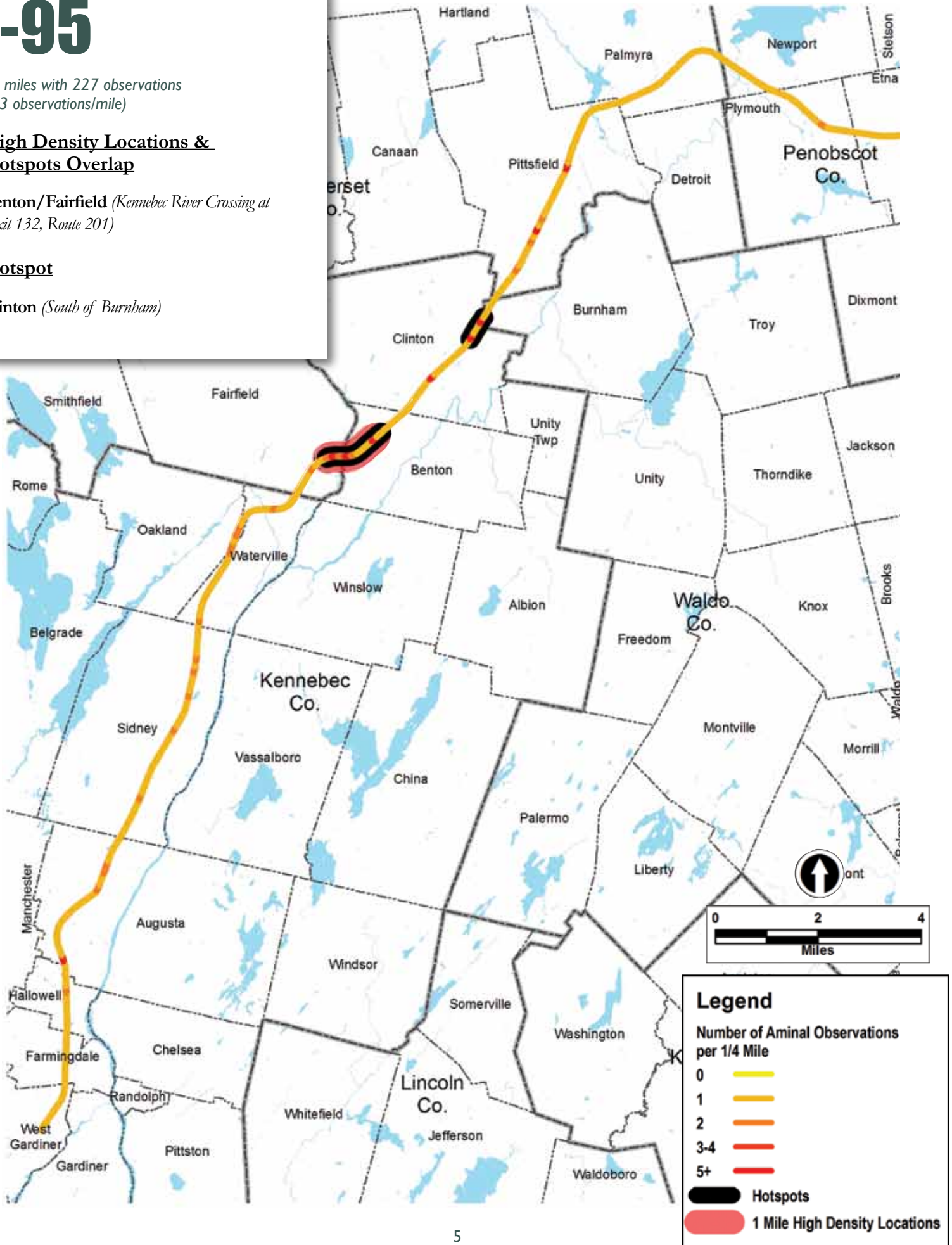
98 miles with 227 observations
(2.3 observations/mile)

High Density Locations & Hotspots Overlap

Benton/Fairfield (Kennebec River Crossing at Exit 132, Route 201)

Hotspot

Clinton (South of Burnham)



I-95

98 miles with 227 observations
(2.3 observations/mile)

Hotspots

Bangor (North of Exit 186 to North of Chase Rd)

Orono (Exit 193)



I-295

53 miles with 382 observations
(7.2 observations/mile)

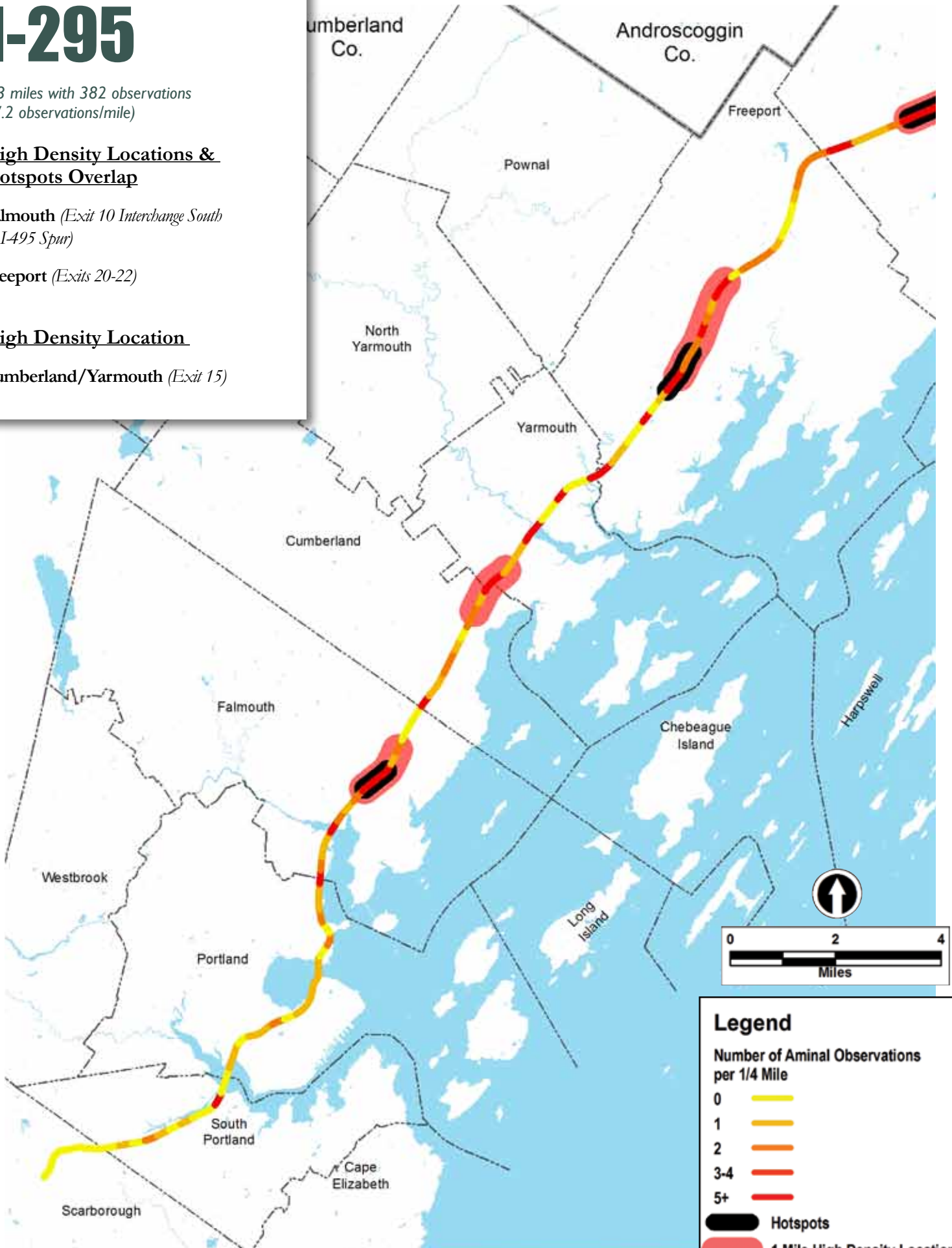
High Density Locations & Hotspots Overlap

Falmouth (Exit 10 Interchange South of I-495 Spur)

Freeport (Exits 20-22)

High Density Location

Cumberland/Yarmouth (Exit 15)



I-295

53 miles with 382 observations
(7.2 observations/mile)

High Density Locations & Hotspots Overlap

Brunswick Route 1 Interchange

Bowdoinham (*Exit 37 Interchange Route 125 to North of Millay Road*)

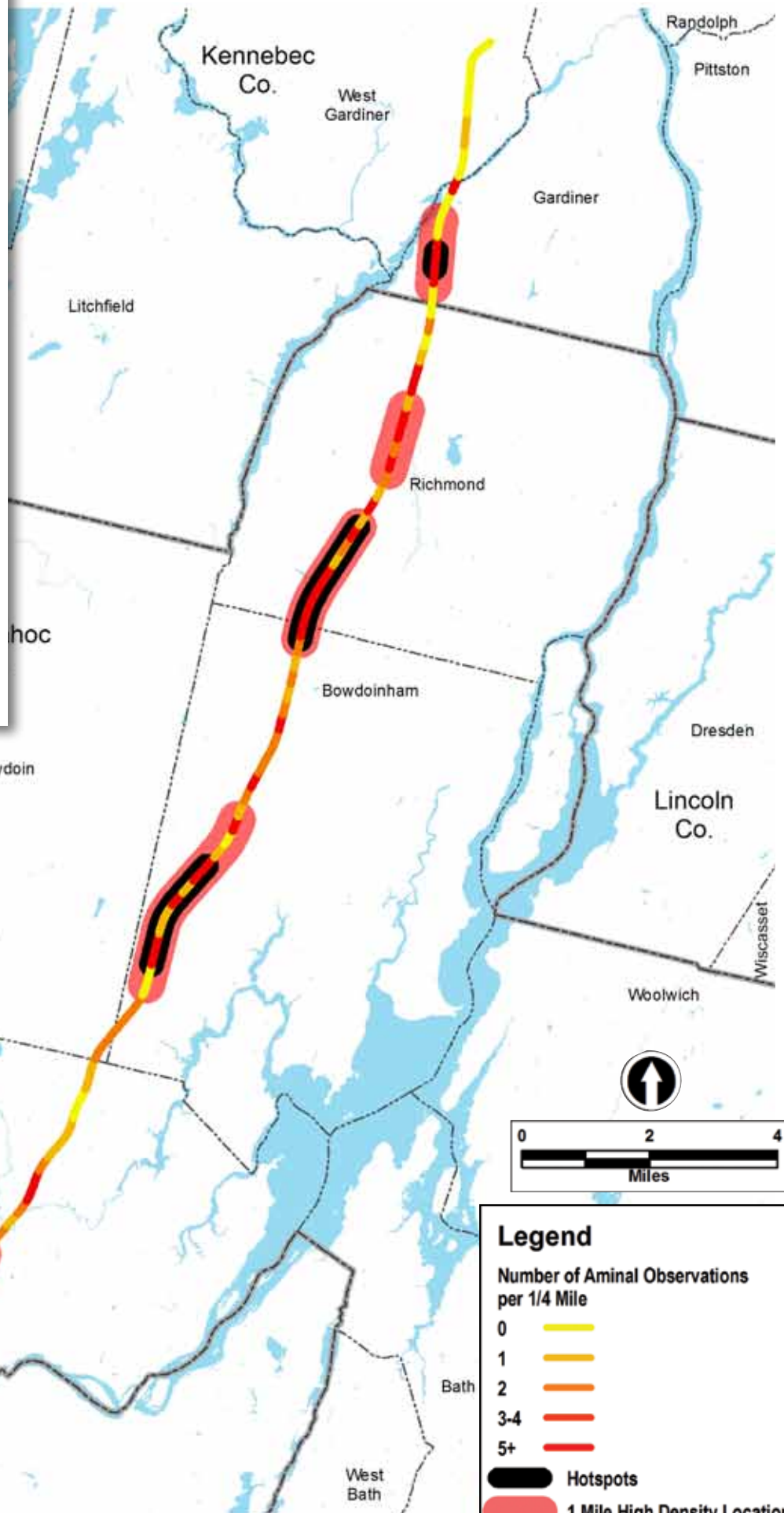
Richmond (*South of Exit 43 North to Langdon Road*)

Gardner (*Exit 49*)

High Density Locations

Brunswick/Topsham (*Androscoggin River and Exit 31, 2 miles long*)

Richmond (*Alexander Reed Road Crossing*)



Legend

Number of Animal Observations per 1/4 Mile

0	Yellow line
1	Light Orange line
2	Orange line
3-4	Dark Orange line
5+	Red line

Hotspots
 1 Mile High Density Locations

Rte 4/16

53.7 miles, 86 records with 278 observations
(5.2 observations/mile)

High Density Locations & Hotspots Overlap

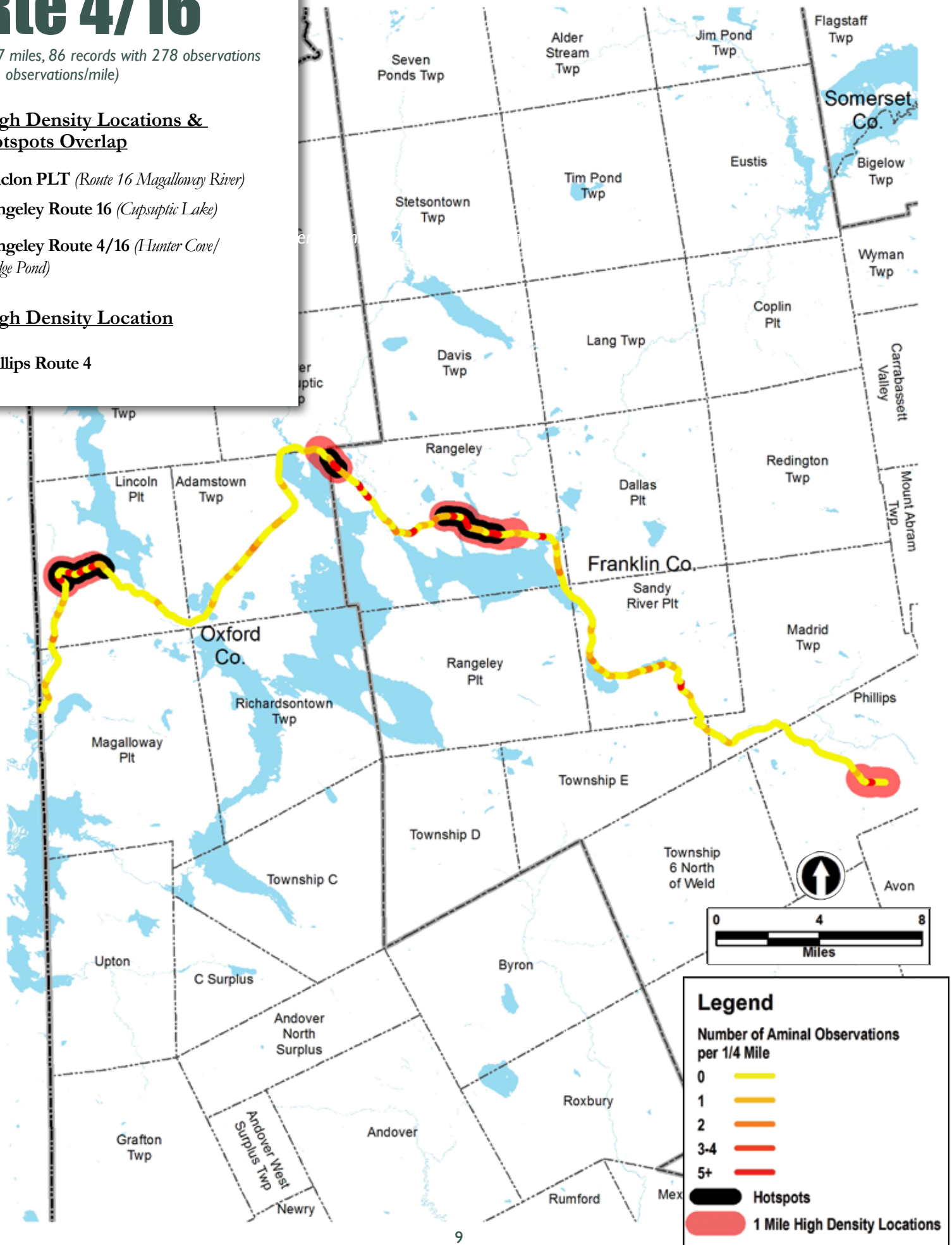
Linclon PLT (*Route 16 Magalloway River*)

Rangeley Route 16 (*Cupsuptic Lake*)

Rangeley Route 4/16 (*Hunter Cove/
Dodge Pond*)

High Density Location

Phillips Route 4

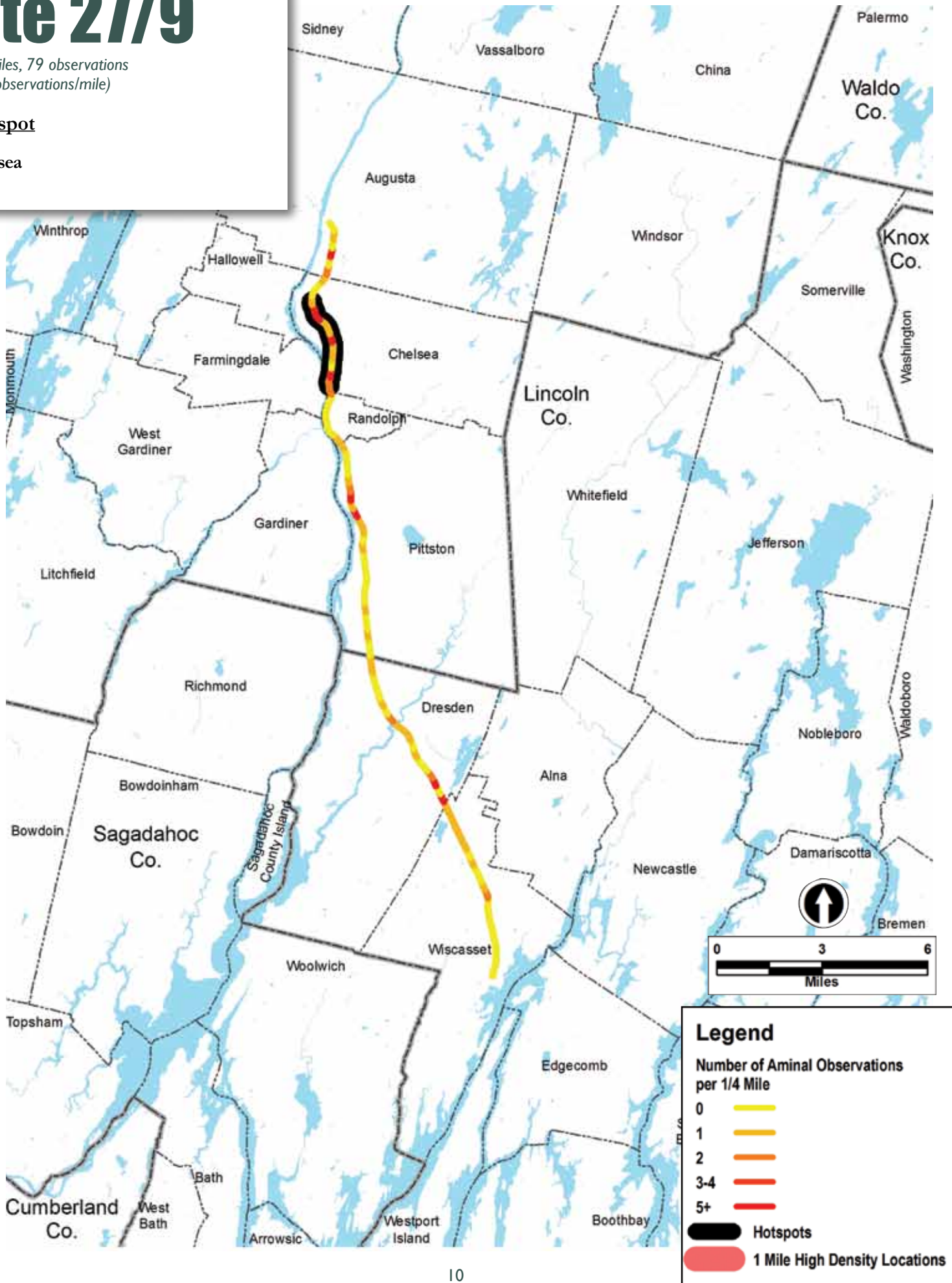


Rte 27/9

23 miles, 79 observations
(3.4 observations/mile)

Hotspot

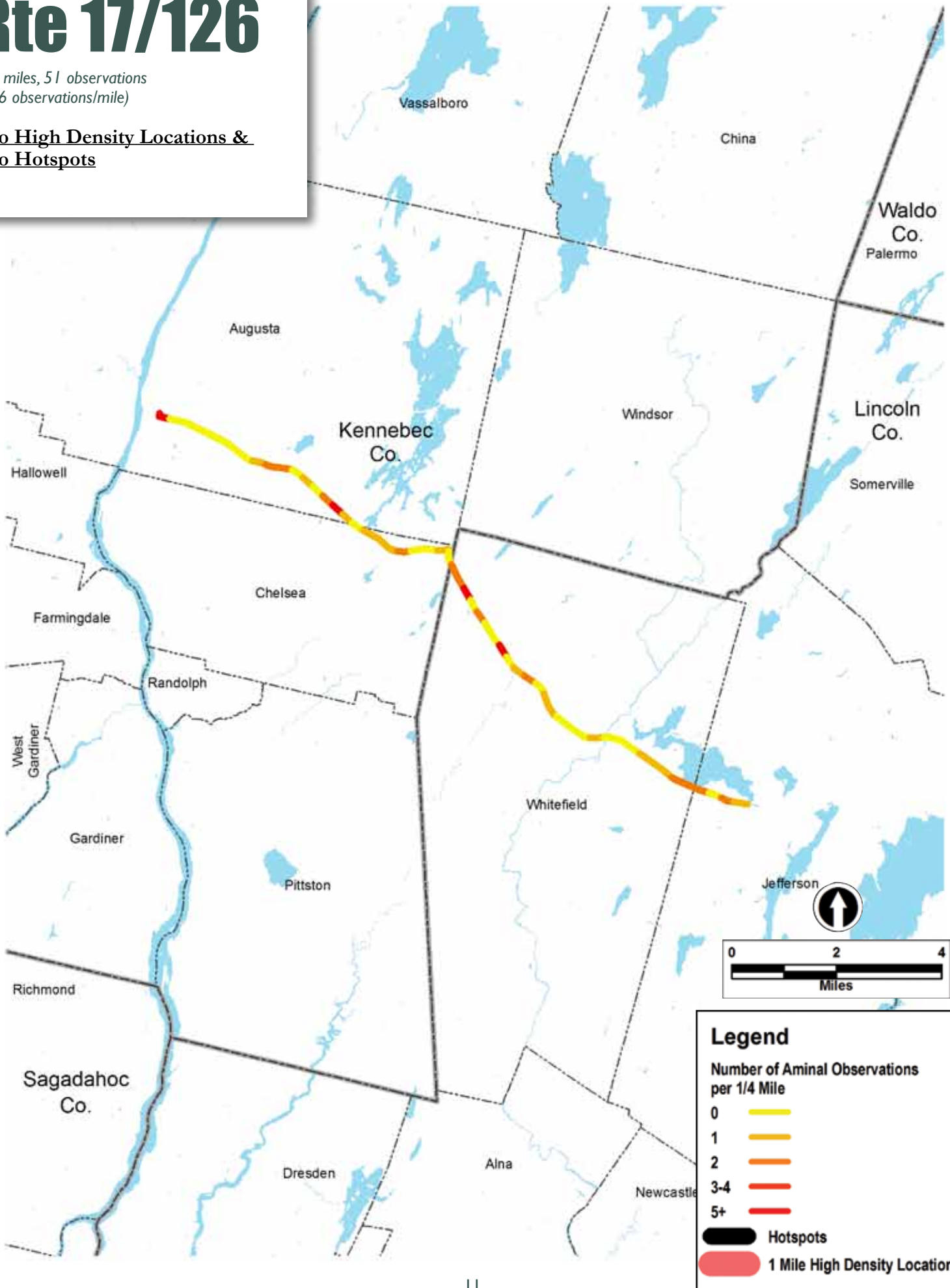
Chelsea



Rte 17/126

14 miles, 51 observations
(3.6 observations/mile)

No High Density Locations &
No Hotspots



Rte 139/202/100A

24.8 miles, 298 records with 336 observations (13.5 observations/mile)

High Density Locations & Hotspots Overlap

Unity Route 139

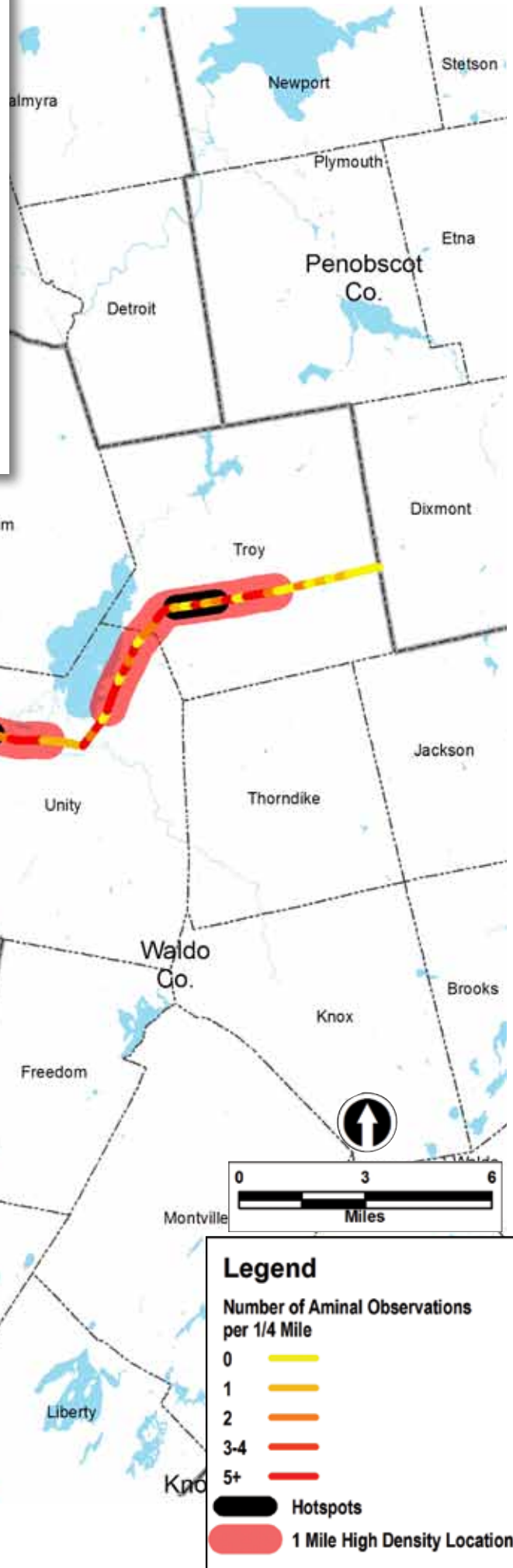
Troy Route 202

High Density Locations

Winslow/Benton Route 100A

Benton to Unity

Unity to Troy, Route 202



Rte 128

15.2 miles, 92 records with 215 observations
(14.1 observations/mile)

High Density Location & Hotspots Overlap

Dresden

High Density Locations

Dresden

Woolwich

Rte 127

12.75 miles, 58 records with 136 observations,
(10.7 observations/mile)

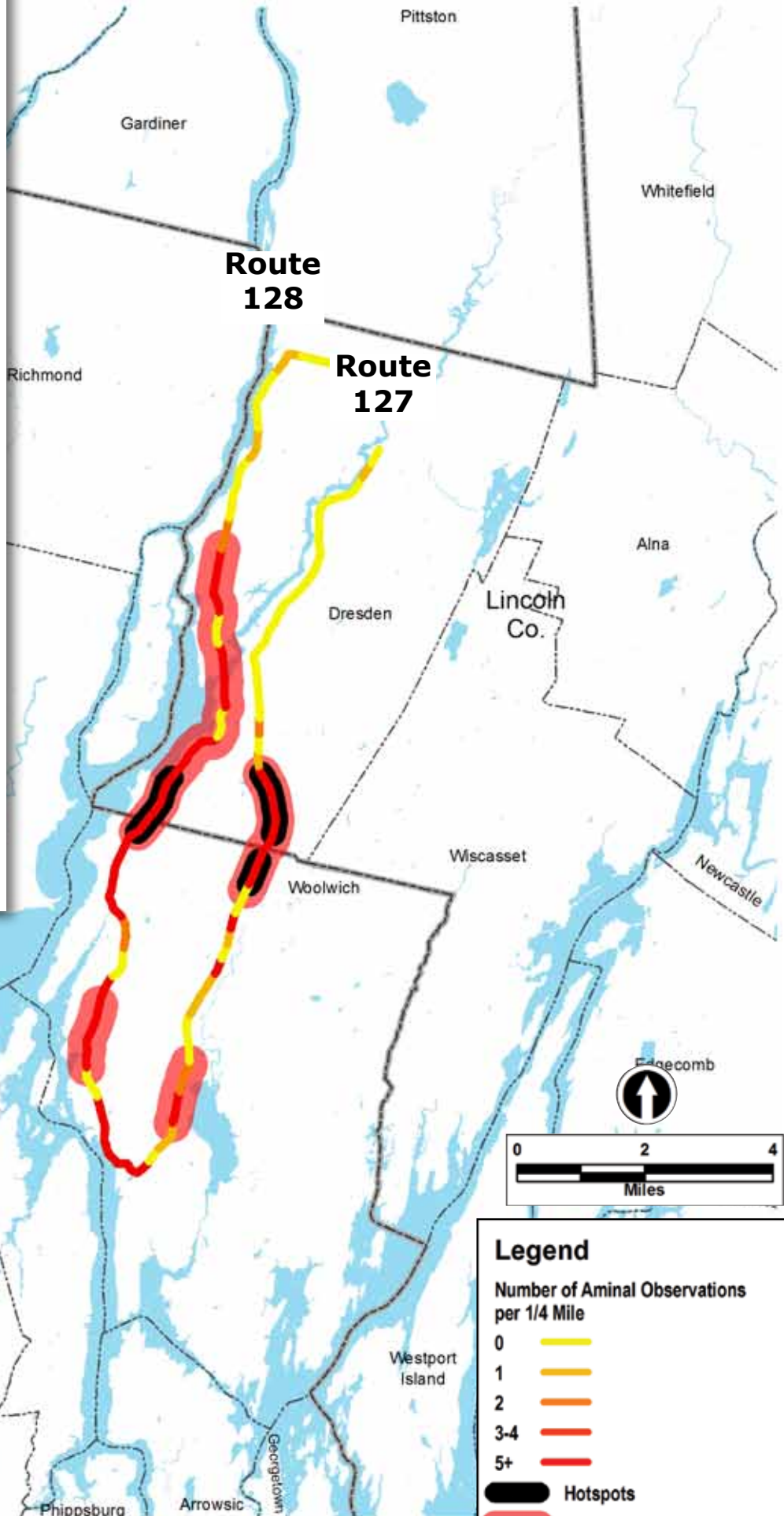
High Density Location & Hotspots Overlap

Dresden

Woolwich

High Density Location

Woolwich, Nequasset Lake



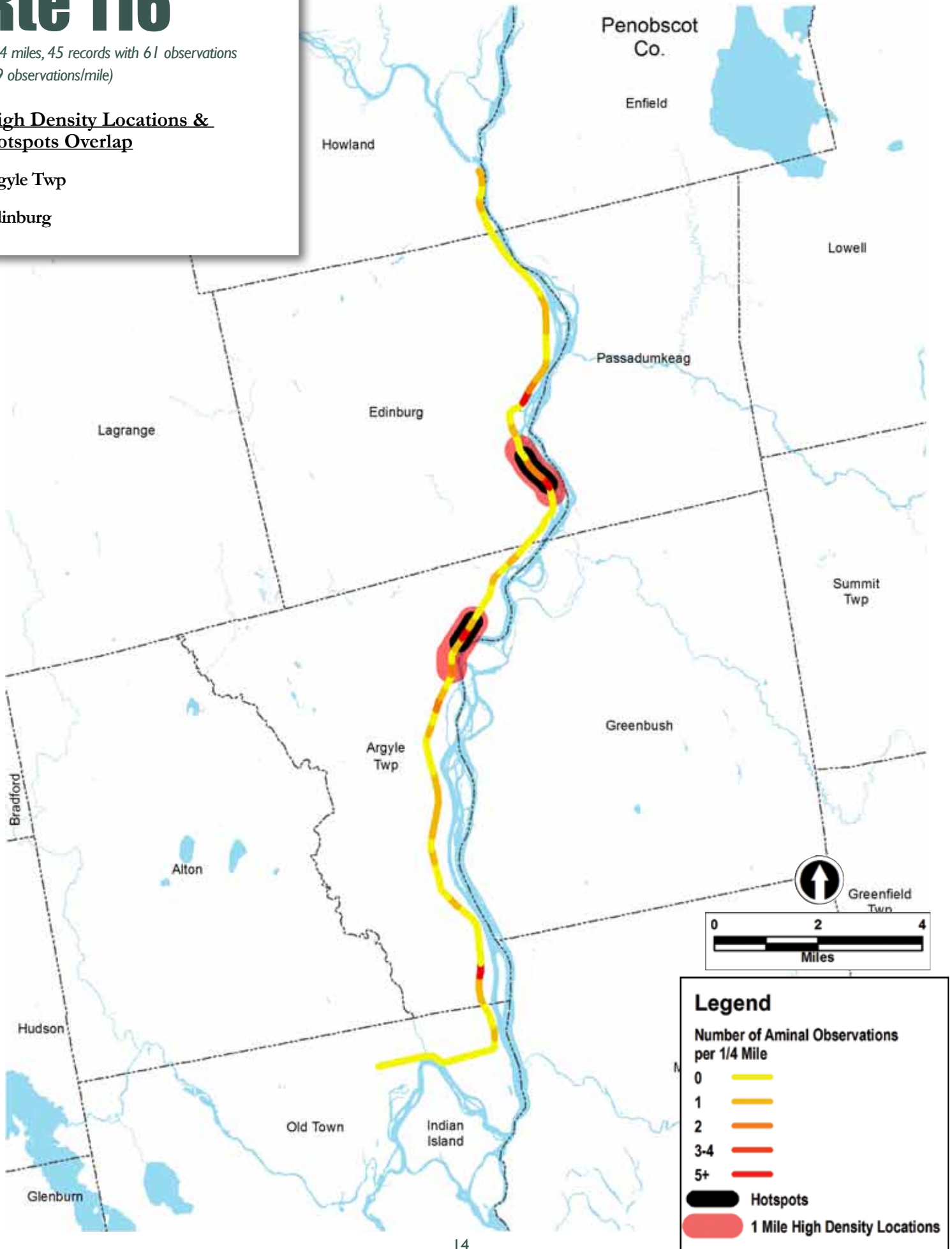
Rte 116

21.4 miles, 45 records with 61 observations
(2.9 observations/mile)

High Density Locations & Hotspots Overlap

Argyle Twp

Edinburg



Rte 1

317 miles, 295 observations
(0.9 observations/mile)

**No High Density Locations &
No Hotspots**



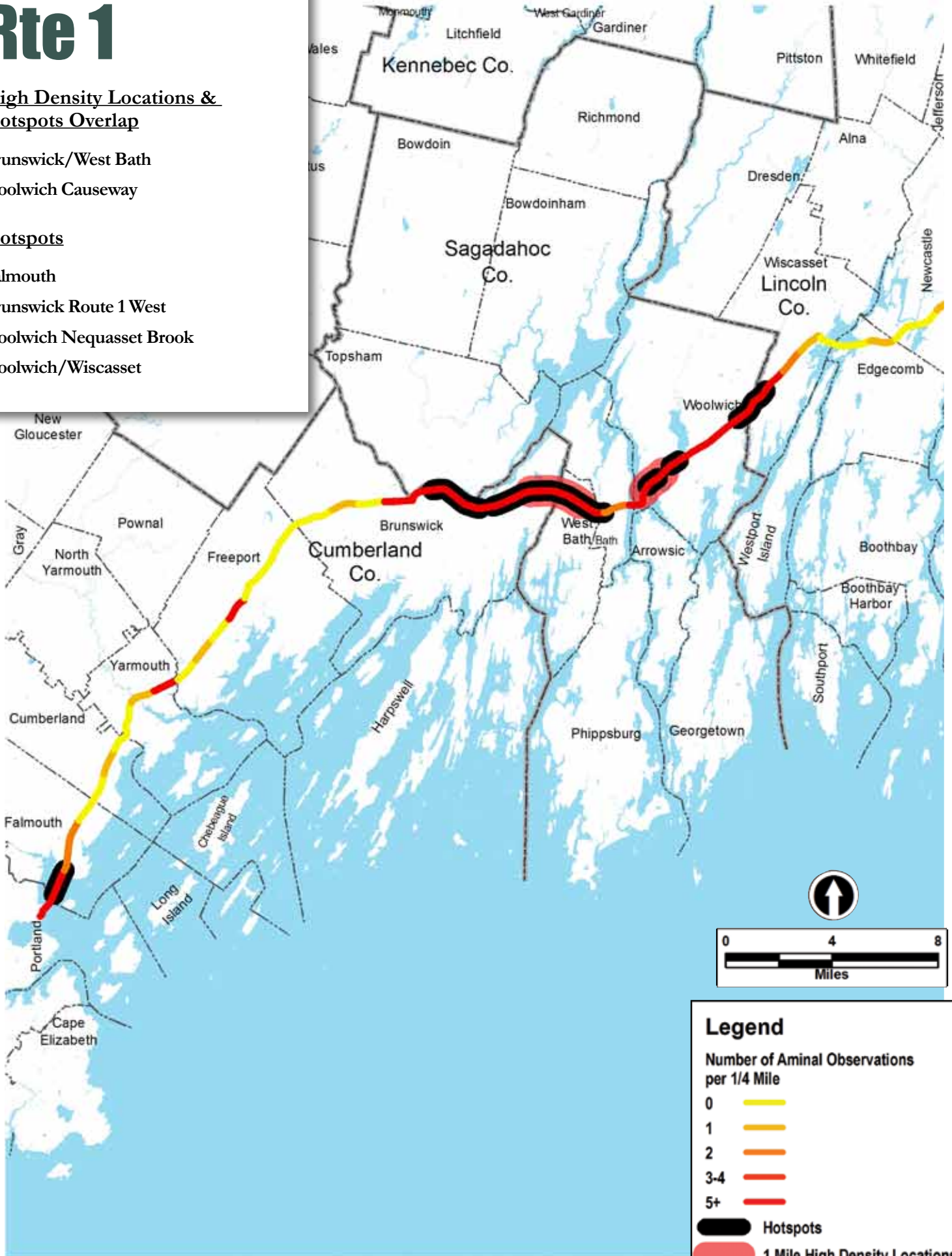
Rte 1

High Density Locations & Hotspots Overlap

Brunswick/West Bath
Woolwich Causeway

Hotspots

Falmouth
Brunswick Route 1 West
Woolwich Nequasset Brook
Woolwich/Wiscasset



Legend

Number of Animal Observations per 1/4 Mile

- 0
- 1
- 2
- 3-4
- 5+

Hotspots

1 Mile High Density Locations

Rte 1

No High Density Locations &
No Hotspots



Rte 1

Route 1-East 158 miles, 89 observations,
0.6 observations/mile

Hotspot

Hancock



Rte 1

No High Density Locations &
No Hotspots



Rte 1

Hotspots

East Machias

Whiting

Edmunds Twp



Endangered Species Road Watch

In 2012, 2013 & 2014 volunteers surveyed 1 mile-long walking routes from April through September and reported all of their wildlife observations. Volunteers were asked to survey their assigned route a minimum of 8 times. They also recorded when they surveyed the route but did not see any wildlife. Volunteers surveyed 25 routes. Of those, 13 routes did not have enough wildlife observations for data analysis. For the remaining 12 Endangered Species Road Watch Routes, 100 meter-long (330 feet) High Density locations and Hotspots of varying lengths were identified. These are shown on the following pages overlain or aerial photos so you can see the underlying landscape. In addition, the number of animal observations per 50 meter (165 feet) road segment are shown along the entire route.

High Density Location & Hotspot Road Segments Identified:

Berwick, Sullivan Street/School Street/Route 9 (7 observations/mile)

Sanford, Kennebunk Road (13 records, 18 observations/mile)

Eliot, Harold L Dow Highway (13 records, 18 observations/mile)

Kittery, Pocahontas Road (11 observations/mile)

York/Ogunquit, Boston Road/North Village Road (69 records, 82 observations/mile)

North Berwick, Elm Street (26 observations/mile)

Biddeford, Newtown Road (30 observations/mile)

Cape Elizabeth, Charlie E. Jordan Road (32 records, 45 observations/mile)

Alfred, Gebung Road (48 records, 126 observations/mile)

York, Mountain Road (44 records, 53 observations/mile)

York, Clay Hill Road (36 observations/mile)

Scarborough, Pleasant Hill Road (53 records, 56 observations/mile)

Routes not analyzed due to low numbers of wildlife observations:

Kennebunk, Webber Hill Rd.

York, Route 103

South Berwick, Dow Highway

Ogunquit, Captain Thomas Rd.

Eliot, Depot Rd.

Waterboro, Main St.

Old Orchard Beach, Ross Rd.

Scarborough, Payne Rd.

Scarborough, Eastern Road Marsh

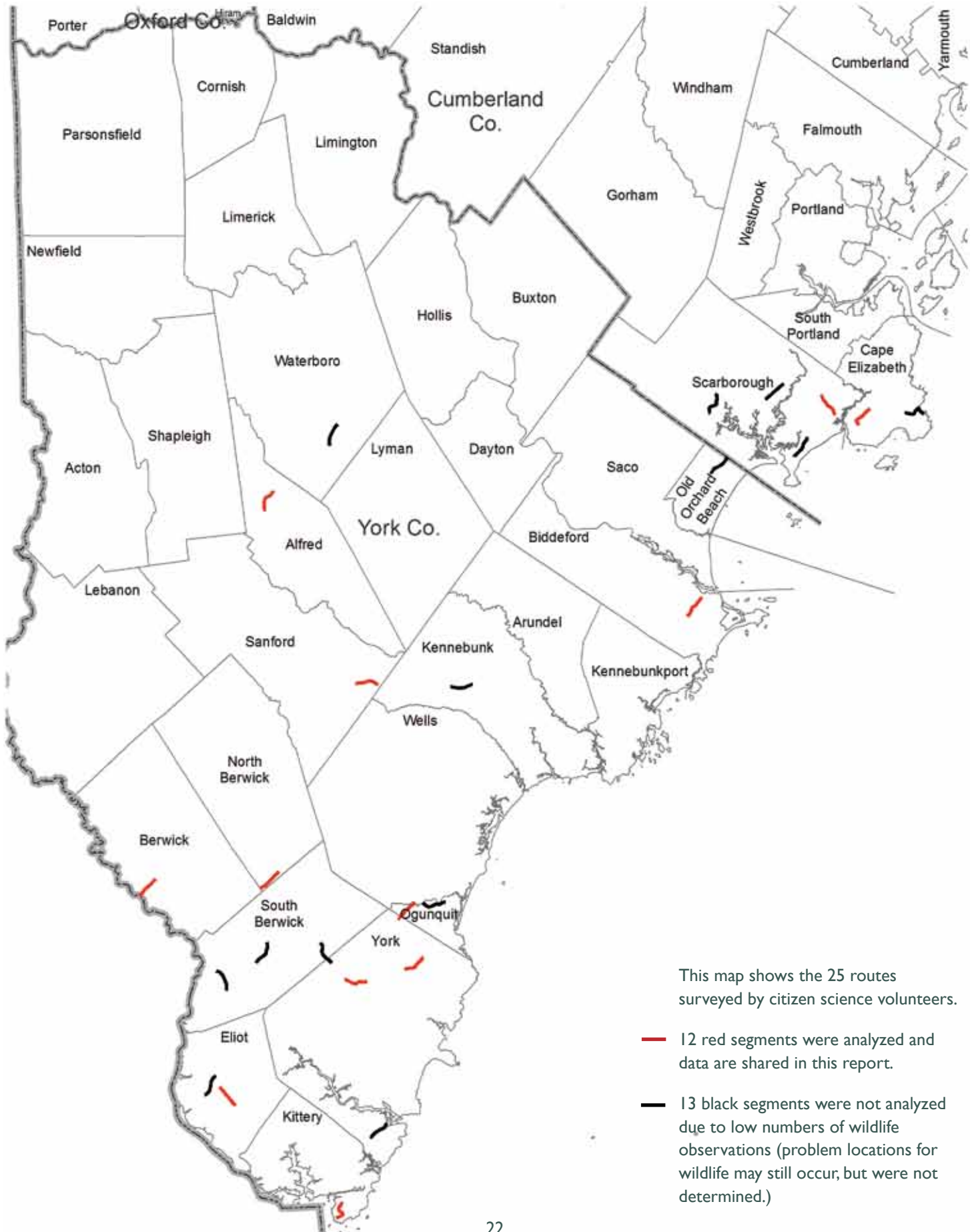
*Cape Elizabeth, Broad Cove Rd./
Saltspray Ln.*

South Berwick/York, Mountain Rd.

Scarborough, Black Point Rd.

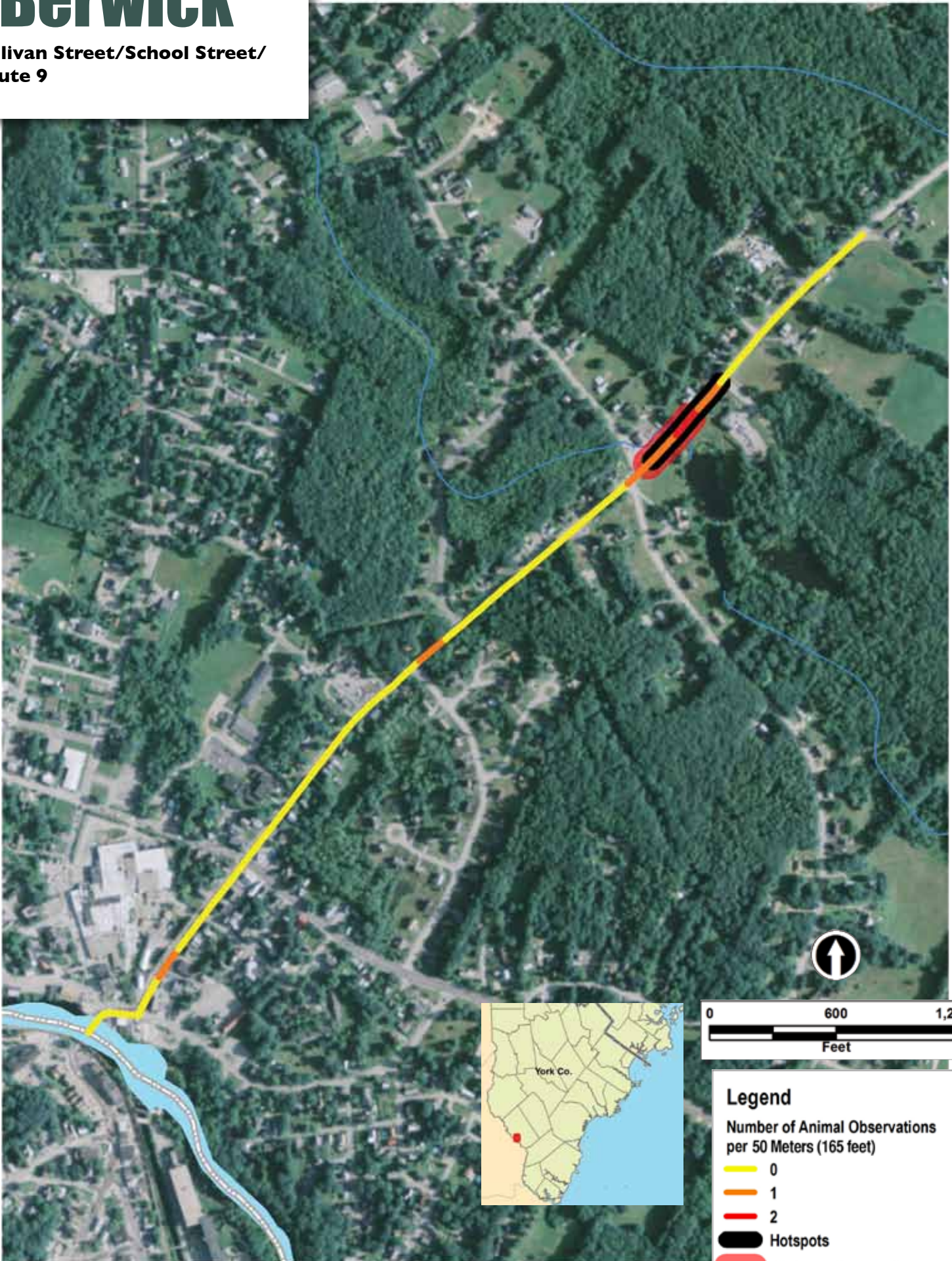
South Berwick, Wichtrot Rd.

Endangered Species Road Watch Routes



Berwick

Sullivan Street/School Street/
Route 9










Sanford

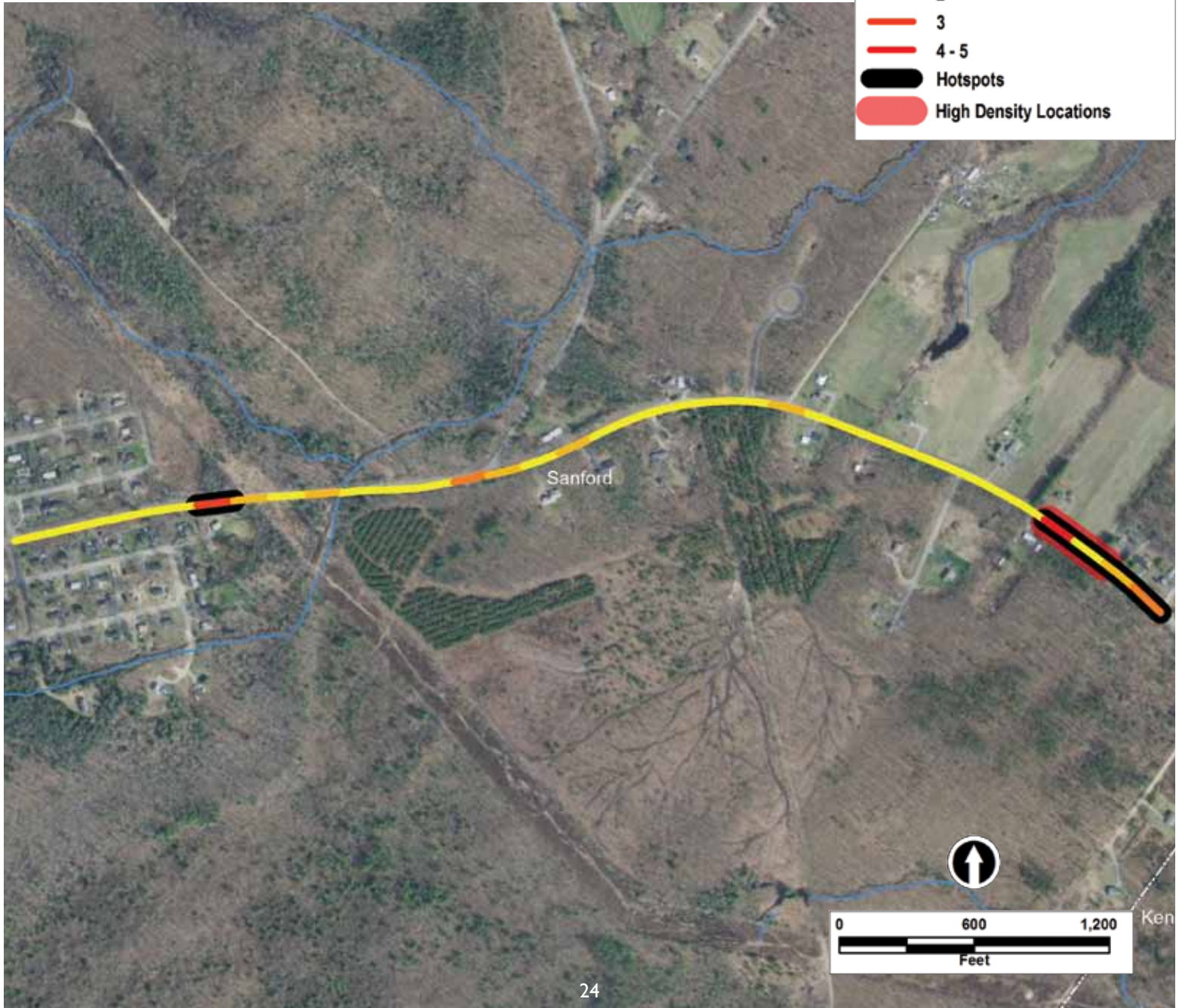
Kennebunk Road



Legend

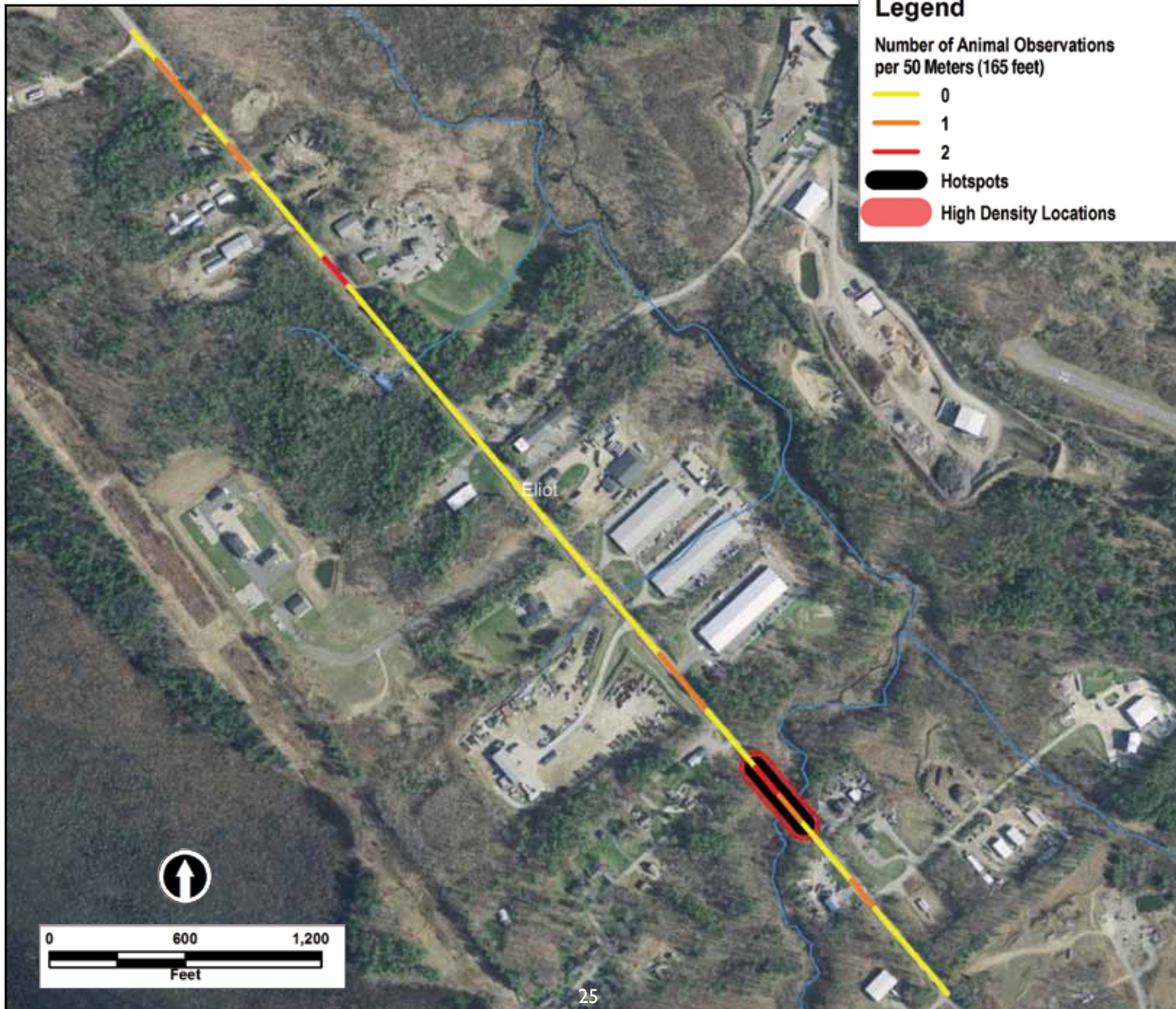
Number of Animal Observations per 50 Meters (165 feet)

-  0
-  1
-  2
-  3
-  4 - 5
-  Hotspots
-  High Density Locations



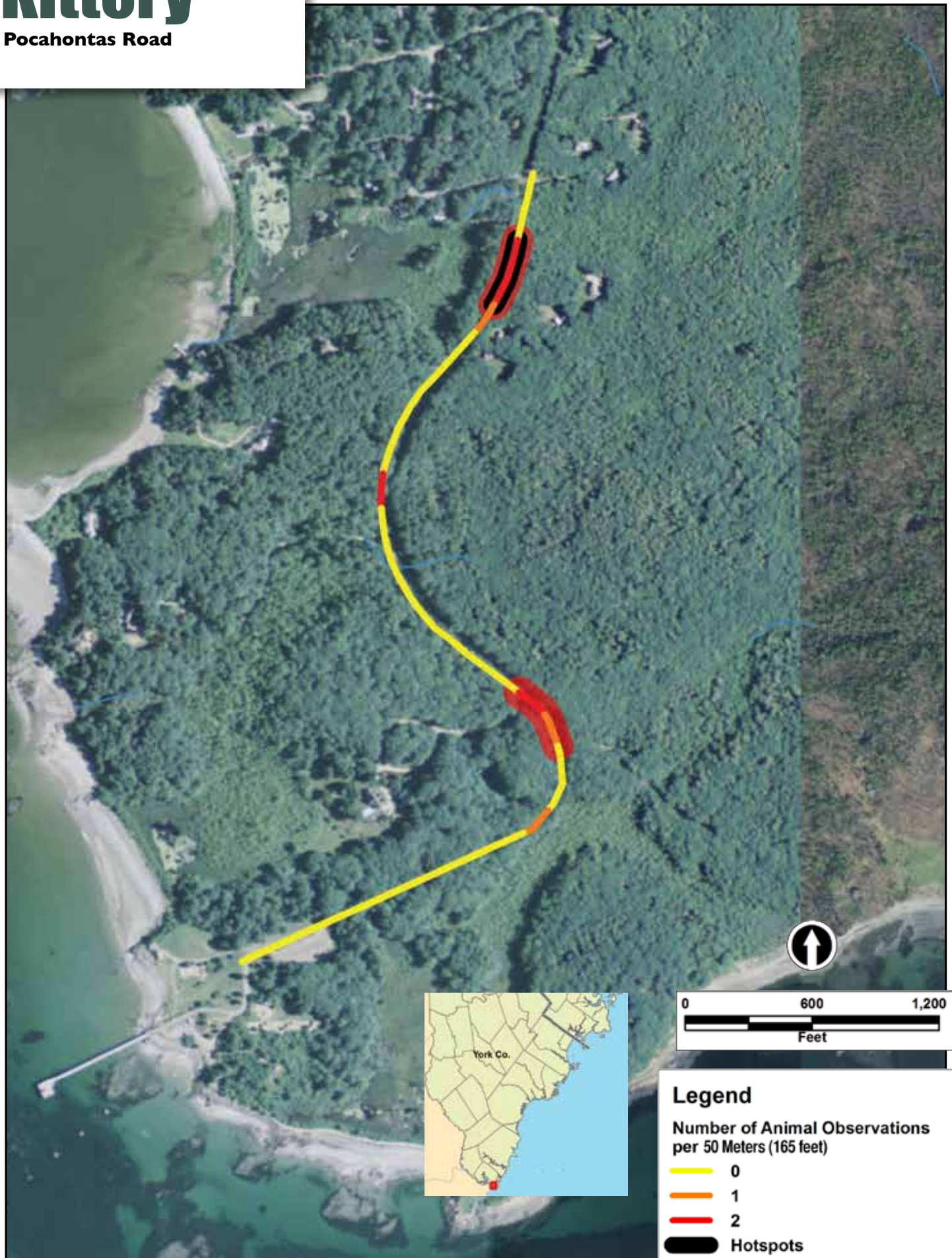
Eliot

Harold L. Dow Highway



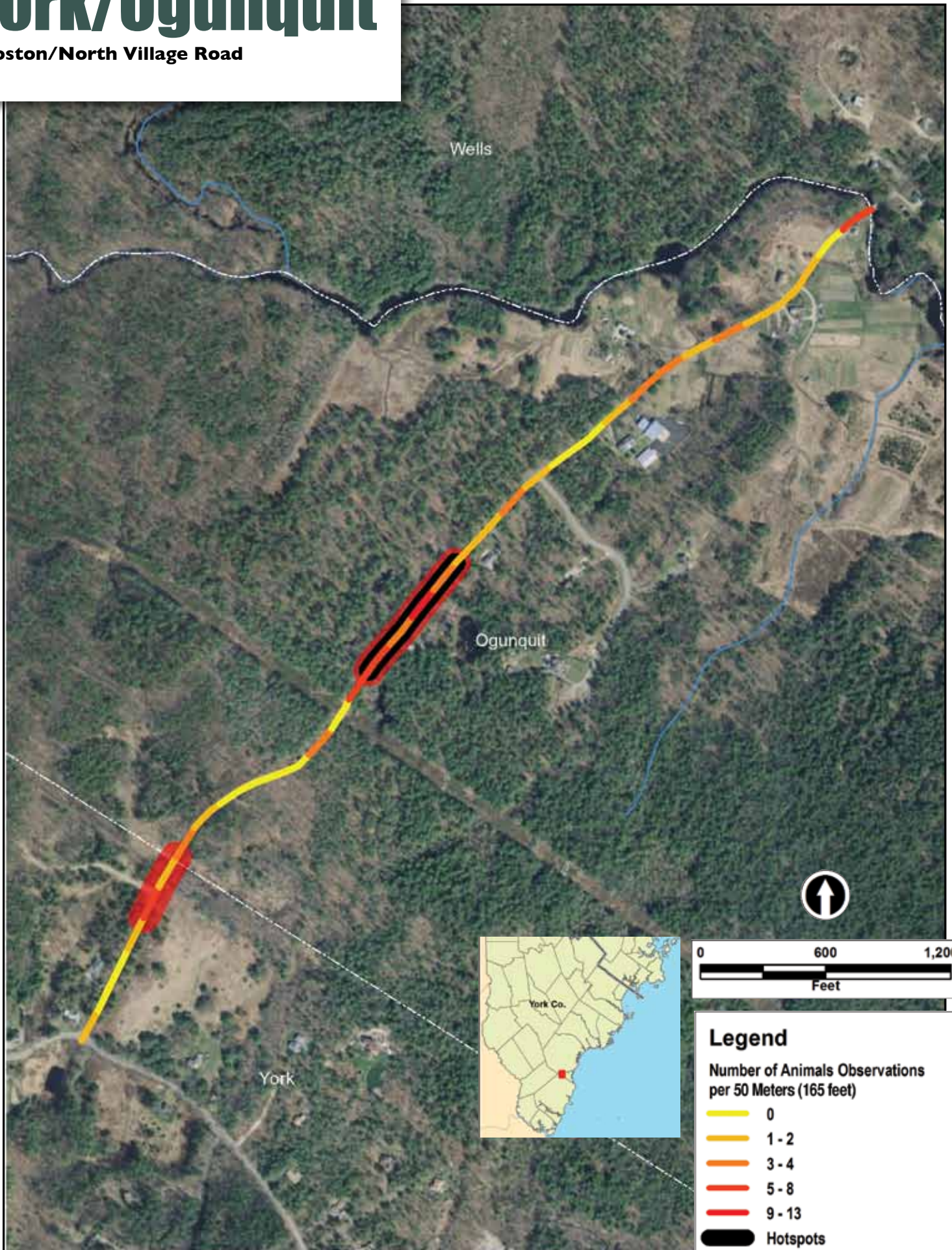
Kittery

Pocahontas Road



York/Ogunquit

Boston/North Village Road









N. Berwick

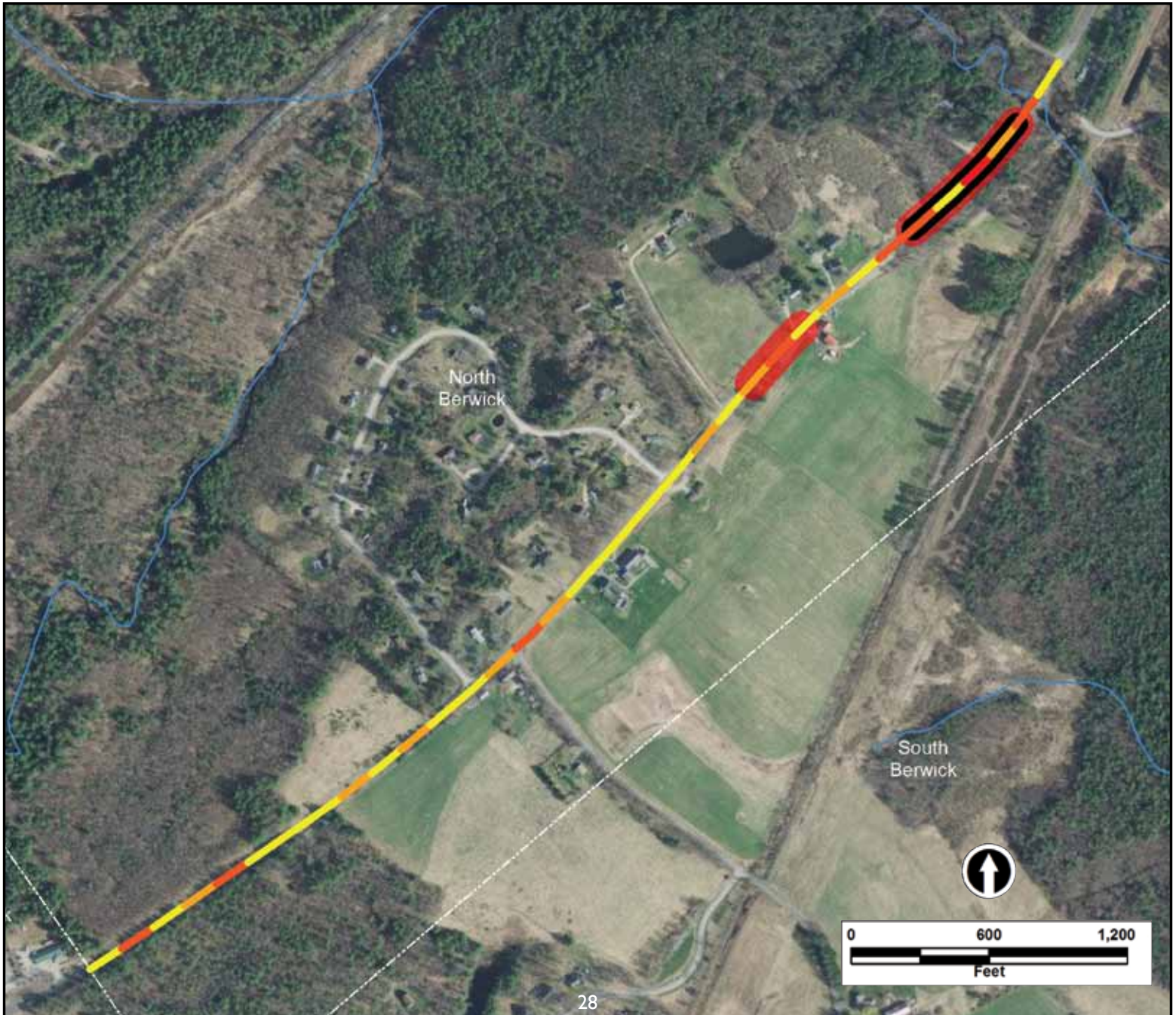
Elm Street



Legend

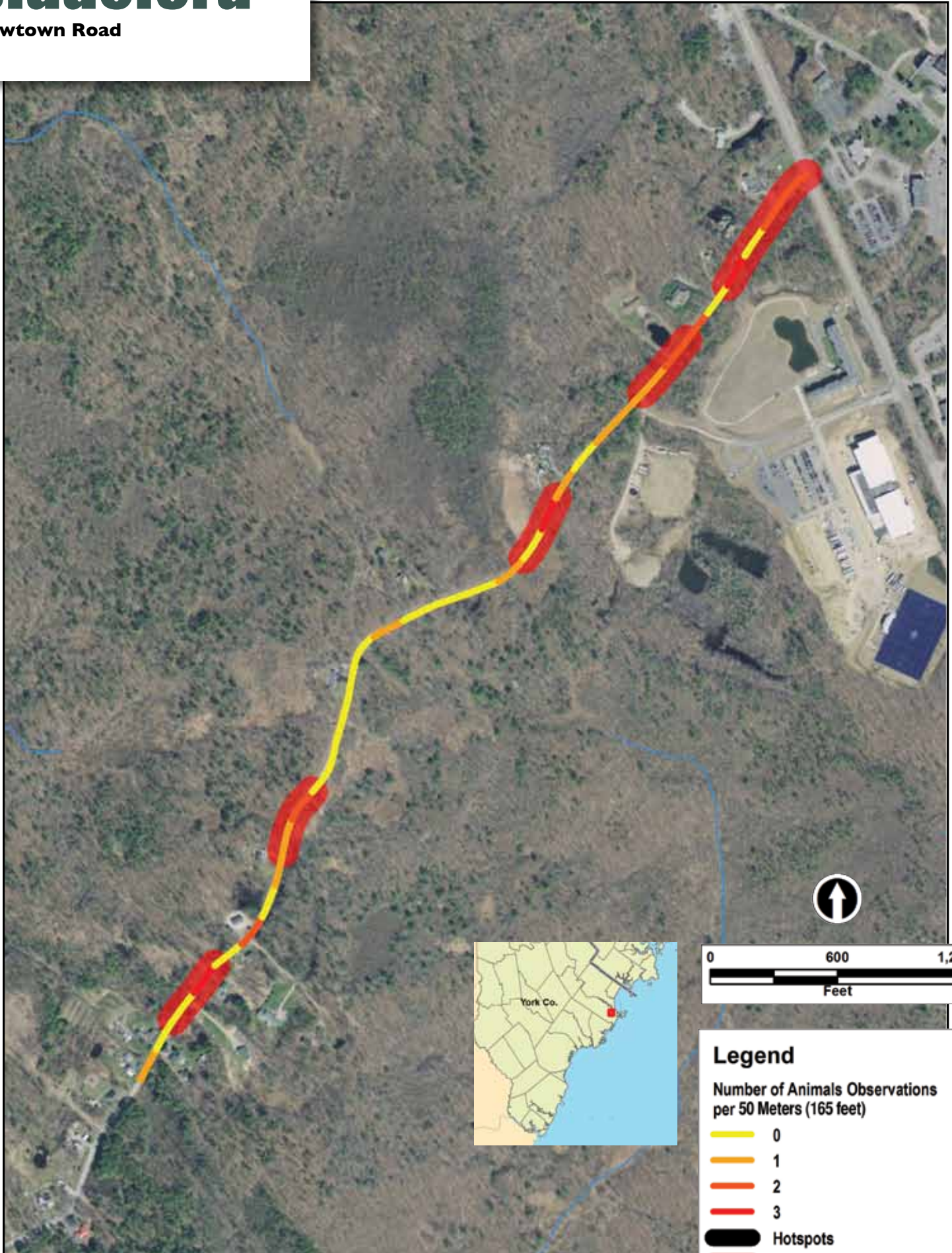
Number of Animals Observed per 50 Meters (165 feet)

-  0
-  1
-  2
-  3
-  Hotspots
-  High Density Locations



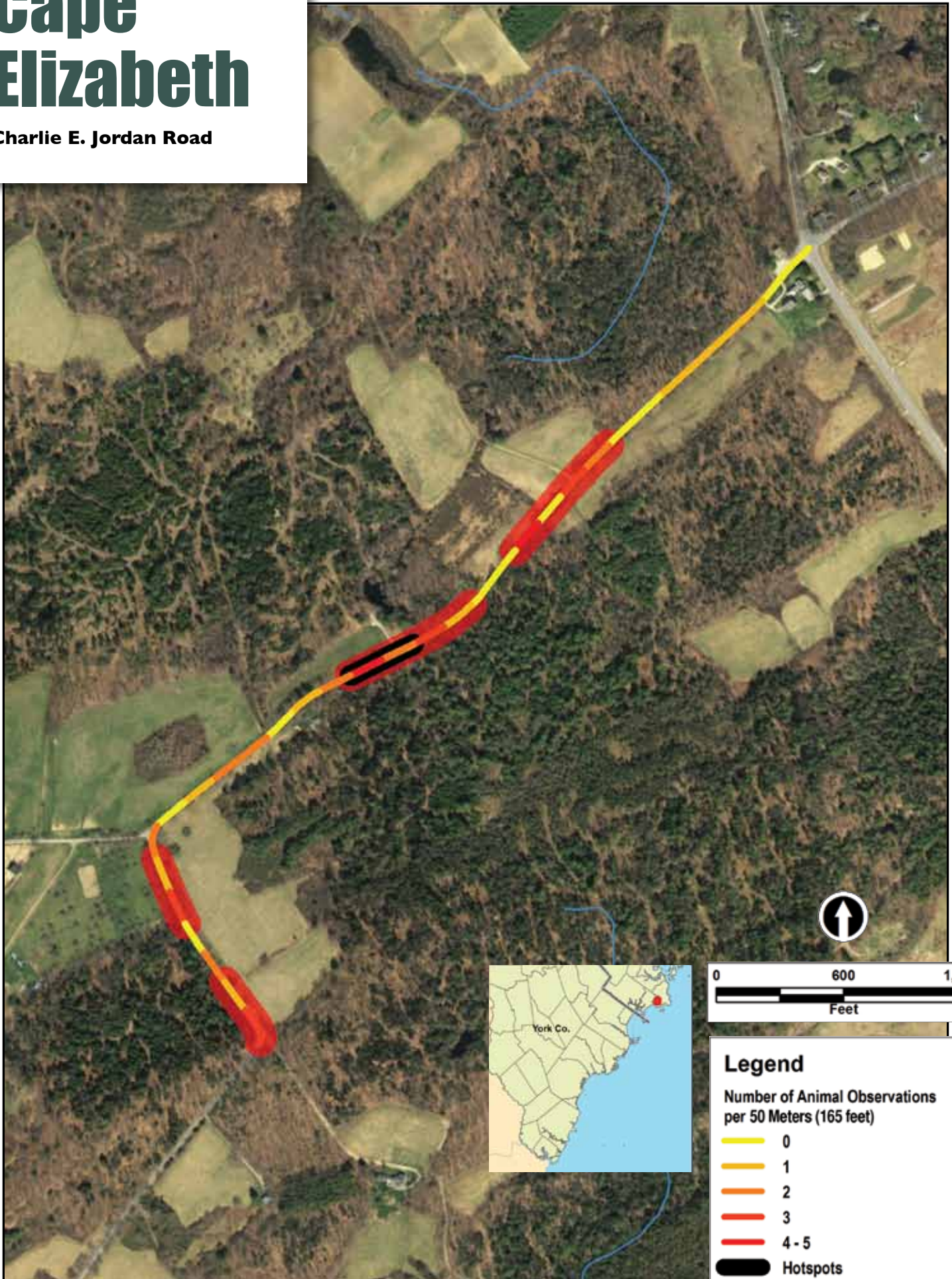
Biddeford

Newtown Road



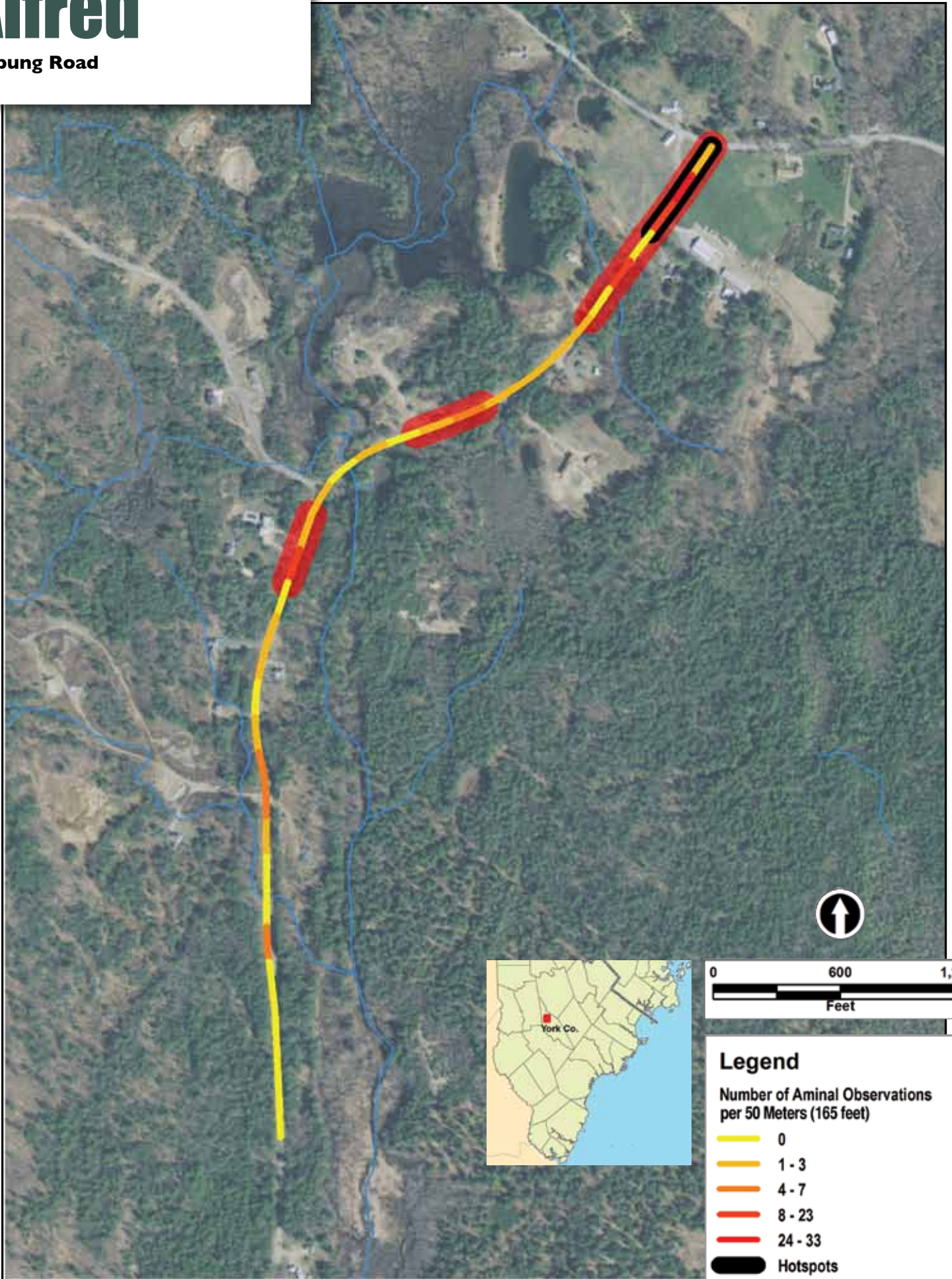
Cape Elizabeth

Charlie E. Jordan Road



Alfred

Gebung Road










York

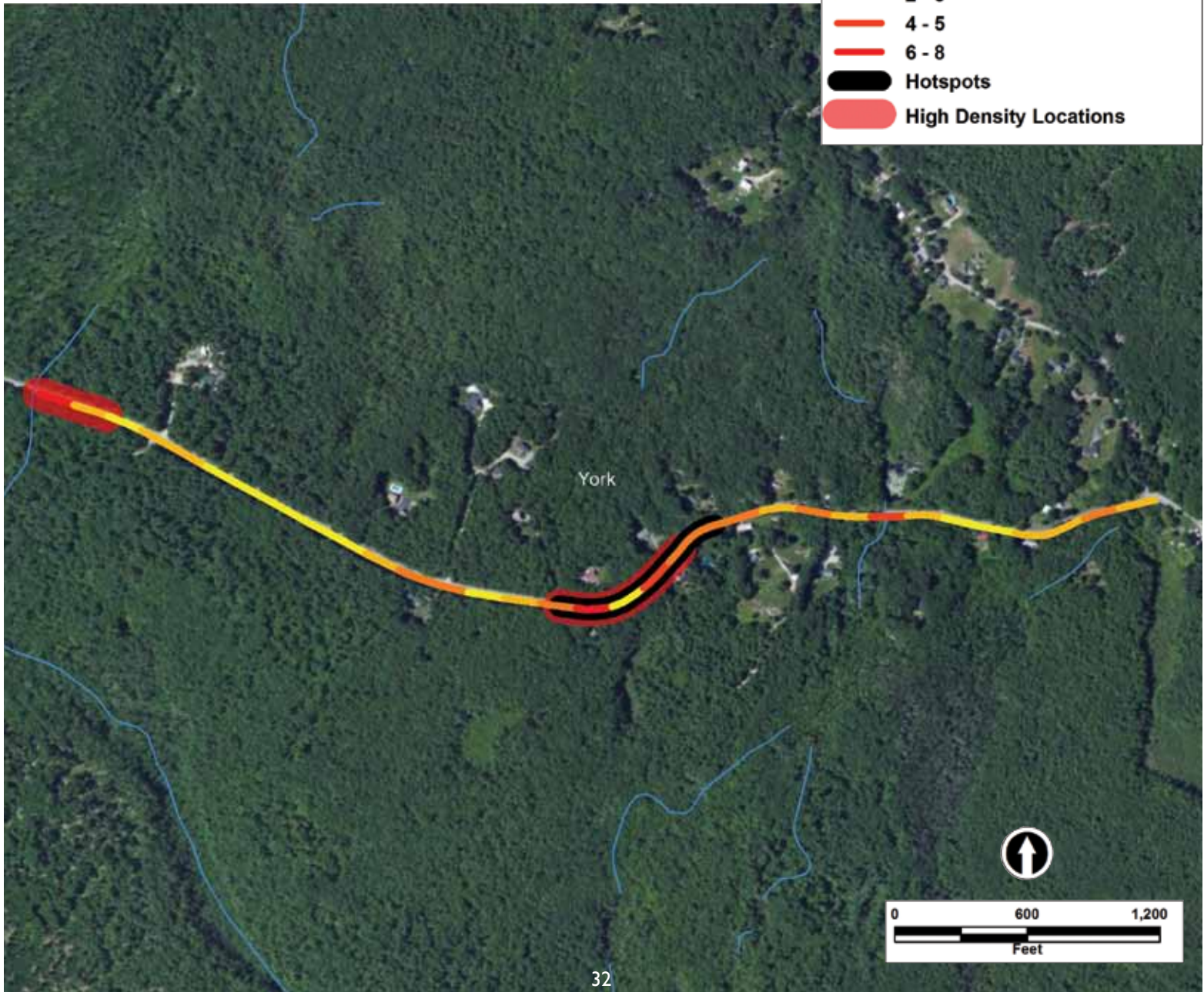
Mountain Road



Legend

Number of Animal Observations
per 50 Meters (165 feet)

-  0
-  1
-  2 - 3
-  4 - 5
-  6 - 8
-  Hotspots
-  High Density Locations










York

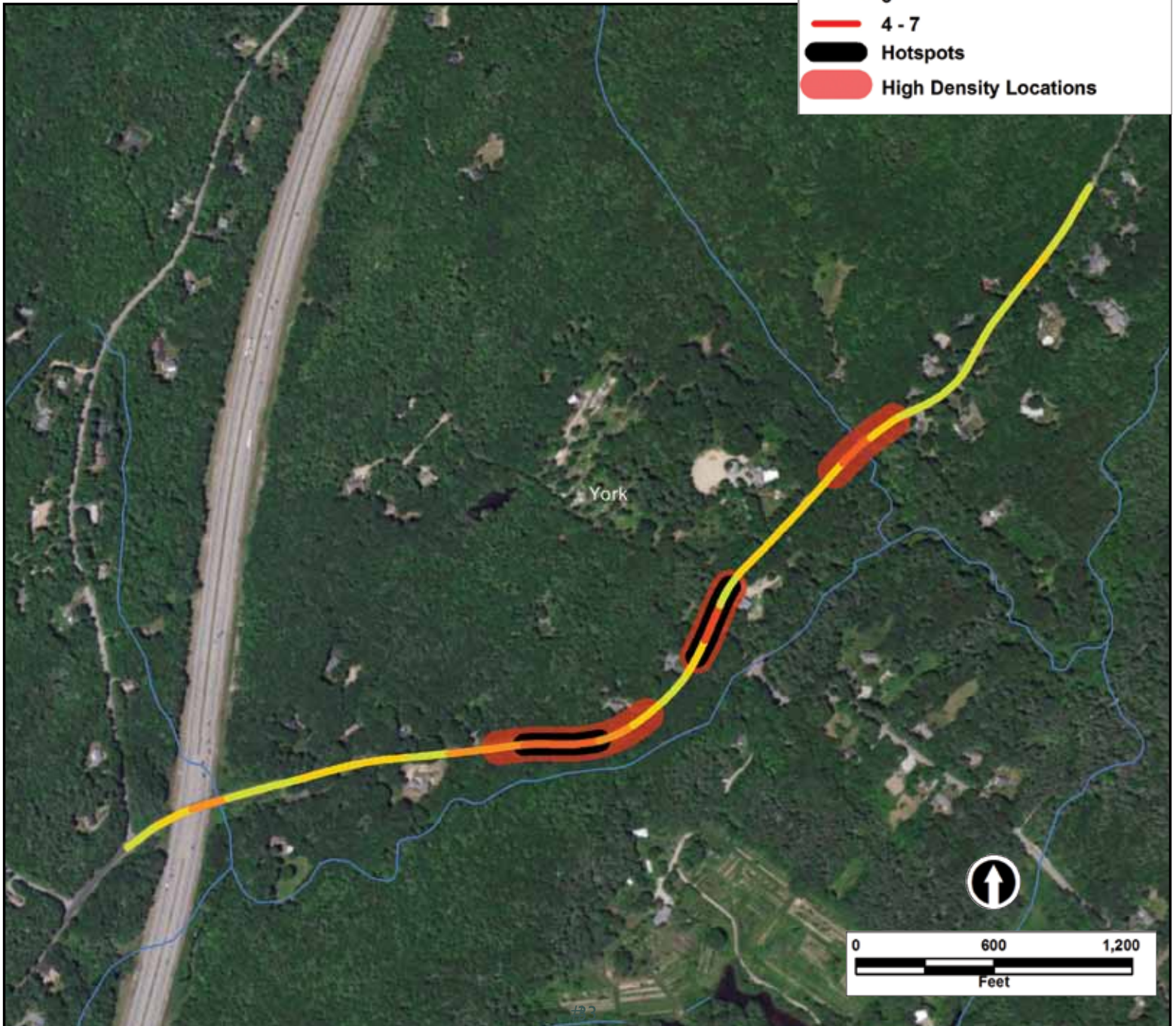
Clay Hill Road



Legend

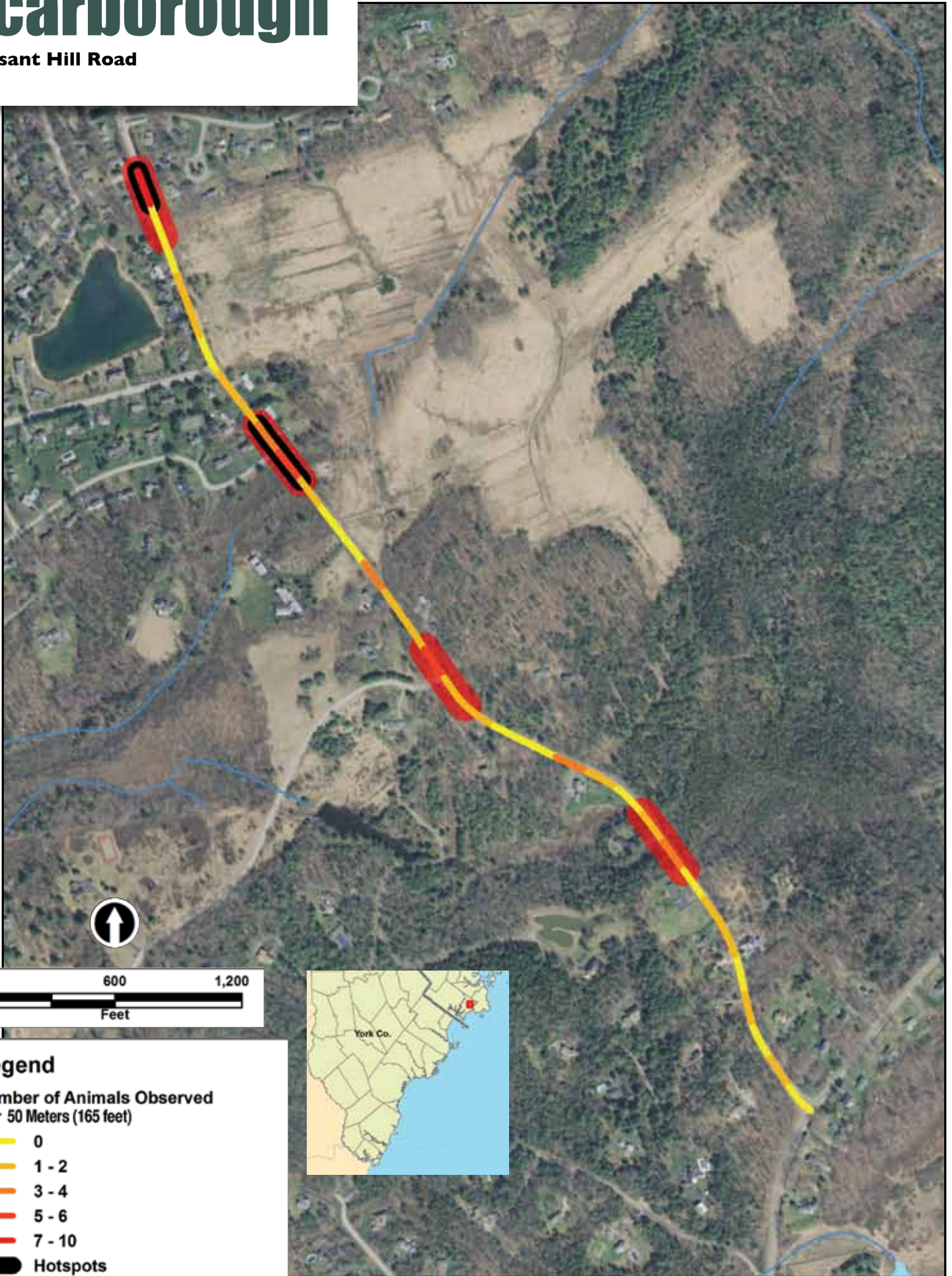
Number of Animal Observations
per 50 Meters (165 feet)

-  0
-  1
-  2
-  3
-  4 - 7
-  Hotspots
-  High Density Locations



Scarborough

Pleasant Hill Road



The Author

Barbara Charry, Maine Audubon Conservation Biologist/GIS Manager, works on minimizing the impacts of sprawl and development on Maine's wildlife, including the impact of roads and traffic. Under Barbara's leadership, Maine Audubon convened the first-ever state-wide conference on road ecology in Maine. She has also presented at the International Conference on Ecology and Transportation. She has written several guides for land use decision makers and community members on the impacts of development on wildlife including a community conservation guide, "Conserving Wildlife On and Around Maine Roads". She may be reached at bcharry@maineaudubon.org or (207)781-2330 ext. 225.



Acknowledgements

Thank you to all the volunteers who have kept their eyes peeled while out driving or walking along the Maine roads and recorded all their sightings onto the website. Your cumulative work is invaluable. A special thank you to Dr. Fraser Shilling, UC Davis California, for making it possible for Maine to become the second state in the country to have a statewide wildlife-road reporting system modeled on the California program, as well as for his generous time and expertise guiding analysis of the data and many other questions along the way. Thank you to Dr. Dave Waetjin, UC Davis California, for his technical expertise in developing the website on a shoestring and making endless modifications to customize it for Maine with patience and good humor. Thank you to Richard Bostwick, Maine Department of Transportation, Jonathan Mays, Maine Inland Fisheries and Wildlife (now in Florida), and Susan Gallo, Maine Audubon for your guidance developing this citizen science program. Funding from Toyota Together Green, the TransWild Alliance and the Maine Outdoor Heritage Fund provided essential support in making this project possible.

Between the project start in mid-2010 through the end of December 2014, over 460 volunteers have recorded over 4800 observations.



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Conserving Maine's wildlife.

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