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A collaborative policy analysis of a proposed vernal pool regulatory mechanism

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University of Maine

Policy background

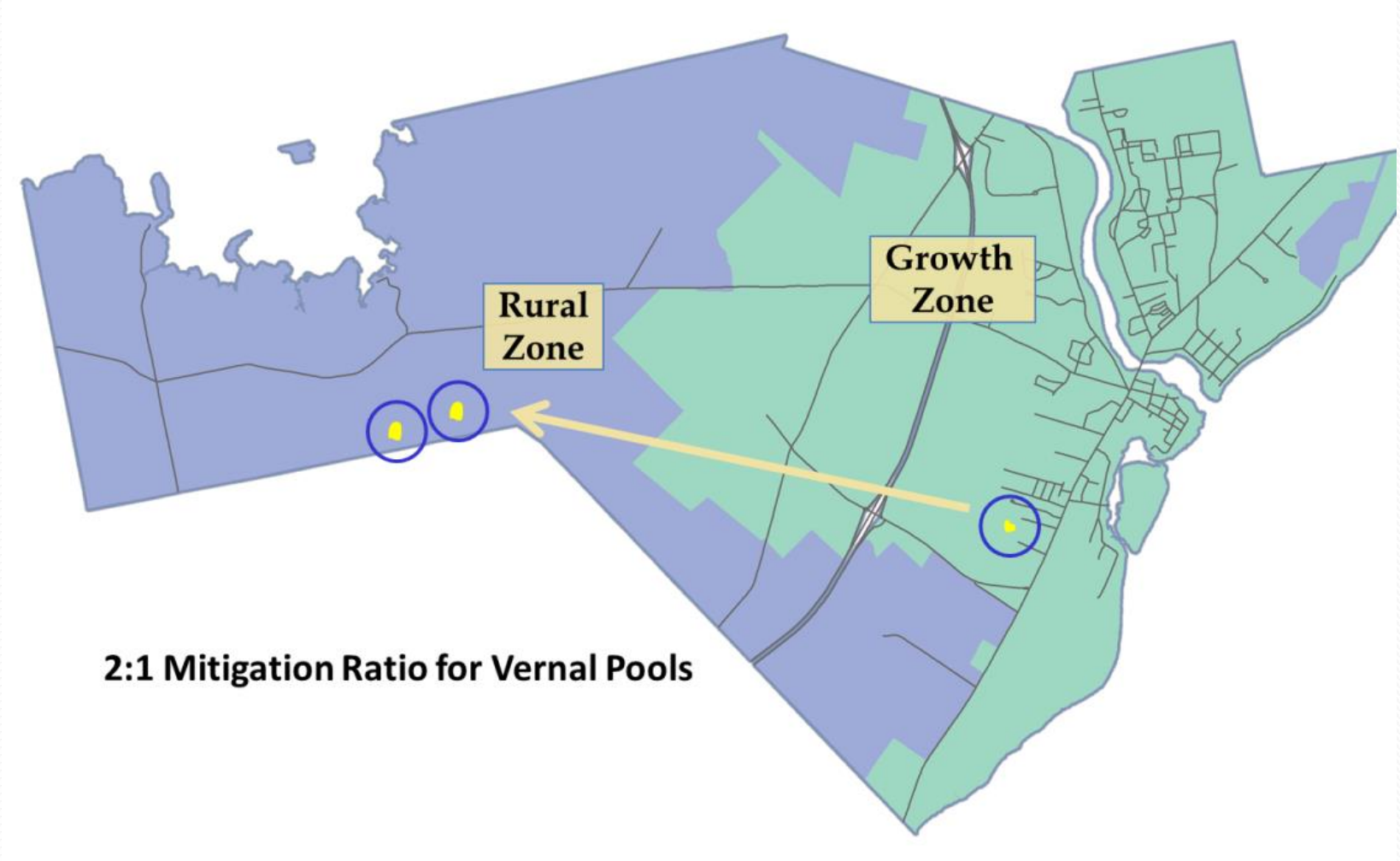
- Existing policy
  - State: Natural Resource Protection Act
  - Federal: Clean Water Act

Policy background

- Existing policy
  - State: Natural Resource Protection Act
  - Federal: Clean Water Act

- Effort to develop new mechanism
  - 4 years of stakeholder engagement: ongoing
  - Town-tailored, market-based mechanism

Proposed market-based mechanism



Research Questions

1. What are the relative costs and benefits of the proposed mechanism compared to existing policies?

2. What can this analysis tell us about the strengths and limitations of various tools for protecting habitat on private land?

3. How does collaborative research impact the questions asked and the use of results?

- Simulate existing and proposed policies using data from Orono and Topsham
  - Uncertain futures (what parcels develop, how much are properties worth, where will there be housing demand, which landowners will conserve?)
  - Uncertain landscape conditions (where are VPs located, which are significant, where are other protected resources?)
  - Uncertain policy details (changing ACOE interpretation of CWA, new mechanism in development)

Simulation of Existing VP Policies

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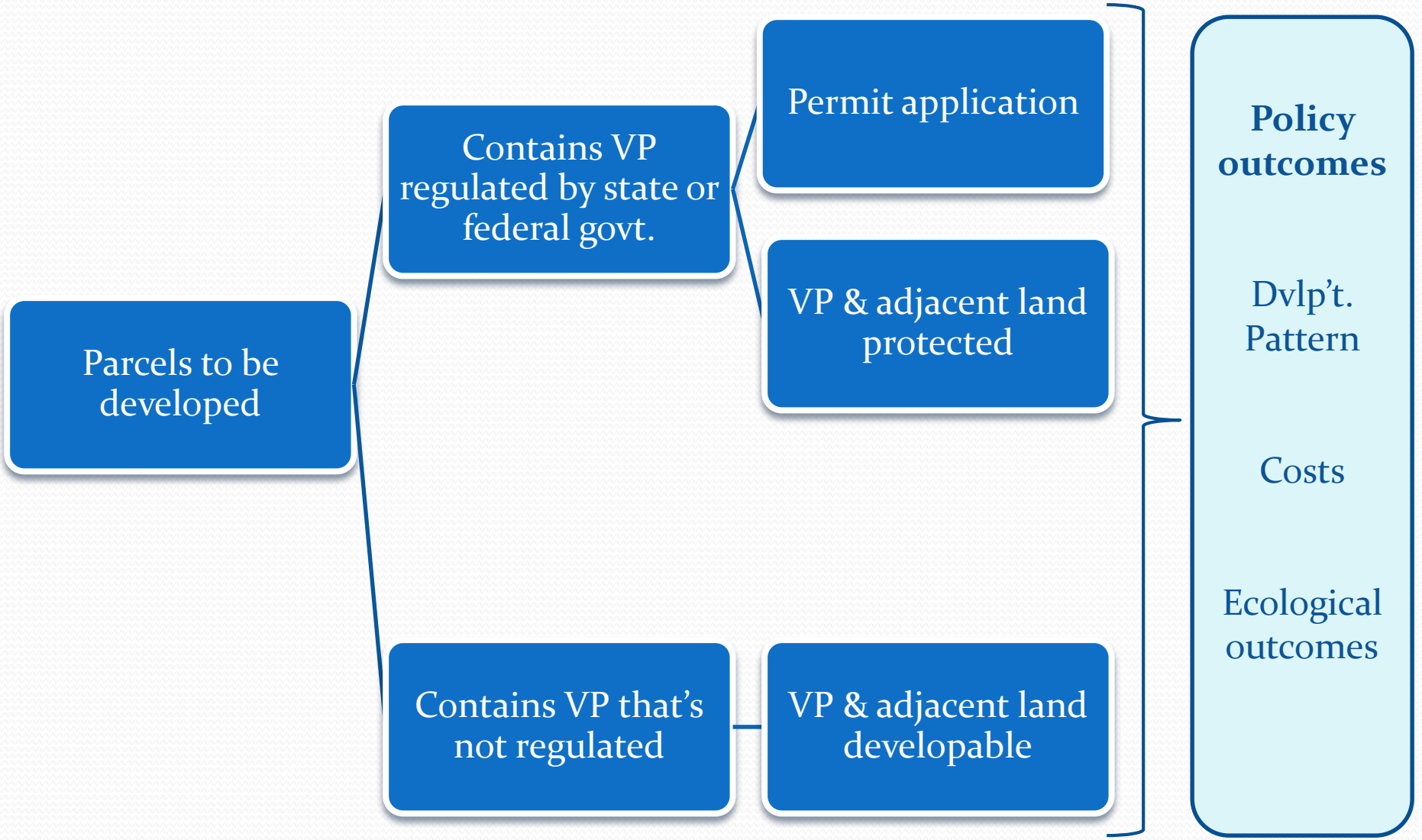

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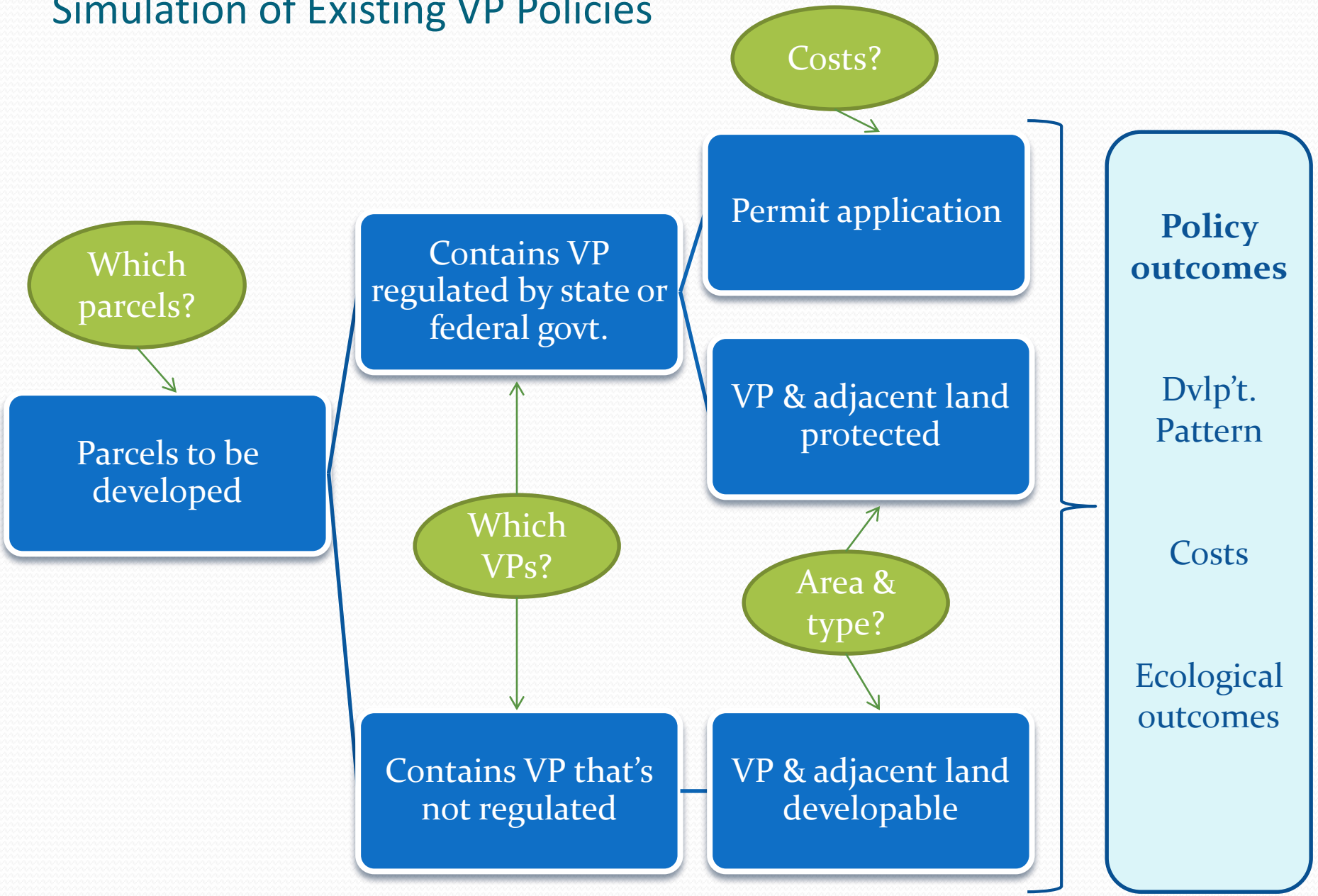

Simulation of Proposed VP Mechanism

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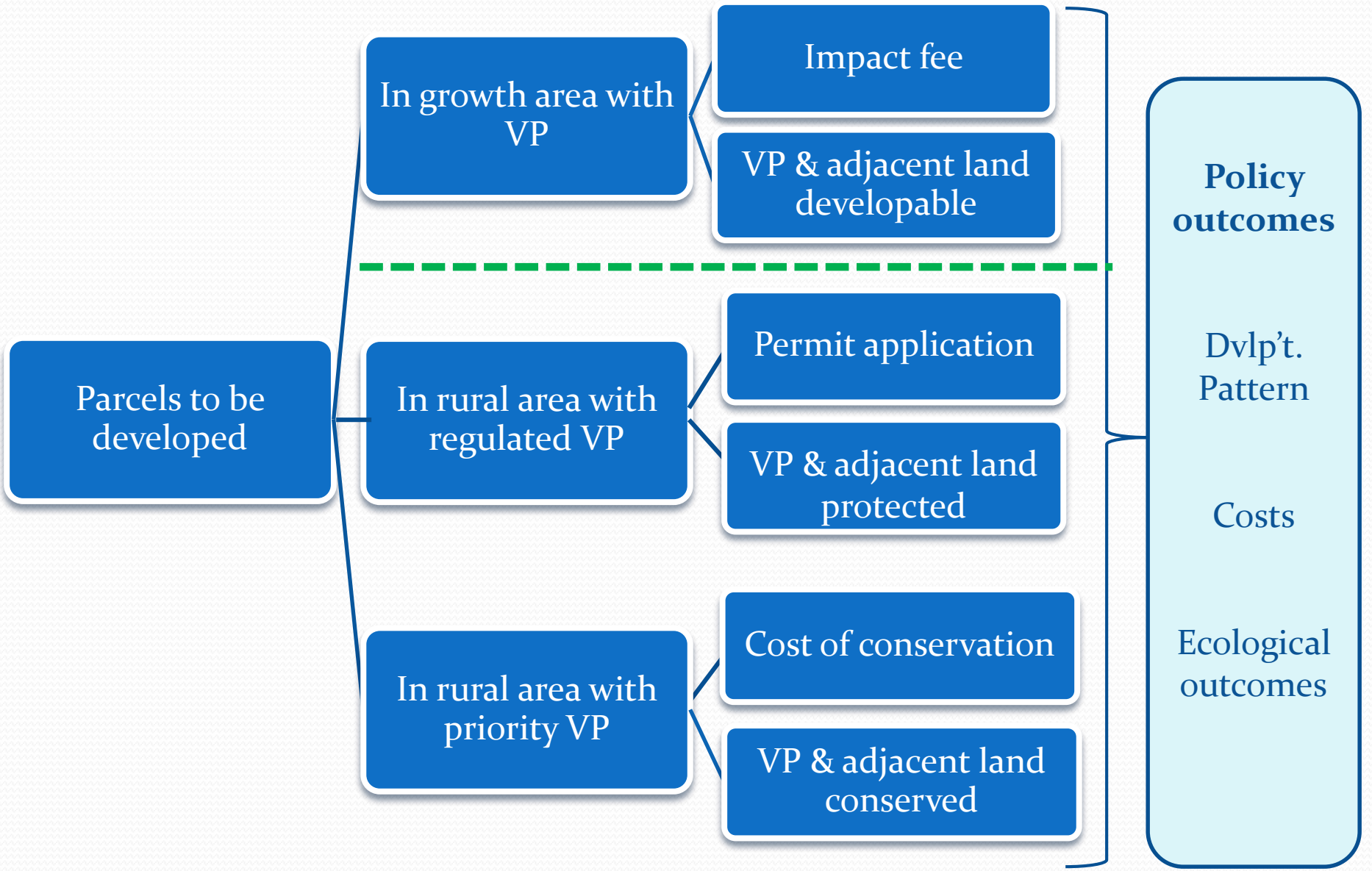

Simulate policies using data from Orono and Topsham

- Compare performance of existing and proposed mechanisms town-wide
  1. How many parcels are regulated?
  2. What is the development potential?
  3. How many VPs are protected?
  4. What type & amount of surrounding habitat is protected?
  5. How much money would be raised with an impact fee?
  6. How much would it cost to conserve required VPs?

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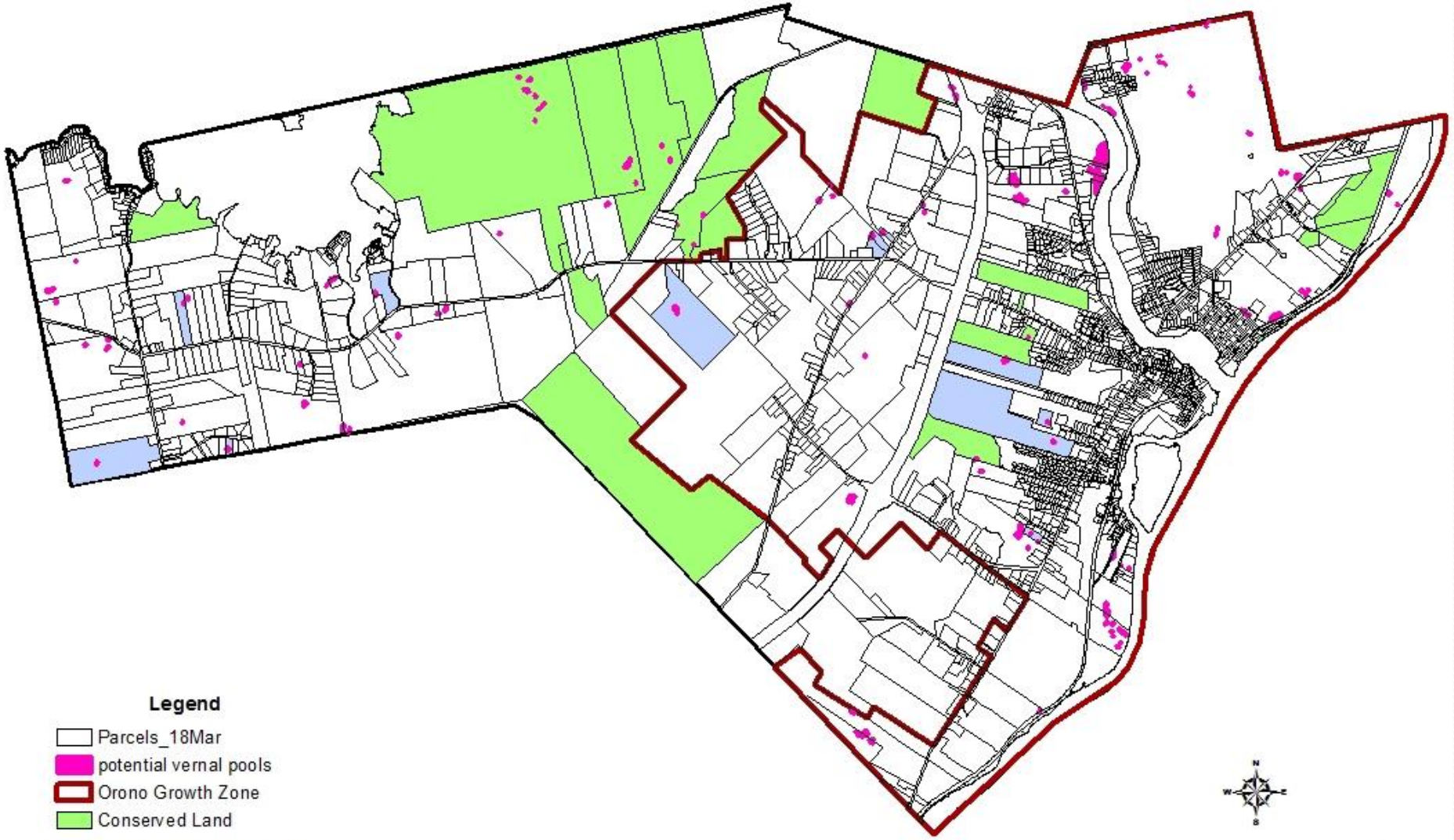
Orono
Vernal pool regulatory landscape



Notes: (1) State regulatory status based on survey and model data
(2) Federal regulatory status dependent upon site-specific development characteristics

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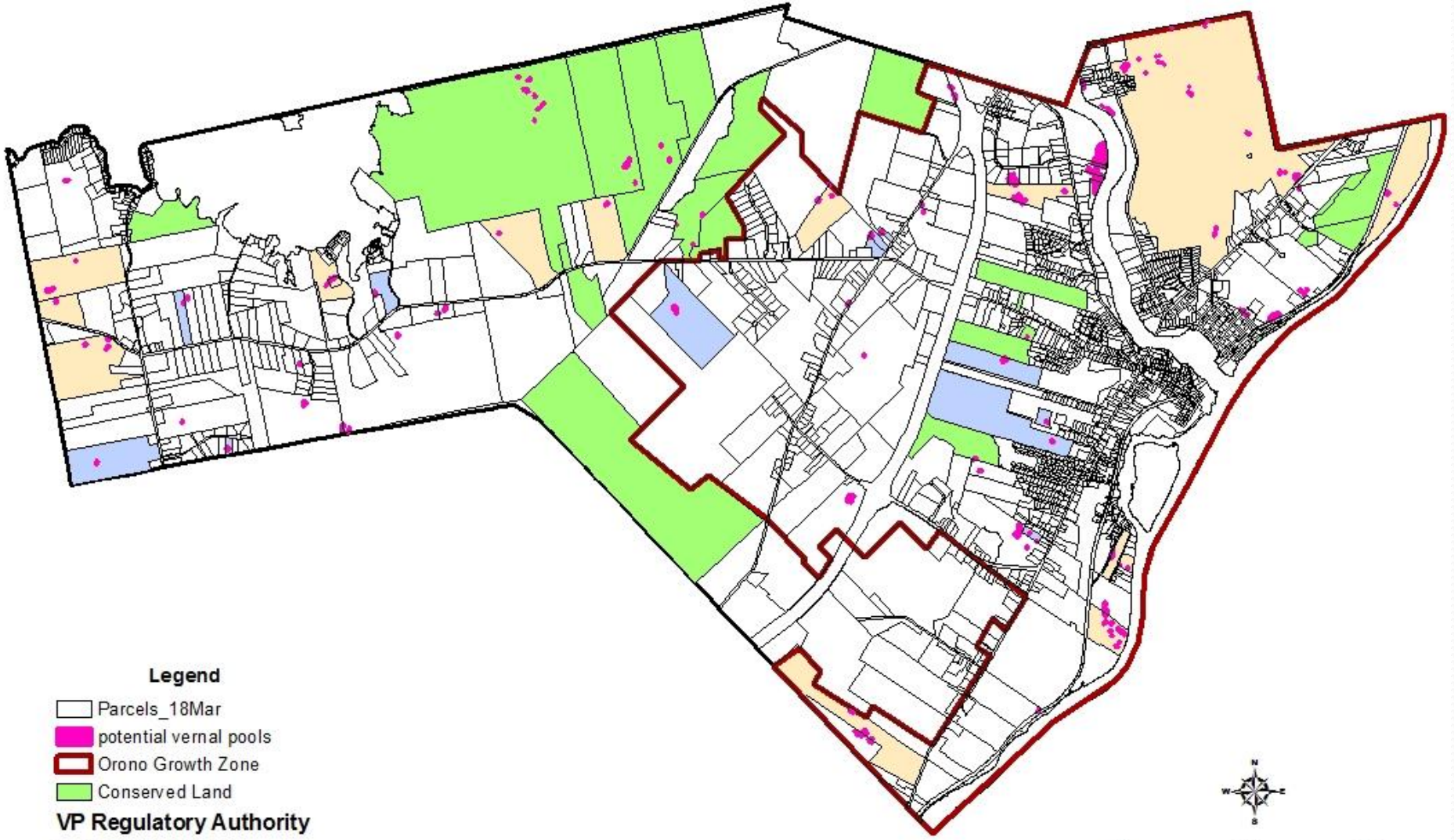

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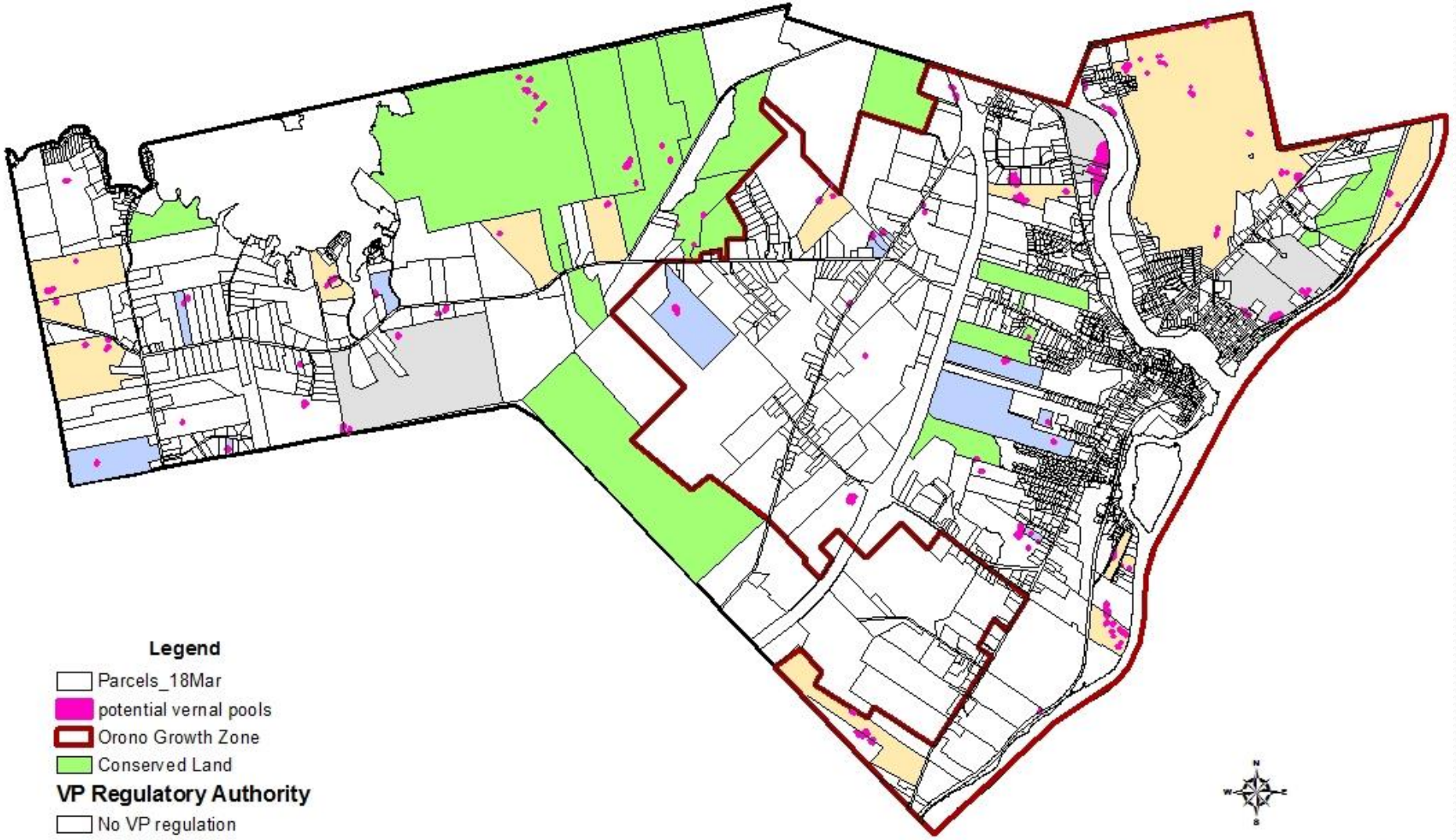

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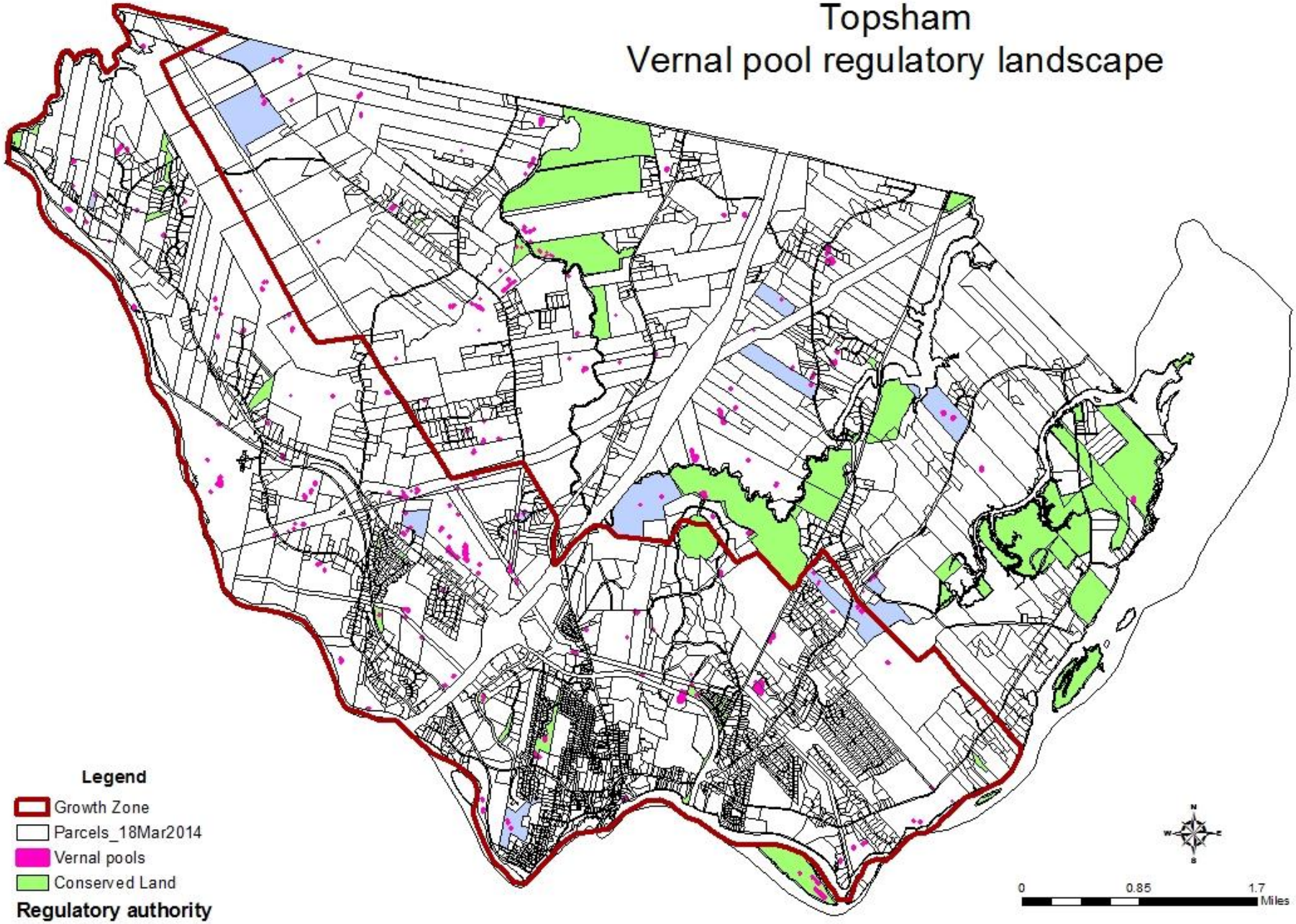
Topsham
Vernal pool regulatory landscape



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Topsham
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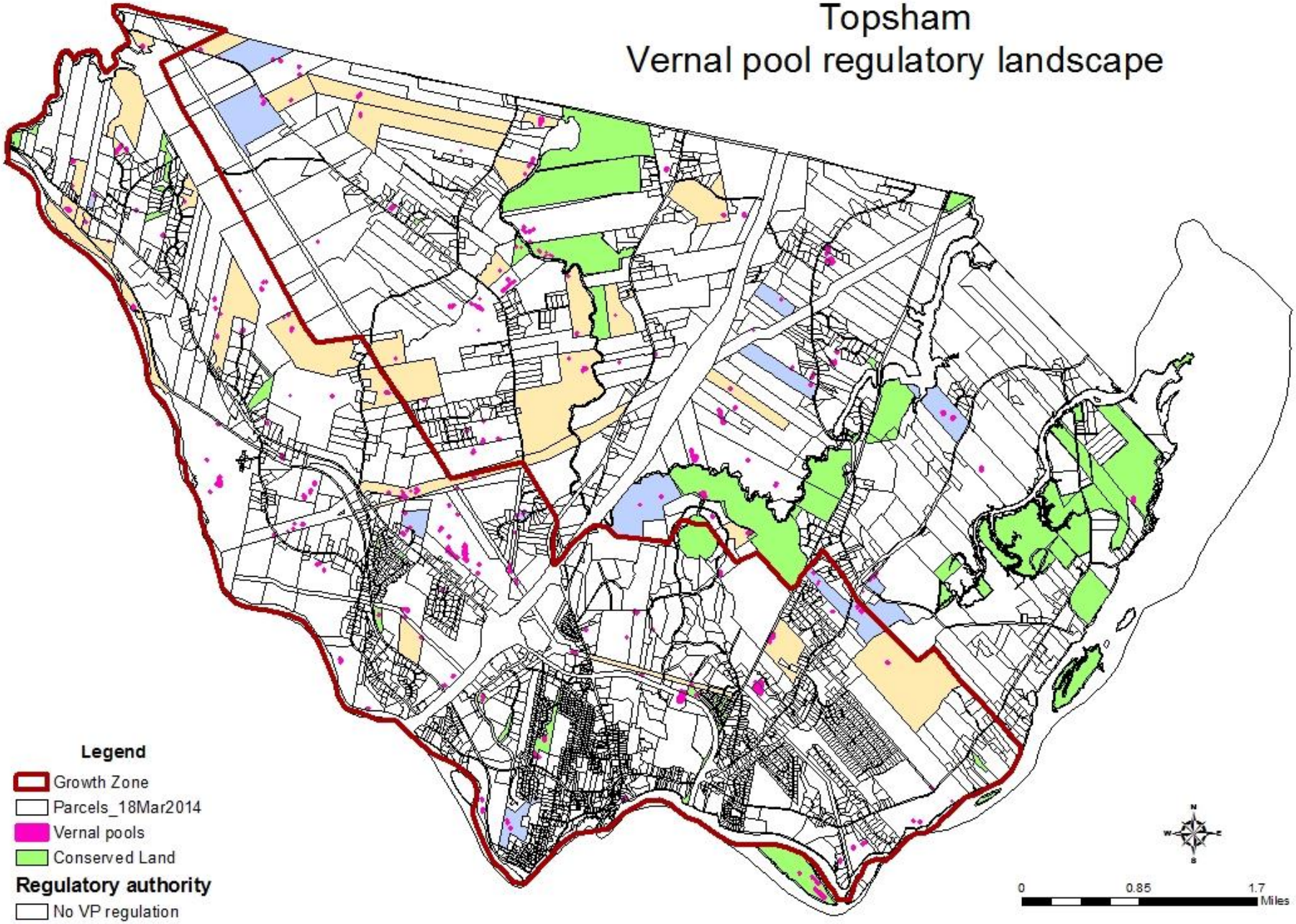

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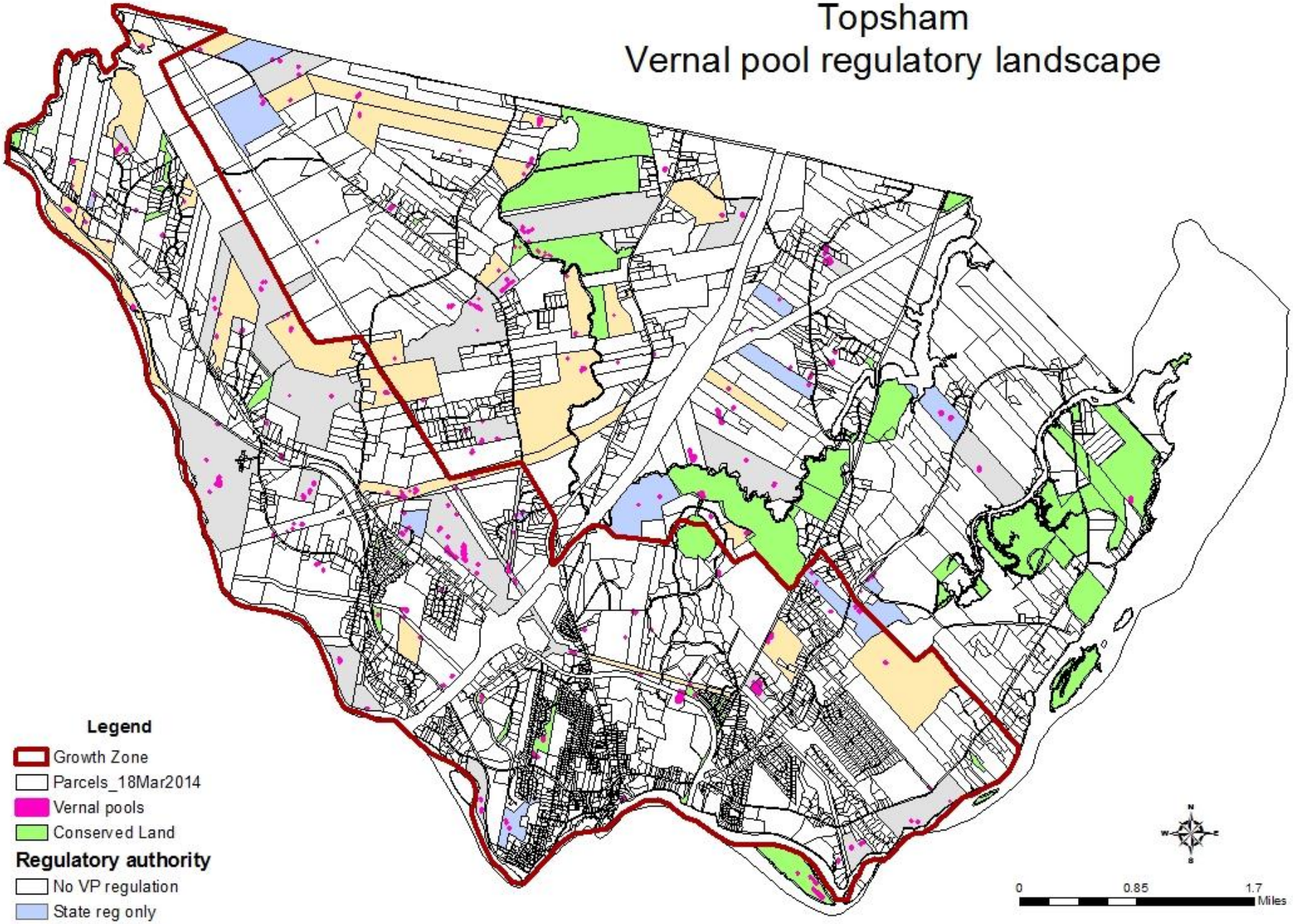

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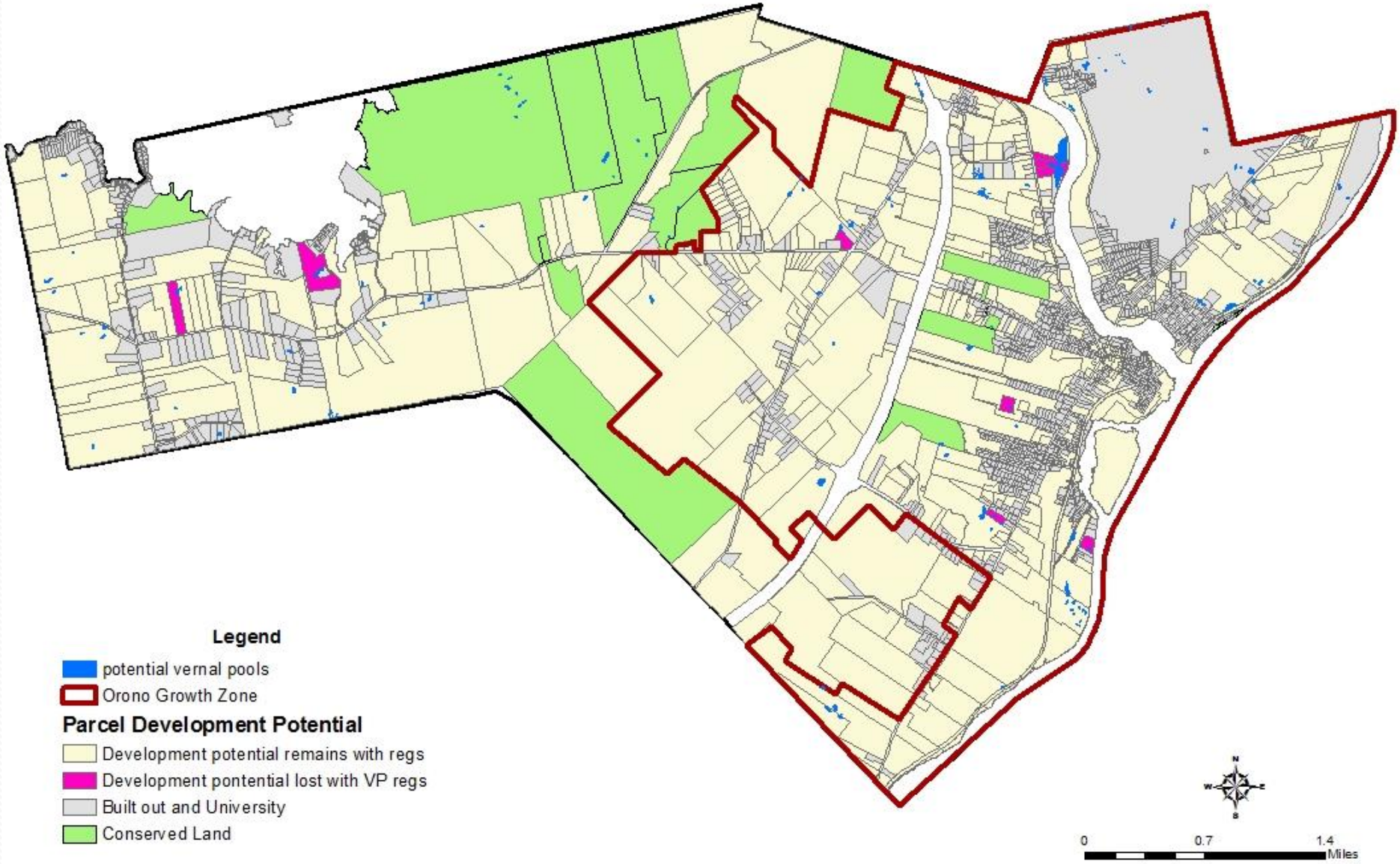
Orono
Loss of Development Potential Due to Vernal Pool Regualtions



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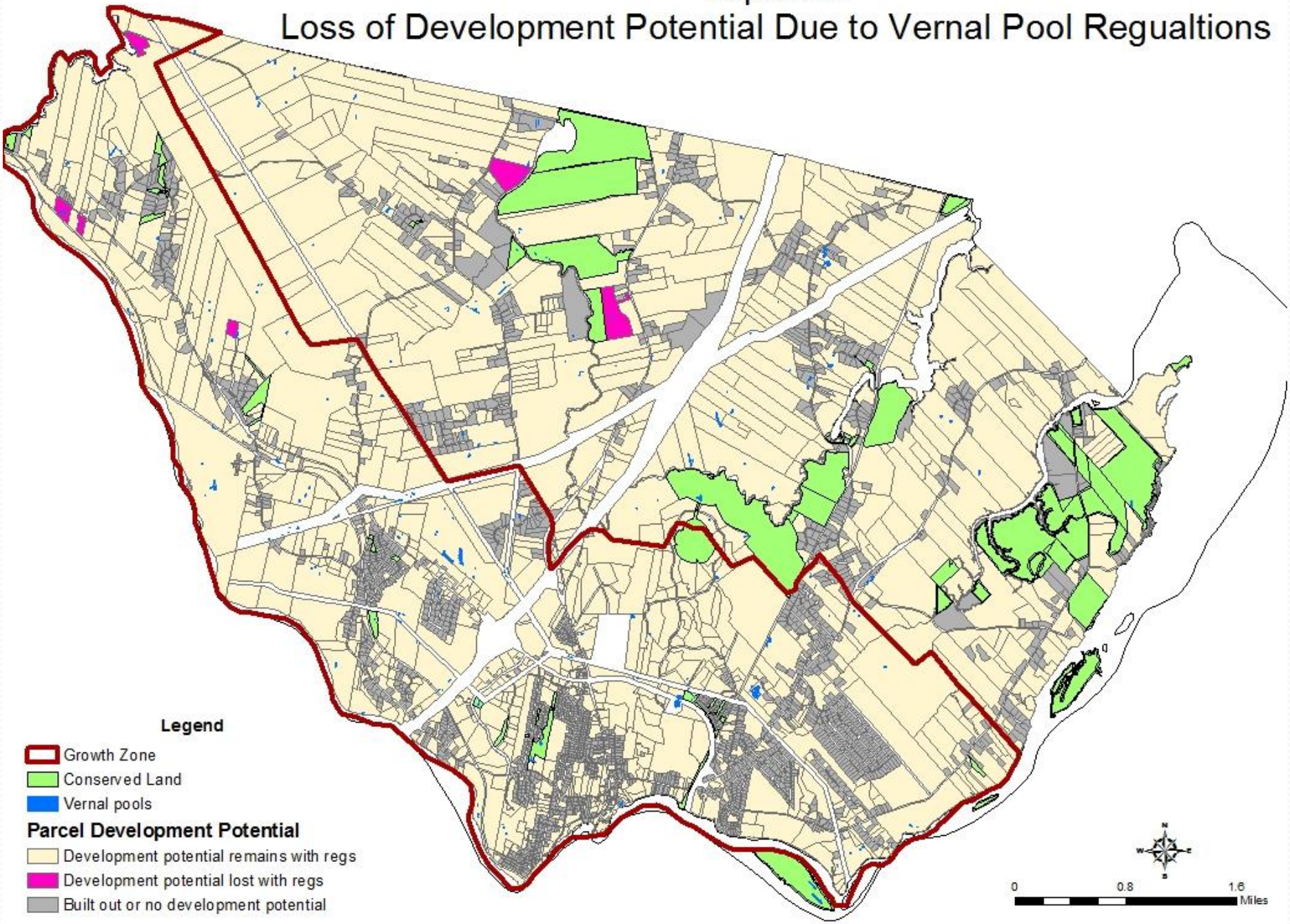

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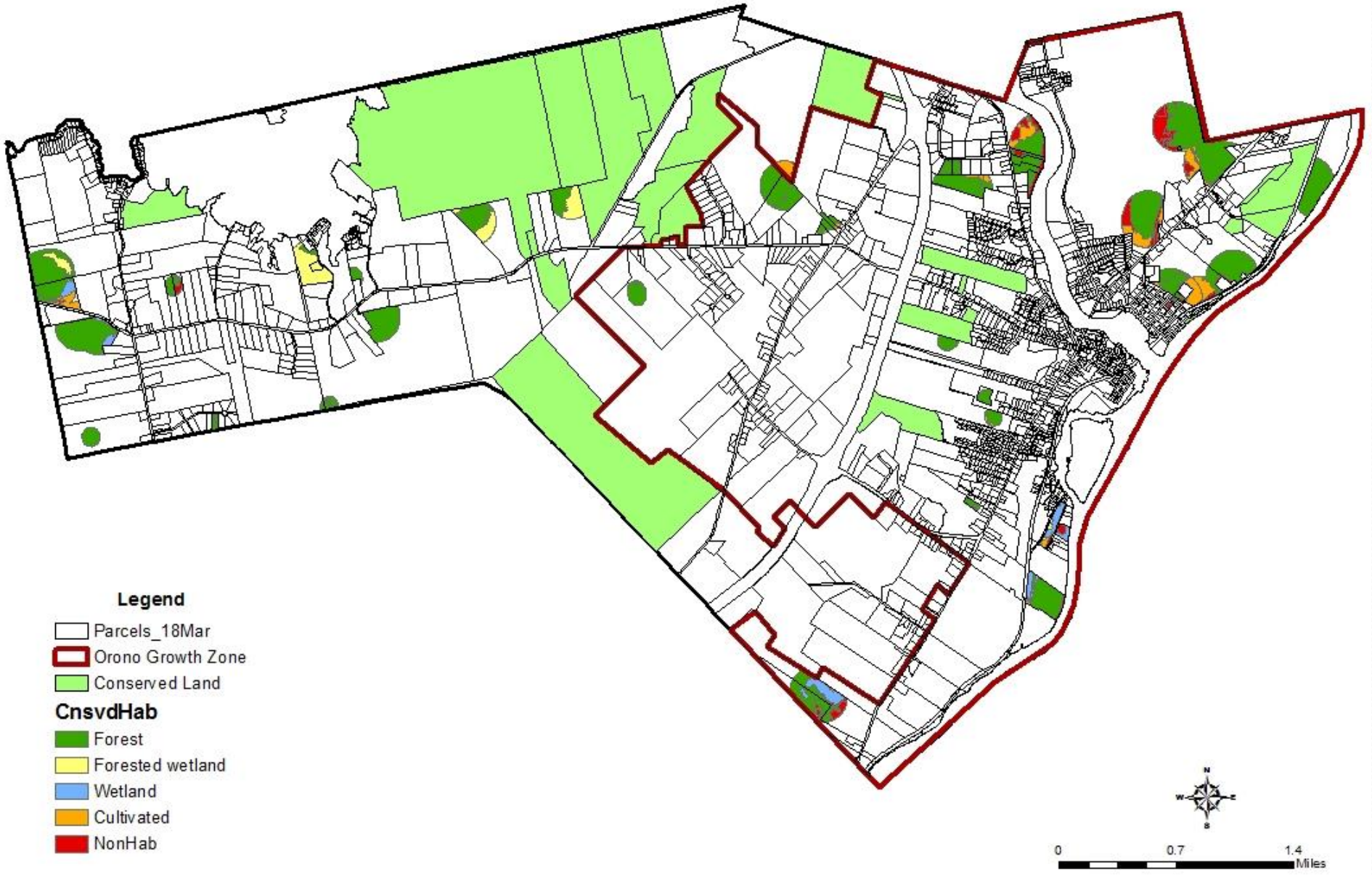
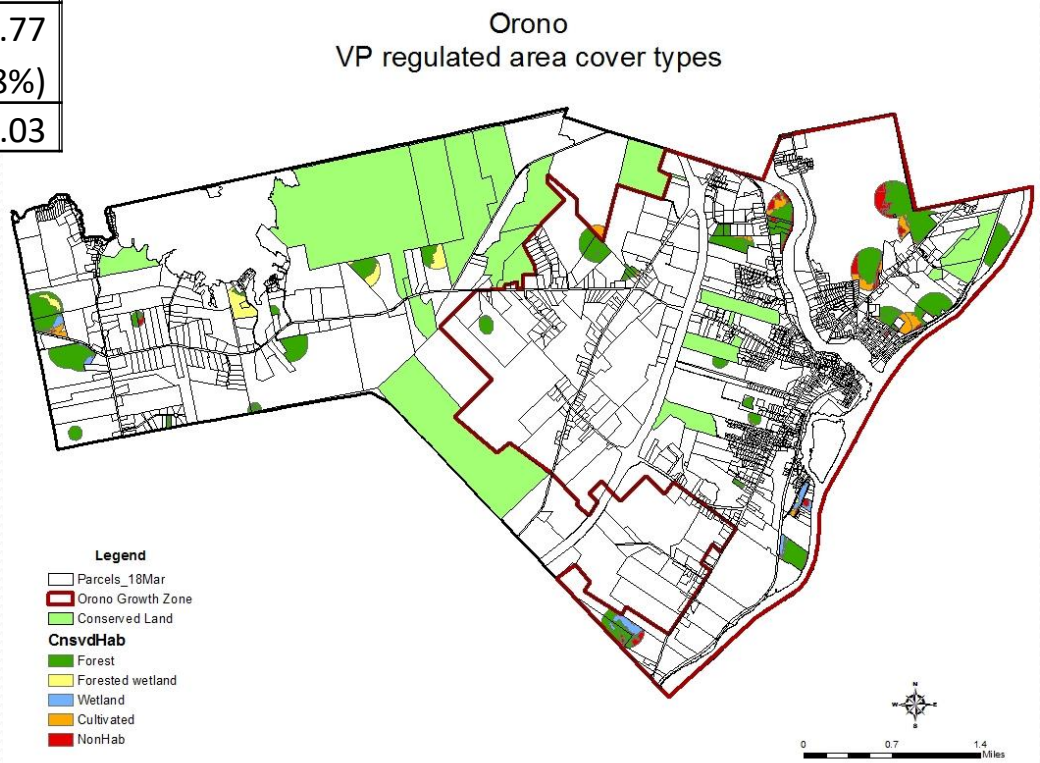
Orono
VP regulated area cover types

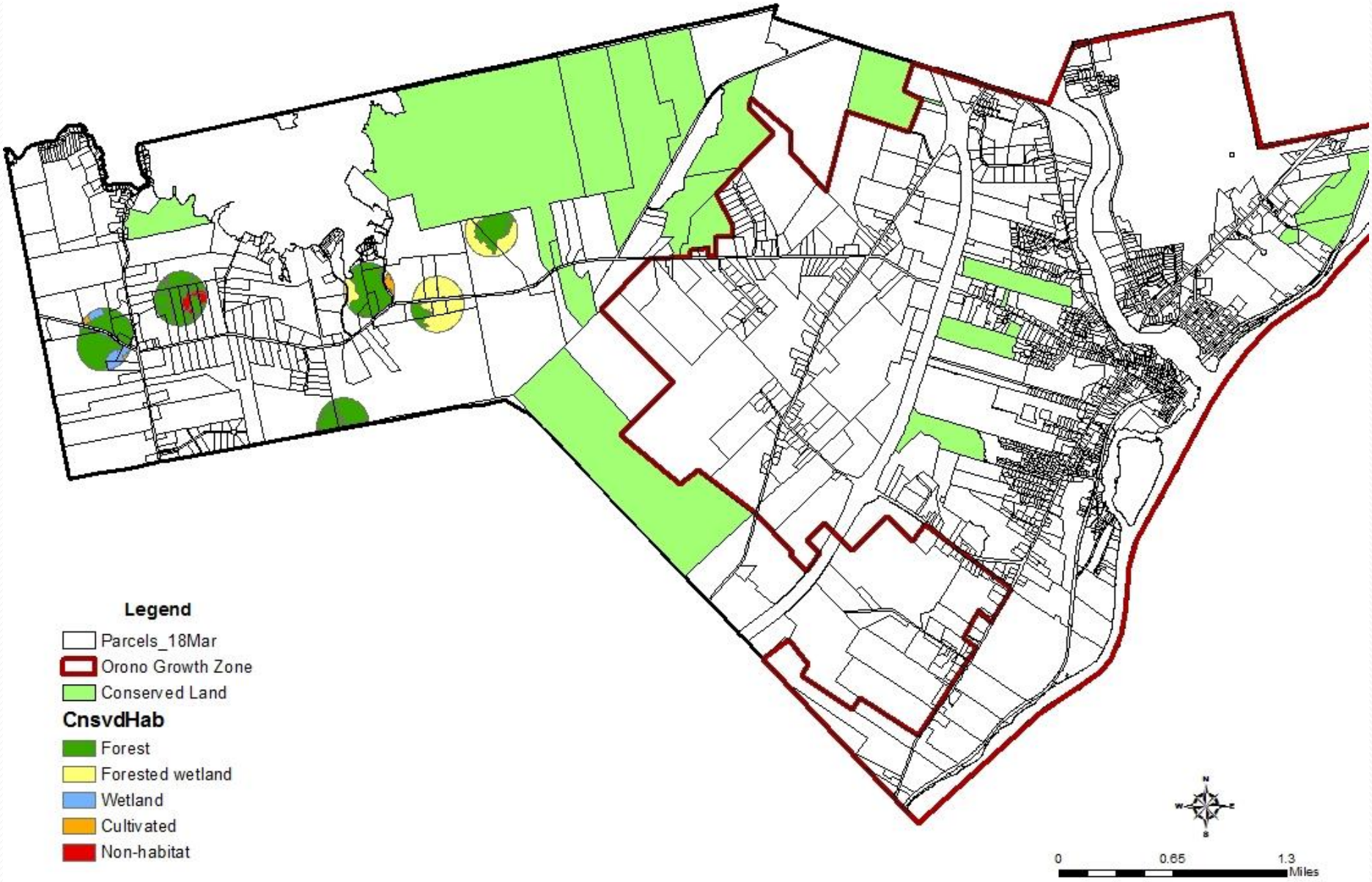


Type and amount of habitat surrounding regulated VPs in Orono

Cover Type around regulated VPs	# acres	
	Growth	Rural
Non-habitat	18.50 (8.4%)	1.45 (0.8%)
Cultivated	25.45 (11.6%)	5.43 (2.8%)
Forest	154.26 (70.0%)	133.87 (69.7%)
Wetland	20.81 (9.4%)	7.52 (3.9%)
Forested wetland	1.24 (0.6%)	43.77 (22.8%)
Total	220.27	192.03



Orono
Conservation priority VPs - surrounding cover types



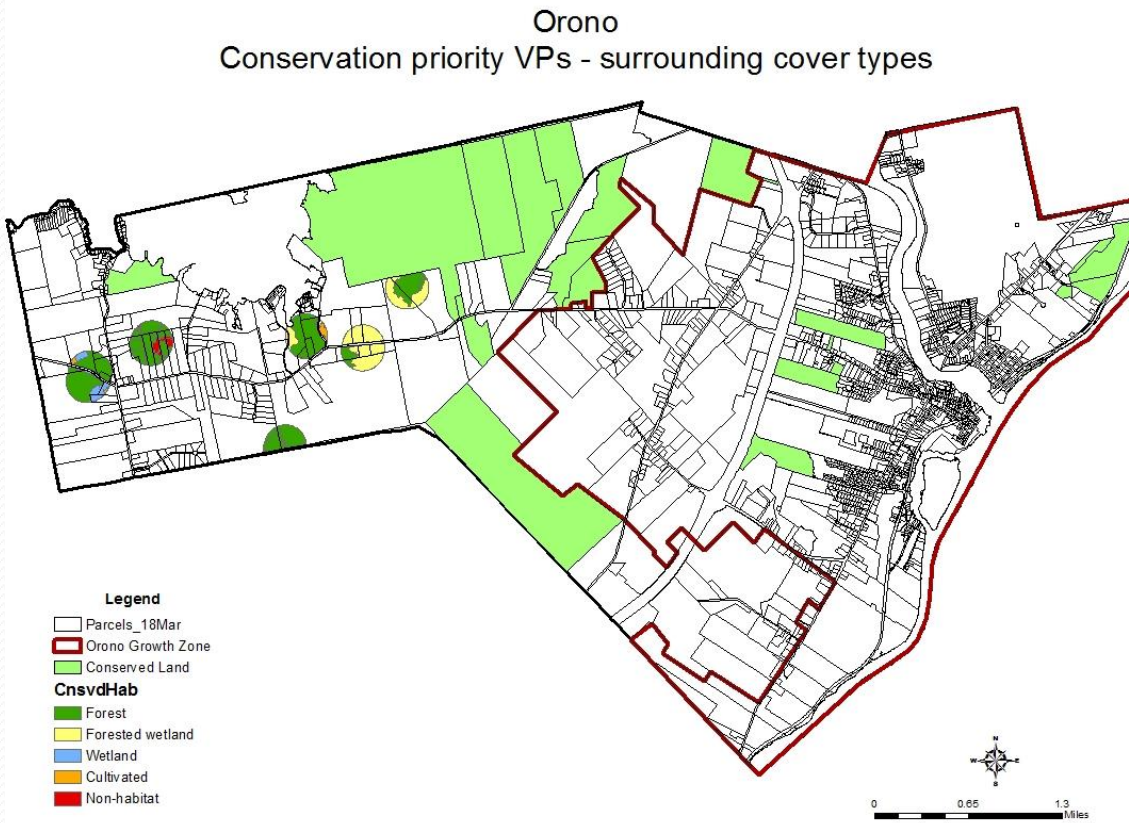
Type and amount of habitat surrounding conservation priority VPs in Orono

Cover Type around conservation priority VPs	# Acres
Non-habitat	23.58
Cultivated	4.31
Forest	197.07
Wetland	11.33
Forested wetland	65.00
Total	301.28

10 VPs identified as conservation priorities.

-located on 8 parcels

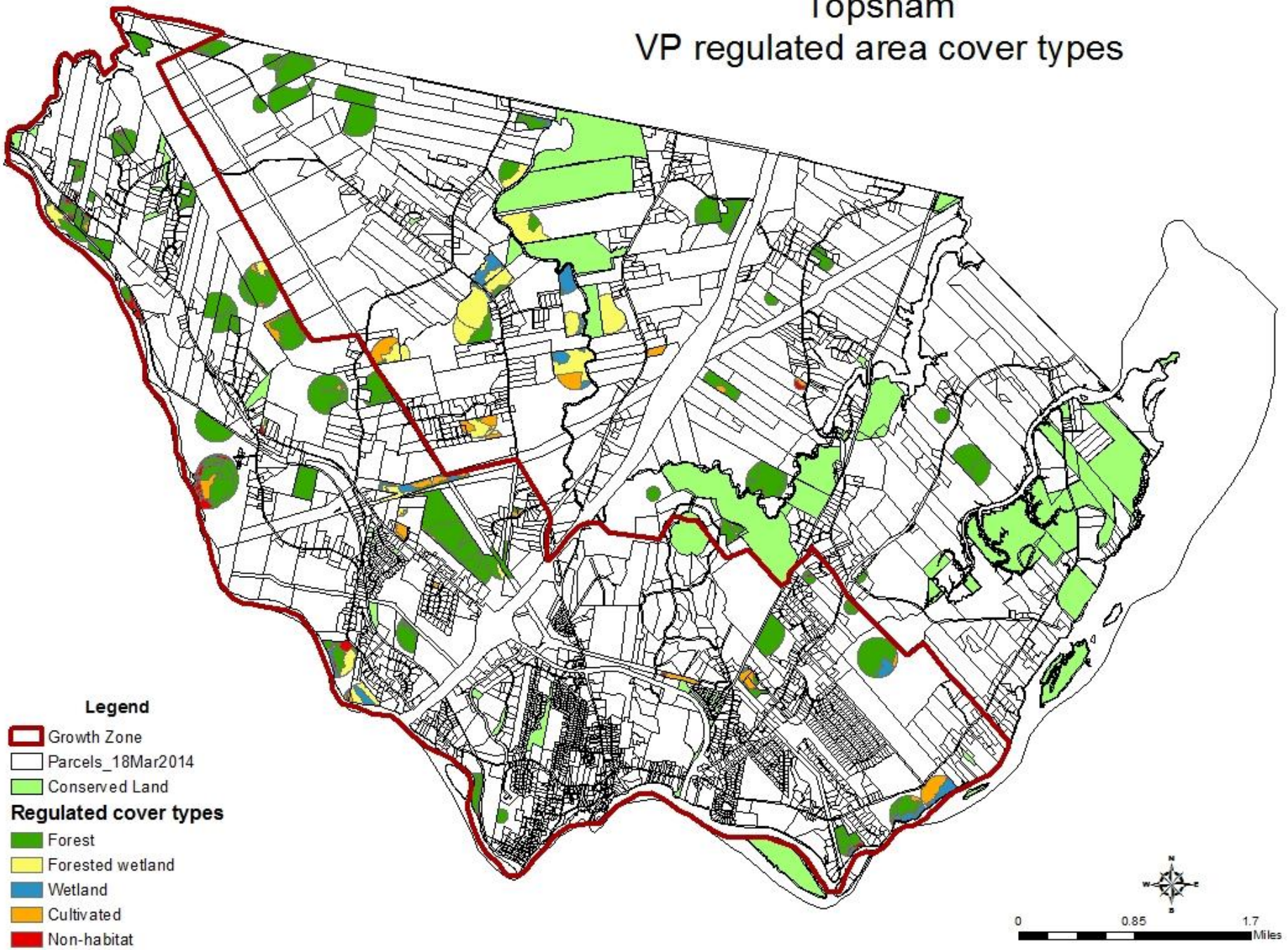
-buffers on 45 parcels



Mitigation ratio analysis: Orono

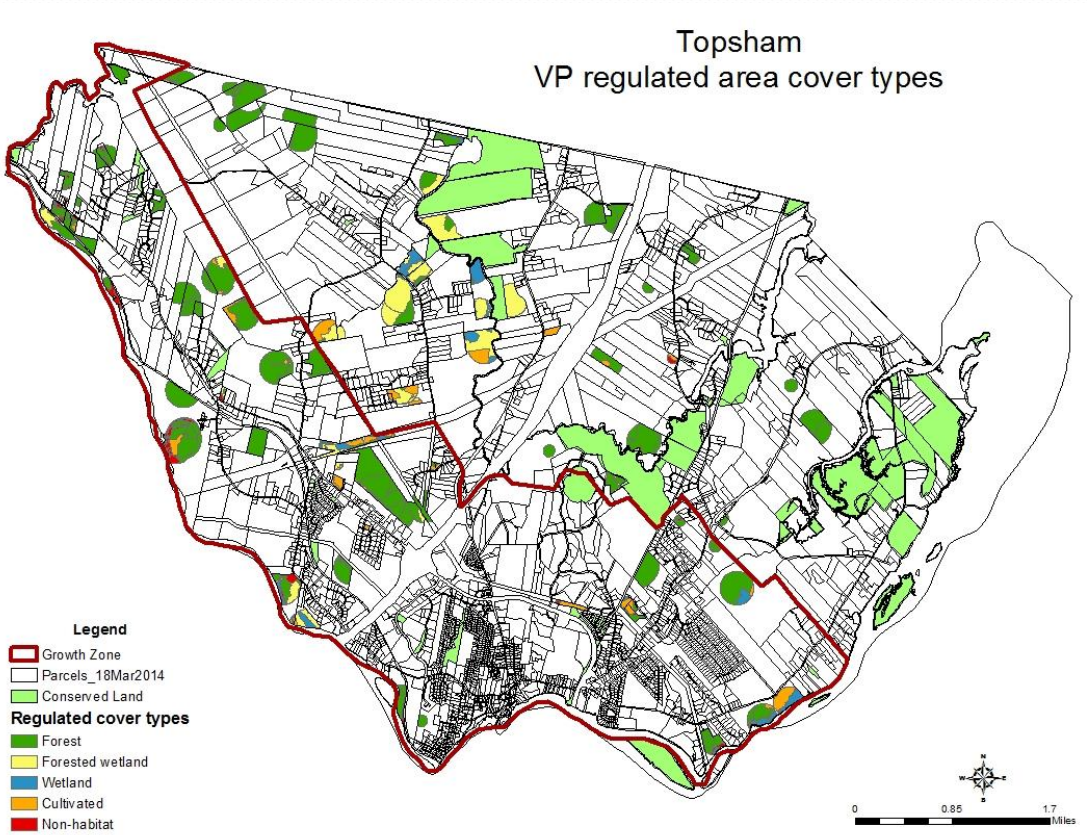
- 10 conservation priority VPs in rural area
- 35 regulated VPs on developable parcels in growth area
- With a 2 to 1 mitigation ratio, 5 VPs in the growth area can be developed

Topsham
VP regulated area cover types



Type and amount of habitat surrounding regulated VPs in Topsham

Cover Type around regulated VPs	# acres	
	Growth	Rural
Non-habitat	43.83 (5.8%)	3.65 (0.7%)
Cultivated	51.13 (6.7%)	41.99 (7.7%)
Forest	592.52 (78.2%)	316.96 (58.4%)
Wetland	31.67 (4.2%)	10.63 (2.0%)
Forested wetland	38.39 (5.1%)	169.15 (31.2%)
Total	757.55	542.37



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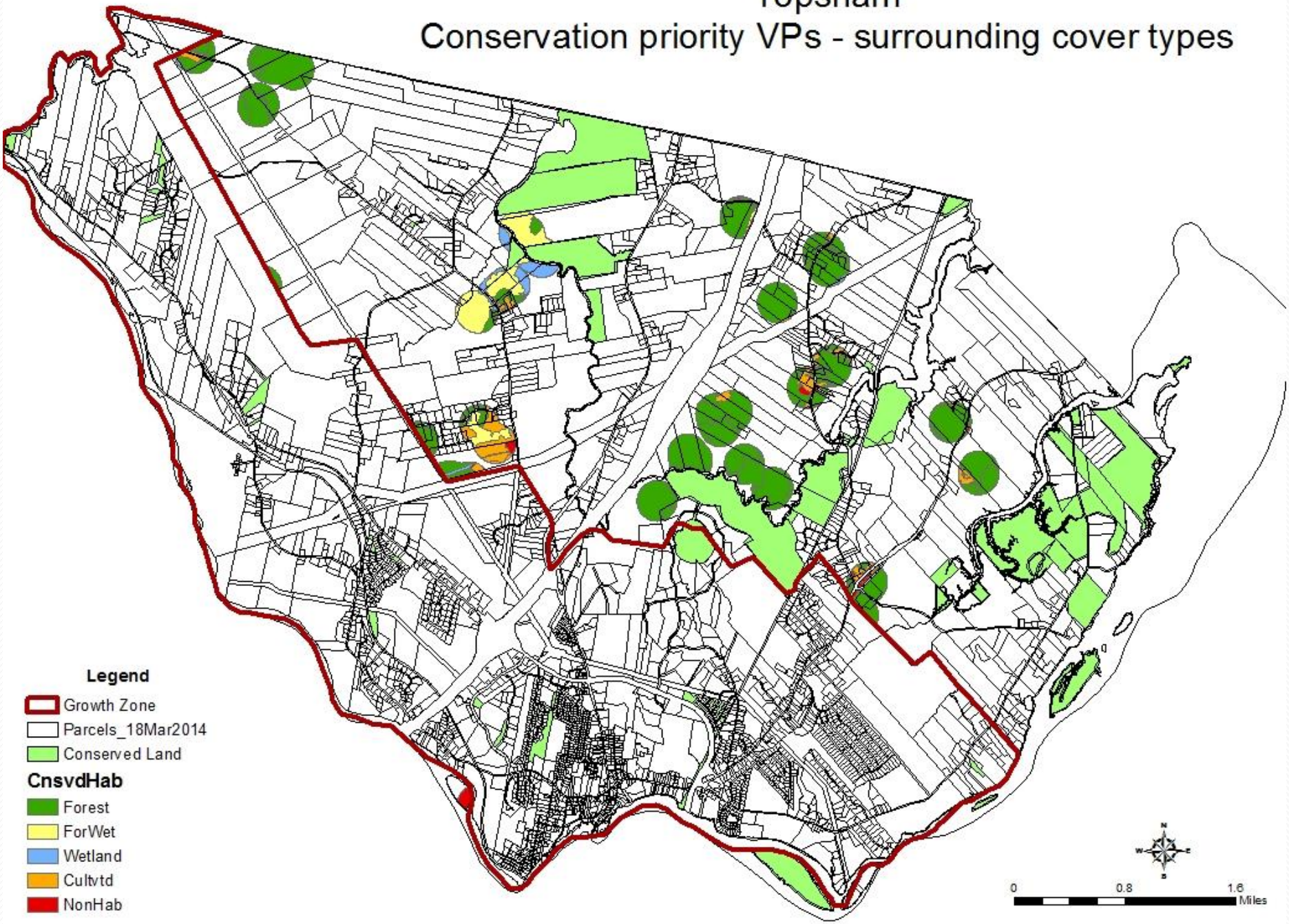
Conservation priority VPs - surrounding cover types



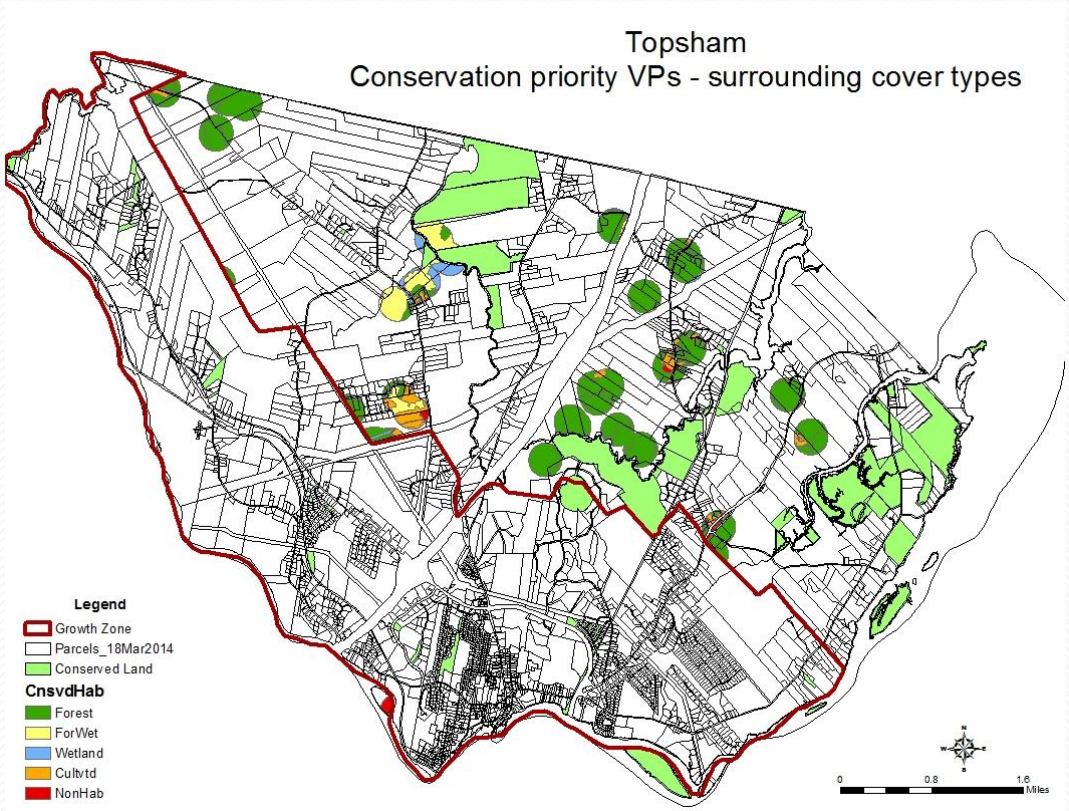
Type and amount of habitat surrounding conservation priority VPs in Topsham

Cover Type around conservation priority VPs	# Acres
Non-habitat	25.83
Cultivated	87.00
Forest	753.17
Wetland	39.23
Forested wetland	118.41
Total	1023.64

29 VPs identified as conservation priorities.

-located on 23 parcels

-buffers on 188 parcels



Mitigation ratio analysis: Topsham

- 29 conservation priority VPs in rural area
- 72 regulated VPs on developable parcels in growth area
- With a 2 to 1 mitigation ratio, 14 VPs in the growth area can be developed

- Compare performance of existing and proposed mechanisms
  1. How many parcels are regulated?
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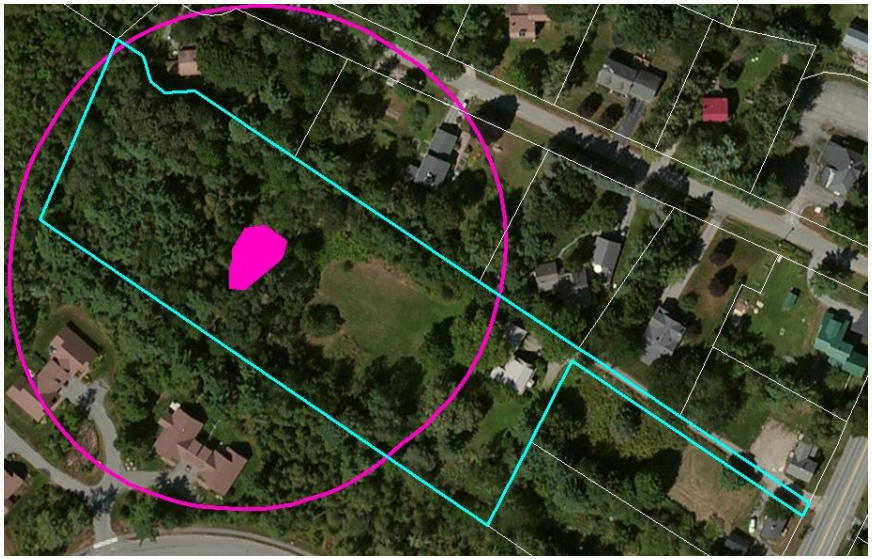
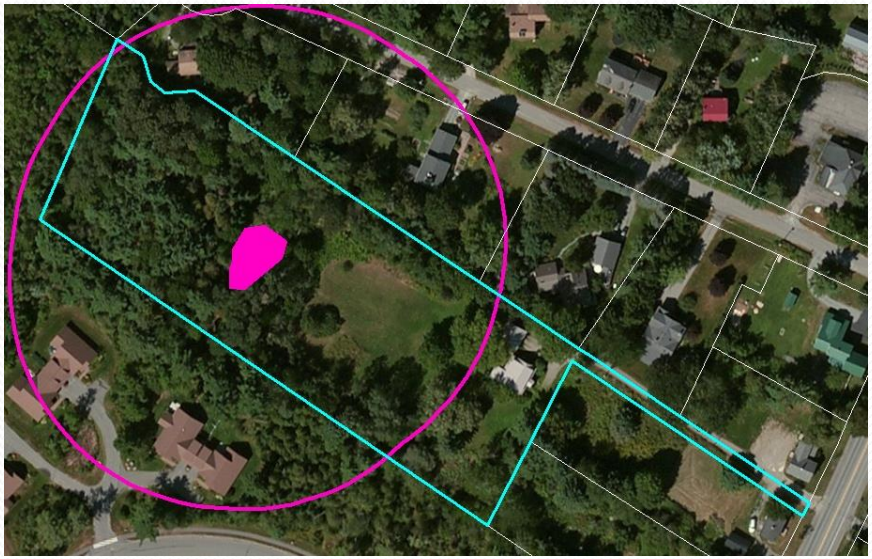
  5. **How much money would be raised with an impact fee?**
  6. **How much would it cost to conserve required VPs?**

Impact fees: Growth area parcels



Value of property with existing vernal pool regulations in place.

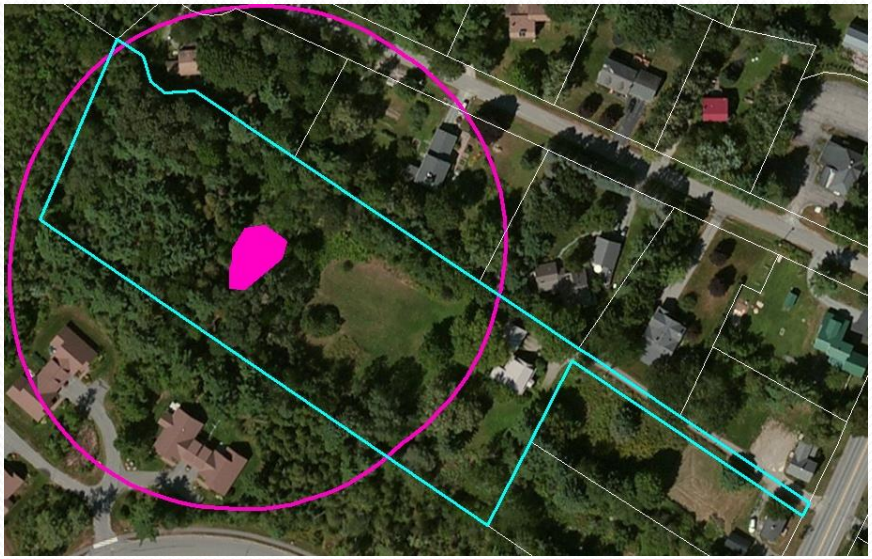
Impact fees: Growth area parcels



Value of property with existing vernal pool regulations in place.

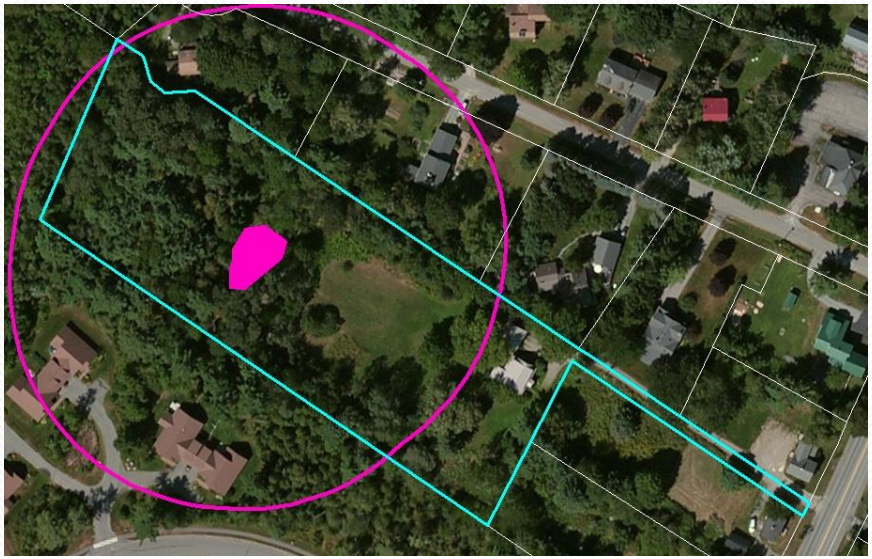
Value of property as if no VP regulation.

Impact fees: Growth area parcels



Impact fee = Difference in property values * fee percentage

Impact fees: Growth area parcels



Impact fee = Difference in property values * fee percentage

EXAMPLE:

If increased value for this parcel is $64,000:

20% of increased value	**30%** of increased value	**40%** of increased value
$12,800	$19,200	$25,600

Costs of conservation

VPs impacted in growth area	#of VPs to protect in rural area	Rural acres to conserve
1	2	~100

Costs of conservation

VPs impacted in growth area	#of VPs to protect in rural area	Rural acres to conserve
1	2	~100

Two conservation VPs with 750' buffers on one parcel.

Costs of conservation

VPs impacted in growth area	#of VPs to protect in rural area	Rural acres to conserve
1	2	~100

Two conservation VPs with 750' buffers on one parcel.

Two conservation VPs with 750' buffers on multiple parcels.

Impact fee - Conservation Cost analysis

Would we raise enough money from impact fees to cover the costs?

It depends on which properties get developed in the growth area!

It depends on the configuration and costs of conservation!

Discussion

- Analysis is ongoing based on stakeholder meeting last week (e.g. input on the “which parcels” questions)
  - Proposed mechanism can work – but not guaranteed
- Uncertainties in analysis
  - Relative comparison more useful than straight numbers
- Which tools work best at a municipal level?
  - Market-based allows tailoring but has supply issues
- Option for regional conservation?

Collaborative research

- Iterative discussion-analysis-presentation cycles.
- Diverse participant group that developed trust
  - Ideas, data & interpretation
- Researcher role: tools & time to conduct analysis
  - Shaping outcomes – uncomfortable but important role?

Acknowledgements

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Kathleen P. Bell, co-chair
Aram Calhoun, co-chair
Teresa Johnson
David Owen
Mario Teisl

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Maine Departments of:
- Inland Fisheries & Wildlife
- Environmental Protection
- Agriculture, Conservation & Forestry

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US Environmental Protection Agency
US Fish & Wildlife Service
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