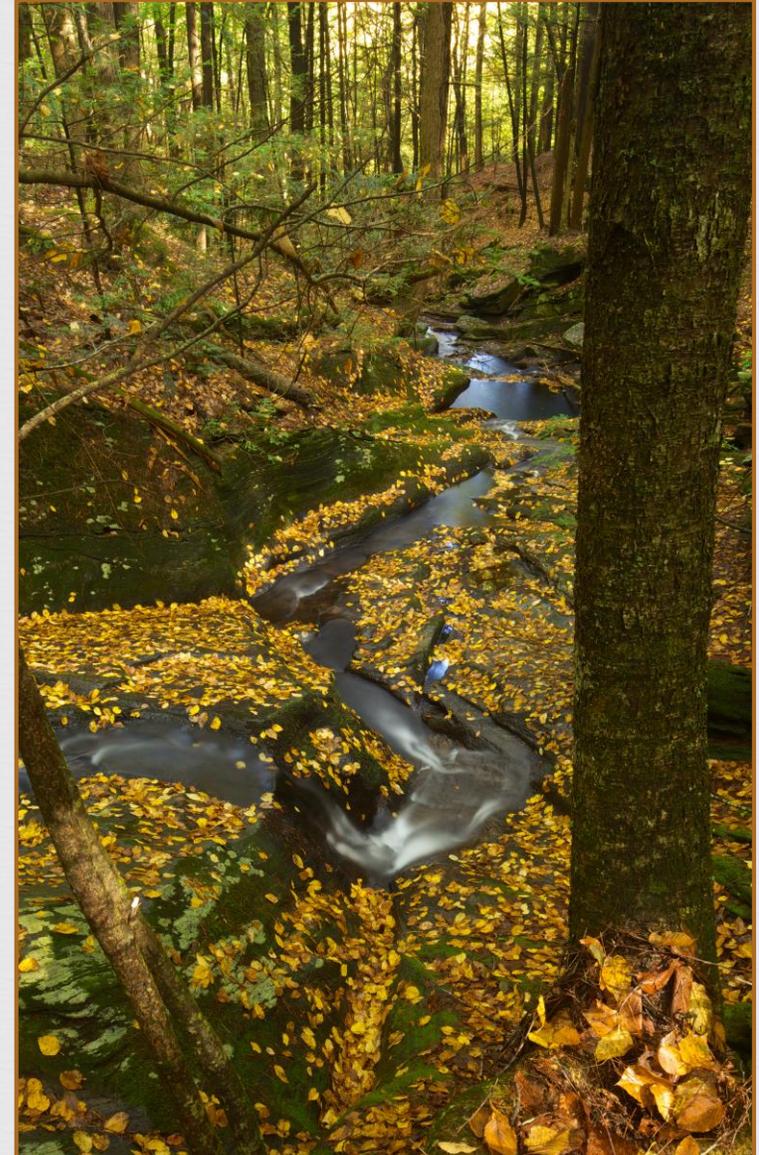


Maintaining the Integrity of Forests and Water Quality: Challenges and Opportunities

Jamey Fidel, General Counsel and Forest and Wildlife Program Director
Jon Groveman, Policy and Water Program Director
Vermont Natural Resources Council

Topics We Will Cover

- Forest Fragmentation/Parcelization
- Land Use Trends in Forests
- Statewide Reports and Initiatives
- Regulatory/Non-Regulatory Strategies
- Issues Related to Industrial Scale SAP Extraction
- Federal and State Laws Related to Water Pollution from Logging
- Regulation of Water Pollution from Public and Private Roads and Driveways















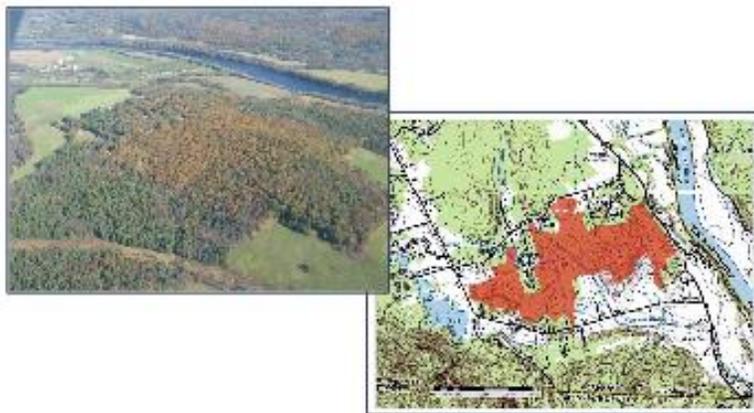






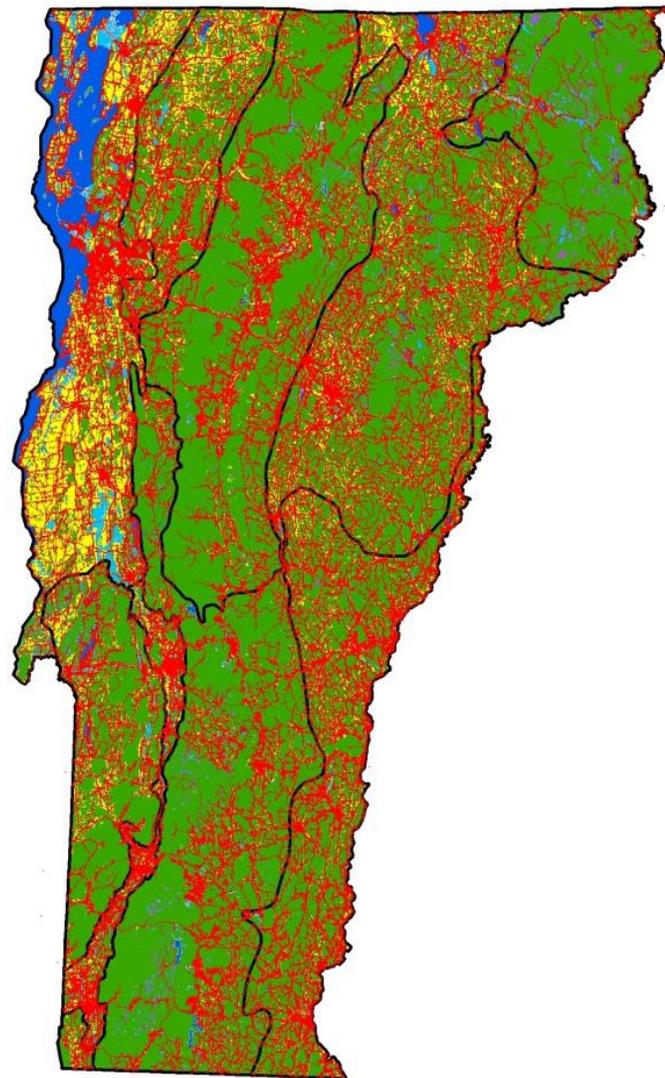
Intact Blocks and Fragmentation

Vermont Habitat Blocks and Habitat Connectivity: An Analysis using Geographic Information Systems



Vermont Fish and Wildlife Department
April 2014

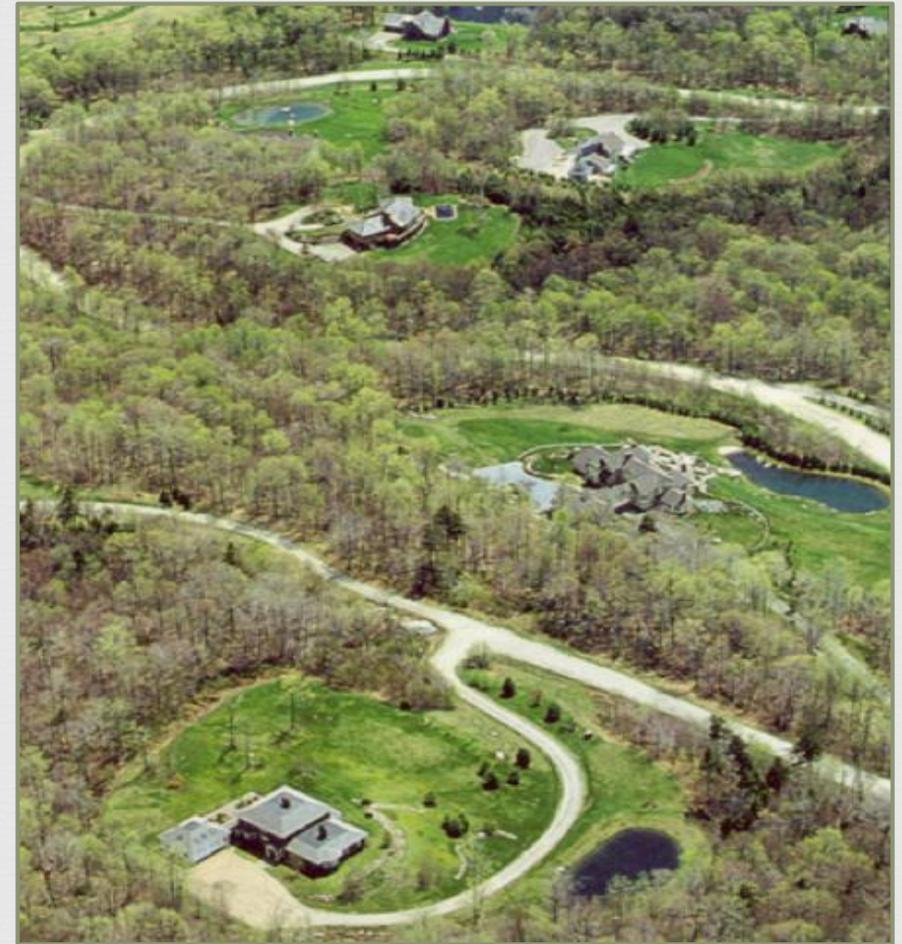
Eric Sorenson, Vermont Fish and Wildlife Department
Jon Osborne, Vermont Land Trust



Parcelization

The breaking up of land into smaller and smaller parcels, usually through subdivision.

- Increased, potentially disjointed ownership of parent parcel;
- Step toward new development, housing and infrastructure that may fragment natural resources and intact forests depending on how it occurs;
- Less viable tracts for forestry; and
- Potential negative ecological impacts.



A. Blake Gardner

Background



- While close to 80% of Vermont is forested, forest cover is actually declining. According to the Forest Service, Vermont may have lost 102,000 acres of forestland from 2012 to 2017 (Morin et al (2017)).
- A more recent U.S. Forest Service report shows that Vermont is losing 14,207 acres of forestland a year (USDA Forest Service (2019)).
- In order to address forest fragmentation and forest loss, it is necessary to understand where parcelization and subdivision are occurring, and the rate at which they are occurring.



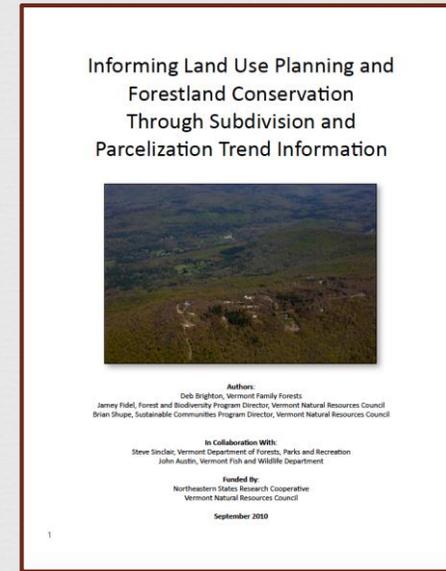
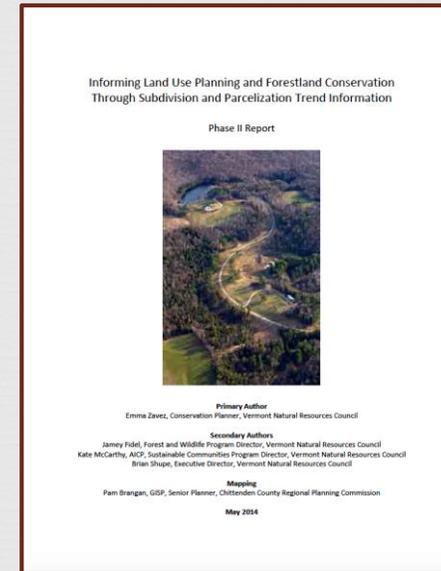
Photo: A. Blake Gardner

Background on VNRC Research

Phase 1 (2010) Statewide parcelization trends,
2003-2009.

Phase 2 (2014) Subdivisions in 22 case study towns.

Phase 3 (2018) **Parcelization trends, 2004-2016**
(state, regional planning commission, county, & town levels)



*Funded by Northeastern States Research Cooperative (NSRC), a partnership of Northern Forest states (New Hampshire, Vermont, Maine, and New York) in coordination with the
USDA Forest Service*

Private Land Trends

In 2016, roughly 3,350,000 acres (70.4% of the land) were in parcels 50 acres or larger.*

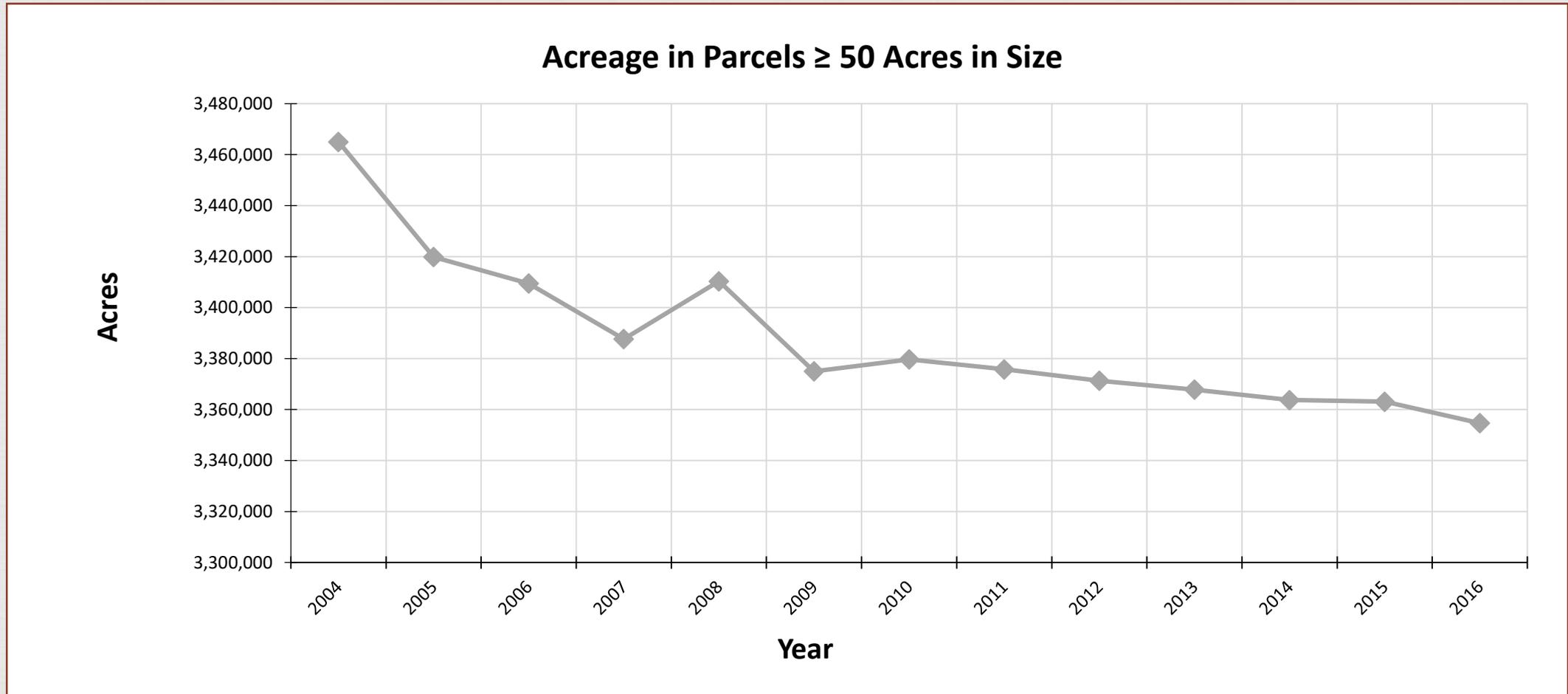
*residential 40.0%

*woodland 25.7%



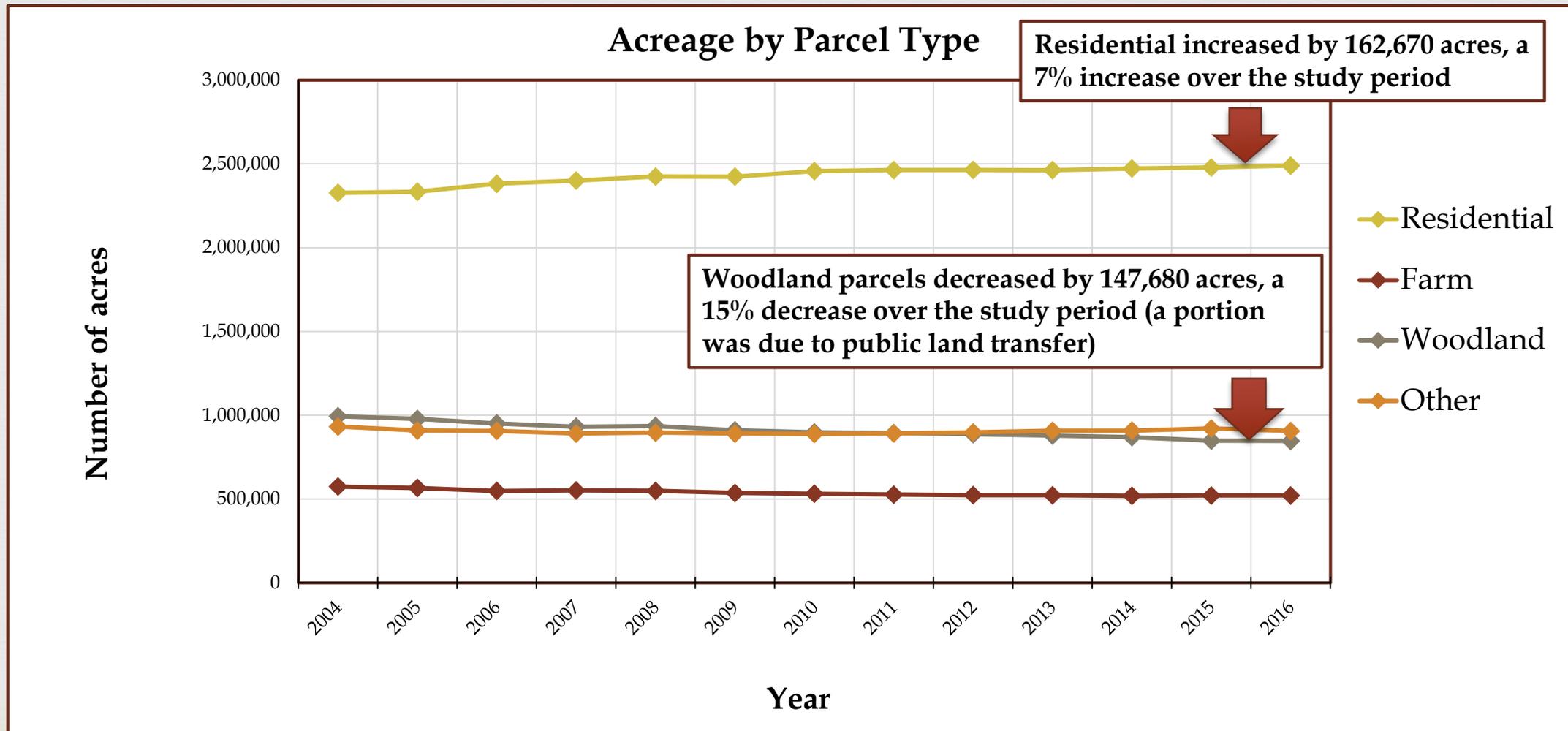
Acres in Parcels \geq 50 Acres in Size

Between 2004 and 2016, the amount of land in parcels 50 acres or larger declined by about 110,300 acres, or roughly 8,485 acres per year.



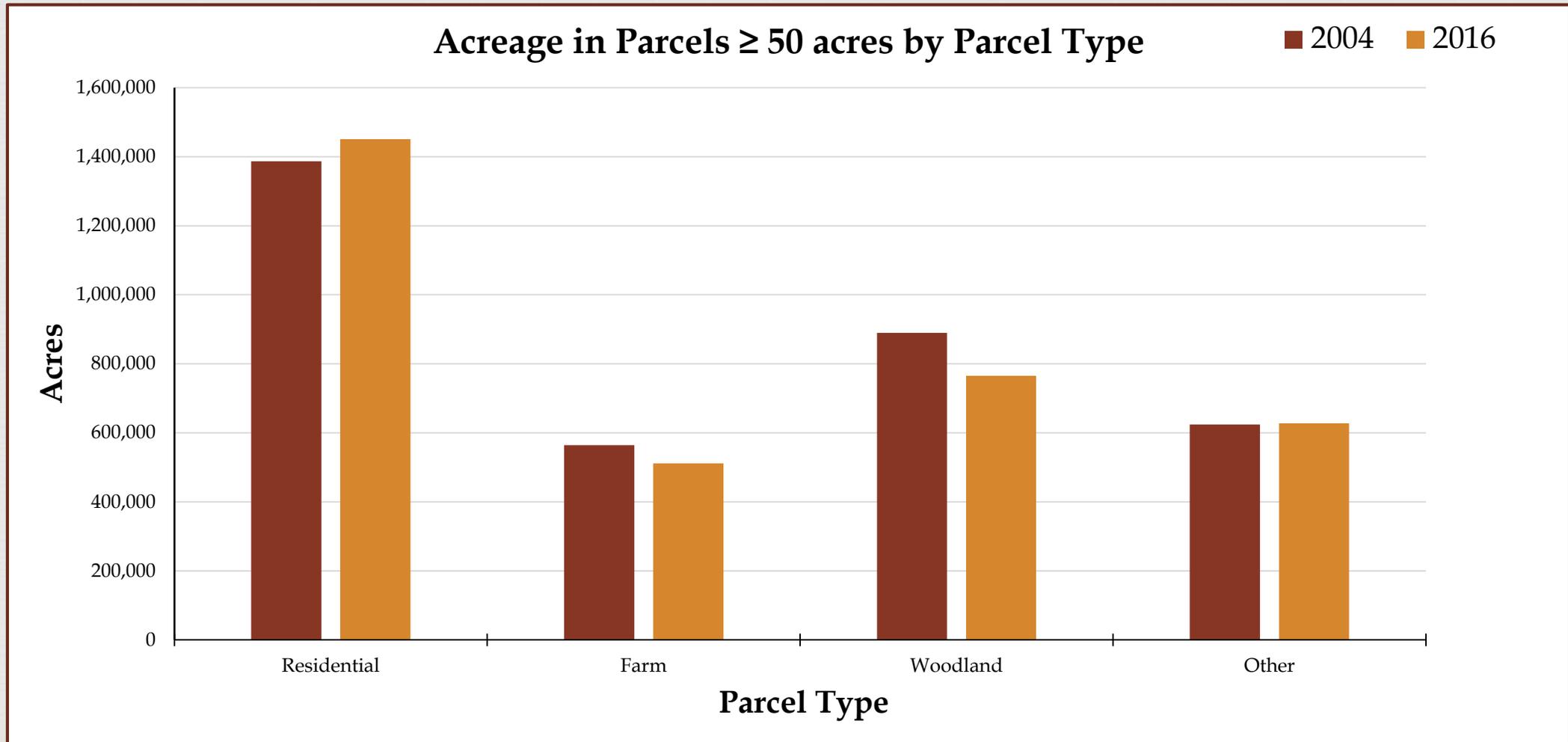
Acreege by Parcel Type

The number of acres in the “residential” category is increasing, while “farm” and “woodland” acreage is decreasing, with “woodland” acreage decreasing the fastest.



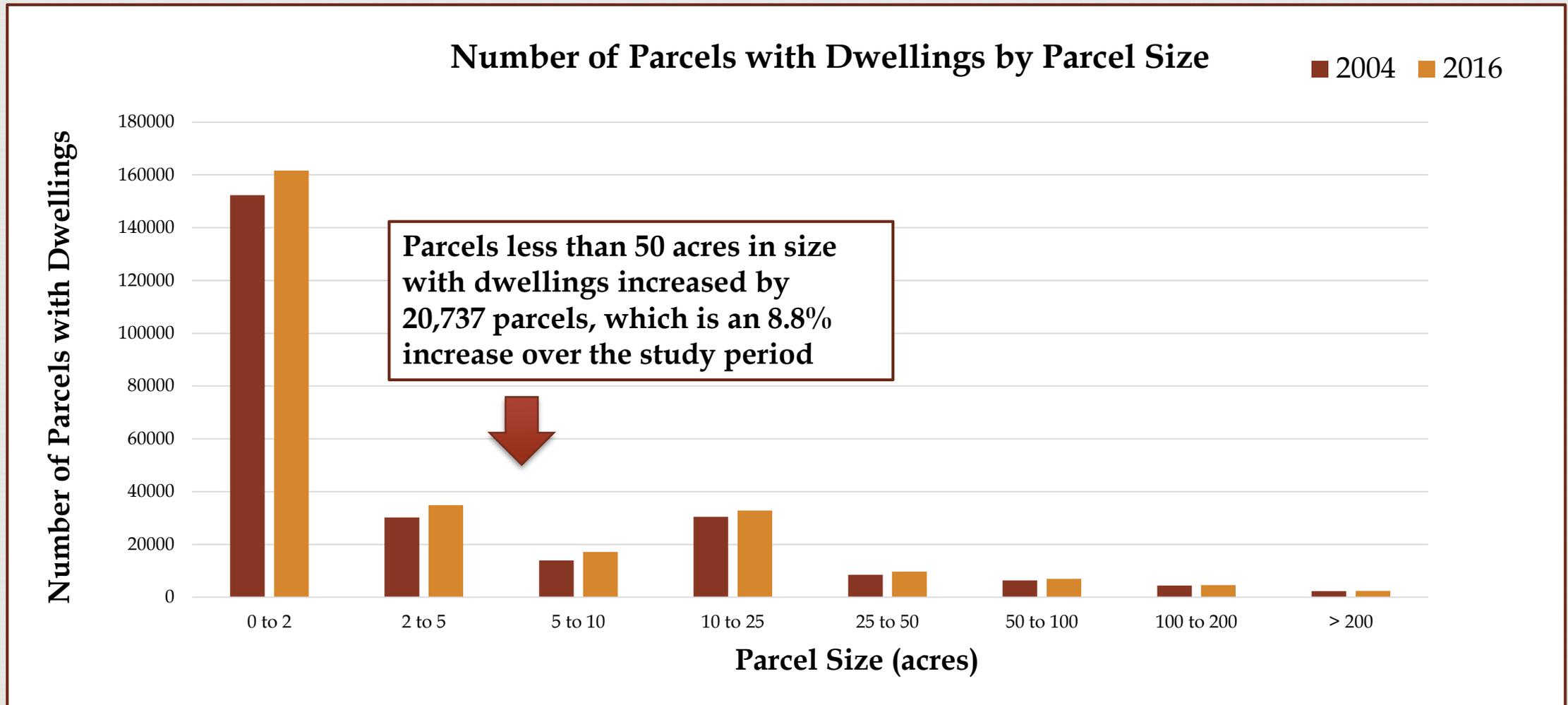
Acres in Parcels ≥ 50 Acres by Parcel Type

The loss of large (50+ acre) woodland parcels outpaced the loss of large parcels in general.



Number of Parcels with Dwellings by Parcel Size

Most dwellings are built on smaller parcels compared to larger parcels.

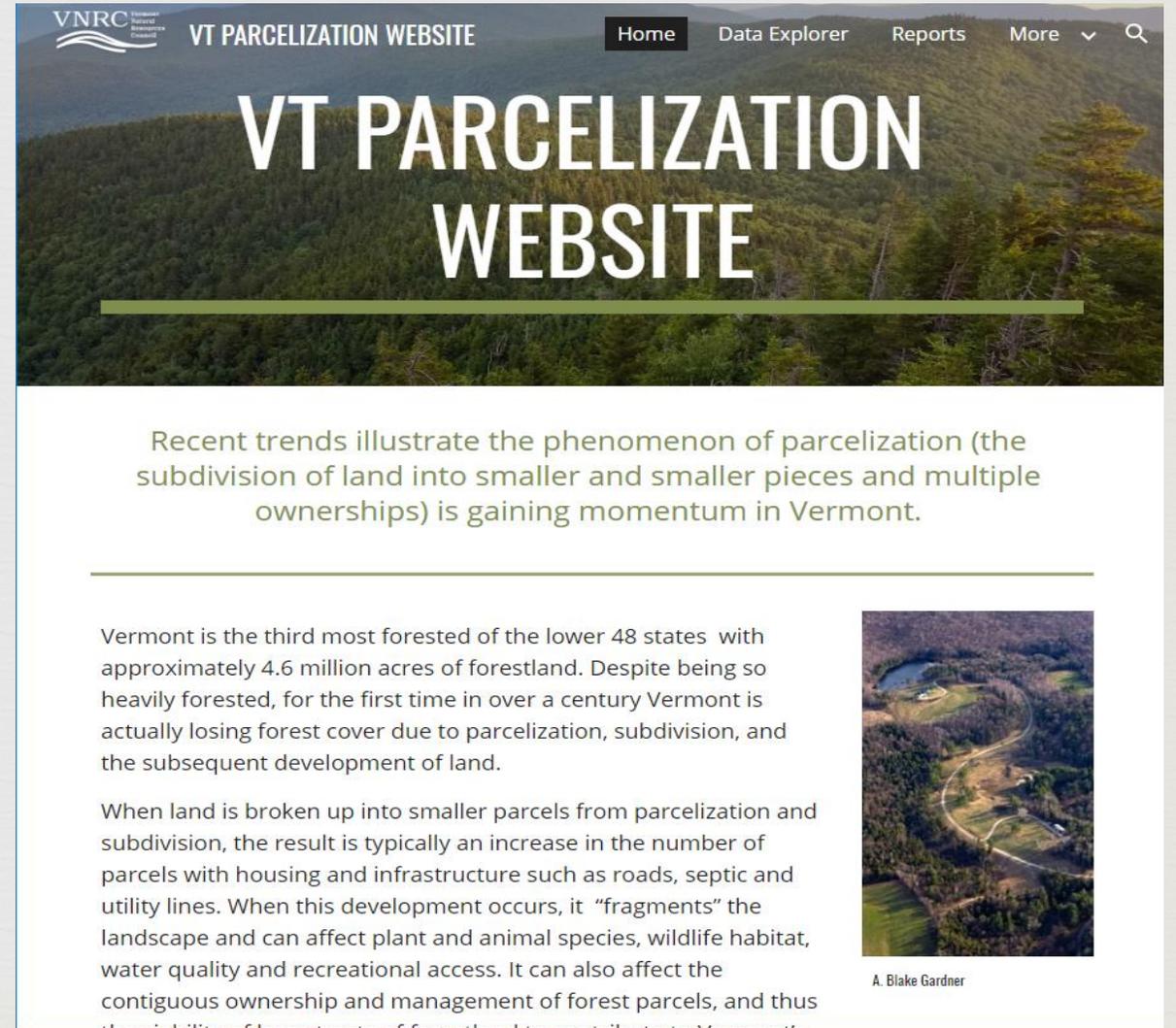


Parcelization Website

- To make parcelization data more accessible
- To visualize change spatially.
- To generate geographically-specific reports

Available at:

www.vtforesttrends.vnrc.org



VNRC Vermont Natural Resources Council

VT PARCELIZATION WEBSITE

Home Data Explorer Reports More

VT PARCELIZATION WEBSITE

Recent trends illustrate the phenomenon of parcelization (the subdivision of land into smaller and smaller pieces and multiple ownerships) is gaining momentum in Vermont.

Vermont is the third most forested of the lower 48 states with approximately 4.6 million acres of forestland. Despite being so heavily forested, for the first time in over a century Vermont is actually losing forest cover due to parcelization, subdivision, and the subsequent development of land.

When land is broken up into smaller parcels from parcelization and subdivision, the result is typically an increase in the number of parcels with housing and infrastructure such as roads, septic and utility lines. When this development occurs, it “fragments” the landscape and can affect plant and animal species, wildlife habitat, water quality and recreational access. It can also affect the contiguous ownership and management of forest parcels, and thus the viability of large tracts of forestland to contribute to Vermont’s



A. Blake Gardner

Strategies to Address Parcelization & Fragmentation - Forest Roundtable

- An ongoing policy discussion on forest policy with a focus on parcelization and forest fragmentation.
- Bringing diverse interests together since 2006 to work on a common issue of concern (Over 200 interested members).
- Information sharing and networking.
- Testing new ideas.



2007 Forest Roundtable Report

ROUNDTABLE ON PARCELIZATION AND FOREST FRAGMENTATION

FINAL REPORT



MAY 2007

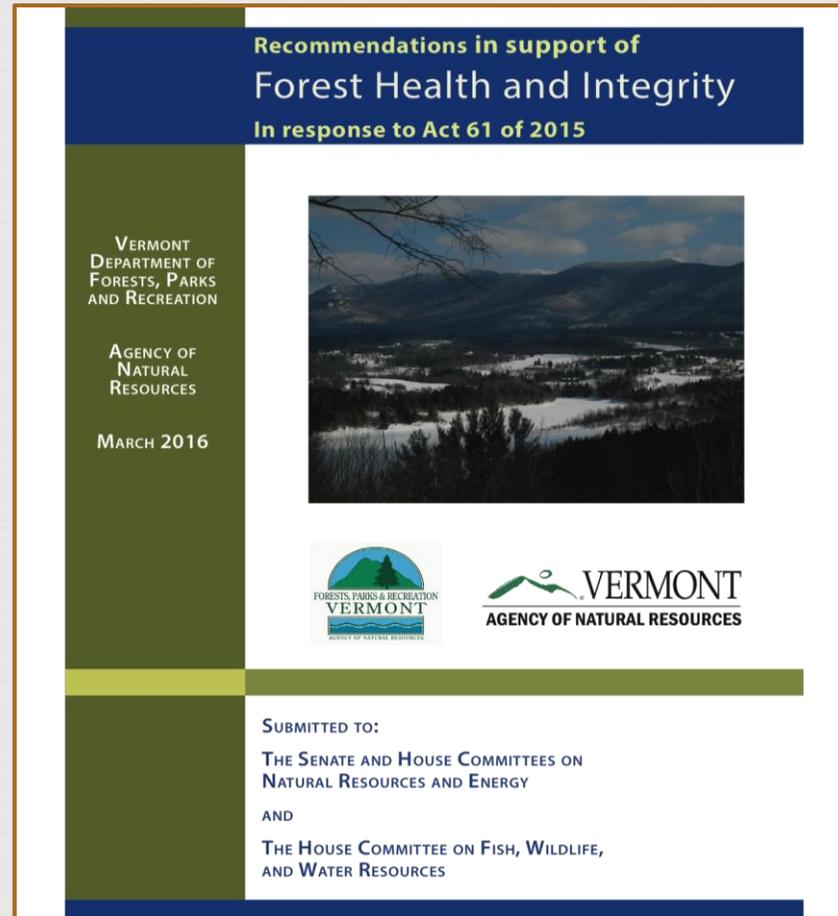
Recommendations from a roundtable of diverse participants.

*Primary Author: Jamey Fidel, Forest and Biodiversity Program Director,
Vermont Natural Resources Council*

Includes 27 strategies to address parcelization and fragmentation.

- Tax Policy
- Land Use and Conservation Planning
- Valuation of Ecosystem Services
- Long-term Sustainability of the Forest Products Industry

ANR Forest Fragmentation Reports for the Legislature



ANR Intergenerational Transfer Report for the Legislature

Intergenerational Transfer of Forestland Working Group Recommendations
In response to Act 171 of 2016

February 6, 2017

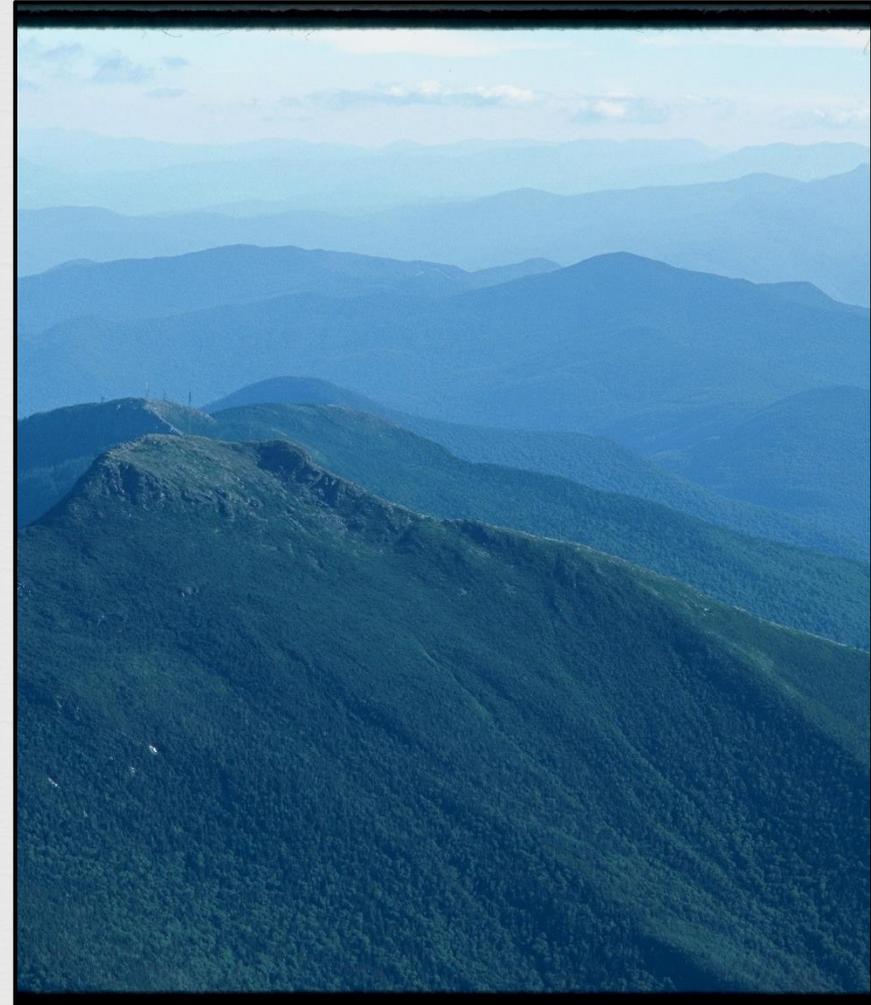
Developed by:
Intergenerational Transfer of Forestland Working Group

Submitted by:
Vermont Department of Forests, Parks and Recreation
Michael C. Snyder, Commissioner

- Today, more than 2.9 million acres or 62% of Vermont's forestland is owned by families and individuals.
- Males over the age of 55 comprise over 65% of the population of forestland owners.
- Fifteen percent of Vermont's forestland is owned by people over the age of 75 (Butler et al 2015). As landowners age, the way that they transfer their land to younger generations will, at least in part, determine the future of Vermont's forests.
- According to surveys conducted by the Sustaining Family Forests Initiative, more than 17% of Vermont landowners (owning more than 10 acres) plan to transfer or sell their land in the next 5 years.

Planning - Act 171 (Effective in 2018)

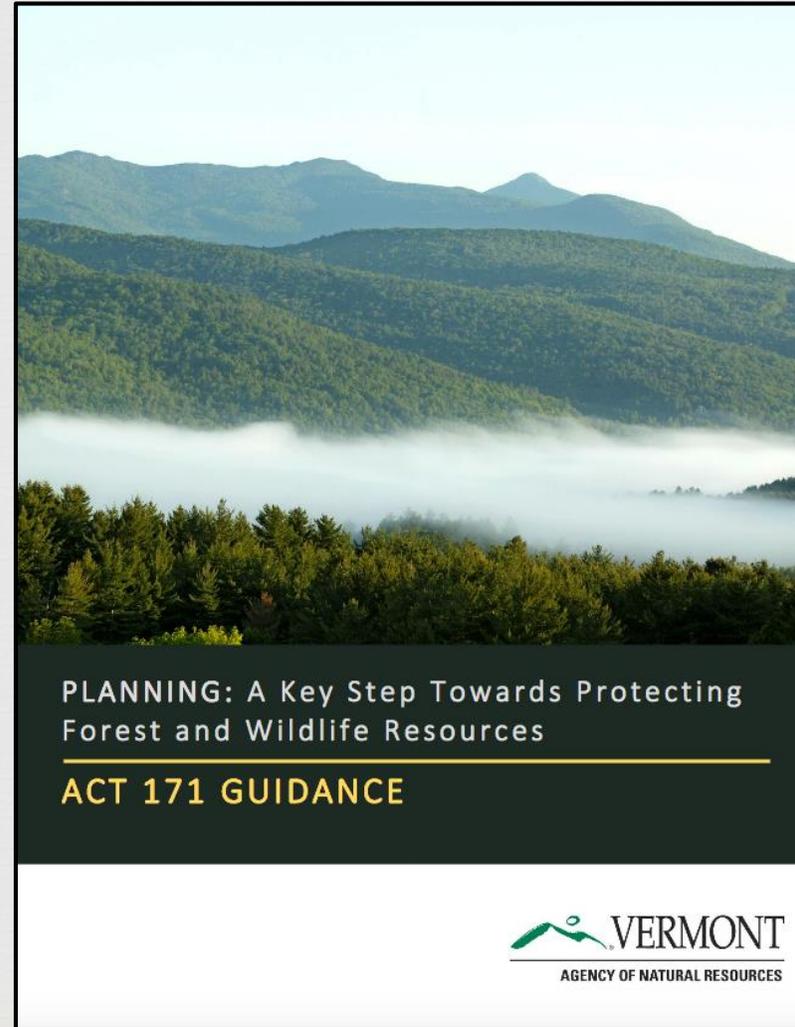
- New state land use planning goal to manage Vermont's forestlands so as to maintain and improve forest blocks and habitat connectors.
- Requires town and regional plans to indicate those areas that each town or region deems to be important or require special consideration as forest blocks and habitat connectors.
- Plan for land development in those areas to minimize forest fragmentation and promote the health, viability, and ecological function of forests.



Act 171 ANR Guidance Document

When Act 171 was signed into law in June of 2016, Governor Shumlin directed the Agency of Natural Resources to publish guidance to help communities.

<https://anr.vermont.gov/sites/anr/files/co/planning/documents/guidance/Act171Guidance.pdf>



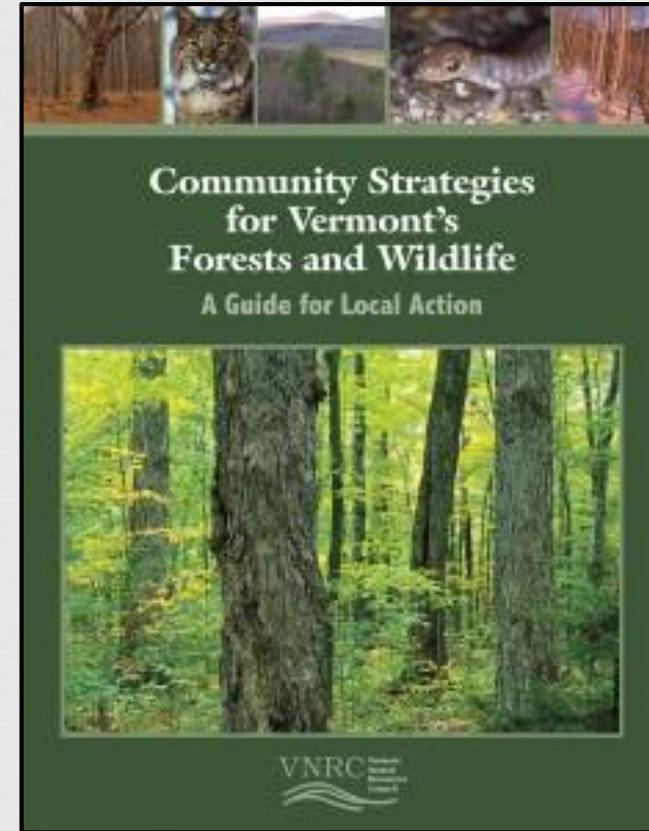
Non-Regulatory Strategies

- ❑ Use Value Appraisal (Current Use)
- ❑ Conservation easements and land trusts
- ❑ Site design around mapped natural resource features – biological inventories, management plans
- ❑ Landowner cooperatives
- ❑ Estate and successional planning
- ❑ Town forests
- ❑ Supporting working forests



Land Use/Regulatory Strategies

- ❑ Planning as a foundation (town plan)
- ❑ Conservation/forest zoning districts
- ❑ Overlay districts
- ❑ Subdivision regulations
- ❑ Planned Unit Developments
- ❑ Clustering and conservation subdivisions



Community Strategies for Vermont's Forests and Wildlife: A Guide for Local Action

Industrial SAP Extraction

- Over the last 5 years there have been a number of “large scale” sap extraction operations that have been developed in Vermont.
- These operations typically have over 100,000 taps and can involve tens of thousands of acres.
- The scale of these operations have raised concerns about impacts on water quality, wildlife, recreation, aesthetics, roads and other community impacts.
- These operations are exempt from most environmental regulations and are eligible for significant tax breaks via the current use UVA program.

Industrial SAP Extraction

- In Marshfield we have seen a large scale SAP extraction operation that involves approximately 200,000 taps on thousands of acres.
- Because there was no permitting the public did not have notice of the significant road construction, installation of tubing, utility lines and infrastructure.
- Concerns emerged about impacts on water quality, wildlife, roads, quiet forest areas and recreation.
- Community meetings were held after complaints were filed to begin to address these concerns.

CWA of 1972

Let's take a step back and look at how the CWA addresses different sources of pollution, including pollution from logging operations.

CWA of 1972

- Established the basic structure for regulating pollutant discharges into the waters of the United States.
- Gave EPA the authority to implement pollution control programs for different industries and types of pollution.
- Set water quality standards for all contaminants in surface waters.

CWA of 1972

- Made it unlawful for any person to discharge any pollutant from a **point source** into navigable waters, unless a permit was obtained under its provisions.
- Funded the construction of **sewage treatment plants** under the construction grants program.
- Recognized the need for planning to address the critical problems posed by **nonpoint source pollution**.

CWA of 1972

- Water pollution (and laws and strategies for regulating it) comes in two basic varieties:
 1. POINT SOURCE (discernible, confined, discrete conveyances) the *end of the pipe*
Analogous to stationary sources of air pollution
 2. NON-POINT SOURCE (stormwater runoff, agricultural, logging runoff, etc.)

State WQS

- CWA requires states to adopt *Water Quality Standards*
- For each water body in a state, must identify designated and protect existing uses – level of water quality:
 - State must monitor water quality to ensure WQS are met and report to EPA. WQS include parameters that include chemical, physical and biological. Specific parameters include:
 - Nutrients (phosphorus, nitrogen, etc.)
 - Sediment (TSS)
 - BOD
 - Temperature

Non Point Source Pollution

- The CWA treats certain types of pollution that does not come from a pipe from a WWTP or industrial facility as not needing a CWA discharge permit except under certain specific conditions.
- This pollution is called non point source pollution under the CWA and applies to specific types of stormwater and pollution from agricultural and logging operations

Farm Pollution

- Exempt unless a CAFO that discharges or proposes to discharge
- There is a direct discharge from discrete conveyance or
- Water pollution from a farm is causing or contributing to a violation of WQS.

Farm Pollution

- In Vermont we comply with the CWA creating a set of regulations for farms known as the RAPs.
- If you are in compliance with RAPs you are presumed to not be discharging.
- We also have permits for our larger farms that substitute for CAFO permits.
- And since Act 64, a CAFO permit is required from ANR when you meet the size threshold for a CAFO and you have a discharge.

Pollution from Logging Operations

- Also limited jurisdiction
- Silvicultural pollution exempt except:
 - Discrete conveyance – not well defined
 - Causing or contributing to WQS violation

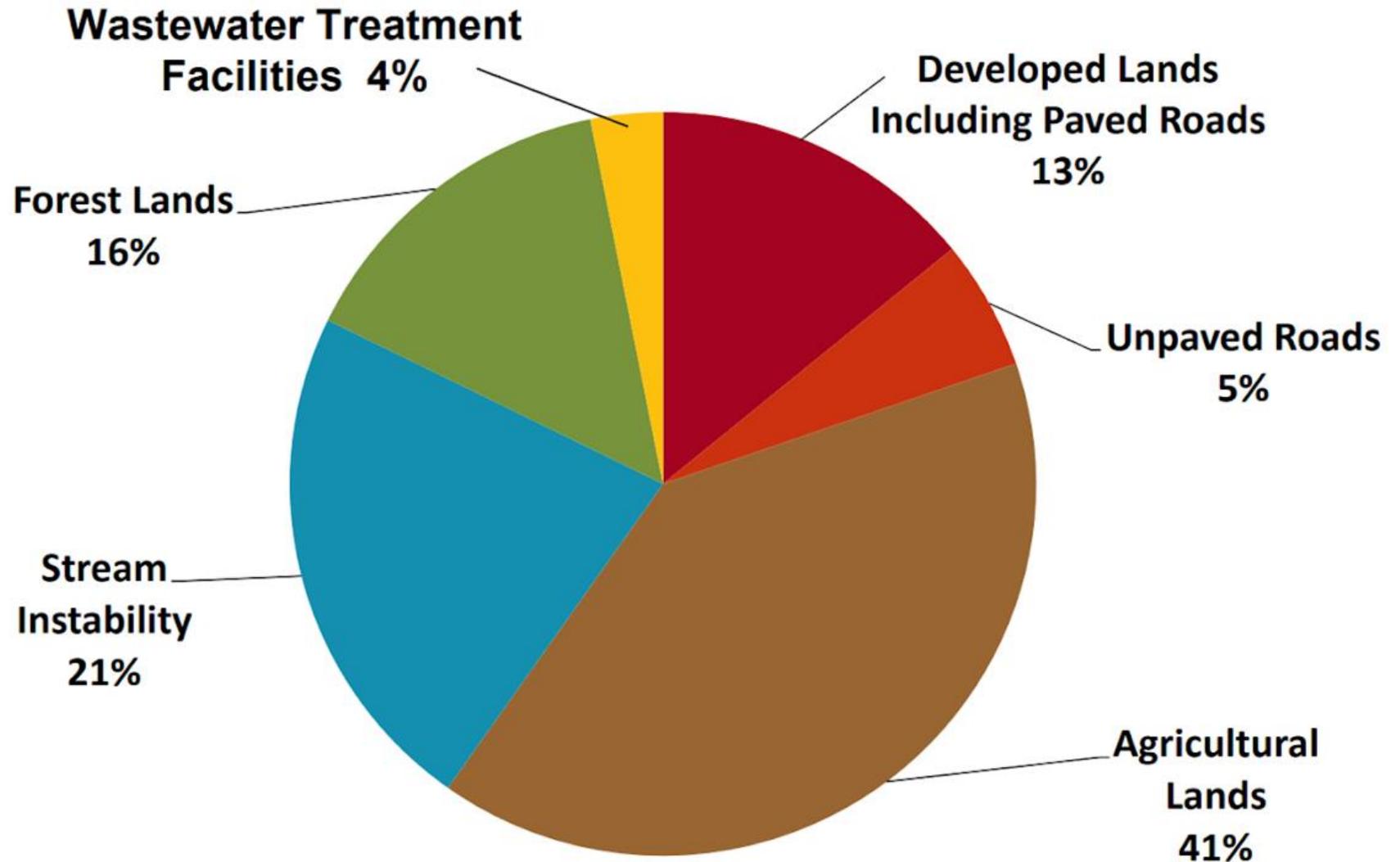
AMPs for Logging

- In Vermont, like the RAPs, we have adopted AMPs that establish practices for addressing impacts to water resources from logging operations.
- Also like the RAPs, if a logging operation is in compliance with the AMPs, there is a presumption that there is no discharge.
- If discharge occurs, a logger is subject to enforcement by ANR.

Act 64 and AMPs

- Act 64, Vermont's Clean Water Act, which was enacted in 2015 in response to the federal mandate to update the Lake Champlain TMDL, included a requirement that ANR update the Acceptable Management Practices for Water Quality on Logging Jobs by July 1, 2016 to ensure that all logging jobs are designed to prevent water quality impacts.

Phosphorus Sources in the Vermont Portion of the Lake Champlain Basin



From *An Overview of Vermont's Clean Water Act*, presented by Julie Moore, 2017.

https://www.vacd.org/wp-content/uploads/2017/09/NE-NACD-2017_Julie-1.pdf

AMP Requirements and Compliance

- The AMPs are a set of technical requirements/management practices that are designed to minimize impacts of logging on water quality and prevent discharges.
- The AMPs and compliance reports can be found here <https://fpr.vermont.gov/forest/managing-your-woodlands/acceptable-management-practices>

Implementation of AMPs

- ASSESSMENT OF TIMBER HARVESTING AND FOREST RESOURCE MANAGEMENT IN VERMONT: 2012 - VERMONT AGENCY OF NATURAL RESOURCES DEPARTMENT OF FORESTS, PARKS AND RECREATION - Published December, 2014
- https://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Forest_Based_Business/Library/Assessment%20of%20Timber%20Harvesting%20and%20Forest%20Resource%20Management%202012_FINAL_2.pdf

Implementation of AMPs

- CONCLUSIONS:
- Results of this assessment, suggest a lower incidence of negative impacts to water quality, as compared to the 1990 report findings.
- Improvements were noted for presence of sediment and logging slash at stream crossings and a lower frequency of petroleum spills.
- Stream crossing practices have improved and culverts were the most commonly used structure type for crossing streams on the assessed timber harvesting operations. However, most of the culverts left in place following logging were not adequately sized to handle longterm flood events.

Implementation of AMPs

- AMP compliance was high for streamside protective strips, truck roads, and log landings.
- There was a high level of compliance with the Vermont Wetlands Rules on timber harvesting operations.
- Findings from this assessment indicate that 22% of stream crossings showed evidence of sedimentation and represented the principal source of sediment associated with the timber harvesting operations observed.
- Numbers of waterbars observed on skid trails were below levels recommended by the AMPs.

Implementation of AMPs

- RECOMMENDATIONS:
- See page 152 of the report. Perhaps most direct to your efforts:
- Provide technical guidance and training for installing and sizing permanent bridges and culverts on perennial streams to improve flood resiliency and reduce sedimentation.

Pollution from Roads

- Act 64 addressed pollution from public roads by requiring municipalities to comply with the municipal roads general permit.

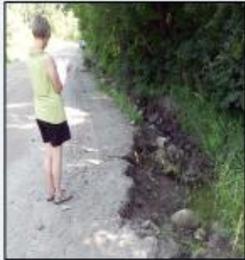
Act 64 - Stormwater - Municipal Roads General Permit

Municipal Road Stormwater Management Plan

Inventory



Prioritize



Implement



Private Roads v. Public Roads

- The MRGP addresses only public roads that are hydrologically connected to Vermont waters.
- However, towns can address pollution from private roads and driveways through zoning and/or subdivision bylaws or road ordinances.