Wildlife Considerations in Local Planning

Evaluating Twenty Years of Progress in Vermont

Prepared by:

VNRC Vermont Natural Resources Council

VERMONT FISH & WILDLIFE

Acknowledgments

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Introduction

For the past twenty years, the Vermont Fish and Wildlife Department (VFWD) has collaborated with the Vermont Natural Resources Council (VNRC) to evaluate how Vermont municipalities address wildlife conservation in local planning.

Wildlife considerations in municipal plans were first documented in a 2000 report prepared for the Department by Burnt Rock Inc. Associates in Community Planning. A second report, *Wildlife Considerations in Local Planning: An Evaluation of a Decade of Progress in Vermont*, published with VNRC in 2011, once again looked at wildlife considerations in municipal plans and, for the first time, in zoning and subdivision regulations. This more comprehensive approach provided insights into the relationship between adopted plan policies and policy implementation through local land use regulation.

This third report builds on previous efforts to evaluate how municipal planning and plans have evolved over the intervening two decades. This information is intended to inform the VFWD's technical assistance to communities, including its ongoing outreach in support of community-based conservation planning. Given that 267 separate municipal governments manage land use and development in Vermont, this puts a particular onus on the VFWD, regional planning commissions (RPCs), and other entities concerned with the conservation of the state's wildlife resources to work with hundreds of local officials – the vast majority of whom are volunteers – to understand how to best maintain wildlife populations and habitat.

The Vermont Fish and Wildlife Department has responded to this challenge through a variety of programs and initiatives. For example, the VFWD's Community Wildlife Program provides municipal planners and non-governmental organizations with up-to-date information on conservation science and resources. The Program also helps towns identify and map important wildlife habitat, define related conservation goals and objectives, translate goals into language to include in municipal plans, and prioritize local strategies and actions to protect wildlife resources. The VFWD has prepared several publications to guide this work, including *Conserving Vermont's Natural Heritage* (2nd ed, 2013) and *Mapping Vermont's Natural Heritage* (2018).

In addition to the VFWD's efforts, other organizations have expanded public education and outreach efforts to address habitat conservation issues. RPCs play a critical role in providing technical assistance to communities while also focusing on regional planning. Municipal planning has also benefited from the Municipal Planning Grant (MPG) program, administered by the Vermont Department of Housing & Community Development (DHCD). This grant program allows municipalities to hire consultants to conduct natural resource inventories, and to work on open space and conservation plans that support wildlife and habitat conservation

Non-governmental organizations have also expanded their focus on habitat conservation at the municipal level. On the technical assistance side, VNRC has performed direct technical assistance, and guided many municipalities with planning to conserve wildlife resources though the publication *Community Strategies for Vermont's Forests and Wildlife: A Guide for Local Action* (2013). State and local land trusts, have conserved thousands of acres of open land, including critically important wildlife habitat, which has increased public awareness of habitat issues. Many land trusts also support municipal conservation projects by providing much needed technical, fundraising, and legal assistance.

This report is intended to help evaluate the degree to which technical assistance and conservation efforts to date have assisted municipal planning, and to identify opportunities for continued attention and improvement.

Overview of Municipal Planning Framework

Municipal Plans

Under the Vermont Planning and Development Act (24 V.S.A. Chapter 117), towns, cities, and incorporated villages are authorized, but not required, to prepare and adopt municipal plans to identify and address local needs, create a community vision, and guide future growth and development. An adopted municipal plan establishes long-term community goals and objectives, and the policy framework for both local conservation and development initiatives. A municipality must have a plan in effect to enact bylaws that allow, regulate, and limit the impacts of development on natural resources important to the community. Plan policies applicable to a particular site or project are also considered in state development review, including Act 250 and Public Utility Commission (Section 248) proceedings. The municipal plan also provides the basis for local conservation initiatives, including the public acquisition of land or interests in land to conserve natural resources or areas identified for protection. As often required for public funding, a conservation project must also conform to the municipal plan.

Municipal plans are prepared by appointed or elected planning commissions with information, data, and input from state and regional sources, local boards and commissions, and the community at large. A local conservation commission, as advisory to the planning commission, often plays an important role in this process by identifying, inventorying, and mapping natural resources important to the community, and proposing strategies for their protection. Following public hearing, a plan must be formally adopted by either the local legislative body or by municipal vote. Once adopted the plan remains in effect for eight years, after which it must be updated with current data and information and readopted. An incorporated village within a town may adopt a plan specific to the village, or participate in the development of a joint plan for the town and village.

Under the Planning Act, if a municipality decides to prepare and adopt a plan, the plan must be based on an analysis of existing conditions, and incorporate twelve "elements," several of which relate to natural resources (24 V.S.A. § 4382). These include:

- A statement of objectives, policies, and programs of the municipality to guide the future growth and development of land, public services, and facilities, and to protect the environment.
- A statement of policies on the preservation of rare and irreplaceable natural areas, scenic and historic features, and resources.
- A land use plan and map that, in addition to development, indicate those areas proposed for forests, recreation, open spaces, floodplains, and areas identified by the state, regional planning commission, or municipality that require special consideration for wetland protection, the maintenance of forest blocks, wildlife habitat, habitat connectors, and other conservation purposes.

In 2016 the planning statutes were amended under Act 171 to:

- Include statutory definitions relevant to local planning and development review for "forest block" "forest fragmentation," and "habitat connector" (24 V.S.A. § 4303); and to
- More specifically require that the land use plan indicate "those areas that are important as forest blocks and habitat connectors and plans for land development in those areas to minimize forest fragmentation, and promote, the health, viability, and ecological function of forests." The plan may also include specific policies to encourage the active management of those areas for wildlife habitat, among other values or functions identified by the community.

As a result, plans adopted since 2018 have been required to address forest blocks, wildlife habitat, and habitat connectors in some form.

To receive the benefits of having a plan "approved" by the regional planning commission – including municipal access to planning grants – the municipal plan must also be compatible with the regional plan and other approved municipal plans, and be consistent with a number of state planning goals, including broadly stated goals (under 24 V.S.A. § 4302) to:

- Consider the use of resources and the consequences of growth and development for the region and state, as well as the local community;
- Identify, protect, and preserve important natural and historic features of the Vermont landscaped, including significant natural and fragile areas;
- Maintain and improve the quality of air, water, wildlife, forests, and other land resources;
- Identify, provide, and protect public access to noncommercial outdoor recreational opportunities, wherever appropriate; and to
- Encourage and strengthen agricultural and forest industries, including strategies to protect the long-term viability of agricultural and forest lands, to include low overall densities of development.

As also amended in 2016 (Act 171), state planning goals highlight the need to include the management of Vermont's forestlands to maintain and improve forest blocks and habitat connectors, which should address wildlife resources, but also complementary resource goals, such as providing public access to outdoor recreation and strengthening Vermont's forest economy.

Land Use Regulations

Under the Planning Act, a municipality with a plan in effect is authorized to adopt local bylaws that conform to and implement the plan, including zoning and subdivision regulations (24 V.S.A. §§ 4401, 4402). Vermont municipalities are granted broad authority to address a range of land use, land development and natural resource protection planning goals through their bylaws. Zoning bylaws, one of the primary tools for regulating development in the state, provide the regulatory framework through which municipalities can manage the location, type, density, and associated impacts of land use and development – for example by establishing allowed uses and densities of

development within mapped "Conservation" or "Forest Resource" districts. The impacts of development are typically addressed, under site plan or a conditional use review, through the application of resource protection standards specific to a particular area or resource.

Subdivision bylaws more fundamentally regulate the overall pattern of development – including the division of a parcel of land for sale, development, or lease – in relation to community settlement patterns, the extension of municipal infrastructure and services and, by law, the protection of natural resources and the preservation of open space, as appropriate to the municipality (24 V.S.A. § 4418). Most subdivision bylaws address natural resources and open space under purpose statements, and in associated subdivision plan and platting standards. Conservation subdivision regulations, or related "planned unit development" provisions that are specifically intended to conserve local resources and open space can be an especially effective tool to address resource fragmentation associated with land subdivision and development.

Since the initial study in 2000, it is important to note that the nature of planning in Vermont has also evolved under related state guidance. Comprehensive plans that once served as a primary source of local information are becoming more strategic in their scope and content, with more emphasis placed on proposed actions or strategies needed to achieve plan goals and objectives. As a result, many plans are now shorter, incorporating by reference much of the inventory information, maps, and data used in their development. These often include separate resource inventories, studies, and "supporting" conservation or open space plans, as enabled in statute (24 VSA § 4432). A full review of associated planning documents was beyond the scope of this study.

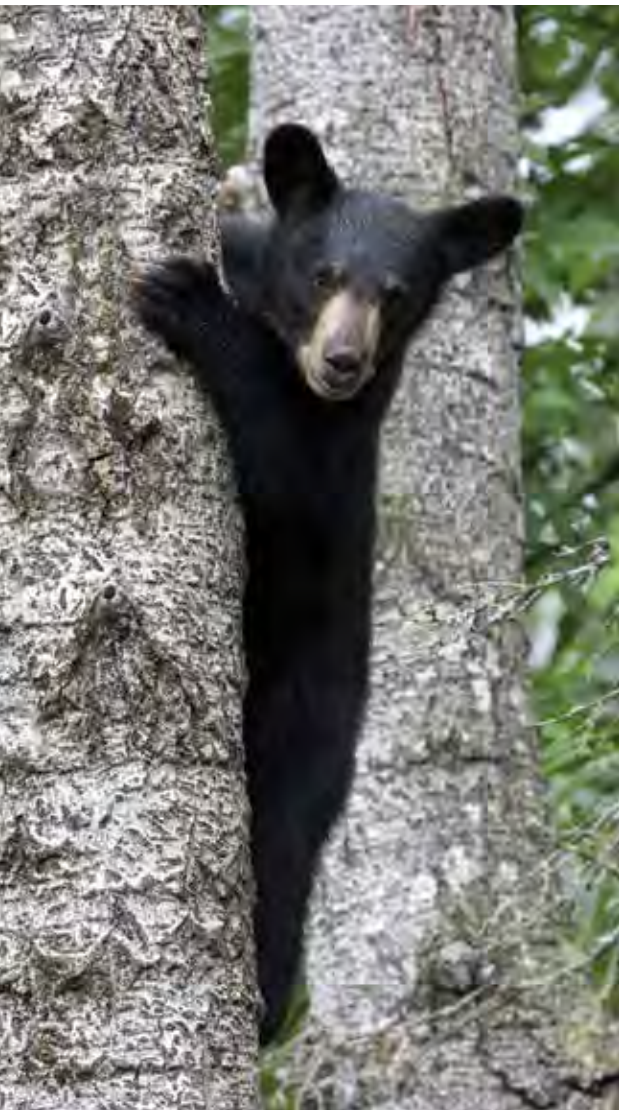
Availability of Planning Documents

The Department of Housing and Community Development (DHCD) maintains the most complete repository of municipal planning documents, including a searchable online Plan and Bylaw Database. According to state law, copies of both draft and adopted plans must be sent to the DHCD as part of the local adoption process (24 V.S.A. §§ 4384, 4385, 4441, 4445). Municipalities and regional planning commission must also maintain and make available copies of adopted plans and bylaws. Many are now found online, either on RPC or municipal websites.

Summary of Key Findings

Municipal Plans

Municipal planning is aided by strong planning commissions and planning assistance from RPCs, state agencies, and technical assistance providers. It is encouraging that nearly every town in Vermont has a planning commission, and 43% of towns have a conservation commission. When enabled by a Select Board, a conservation commission can act in a variety of advisory roles, including recommending conservation strategies to a planning commission, managing a town conservation fund, or overseeing a natural resource inventory. Ten percent of municipal plans discuss establishing a conservation commission, which means that more municipalities intend to boost conservation commission capacity, although this would still leave roughly half of all Vermont towns without this type of assistance.



Municipal plans continue to show a marked improvement recognizing the public benefits associated with wildlife habitat. In addition, there has been steady growth in the number of municipalities that identify wildlife habitat, with forests, wetlands, and surface waters being the most popular habitats recorded. Across the board, diverse habitat types saw noticeable increases in municipal plans, including deer wintering yards, endangered/threatened species, riparian habitat, fisheries, bear habitat, and waterfowl habitat. Despite these gains, more attention is needed to address certain types of habitats, such as grassland, shrubland, early successional and mature forests.

Municipal plans strongly recognize the value of non-regulatory and regulatory strategies to achieve conservation. In addition, municipal plans showed a marked increase in the utilization of local inventory and mapped natural resource data to inform planning and conservation efforts. This significant increase from the first study in 2000 demonstrates important progress in mapping natural resources and these numbers should continue to grow as the availability of state and local data increases.

Another promising trend regarding municipal planning is the number of municipalities that now identify forest blocks and travel corridors. This is likely attributable to increased attention to these features through technical assistance efforts, and state law updates through Act 171, which requires the identification of forest blocks and habitat connectivity areas in a municipal plan. A review of municipal plans that have implemented Act 171 planning requirements demonstrates that a strong percentage of municipal plans include policies to minimize forest fragmentation, although the implementation of these policies through bylaws and subdivision regulations is lagging.

Despite the progress mentioned above, much more can be done to integrate important concepts into municipal plans such as addressing climate change impacts on wildlife. In addition, more education is needed to promote coordination with neighboring towns and regional planning commissions to focus on landscape level conservation, such as large forest blocks, travel corridors or habitat connectivity areas that are located in multiple

municipalities.

Finally, between 2009 and 2020, there was a decrease in the number of plans that recommend coordination with state and regional efforts, including site review with the Fish and Wildlife Department. This is not necessarily concerning as more towns are likely relying on mapped data versus recommending site review coordination with the Department.

Zoning Bylaws and Subdivision Regulations

Having effective zoning and subdivision review is one way to implement municipal plan support for siting standards, subdivision regulations, and the clustering of development. A growing number of municipalities see the benefit in shaping how development occurs on the land, although it is important to note that while 74% of municipalities recommend subdivision regulations, only 55% of municipalities have implemented them.

For the municipalities that have subdivision regulations, natural resource considerations continue to be a strong factor for guiding subdivision development. It is encouraging to see that when mapping is required for a subdivision proposal, a growing number of regulations require natural resources and wildlife to be identified, although there is still substantial room to focus more attention on wildlife resources, including forest and habitat fragmentation. Currently, only 39% of subdivision regulations address fragmentation.

In regards to zoning regulations, municipalities are doing a better job of supporting siting standards. This reflects that more municipalities are incorporating natural resources into the review of all districts, versus doing it through specific districts, demonstrating the evolving role of general use standards, which are an important tool to reduce potential impacts on wildlife.

It is encouraging to see that the number of general use standards that consider wildlife grew between 2009 and 2020. Furthermore, conditional use and site plan provisions continue to be heavily utilized in Vermont zoning regulations, and more municipalities are incorporating natural resources into the regulations of all districts, versus doing it through specific districts, which highlights the evolving role of development standards as a tool. Despite the common use of development standards to address natural resources (52%), only one fifth of those standards mention wildlife, and only 8% of towns with development standards address habitat fragmentation, indicating there is large room to improve on this front.

An additional provision that is important for wildlife conservation is whether an inventory for wildlife and natural resources is required during the development review process. It is promising to see increased utilization of inventories in order to ensure that the proposed development factors in the wildlife resources of an area (34%). It is also notable that more bylaws define wildlife habitat than the previous study; however, the number is still very low and significant progress is needed to provide clarity to what habitat is intended to be regulated.

A variety of conservation-oriented districts are utilized in Vermont, although some appear to do a better job in addressing wildlife impacts. “Conservation districts” are the most popular, and a large percentage of them mention wildlife, but only 19% specifically address wildlife impacts. Another observation is that many conservation related zoning districts lack specific standards to address habitat or forest fragmentation. For example, 57% of conservation districts allow single family homes as a permitted use, but only 10% of those districts have fragmentation standards. In residential-oriented districts, only 9% of towns mention wildlife, and only 4% of residential districts have fragmentation standards, even though this is where the majority of residential development occurs. Wildlife overlay and natural resource overlay districts are the strongest in paying particular attention to wildlife and fragmentation impacts, yet they are only included in 3% and 4% of zoning regulations respectively.

Recommendations

The following recommendations are based upon the observations and findings reported in this study, and from the experience of the authors and their partners with regard to municipal planning. They are intended for consideration by the VFWD and other state officials, municipal and regional planners, and other organizations involved in some aspect of land use planning and natural resource conservation.

1. **Continue to support the VFWD's technical assistance efforts, specifically assistance to municipal government organizations via the Community Wildlife Program and related outreach and technical assistance programs. With the reduction in funding of other state programs to promote municipal planning (e.g., municipal planning grant program), it is critical that the VFWD continue to support this successful and unique effort to connect municipal planners with VFWD staff.**

2. **Continue to support coordination between the VFWD and regional planning commissions to build capacity for the RPCs to assist municipalities with conservation planning, and to address habitat issues on a regional scale – especially maintaining intact forest blocks and connectivity areas that transcend municipal boundaries. Gains have been made through the implementation of Act 171 planning for forest blocks and habitat, although financial assistance is needed to help RPCs hire natural resource staff to assist with regional landscape planning.**

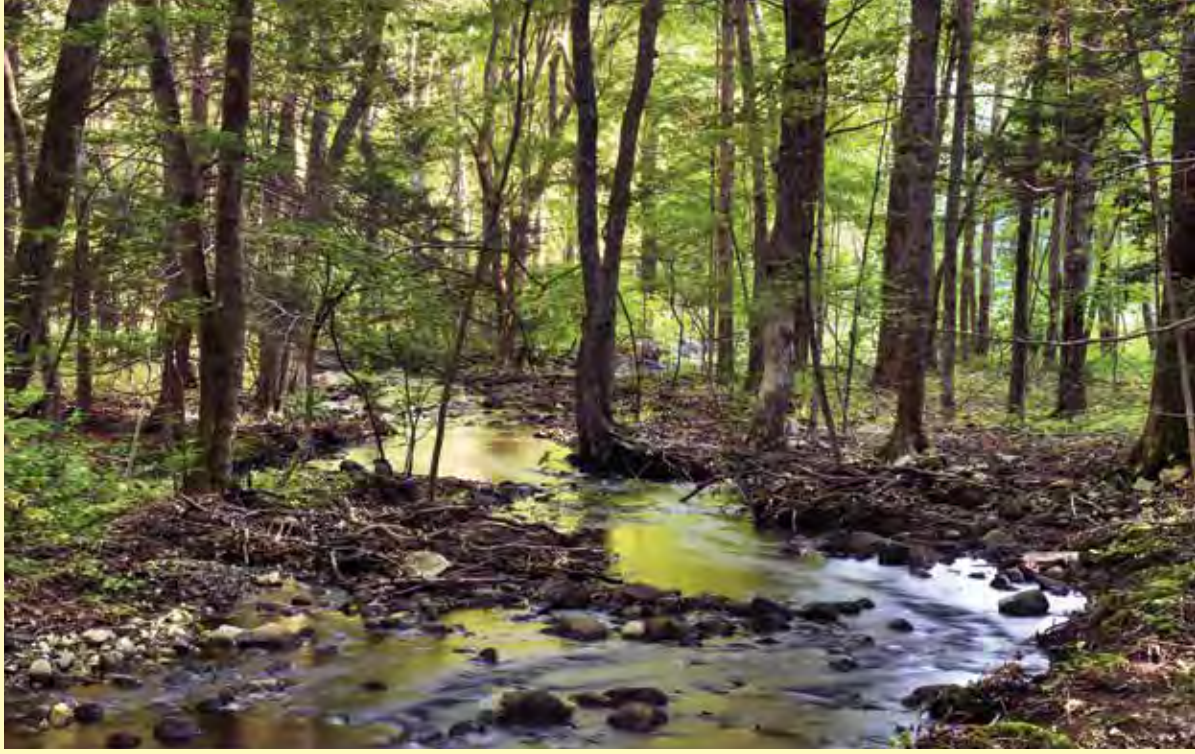
3. **Continue to support the availability and continued development of online mapping resources such as Biofinder, which offers municipalities and RPCs valuable natural resources information.**

4. **Complement the use of online resources with local habitat inventories, and require the local inventory of important ecological resources through the development review process for large subdivisions, or projects that are located in important resource areas.**

5. **Continue to fund the Municipal and Regional Planning Fund, funded through a dedicated percentage of the property transfer tax, and make conducting wildlife habitat inventories and updating zoning and subdivision regulations priorities for grant funding.**

6. **Continue to support the formation of conservation commissions to assist with wildlife conservation efforts. Towns with existing conservation commissions should strive to appoint members with diverse backgrounds and expertise, and should strive to recruit the pipeline of next-generation municipal leaders.**

7. **Expand attention in town plans for certain types of habitats that may require specialized technical assistance such as grassland, shrubland, early successional and mature forests. Facilitate connections between towns and natural resources professionals able to provide the expertise necessary for managing those habitat types.**



8. Convene a group of technical experts, including climate scientists, land use planners, and wildlife and conservation biologists to develop municipal and regional land use planning strategies to maintain resilient landscapes and habitat functions in order to mitigate the effects of climate change. Disseminate these strategies via best practices to town planning staff and officials through direct technical assistance and outreach.

9. Provide technical assistance to municipalities to transition municipal plan support for regulatory action into meaningful policies. While a majority of plans demonstrate strong support for siting standards, subdivision regulations, and the clustering of development, the implementation of these tools still lag in zoning bylaws and subdivision regulations.

10. Provide technical assistance to municipalities to strengthen the manner in which development review standards address wildlife impacts, and the fragmentation of habitat. Conservation-oriented zoning districts should have strong standards to address wildlife and fragmentation impacts, and residential-oriented districts need to do a much better job of incorporating minimum standards to address wildlife and fragmentation impacts, since this is where the bulk of subdivision occurs.

11. Support efforts to help towns define with specificity the wildlife resources they are trying to conserve. In light of the Supreme Court case, JAM Golf, municipalities need to guard against implementing overly broad and unenforceable policies for wildlife conservation. This means including definitions in bylaws or subdivision regulations to identify relevant species and habitat, and articulating a clear standard of review for addressing impacts.

12. Continue to support the implementation of riparian buffer standards in municipalities across the state. While many municipalities have riparian protection bylaws or ordinances, because approximately half still lack riparian buffer standards, addressing gaps would help protect Vermont's rivers and streams and riparian habitat through the implementation of vegetated buffer zones. The Agency of Natural Resources should develop model riparian and shoreline buffer standards that towns could voluntarily incorporate into municipal regulations.

13. Continue efforts to implement Act 171 planning for forest blocks and habitat connectors as a high-impact opportunity to plan for forest habitat and connectivity integrity at the municipal and regional level.

Study Methodology

This study was designed to facilitate information and data comparisons with two previous assessments conducted in 2000 and 2010. This new study allows for data comparisons over a twenty-year period, across a variety of metrics relating to wildlife considerations in local planning. The study's evaluation criteria were revised and expanded from previous evaluation templates to better assess topics that have emerged as important considerations in intervening decades. In all, these metrics reflect a diverse set of important wildlife and habitat-related planning considerations and resources. The full list of criteria used in this round of review are included as Appendix A and Appendix B.

Project staff and interns compiled a candidate list of every adopted municipal plan and zoning bylaw, and then selected for a subset of plans and bylaws that could be fully assessed according to the intent and design of the study. According to the DHCD, there are 267 municipal entities in Vermont. We reviewed a subset of eligible, adopted plans, omitting expired plans, or plans that were in draft form or being updated over the course of the year 2020 when the study was conducted. This means certain municipalities that have updated plans as of 2021 were not included in this review. Furthermore, some towns and villages share a plan or set of bylaws. In all, 235 plans and 207 sets of bylaws and 145 sets of subdivision regulations were reviewed, which translates into a complete review of every unique bylaw and a high representative sample of municipal plans. It is worth noting that the total number of regulations reviewed in this study reflects the same number of towns with regulations listed in DHCD's *Municipal Planning Atlas*.

The criteria used to review municipal plans fit into general categories that are available for review in Appendix A and B. Each of the categories contained a subset of questions relating to wildlife, wildlife habitat, and other natural resource planning

considerations. A team of reviewers analyzed eligible plans, evaluating each plan according to study questions, and recording answers in a spreadsheet as a particular metric. The reviewer also had the opportunity to add comments or sample language from the plan. Although an evaluation of this nature requires a certain amount of subjective analysis, this study attempted to literally and consistently interpret plan language in relation to the established evaluation criteria.

Reviewers also reviewied criteria relating to zoning and subdivision regulations to evaluate the effectiveness of local bylaws in addressing resource and wildlife conservation. This included examining specific zoning districts, and whether bylaw or subdivision regulations included standards to review impacts to wildlife and address habitat fragmentation. In addition, reviewers analyzed the utilization of clustering and open space provisions, and whether development review standards required or recommended habitat assessments or consultation with wildlife and conservation professionals as part of a development review process. The review also examined the degree to which bylaws provide specific definitions to aid in the implementation of development review standards.

Plan and Bylaw Review

Each plan and land use regulation was examined, with extra attention applied to chapters and sections most likely to contain information relevant to wildlife, habitat, and natural resources considerations. All sections that contained bulleted or numbered lists of policies and actions received special attention; however, we also credited policy positions embedded in narrative text elsewhere. For example, many municipal plan policies affecting habitat conservation occur in chapters on transportation, land use, and energy – reviewer efforts often concentrated on analyzing these sections of the plan.

Following the initial read-through, reviewers conducted targeted keyword searches using Adobe Pro software as a secondary check to locate relevant information. Importantly, keyword analysis was used only as a secondary strategy, and was not relied upon as the principal method to locate relevant information. A variety of keywords were chosen for each analysis metric to credit plans that addressed a particular topic, but may have used interchangeable or alternative terms. For example, terminology around concepts such as wildlife corridors vary: some plans refer to them as habitat connectors, others as wildlife crossings, still others as travel corridors. Accordingly, all of those terms were recognized as interchangeable for the purposes of this study.

Data Analysis

Because this analysis was subjective in many regards, towns belonging to the same RPC were largely reviewed by only one project member, ensuring consistency across the RPC. In some cases, this was not possible due to staffing constraints. However, the majority of plans available were reviewed by one analyst (approximately 74%). A larger number of reviewers examined zoning bylaws and subdivision regulations, which could result in more subjective data interpretation across metrics, although we strived to have one reviewer tackle an entire suite of local regulations within a given RPC.

Plans that partially or vaguely referred to a concept were still credited for addressing the concept. This reflected our overall philosophy of crediting the intent of a plan above its technical accuracy. As such, if we did not credit a plan for a particular concept, it was because we encountered no substantive information relating to that concept within the plan.

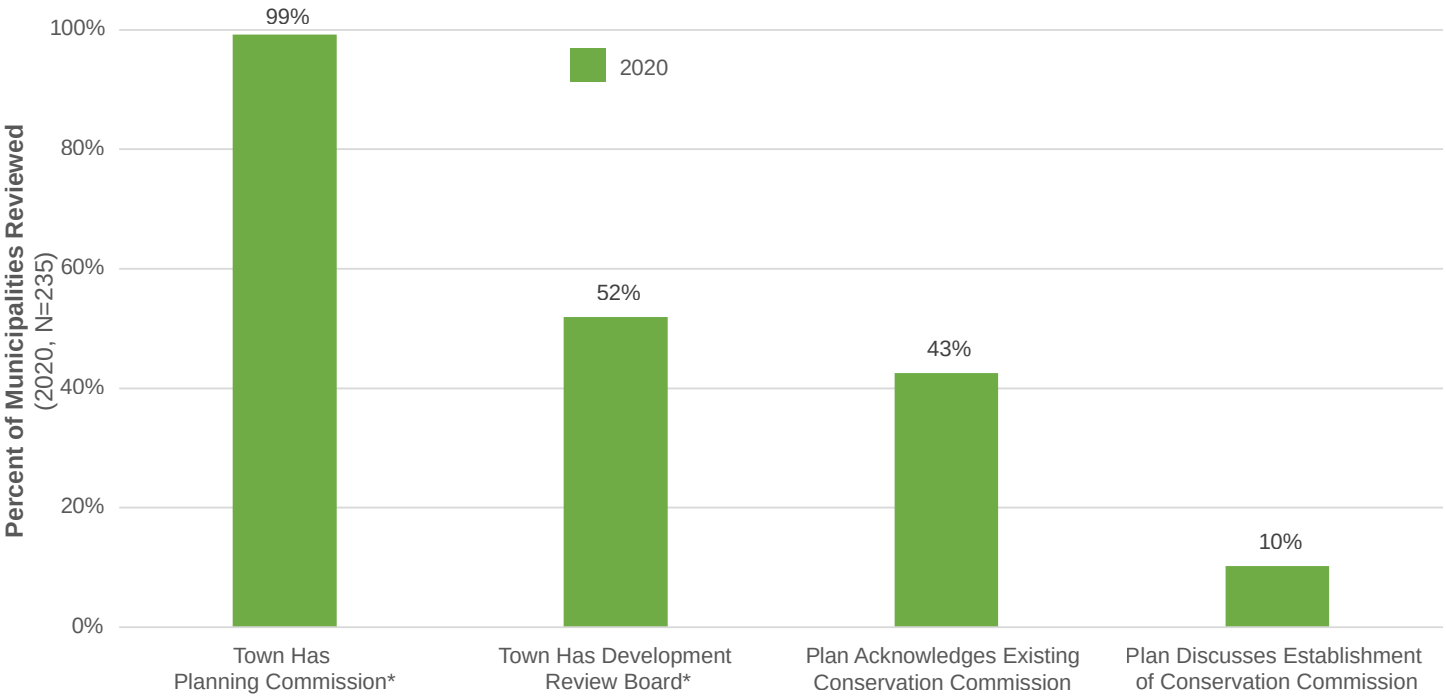
Findings from the plan and bylaw review are described in the following charts, tables, maps, and narrative text. An additional section summarizes data at the RPC level. Summarizing data within the geographic areas of the RPCs is a useful way to look at regional trends.

Observations and Findings

In Vermont, almost all municipalities have a Planning Commission

In Vermont, almost all municipalities have a planning commission, as required to prepare a municipal plan. About half of Vermont municipalities (52%) have a development review board (DRB) that administers local zoning and subdivision regulations (52%). A growing number of municipalities also have a conservation commission (43%), or a plan that recommends the establishment of a conservation commission (10%). A conservation commission can be an important way for a municipality to prioritize natural resource and wildlife conservation in local planning and development review.

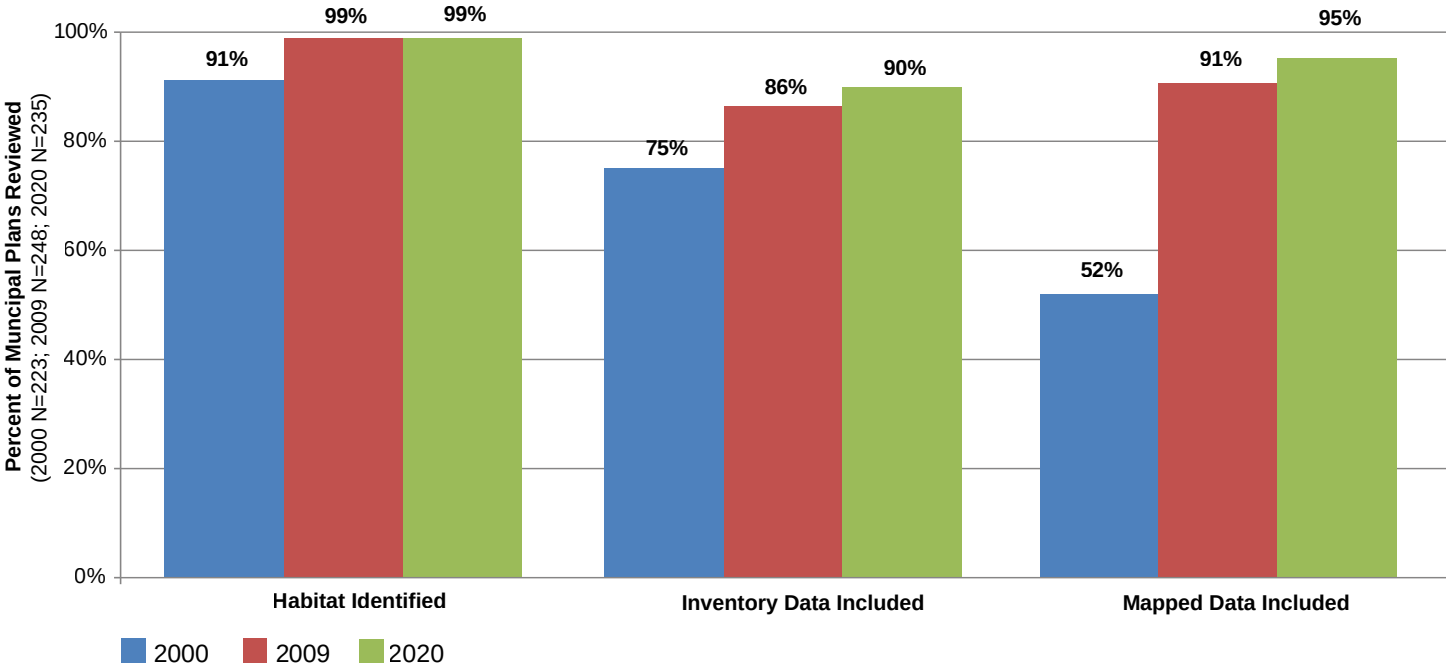
Figure 1. Municipal Governance Structure *(2020 Data Only)*



(*Denotes data were retrieved from VT Planning Atlas sources; all other data were created from plan analysis.)

The Putney Conservation Commission was created in 1995, with local residents appointed by the Selectboard. The Conservation Commission acts in an advisory capacity to the Selectboard and Planning Commission about conservation, natural resources, and land use issues. The Commission has provided significant assistance to the PC in updating the Natural Resources and Energy portions of the Municipal plan, and taken stewardship of Town-owned conservation lands. (Putney Town Plan 2015)

Figure 2. Habitat Information, Inventory, & Mapped Data



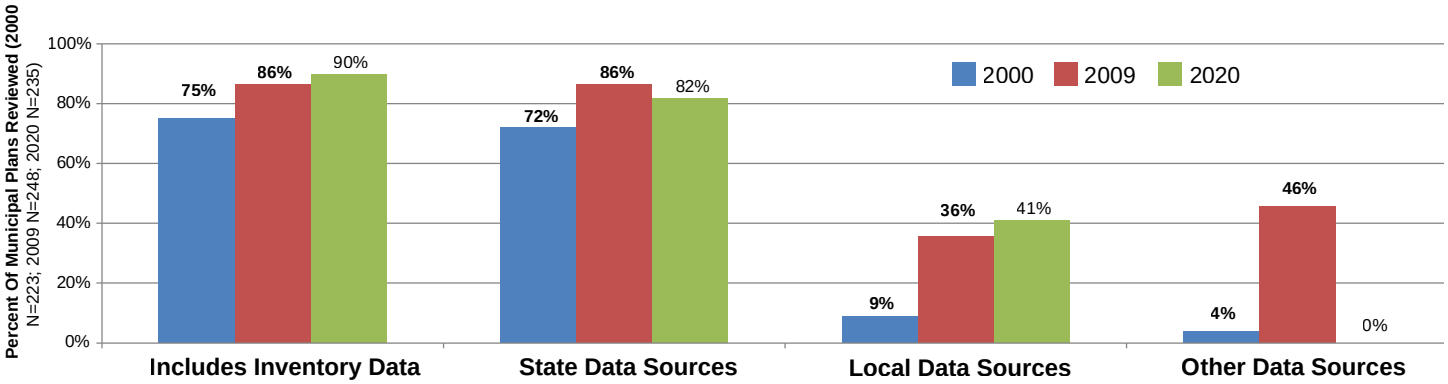
Overwhelmingly, Vermont communities identify some form of wildlife habitat in municipal plans (99%). Additionally, 90% of plans reviewed include or reference natural resource inventories, marking a steady increase in the availability and use of inventory data for planning purposes. The inclusion of mapped natural resource data in municipal plans has almost doubled over the years, from 52% in 2000 to 95% in 2020. This reflects a significant increase in the availability of related GIS data produced by the Vermont Agency of Natural Resources, the USDA Natural Resources Conservation Service, the U.S. Fish and Wildlife Service, regional and local planning or conservation commissions, and other entities, including nonprofits, land trusts, etc. – and information that comes out of development review (e.g., Act 250).

The Natural Resource Inventory of the Town of Newark identified the highest value riparian restoration opportunities by means of a screening process that involved:

- *Delineating 100-foot-wide buffers along streams and rivers.*
- *Identifying areas within buffer zones that are not currently covered by forest, shrubland, or wetland vegetation.*
- *Excluding sites with an existing building, road, or pond.*
- *Evaluating the remaining sites for restoration potential.*

(Newark Town Plan 2016)

Figure 3. Data Included in Plans



90% of municipal plans reviewed now include inventory data from state or local sources.

As highlighted in the previous figure, the results from this study show an increase in the use of resource inventory data in municipal plans over the last twenty years. The Fish and Wildlife Department continues to be the primary source of available wildlife data, information, and maps for use in local planning. Local data, where available, have also gained in importance, as referenced in 41% of the plans reviewed. This is encouraging given that local data often include site specific information that cannot be replicated in statewide coverages derived from desktop modeling and analyses. Both data sources are important, and it is encouraging that 90% of municipal plans reviewed now include inventory data from state or local sources. As a general trend, many municipalities have more data available now than ever before – the challenge is to determine which data are most relevant in each community, and to ensure that this information is field checked and updated as needed for use in local planning and development review.

The most significant wetlands in Bradford have been mapped and are included as part of the National Wetlands Inventory (NWI) prepared by the U.S. Fish and Wildlife Service. However, many smaller wetlands are not included in the NWI.

In 2005, the Bradford Conservation Commission conducted a local wetlands inventory. The inventory identified the largest wetlands to be those located along the Connecticut River and its confluence with the Waits River. These wetlands, plus those determined in the NWI have been delineated, and are included in this Plan. (Bradford Town Plan 2016)

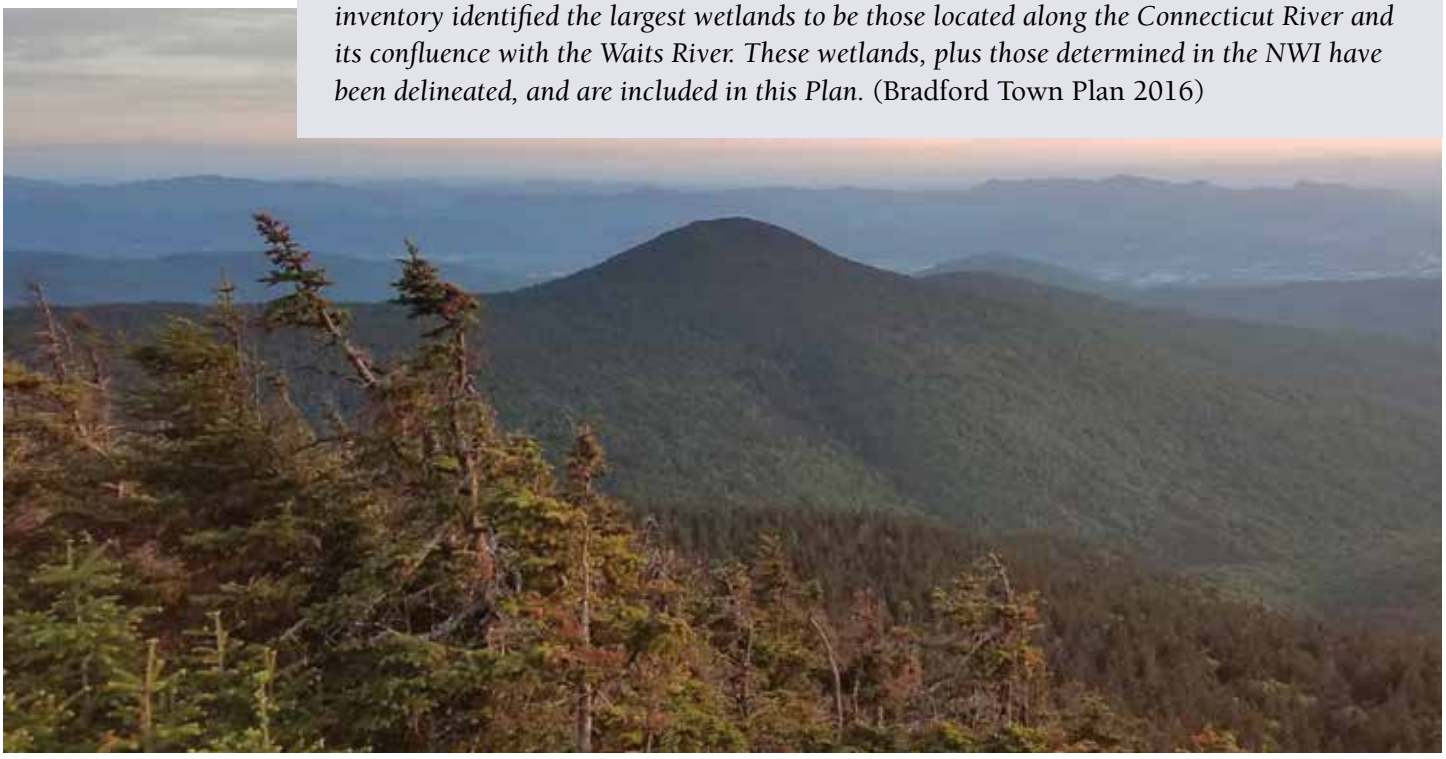
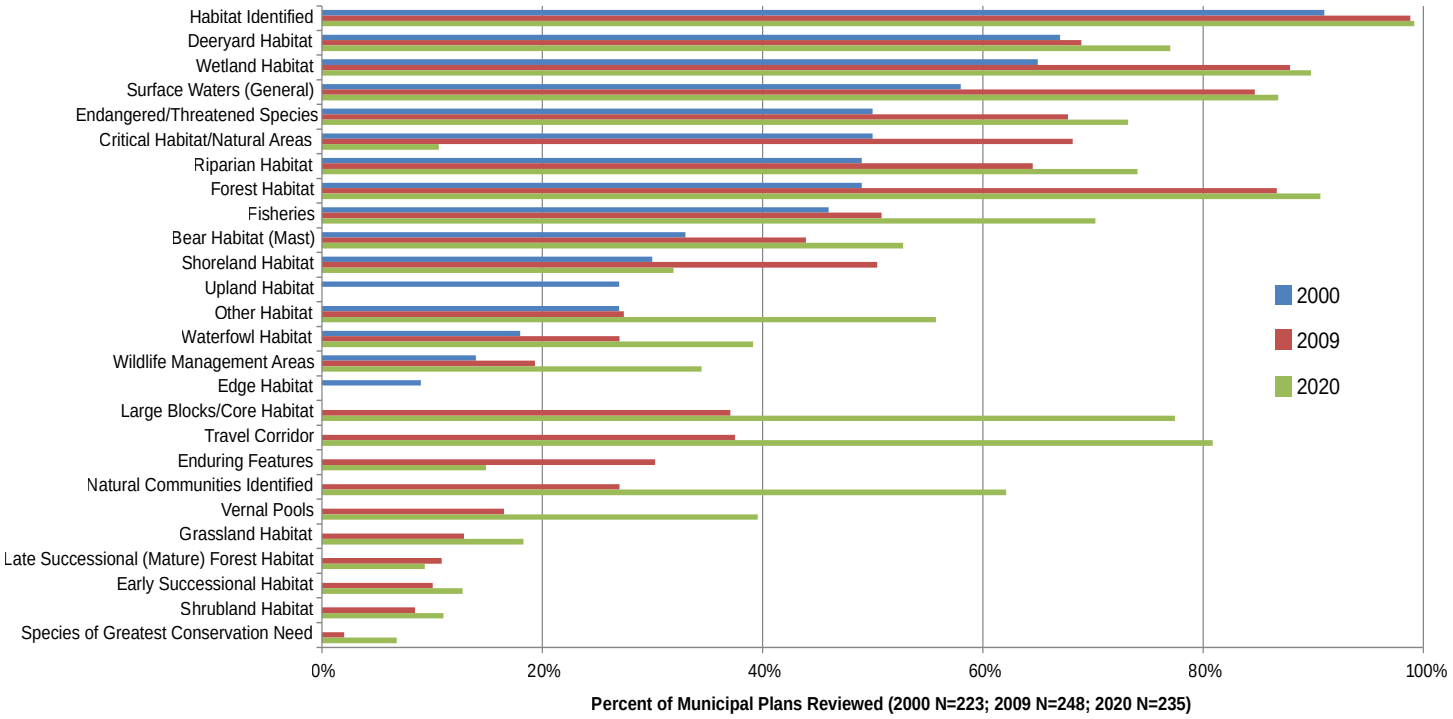


Figure 4. Habitat Types Identified in Plans



This figure offers twenty years of trend data on the types of wildlife habitat recognized in municipal plans. The most often identified general habitat "types" are forests (91%), wetlands (90%), and surface waters (87%). Across the board, more diverse and species-specific habitat types referenced in municipal plans saw noticeable increases in recent years, including deer wintering yards, endangered/threatened species habitat, riparian habitat, fisheries, bear habitat, waterfowl habitat, and wildlife management areas. The category of "Other" – representing more site specific or limited habitat types, such as migratory bird habitat, cliff and talus habitat, or turtle habitat – also saw a noticeable increase. This amount of differentiation reflects both a broader understanding of more diverse habitat settings, functions, and values, and the greater availability of mapped resource data.

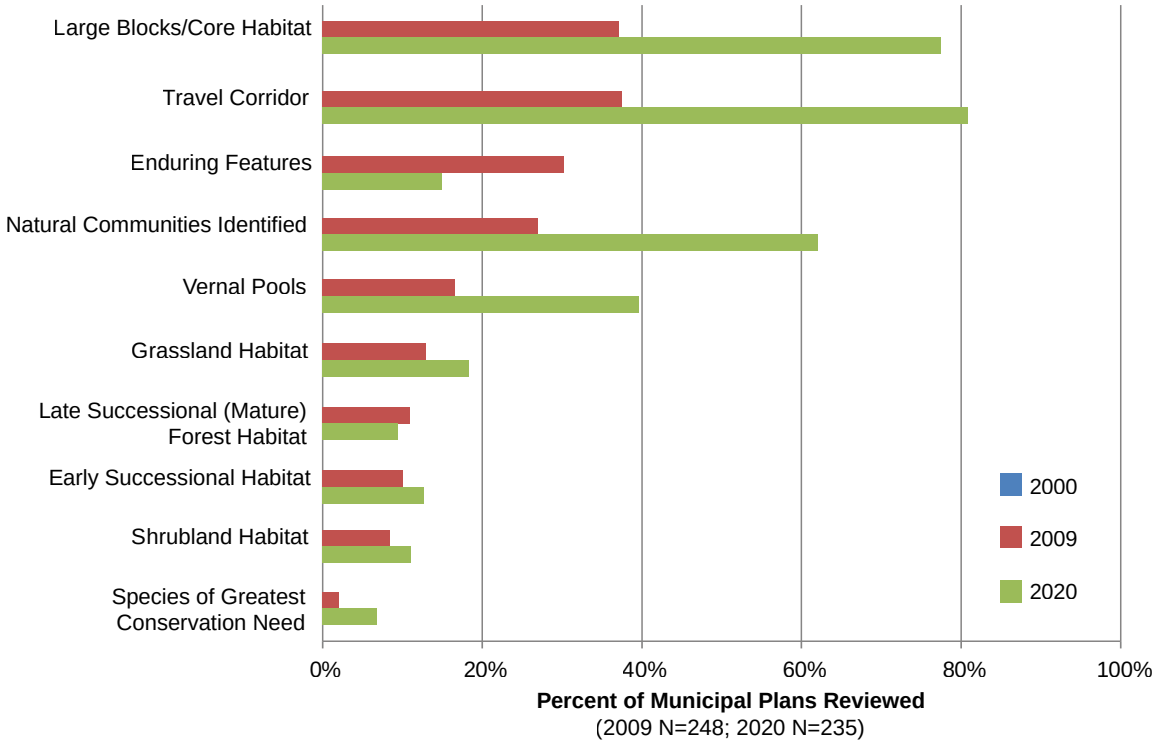
The most often identified general habitat "types" are forests (91%), wetlands (90%), and surface waters (87%).

Two habitat types saw noticeable declines: "critical" habitat and "shoreland" habitat. In this context, it is important to note that the Department, regional planning commissions, and other technical assistance providers have recommended limiting the use of the term 'critical habitat' since it may be confused with critical habitat designations at the federal level under the Endangered Species Act. "Significant" wildlife habitat is now the preferred term. Shoreland habitat considerations may have seen a decline at the municipal level in response to the 2014 Shoreland Protection Act, which allows municipalities to defer to the state to regulate shoreland area development.

Deer wintering areas provide critical habitat for white tail deer and other species of vertebrates. In Fairfax the largest mapped wintering range borders the Town of Fletcher along and south of Stones Brook. Smaller areas in central Fairfax and along the southern border with Chittenden County have also been recorded. These mapped areas support micro-climatic conditions–combinations of elevation, vegetation, and solar aspect–that significantly increase the winter survival rates of deer populations, and therefore critically impact Vermont's landscape ecology. These areas have been targeted for protection by the U.S. Fish and Wildlife Service. (Fairfax Town Plan 2018)

Figure 5. Habitat Types Identified in Plans (2009 -2020 Data Only)

Plans developed over the last decade have significantly increased their coverage of natural communities, vernal pools, core habitat areas, and wildlife travel corridors.



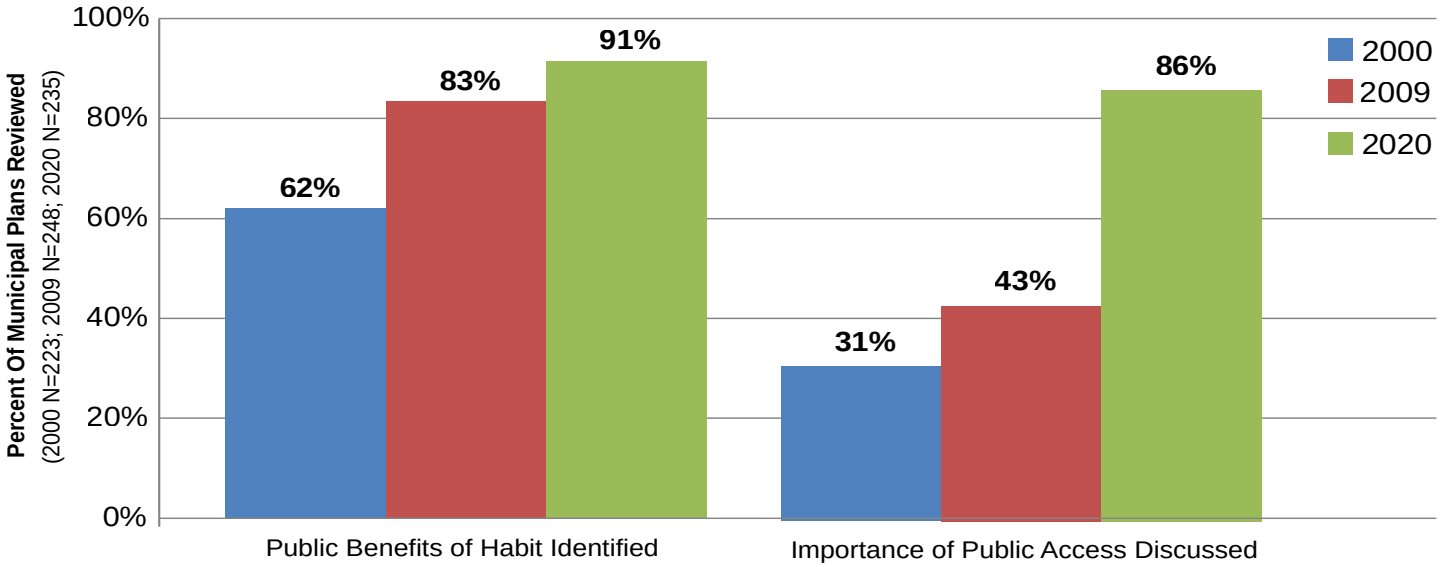
This figure focuses on additional habitat types that were not considered in the 2000 review of municipal plans. It is encouraging to observe that plans developed over the last decade have significantly increased their coverage of natural communities, vernal pools, core habitat areas, and wildlife travel corridors. The significant increase in planning for wildlife travel corridors ("habitat connectors") and core habitat areas ("forest blocks") is likely directly attributable to both recent changes to state planning statutes (Act 171) that require consideration of these features in municipal plans, and to subsequent community outreach, information, and technical assistance provided by VFWD, VNRC, and regional planning commissions. The dip in references to "enduring features" is attributable to the Department of Fish and Wildlife no longer using this term for planning purposes. VFWD now uses the term 'Landscape Diversity' to address the habitat role of geophysical diversity.

These data also demonstrate that there is room for improvement in understanding forest succession stages and management as components for maintaining wildlife habitat. Additionally, some of the habitat features represented above require technical knowledge and forms of active management that may not be well understood by non-specialists, and may therefore factor less in local planning. For example, of the plans reviewed that addressed both shrubland habitat and early successional habitat, very few adequately differentiated between the two habitat types. This study only reviewed municipal plan appendices, but not incorporated documents, which may have limited some of the responses.

Primary Conservation Areas *are the most sensitive places: the rare natural communities, rare species, vernal pools, riparian areas, river corridors, and wetlands. These areas occupy a small percentage of the town and should not be developed.*

Secondary Conservation Areas *are also very sensitive but some activities can occur within them without compromising their integrity. These include wildlife road crossings, a larger area surrounding vernal pools, significant (but not rare) natural communities, and ledge and cliff habitat that may be important for wildlife. In general, these places should be evaluated carefully when development is proposed within them for potential conflicts with the natural resource values.* (Jericho Town Plan 2016)

Figure 6. Public Benefits



Municipal plans continue to show marked improvement in identifying the public benefits associated with wildlife habitat – in 2020 91% of municipal plans reviewed recognized the public benefits of habitat. A significant majority of plans (86%) also recognize the importance of public access to these areas. This correlates with recreational pursuits such as fishing, hunting, hiking, snowmobiling, boating, cross country skiing, and swimming that are all recognized as public benefits associated with habitat protection (with fishing being by far the most popular benefit recognized).

Municipal plans continue to show marked improvement in identifying the public benefits associated with wildlife habitat.

Forests provide Vermonters with enormous benefits and range of critical goods and services. A thriving forest economy, functioning natural systems, and Vermont's quality of life rely on maintaining healthy forests across our landscape. Forest benefits include water supply and water quality protection, flood control and protection, wildlife habitat and biodiversity, clean air, carbon sequestration, outdoor recreation, and scenic beauty. Forests also provide cultural, spiritual, and intellectual enrichment benefits. All of these benefits are known as ecosystem services because of the value they provide. Without forests, these services would need to be replaced and at a great expense. (Newfane Town Plan 2018)

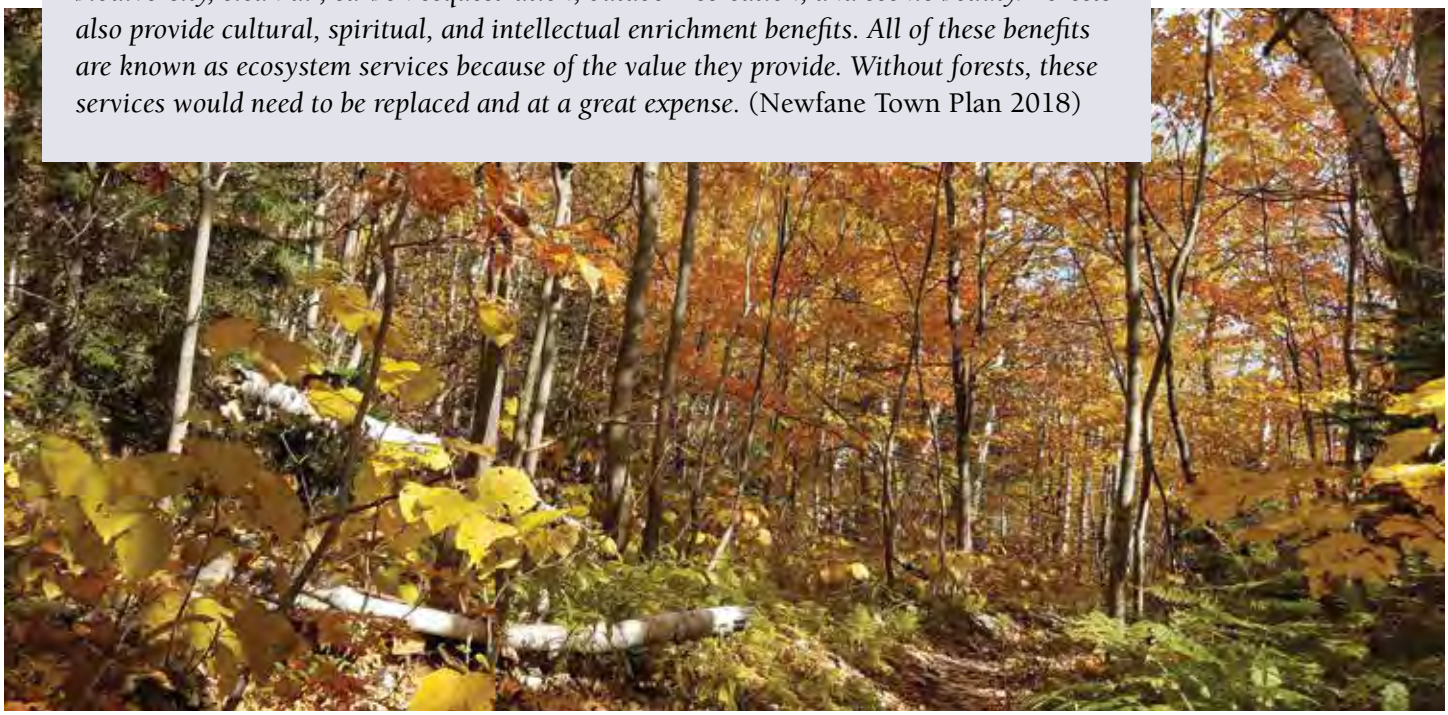
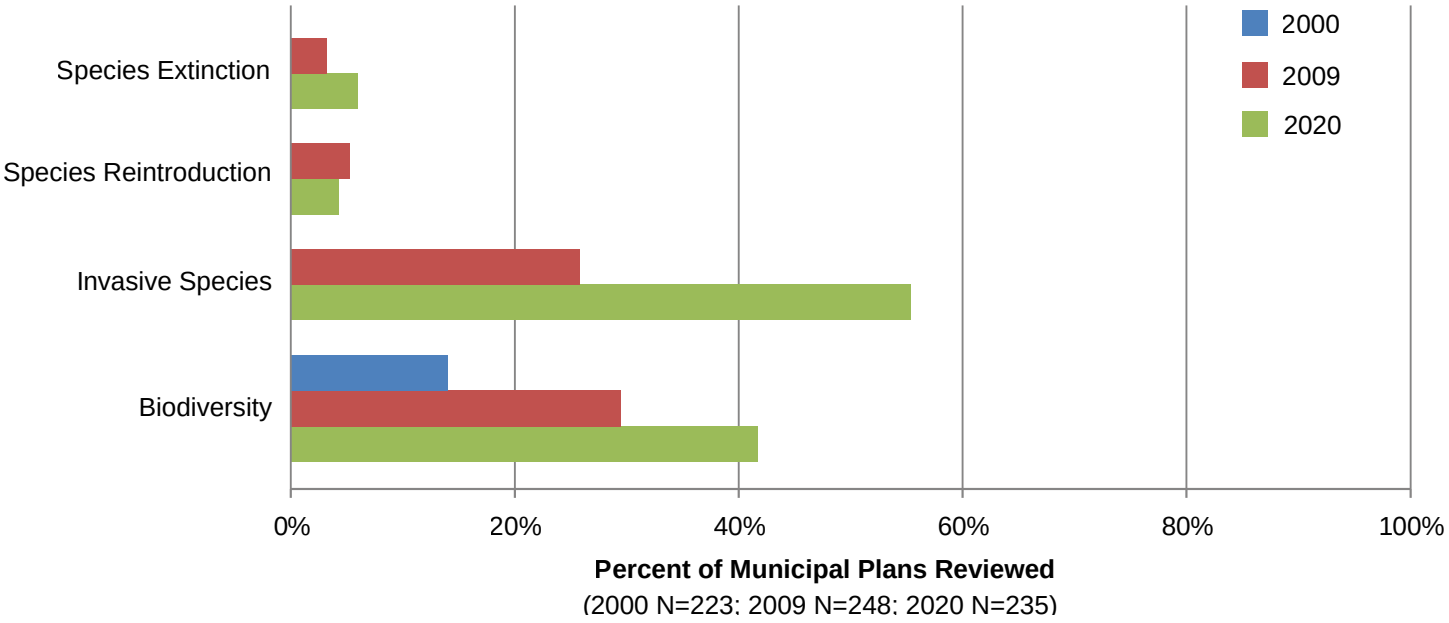


Figure 7. Species and Ecological Concepts



Invasive species management is also a growing area of concern, as now addressed in a majority of municipal plans (55%).

Only a few plans reviewed recognize the importance or relevance of key concepts such as species extinction or reintroduction. An increasing number of municipal plans recognize the importance of maintaining or enhancing biodiversity (42%), indicating a growing awareness around the importance of managing for a variety or diversity of local species. Invasive species management is also a growing area of concern, as now addressed in a majority of municipal plans (55%).

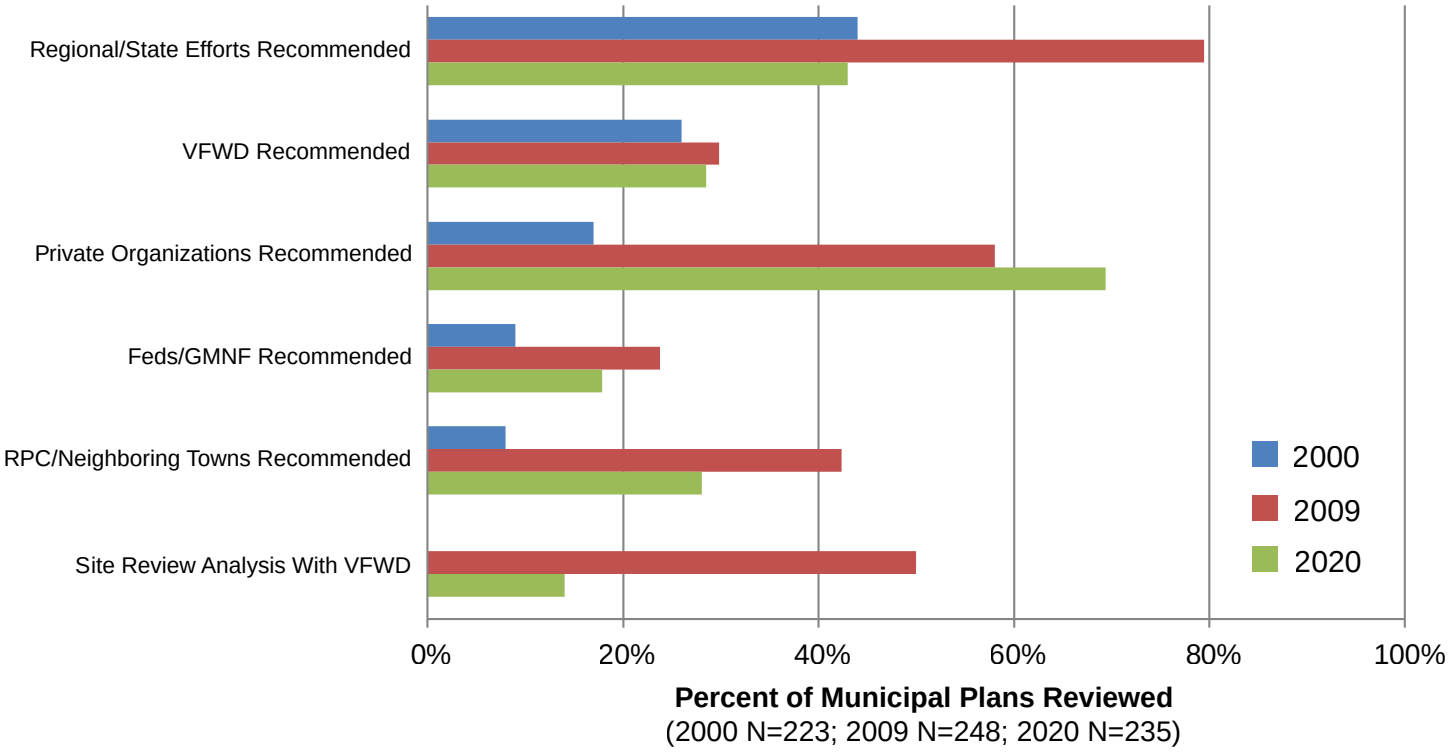
Actions to prevent the spread of invasive species:

1. *Educate residents, visitors and town personnel regarding the identification, threats, and control of invasive species*
2. *Cooperate with private, local, state, and federal groups to address the threat of invasive species*


Emerald Ash Borer

3. *When feasible, control the spread of existing invasive species in coordination with Town-initiated work projects*
4. *When possible, involve Town personnel remove, control or manage invasive species on Town properties and road rights-of-way* (Brattleboro Town Plan 2018)

Figure 8. Partnerships Recommended in Plans



This study examined whether municipal plans encourage coordination with partner organizations, including state or private entities, regional planning commissions, and neighboring municipalities. Results suggest that fewer municipal plans specifically reference the need for local coordination with larger regional or state conservation efforts, the Vermont Fish and Wildlife Department, or federal agencies such as the Green Mountain National Forest (GMNF).

This does not mean that such collaborations are less anticipated; but it does point toward an increased emphasis on local conservation in municipal plans, supported by the increased accessibility of GIS data, information, and technical assistance guidance available to local planning and conservation commissions. The above results also suggest that more education may be needed to promote coordination with neighboring towns and regional planning commissions to focus on landscape level conservation, such as on large forest blocks, travel corridors, and habitat connectivity areas that extend across multiple municipalities.

The study results suggest engaging the VFWD in the local development review process has varied over the years. A clear policy regarding departmental guidance in this area, especially for development that requires no state permits or review, would be helpful.

Relationship of Barnard's Planning Activities to its Neighbors:

Goals

1. *To work to maintain the natural beauty of the region while allowing for economic growth.*
2. *To develop regional solutions to problems that transcend Town borders.*

Objectives

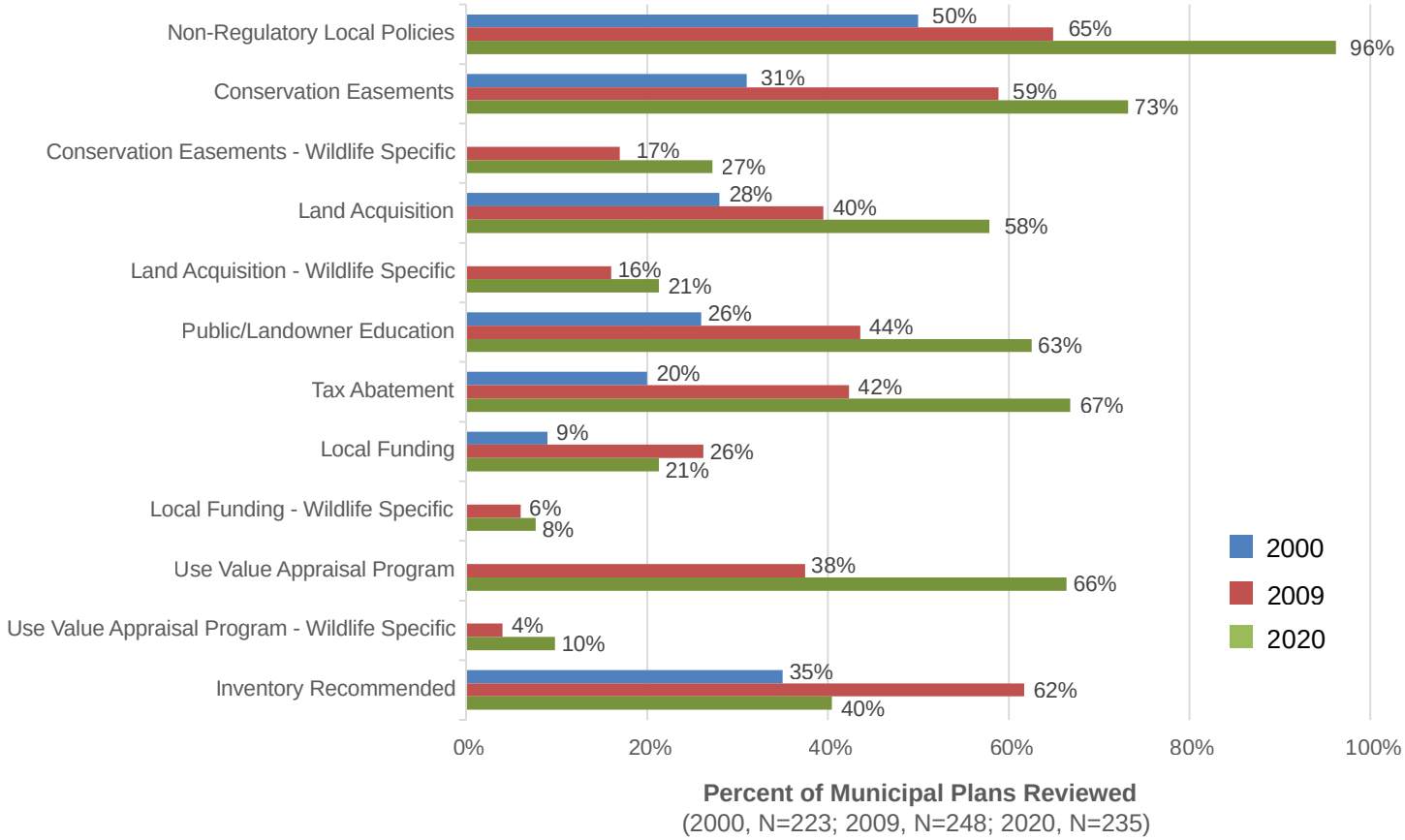
1. *Work with neighboring towns on areas of mutual interest.*
2. *Work to ensure that Barnard's views are known on a wider scale.*

Recommendations

1. *The Town should continue to actively participate in Two Rivers-Ottauquechee Regional Commission and exchange planning information and development trend data with neighboring communities.*
5. *The Conservation Commission should work with neighbors in Pomfret and Royalton (Broad Brook Mountain) to preserve wildlife habitats in large areas of contiguous forest in East Barnard.*
6. *The CNT Committee should work with Stockbridge, Bridgewater, and the Vermont Fish and Wildlife Department to expand the proposed Barnard Chateauguay/No Town Conservation Area.*

(Barnard Town Plan 2016)

Figure 9. Non-Regulatory Strategies Recommended in Plans



Almost all municipal plans reviewed recommend the utilization of non-regulatory strategies (96%), up from 65% a decade ago.

Almost all municipal plans reviewed recommend the utilization of non-regulatory strategies (96%), up from 65% a decade ago. And almost all types of non-regulatory strategies re-sampled from the 2000 and 2009 surveys exhibited an increase, with noticeable growth in policies or strategies related to conservation easements, land acquisition, public/landowner education, property tax abatement, and enrollment in Vermont's Use Value Appraisal Program (Current Use).

The popularity of the Current Use Program, tax abatement policies, and conservation easements suggests that municipalities understand the costs and tax burdens that come with owning undeveloped land and wildlife habitat, and the importance of strategies to help maintain these areas, including local conservation funding and land acquisition programs.

The decrease in the number of towns recommending the performance of an inventory may reflect the substantial number of municipalities that have internally conducted natural resources inventories or hired professional consultants to conduct inventories in the intervening years between our analyses.

Goal 1 — Encourage preservation of undeveloped land as an important element in shaping Dummerston's development pattern and in preserving its aesthetic and environmental quality.

Action Steps:

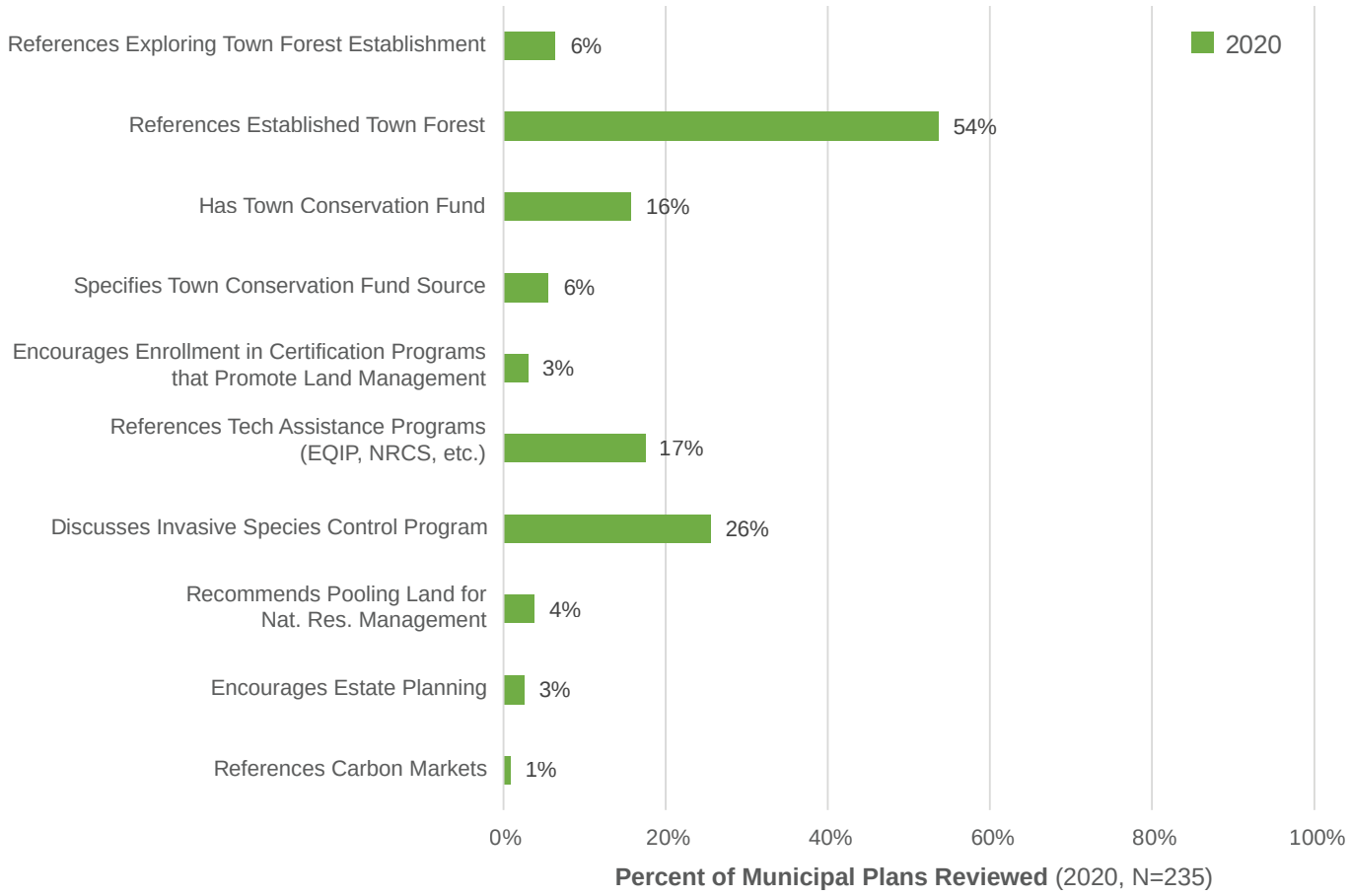
a. Work with conservation land trusts and other conservation organizations to educate landowners about land conservation options.

b. Use multiple strategies and means to protect and preserve land and resources, including for example, direct acquisition, conservation easements and a natural heritage registry.

c. Consider establishment of a Conservation Fund, perhaps through expansion of the Town Farmland Protection Fund.

(Dummerston Town Plan 2018)

Figure 10. Other Non-Regulatory Strategies in Plans (2020 Data Only)



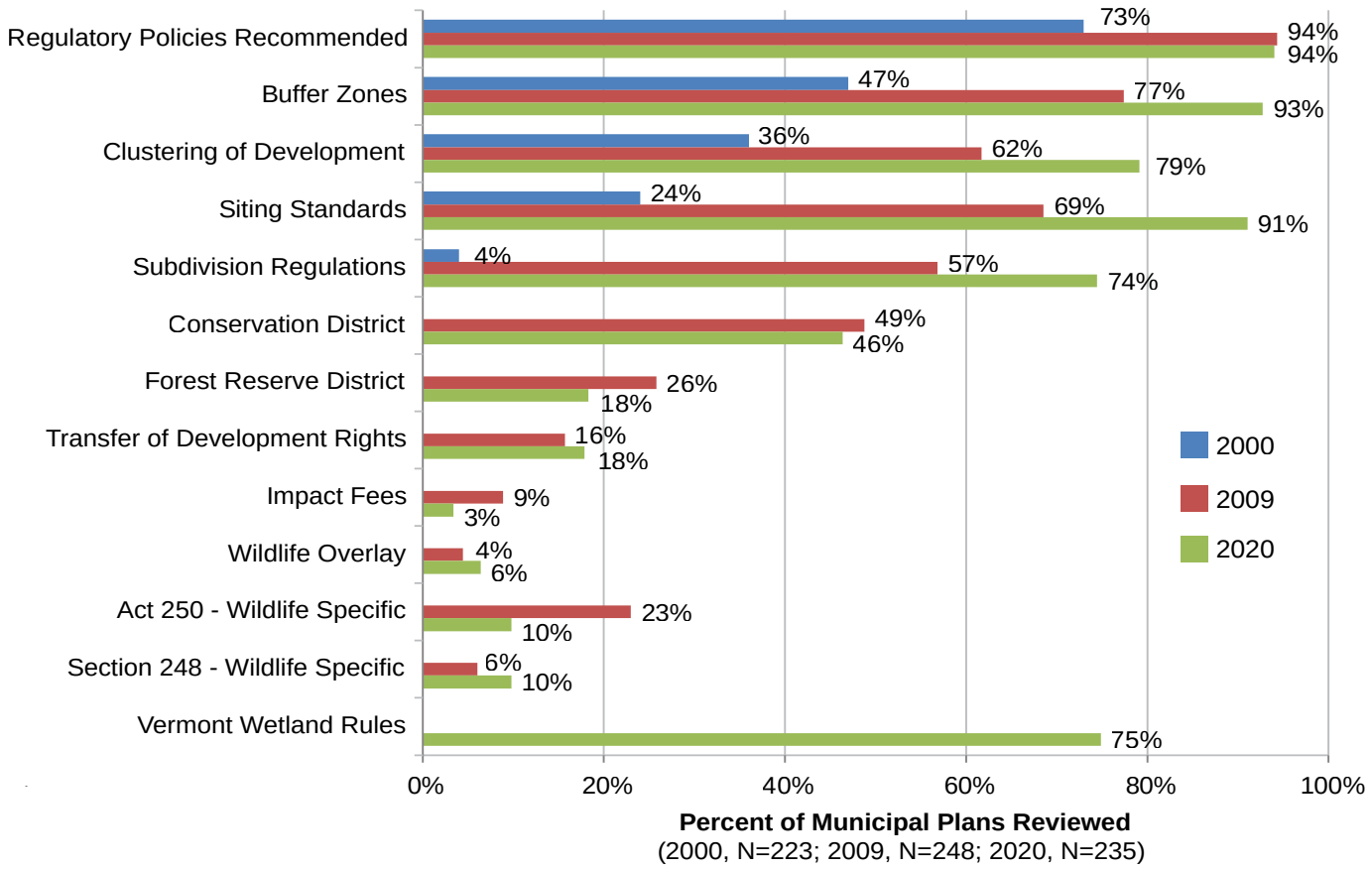
This 2020 study also gathered information on new or additional non-regulatory strategies mentioned in municipal plans that were not referenced previously, providing a baseline for future trends analysis. Over half of the plans reviewed in 2020 (54%) noted the presence of a town forest, and an additional 6% recognize the value of establishing a town forest. Other non-regulatory strategies specifically mentioned in this round of review included invasive species management programs (25%), local conservation funds (16%), and programs that provide technical assistance and funding for resource management (17%).

Over half of the plans reviewed in 2020 (54%) noted the presence of a town forest.

Strategies such as enrollment in carbon markets and encouraging estate planning for landowners to conserve land across multiple generations are infrequently mentioned, demonstrating the need to focus education and outreach on these strategies to the degree that municipalities can encourage their implementation through municipal planning and land conservation. In addition, greater emphasis should be given to high impact strategies, such as the establishment of a conservation fund, which could offer opportunities to both towns and landowners to facilitate and finance priority local conservation projects.

Fairlee could become an active participant in land conservation through the creation of a conservation fund and a Conservation Commission. This fund, which could be funded on a yearly basis, would contain funds that a Conservation Commission could use to purchase land outright, or assist a land conservation organization with the purchase of a conservation easement. (Fairlee Municipal plan 2020)

Figure 11. Regulatory Policies Recommended in Plans



In general, the value of regulatory strategies – the primary means enabled under Vermont statutes to implement municipal plans – is also widely recognized.

In general, the value of regulatory strategies – the primary means enabled under Vermont statutes to implement municipal plans – is also widely recognized. Many of the proposed regulatory strategies re-sampled from previous studies demonstrated an increase in 2020. Increases in the proposed clustering of development, new siting standards, and subdivision regulations all suggest that more municipalities see the benefit in shaping how development occurs on the land. However, while 74% of municipal plans recommend subdivision regulations to control the pattern of development, only 55% of municipalities have actually adopted subdivision regulations, possibly reflecting some local resistance to land use regulation (see Figure 16)

Our review of zoning regulations suggests that an increasing number of municipalities are considering, and implementing, resource-related siting standards, such as setback and buffer requirements established under the Vermont Wetland Rules. More municipalities appear to understand the importance of such resource protection standards as more generally applied to all development, rather than limiting resource protection to specific zoning districts – demonstrating the evolving role of regulatory standards as a tool.

Fewer plans recommend municipal participation in Act 250 review hearings, but slightly more recommend local participation in the Section 248 process with regard to the review of electric generation, transmission, or telecommunication facilities. Enhanced municipal energy planning, as enabled in 2015, may be factoring into this increase.

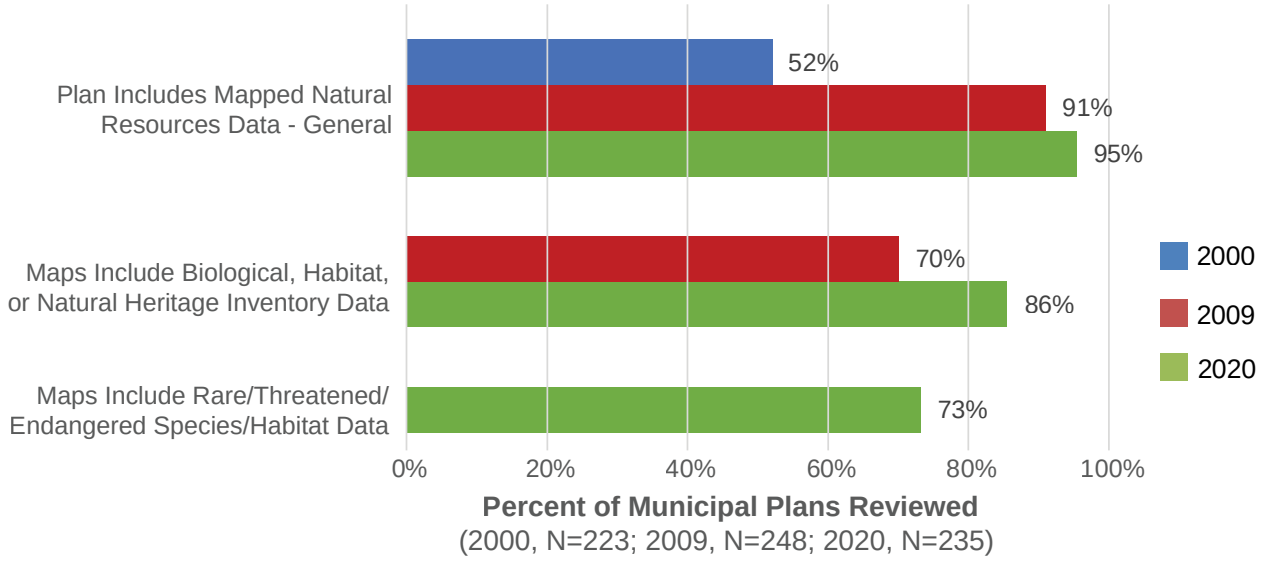
The most commonly used bylaws for controlling development at the local level are zoning and subdivision regulations. Zoning and subdivision regulations control the use of land and structures, and the density, height and bulk of development. 24 VSA Chapter 117 spells out specific requirements and limitations of any municipal land development regulations. The statutes also provide multiple optional tools that communities enact under zoning and subdivision, including:

- *Establishment of zoning and overlay districts*
- *Site plan and conditional use standards*
- *Performance standards*
- *Form Based Code inspired standards*
- *Inclusionary zoning*
- *Waivers*
- *Planned unit development*
- *Transfer of development rights*

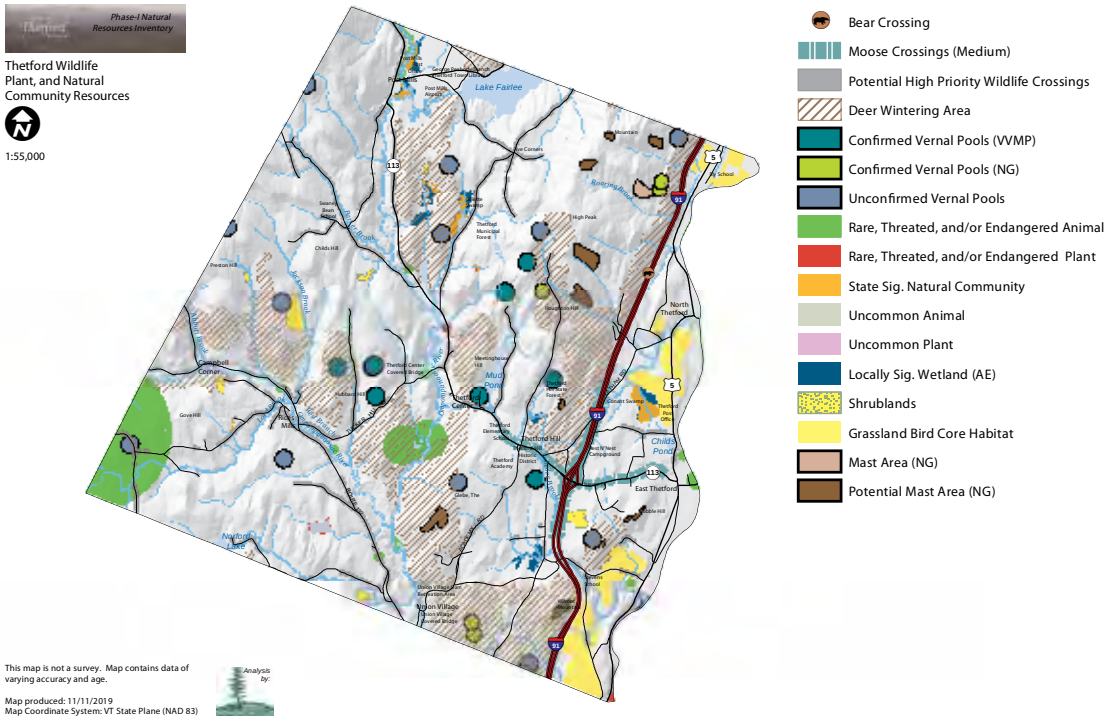
Hinesburg has utilized these regulatory tools for decades, and will continue to improve and refine these regulations to better implement the Municipal plan vision.

(Hinesburg Town Plan 2017)

Figure 12. Mapped Data Within Municipal plans

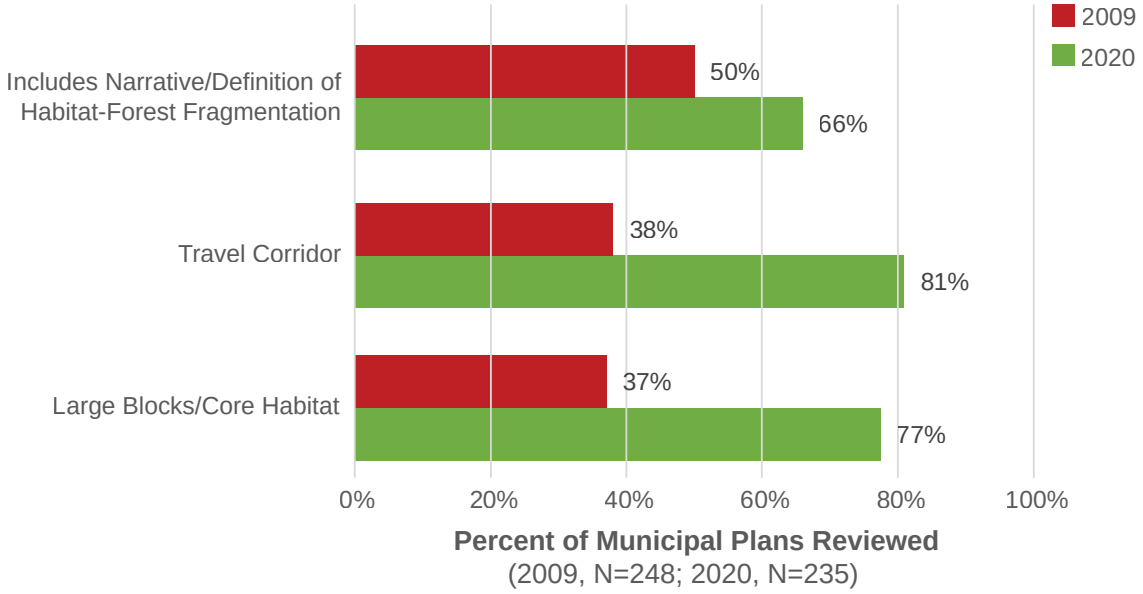


A large majority of municipal plans (95%) include mapped natural resource data. This is a significant increase from the first study in 2000, demonstrating important progress in mapping natural resources. Of the plans that include mapped data, a growing number include data specific to wildlife, such as biological data, habitat data, or Natural Heritage Inventory data collected by the VFWD (86%). This likely reflects the increased amount of mapped information available to local communities through the Vermont Center for Geographic Information, the Agency of Natural Resources' online mapping platforms – including the Natural Resources Atlas and Biofinder – and through local resource inventories.



While a majority of municipal plan maps now identify the general location of rare, threatened, or endangered species (73%), there is some concern that over a quarter of municipalities do not include this information in plan maps even though information is available from the VFWD. It may be that this absence is intended to protect such resources, even though the maps typically only indicate the potential presence of such species within a buffered area, without disclosing their specific locations. It could also suggest that the protection of rare, threatened, and endangered species is more a function of state and federal government. Efforts should be made to determine why more municipalities are not mapping these sensitive wildlife resources to inform development review at the coarse scale, recognizing that review boards need access to more specific (and current) info/data—including site surveys/ inventories for use in local development review.

Figure 13. Fragmentation, Travel Corridors, and Habitat/Forest Blocks (2009-2020 Data Only)



Technical assistance efforts over the last decade by the VFWD, VNRC, RPCs, and other entities, have focused on the importance of maintaining large blocks of core forest and wildlife habitat, and wildlife travel corridors or connectors, that maintain habitat connectivity. Addressing forest fragmentation – the subdividion and breaking up intact forests and habitat – has become a priority concern in Vermont, resulting in related planning legislation passed in 2016 (Act 171). See Figure 14 for additional information on Act 171 trends in municipal plans.

This study confirms that an increasing number of municipalities are now aware of the effects of forest fragmentation on core habitat and wildlife travel corridors.

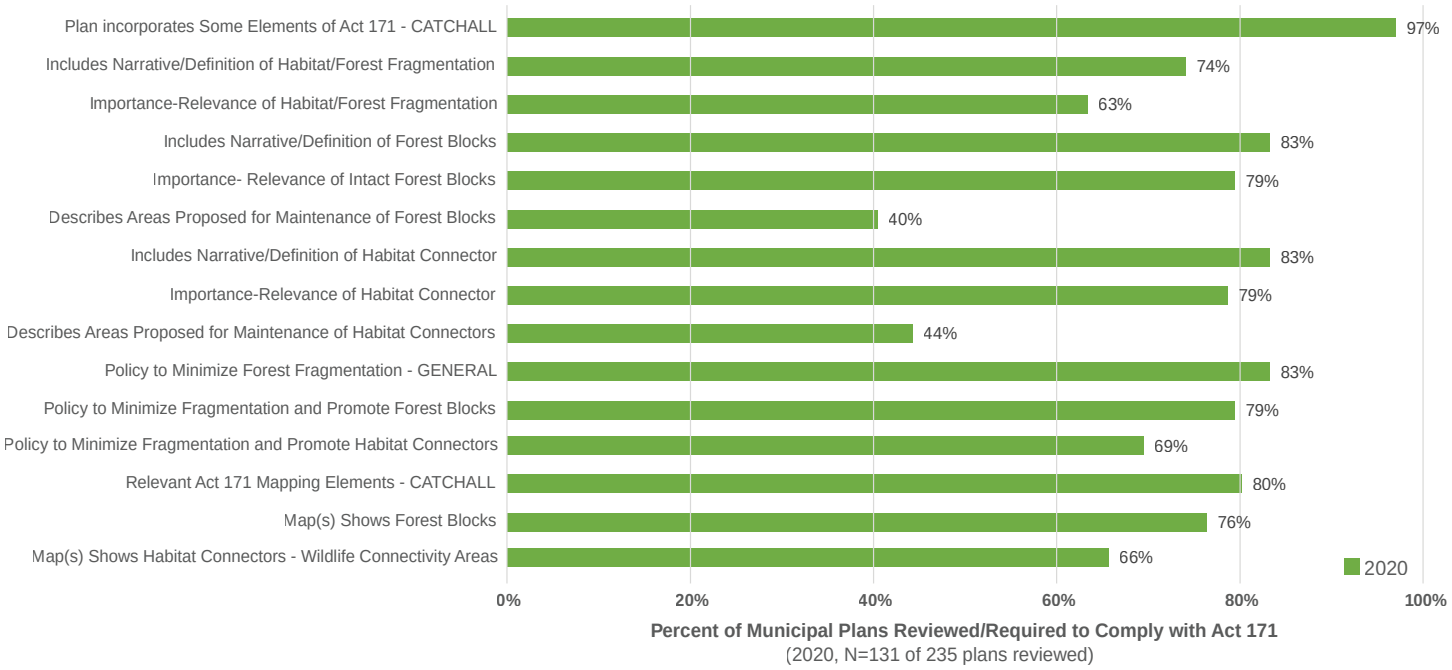
This study confirms that an increasing number of municipalities are now aware of the effects of forest fragmentation on core habitat and wildlife travel corridors.

Maintaining large blocks of interior forest is a simple biodiversity conservation strategy that can help sustain viable populations of native plant and animal species for future generations. Interior forest blocks are particularly important for wide-ranging animals such as bobcat, marten, and bear, which require large areas to survive. These blocks are big enough to:

- *Withstand & recover from catastrophic events like storms or wildfires;*
- *Support breeding populations;*
- *Provide habitat for species sensitive to human disturbance; and*
- *Include a variety of landscape features and habitat types.*

Forest blocks of 500 acres or more are needed to fully provide all of the benefits listed above. Forest covers 83% of Northfield and 87% of that forest land remains part of a large block (more than 500 acres in area) that is unfragmented or minimally impacted by roads, development and agriculture. 73% of forest remains part of a large parcel (more than 50 acres in area). (Northfield Town Plan 2020)

Figure 14. Act 171/Forest Integrity Implementation (2020 Data Only)



Act 171, a bill passed in 2016 to maintain forest integrity, was the result of many years of education in the Vermont Legislature

Act 171, a bill passed in 2016 to maintain forest integrity, was the result of many years of education in the Vermont Legislature about the importance of maintaining intact forest blocks, including working forests and wildlife habitat, in Vermont. The most pertinent aspects to local planning of Act 171 now require town and regional plans that are adopted after January 1, 2018 to:

- Indicate those areas that are important or require special consideration as forest blocks and habitat connectors, and to
- Plan for land development in those areas to minimize forest fragmentation and promote the health, viability, and ecological function of forests.

In 2018, the Vermont Agency of Natural Resources published a guidance document to implement Act 171. Figure 14 provides information from 131 municipal plans reviewed that were in good standing and were required to comply with Act 171 (any plan adopted after January 1, 2018). Overall, a large percentage of these plans incorporated elements of ANR guidance. For example, 76% of municipal plans included maps of forest blocks and 66% of plans included maps of habitat connectors. A significant majority of plans reviewed (83%) included policies to minimize forest fragmentation. and an equal percentage (83%) included relevant statutory definitions or narratives. Municipal plans were less effective in describing in detail those areas to be maintained in forest blocks and habitat connectors – an area identified for improvement.

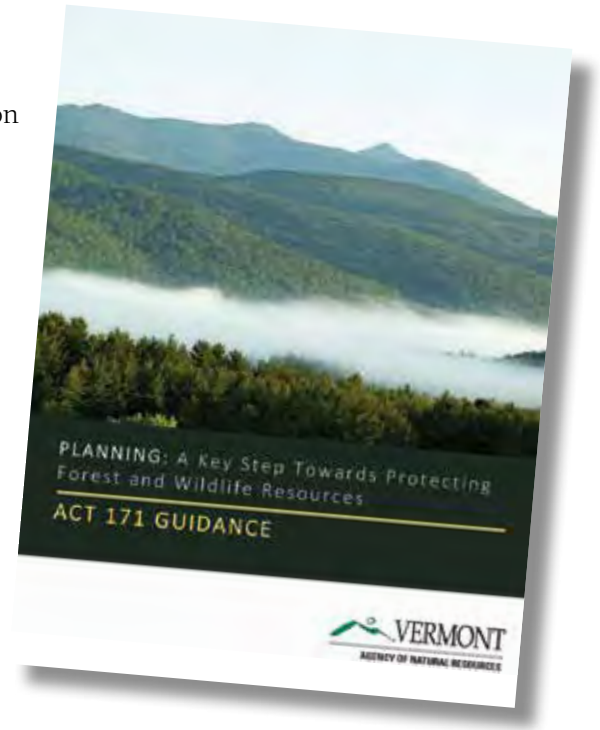
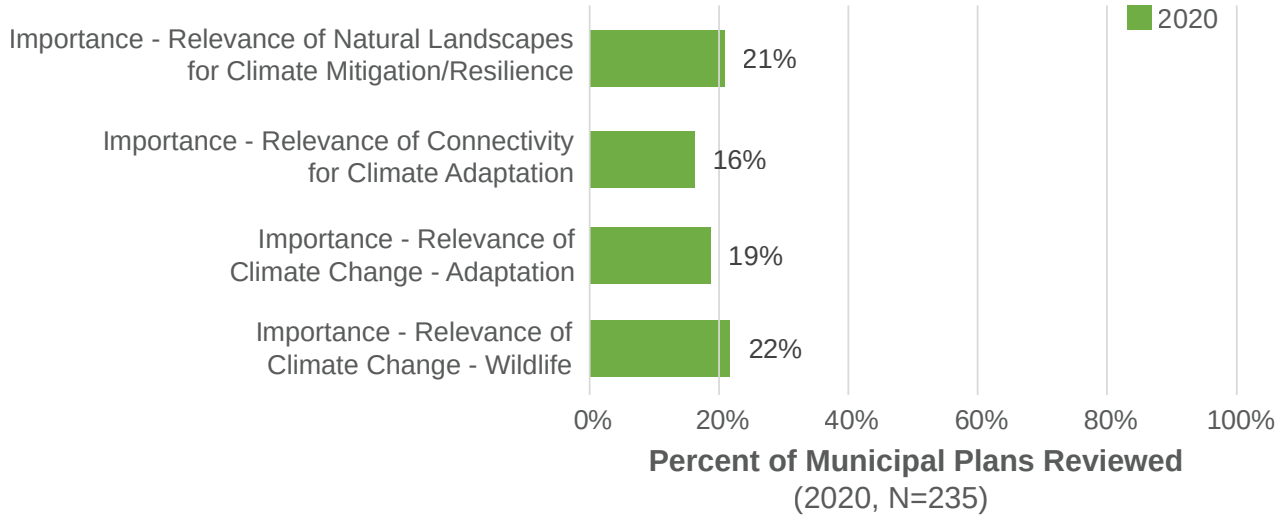


Figure 15. Climate Change and Resiliency Concepts (2020 Data Only)



Another important consideration first examined in this round of review was the concept of "landscape resiliency" in association with climate change. Around 20% of all plans reviewed in 2020 recognized the relevance of natural landscapes in both mitigating and adapting to the effects of climate change. A slightly smaller percentage of plans (16%) recognized the importance of maintaining connectivity for species movement to adapt to climate change.

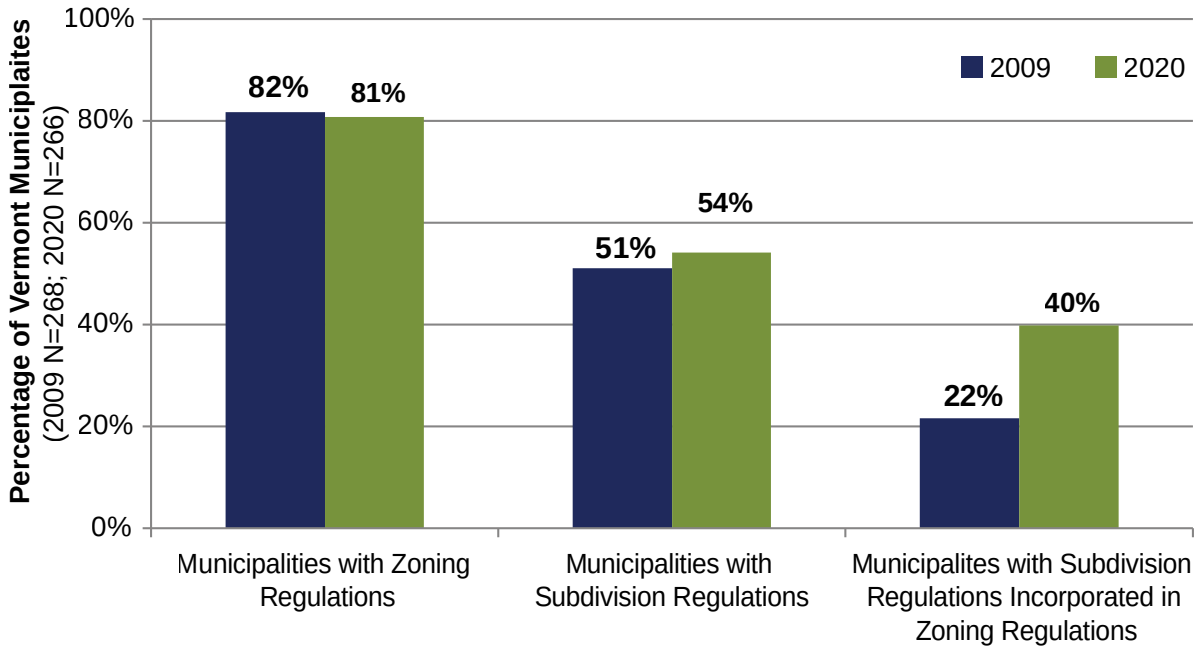
The only comparable metric analyzed in 2009 concerned the relevance of climate change as it relates directly to wildlife. In 2009, only 2% of municipal plans recognized the potential impacts of climate change on local wildlife populations, while in 2020, 22% of municipal plans reviewed referenced this connection. These results highlight the need for additional information, education, and outreach regarding principles and strategies to address the impacts of climate change on our wildlife and natural ecosystems in municipal planning.

These results highlight the need for additional information, education, and outreach regarding principles and strategies to address the impacts of climate change.

Declaration of Climate Emergency

- *The town recognizes that we – our region, our country, our world – have entered a period of unprecedented climate emergency, which requires unparalleled responses at all levels of government and society.*
- *The town also recognizes that refugees and immigration, along with economic, social, and racial justice, are embedded aspects of the climate emergency, as is the protection of farms, forests, wildlife, and natural areas.*
- *Town government must fully integrate these understandings into its future decision-making.*
- *Town government must work with the citizens and organizations of the town, as well as regional and state organizations, to cut CO2 by 45% by 2030. If we fail to do that, the IPCC predicts that the effects on all life will be catastrophic.* (Thetford Town Plan 2020)

Figure 16. Land Use Regulations in Vermont

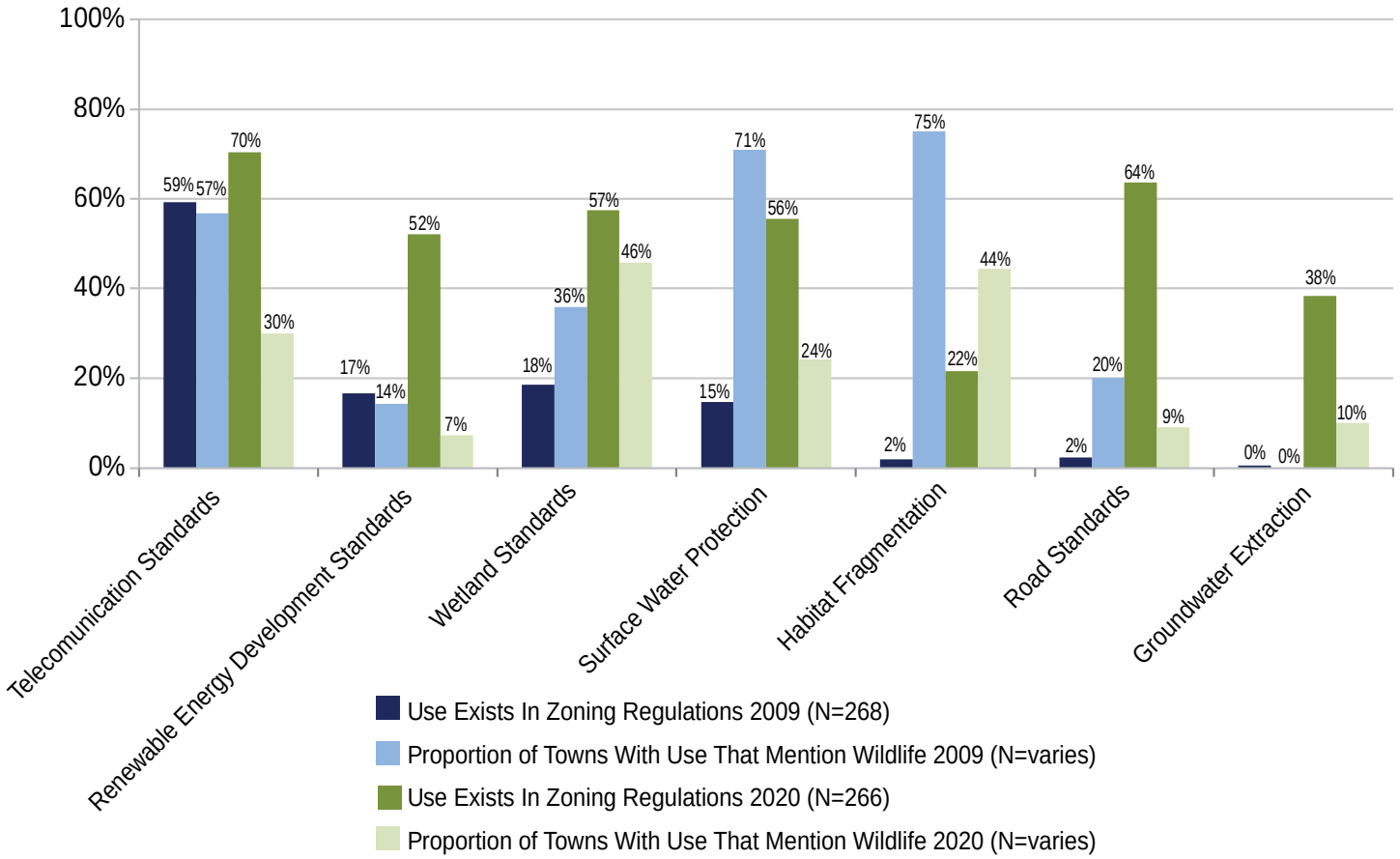


The majority of Vermont municipalities in 2020 (82%) have zoning regulations.

The majority of Vermont municipalities in 2020 (82%) have zoning regulations, but it is worth noting that the number of municipalities with zoning has not changed in 10 years. The observed 1% loss of municipalities with zoning regulations can be attributed to two town/village mergers. This suggests that around 20% of municipalities in the state do not intend to adopt zoning regulations, leaving local natural resources vulnerable to the impacts of development.

There was slight growth in the number of municipalities with subdivision regulations bringing the total to 55%, and nearly twice as many towns (40%) now include their subdivision regulations with their zoning bylaws (40%) under a set of "unified" land development regulations (i.e., that combine zoning, subdivision, site plan, and hazard area regulations).

Figure 17. General Use Review Standards



General use standards include the following standards: use standards (specific to a particular land use), development standards (specific to land development), or environmental protection standards (specific to a particular resource/ resource area). These review standards apply under zoning to new development, and to resources identified for protection, and are an important tool to reduce the potential impacts of development on wildlife species and habitat. It is encouraging to see that the percentage of zoning standards that reference wildlife grew between 2009 and 2020. Only wildlife standards specific to telecommunications facilities saw a decline. It should be noted, however, that Vermont municipalities no longer have the ability to directly regulate telecommunications or renewable energy facilities that are regulated by the state's Public Utilities Commission; but local plan policies are nevertheless a consideration in state review.

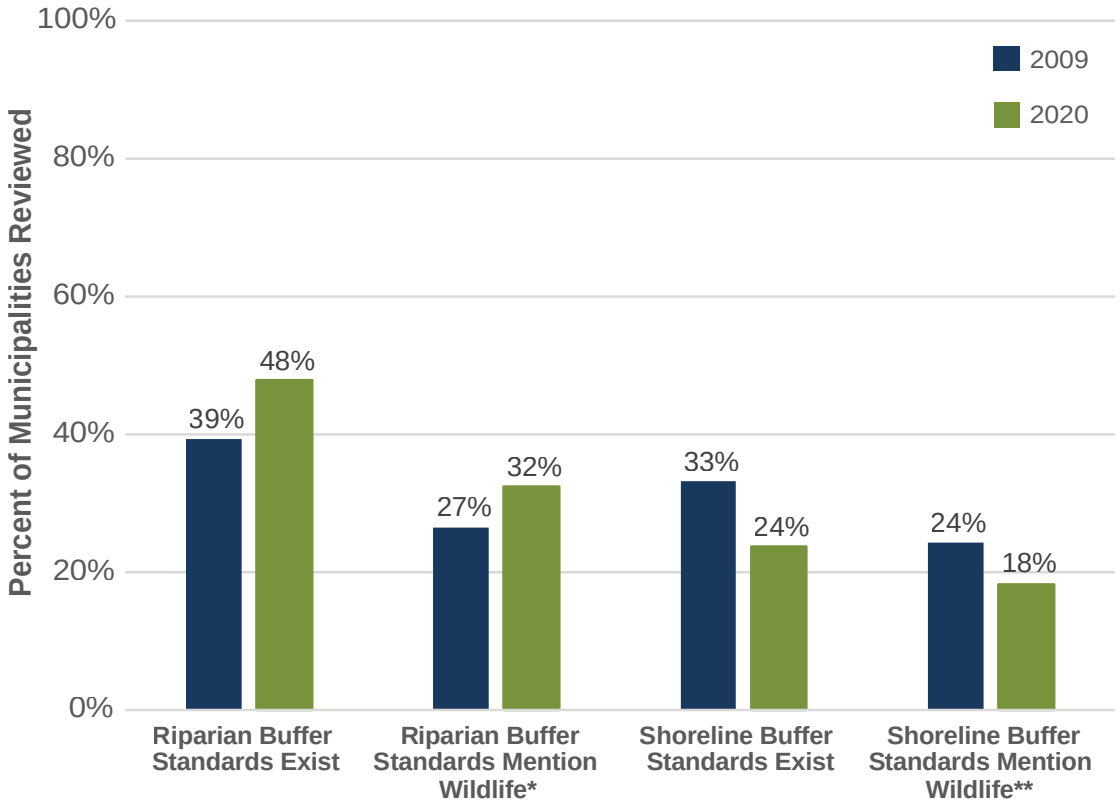
It was also observed that only 18% of zoning bylaws reviewed in 2020 included standards that address forest and habitat fragmentation. It is also worth noting that more municipalities are addressing the impacts of land subdivision, including forest fragmentation, under their subdivision regulations, which may also include other siting and protection standards applicable to subdivision layout and design (e.g., for roads, blocks, building lots, conserved open space). Wildlife impacts may be addressed through these mechanisms as well (see Figure 20). Nevertheless, there is a real need to better address forest and habitat fragmentation under both local zoning and subdivision review standards.

Natural & Historic Resource Protection: Subdivision boundaries, lot lines, and building envelopes should be located and configured to avoid adverse impacts to significant natural and historic features identified in the East Montpelier Municipal plan or through site investigation. For purposes of these regulations, these shall include wetlands, surface waters, and associated buffer areas; flood hazard areas; areas within the Conservation Overlay Districts; slopes in excess of 25%; significant wildlife habitat areas; and historic sites and structures. Accordingly:

1. *Lot lines and building envelopes should be configured to avoid development on, or the fragmentation of, significant natural or cultural features, including designated buffer areas.*

(East Montpelier Zoning Bylaws 2018)

Figure 18. Shoreland and Riparian Buffer Standards



It is promising to see an increase in the number of riparian buffer standards included in local bylaws.

Riparian and shoreland buffers provide important habitat for both aquatic and terrestrial wildlife – and habitat connectivity – in addition to a host of other environmental benefits. It is promising to see an increase in the number of riparian buffer standards included in local bylaws since 2009. This may reflect the increased emphasis statewide on adopting local regulations that limit development within mapped river corridors, in response to both more frequent and severe flooding, and associated erosion hazards attributable in part to the effects of climate change. Limiting new development within these areas also benefits riparian habitat.

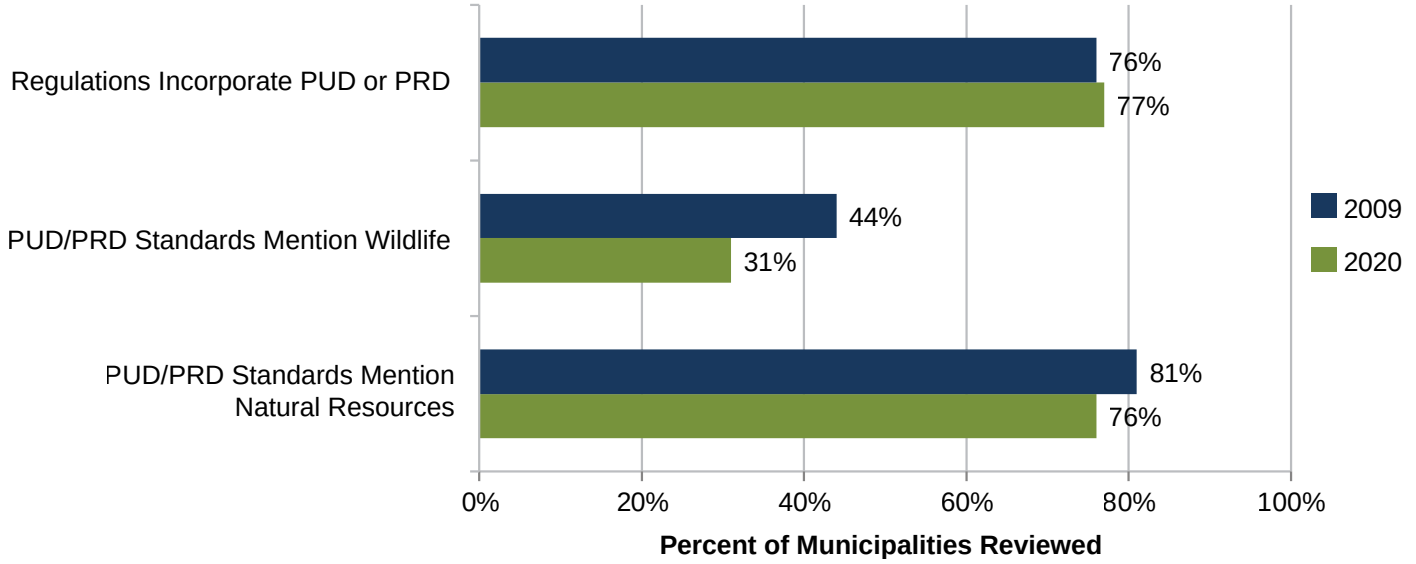
The dip in shoreline setback and buffer standards may be attributable to the passing of the Shoreland Protection Act in 2014, which authorizes state regulation of land clearing activities within 250 feet of the shoreline of any lake larger than 10 acres. Some municipalities may simply be deferring to the state in light of this regulation.

Section 5.10 Riparian Buffer Zones

A. Purpose. It is the purpose of this section to preserve water quality, and to promote the public health, safety and welfare by protecting the streams and rivers in Georgia by buffering them from erosion, pollution and visual blight. These streams and rivers are recognized as providing important fish, wildlife, and ecological habitat, recreational and educational opportunities, and scenic enjoyment for the public. No development within riparian buffer zones may occur except as in this Section.

(Georgia Zoning Bylaws 2013)

Figure 19. Development Density Controls



Planned Unit Development (PUD) or Planned Residential Development (PRD) provisions that allow for more innovative forms of development such as "conservation subdivision design" that modify or supersede underlying zoning requirements, are common in Vermont. PUD/PRD regulations must consider open space, and can help protect wildlife and limit forest fragmentation by requiring the clustering of development, guiding road and utility layout, and requiring a percentage of land to be set aside as conserved open space. Fewer PUD/PRD provisions reviewed mentioned wildlife and natural resources in 2020. This may reflect a trend to incorporate more resource protection standards under standard subdivision regulations, but more analysis is needed to understand this trend.

It is promising to see an increase in the number of riparian buffer standards included in local bylaws.

Planned Residential Developments (PRDs) and Planned Unit Developments (PUDs) are encouraged in designated districts to:

(1) create a more desirable environment than would be possible through the strict application of other sections of these regulations;

(2) concentrate development to avoid the fragmentation of productive forest, wildlife habitat and farmland;

(3) utilize a pattern of development that preserves trees, outstanding natural, topographic and geologic features, and prevents soil erosion, and minimizes visual impact;

(4) increase density, reduce lot size and/or provide for streets and utilities in a cost effective manner;

(5) accommodate new development in a manner that maintains the town's historic settlement patterns and protects significant natural, cultural and scenic features as described in the Fayston Municipal plan;

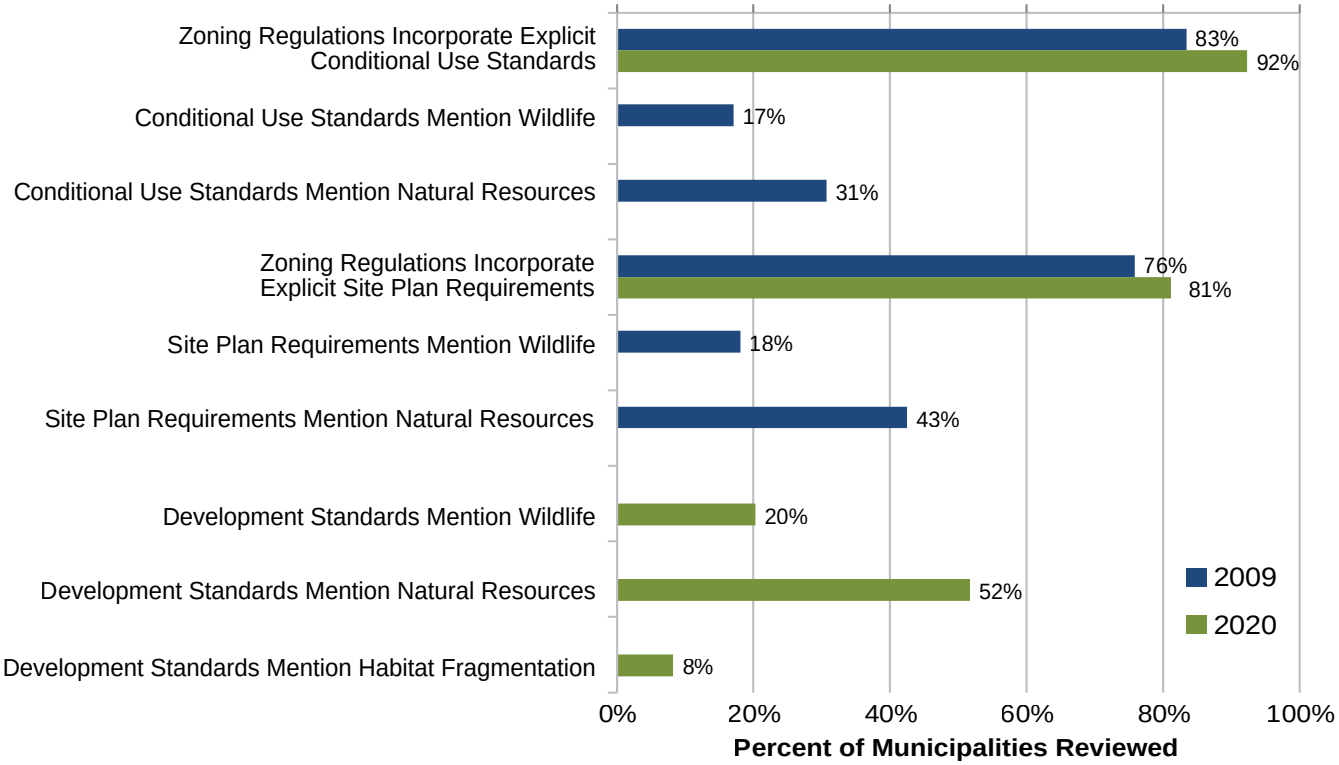
(6) provide for a logical, functional integration of mixed land uses;

(7) incorporate a pedestrian orientation, de-emphasizing private autos;

(8) conserve energy through centralized system design and site orientation

(Fayston Zoning Bylaws 2018)

Figure 20. Conditional Use Standards and Site Plan Requirements



Note: 2020 data collection combined conditional use standards and site plan requirements into a single development standards

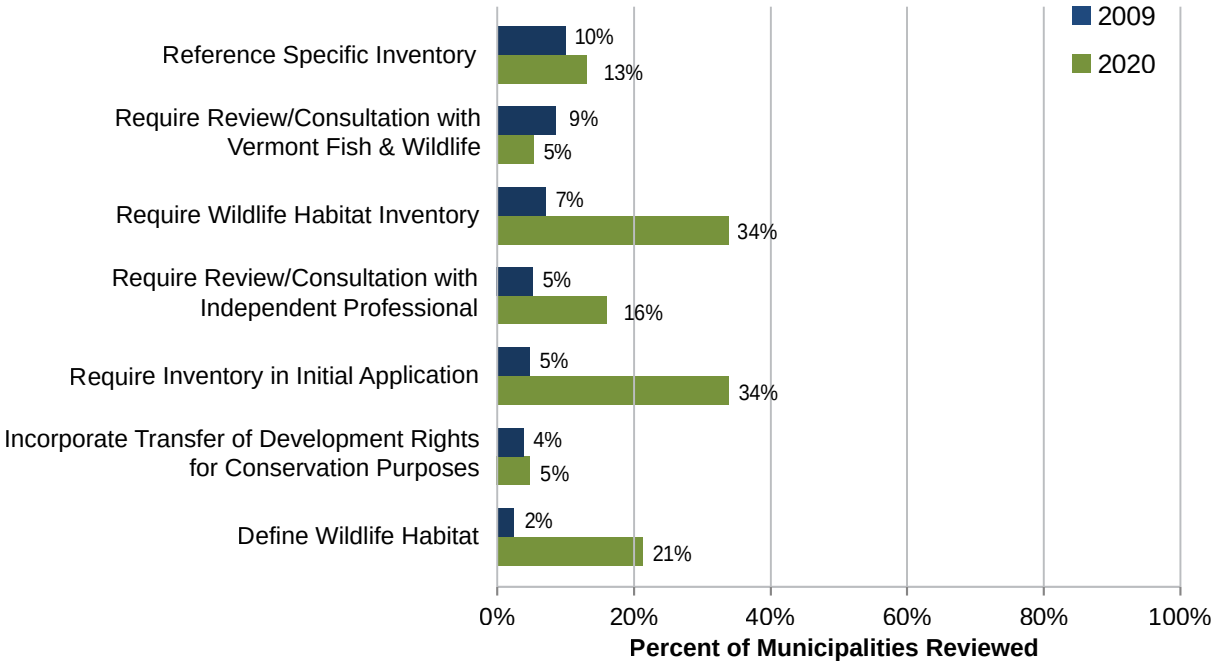
Despite the common use of development standards to address natural resources (52%), only 20% explicitly mention wildlife.

Conditional use and site plan provisions continue to be heavily used in local zoning to address the siting and impacts of development, both on and off site. Conditional use standards provide an additional level of review for certain uses to identify and avoid or mitigate the impacts of development. Site plan review standards apply to site layout and design associated with a particular property—typically covering building sites, access, parking, screening, landscaping, and other site features. In 2020, data were collected by combining conditional use and site plan requirements into a single category called development standards. As noted above, more municipalities are incorporating development standards in their regulations that apply to development in all districts, versus regulating by specific district, which again highlights the evolving role of such standards as a conservation tool.

Despite the common use of development standards to address natural resources (52%), only 20% explicitly mention wildlife – just a slight increase from 2009. A new metric captured in 2020 also tracked the number of standards that address habitat fragmentation. According to the data, only 8% of development standards reviewed address habitat fragmentation, suggesting room for improvement in this area.

Protection of Natural Resources and Open Space *– The proposed development will be appropriately located, scaled, and designed to not cause undue adverse impact to significant natural resources, consume an excessive amount of open space or working land, and/or unnecessarily fragment contiguous blocks of open space or working land. The proposed development has followed the recommendations provided in any required natural resource inventory or study to protect identified natural resources.* (Westford Zoning Bylaws 2018)

Figure 21. Additional Requirements in Bylaws



Note: All percentages are of all municipalites with land-use regulations (N=211/207).

Bylaws were reviewed in 2009, and again in 2020, for additional provisions that support wildlife conservation. More bylaws now define "wildlife habitat" (21%), but definitions important in development review are still lacking in many regulations. Clear definitions help applicants, developers, planning commissions, and development review boards interpret and understand the regulations, to ensure they are applied consistently, efficiently, and fairly. Clear definitions are also important in light of a 2008 Vermont Supreme Court ruling (In re Appeal of JAM Golf, LLC). In this case, the Court held that vague policies or bylaws intended to protect natural resources and wildlife habitat may be struck down and rendered unenforceable.

More bylaws (34%) now require a wildlife habitat inventory in association with development review to identify wildlife resources that may be impacted by development. More municipalities (16%) are now also requiring independent consultations with wildlife professionals, although consultation with VFWD staff is still quite low (5%).

27.5 Significant Wildlife Habitat Areas (SWHA)

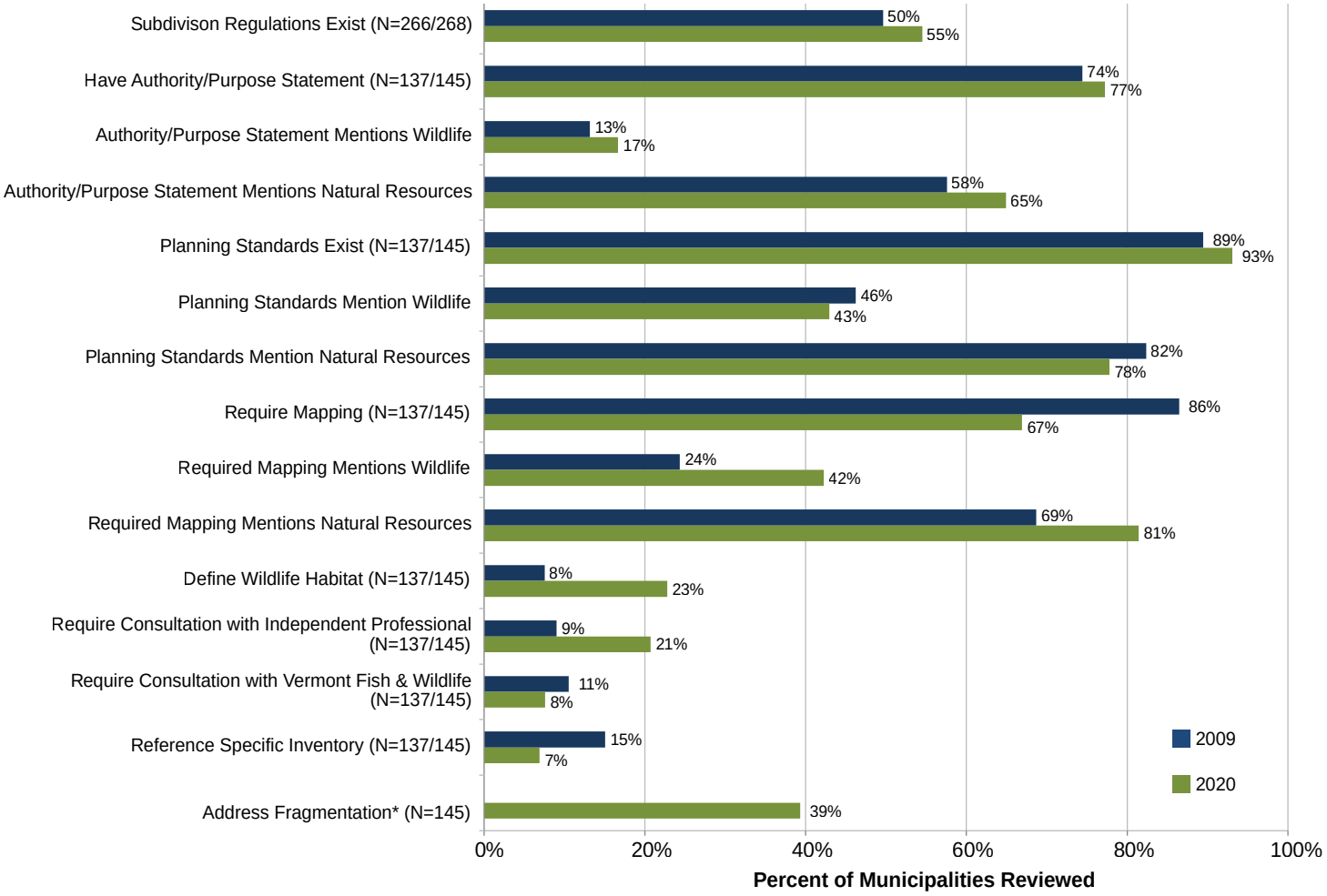
27.5.1 What are Significant Wildlife Habitat Areas (SWHA)? Those natural features that contribute to the survival and/or reproduction of the wildlife of Williston and surrounding communities. This shall include: (1) core habitat; and (2) wildlife connectivity corridors.

27.5.2 What is Core Habitat? A combination of several different wildlife habitat types combined to form a unit of relatively continuous wildlife habitat. Areas characterized as Core Habitat generally consist of relatively large forested areas that might contain a combination of early succession habitats; forested riparian areas; wetlands and vernal pools; deer wintering areas (i.e. deeryards); mast stands; ledge, talus, or cliff habitats; and habitat identified by the Vermont Department of Fish and Wildlife as either significant wildlife habitat or necessary wildlife habitat in accordance with 10 V.S.A. Sec. 6086(a)(8)(A).

27.5.3 What is a Wildlife Connectivity Corridor? A route that permits the direct travel or spread of animals or plants from one area or region to another, either by the gradual spread of a species' population along the route or by the movement of individual members of the species. Generally, such areas are characterized by undeveloped forested and riparian corridors, including forest cover reaching to road rights-of-way, which serve to link large tracks of unfragmented core habitat. In Williston, the corridor was designed to accommodate bobcat, fisher, mink, four-toed salamander, wood frog, smooth green snake, and wood turtle.

27.5.4 What are the boundaries of the SWHAs? The boundaries of SWHAs are shown on the official map titled "Significant Wildlife Habitat Areas," which is available for review at the Williston Planning and Zoning Office. (Williston Zoning Bylaws 2019)

Figure 22. Subdivision Regulations



**2010 report did not collect subdivision data for fragmentation.*

Subdivision regulations are an important tool for guiding the pattern of development within a municipality.

Lot boundaries and development envelopes shall be located and configured to minimize undue adverse impacts on wildlife habitat, including travel corridors, identified in the Waitsfield Municipal plan, by the Vermont Department of Fish & Wildlife, through site investigation, or as identified in habitat inventories conducted by qualified wildlife experts. (Waitsfield Subdivision Regulations 2008)

(Ripton Subdivision Regulations 2018)

Subdivision regulations are an important tool for guiding the pattern of development within a municipality. As indicated in bylaw authority and purpose statements, natural resource conservation continues to be a stated reason for regulating land subdivision in 65% of the bylaws reviewed in 2020. A high percentage of subdivision regulation (78%) also include related planning standards that address natural resources, though less than half (43%) of these specifically mention wildlife.

Similarly, it is encouraging that where mapping is required in association with subdivision review (86%), most regulations reviewed require that this include the mapping of natural resources (81%); however only 42% specifically reference wildlife resources – another area identified for needed attention and improvement.

A new metric in 2020 also captured the number of subdivision regulations that address forest and habitat fragmentation. Currently, only 39% of subdivision regulations address fragmentation. Currently, only 39% of subdivision regulations address land or resource fragmentation. This suggests that, while substantial progress has been made regarding the need to address fragmentation through Act 171 planning, there is still a significant need to improve how this can be implemented through the subdivision process, given that the division of land is one of the greatest contributors to forest and habitat fragmentation.

Figure 23. Zoning District Types

All Percentages Are of Towns with Land-Use Regulations (N=207)	Conservation District	Forest Reserve District	Water Resource District	Natural Resource Overlay District	Wildlife Overlay District	Fluvial Erosion/ River Hazard District	Rural / Ag. / Resource / Residential Districts	Residential District	Open Space District
Percentage of Towns where District Exists *(% of Towns with Zoning Regulations)*	**44%**	**25%**	**11%**	**3%**	**4%**	**14%**	**82%**	**80%**	**16%**
Explicitly Mention Wildlife in District Regulations *(% of Towns with District)*	69%	38%	18%	83%	88%	3%	21%	9%	56%
District Allows Single-Family Residence as a Permitted Use *(% of Towns with District)*	57%	44%	36%	33%	13%	20%	-	-	-
District Allows Single-Family Residence as a Conditional Use *(% of Towns with District)*	33%	42%	27%	17%	25%	30%	-	-	-
District Has Specific Wildlife Review *(% of Towns with District)*	19%	23%	9%	83%	63%	0%	6%	4%	15%
District Has Fragmentation Standards *(% of Towns with District)*	10%	31%	0%	50%	50%	0%	4%	4%	15%

This study examined zoning districts that play a direct role in natural resource conservation. While "conservation districts" are employed in a fair number of municipalities, as evidenced by the numbers in the figure above, few of these reference, or are specific to wildlife conservation. Wildlife overlay districts appear to be the most effective in addressing wildlife habitat and fragmentation, but only 4% of zoning bylaws reviewed include this type of district. There is considerable room for increasing the utilization of wildlife-oriented districts, and incorporating more wildlife protection standards in existing conservation districts.

Many towns have conservation-oriented districts that did not fall within any of the types of districts listed above, even though they further conservation goals. For example, a significant number of bylaws include forest, shoreland, and lakeshore districts, as well as wetland districts or overlays. Ridgeline protection districts are also quite common. These districts, tailored to specific resource objectives, can also be used to protect wildlife habitat, maintain habitat connectivity, and reduce habitat fragmentation.

It is important to note that minimum lot size and other density standards within conservation-oriented districts may unintentionally exacerbate habitat fragmentation by requiring an excessive land area for a single home that may not be large enough to also maintain important ecological functions. For example, the average of minimum lot sizes in bylaws reviewed was 15 acres in conservation districts and 18 acres in forest reserve districts.

Conservation-oriented districts also are not adequately addressing resource fragmentation under district development review standards. As reported above, only 10% of conservation districts include fragmentation standards. Natural resource overlay and wildlife overlay districts incorporate more fragmentation standards, but residential, rural residential, and rural/agricultural zoning districts – where much development is happening – do not adequately address fragmentation. As highlighted above, a very small percentage (4%) of residential and rural residential districts include standards that address resource fragmentation (4%), which is concerning given that these areas typically occupy a high percentage of land area within the

More attention is needed to shape development patterns and to reduce resource and habitat fragmentation, especially in districts where residential growth is encouraged.

municipality, and include areas that are necessary components of wildlife habitat.

Some municipalities may rely on subdivision standards versus district-specific standards to address fragmentation, but clearly more attention is needed to shape development patterns and to reduce forest and habitat fragmentation, especially in districts where residential growth is encouraged.

SECTION 208: Special Features Overlay Zones

208.1 Description

The Special Features Overlay Zones are superimposed over all underlying zoning districts, and include Wetlands, Deer Wintering Areas, Wellhead Protection Areas, Meadowlands, Steep Slopes, Ridgelines, and Wildlife Corridors.

208.2 Purpose

The purpose of the Special Features Overlay Zones is to ensure the protection of the Town's ecological and aesthetic resources. The Municipal plan has identified fragile areas, natural areas, critical wildlife habitat areas, and resource areas which deserve special attention due to the diversity of land use districts that include these resources, and land forms and land capabilities within these districts.

(Shrewsbury Zoning Bylaws 2017)

Regional Comparisons

Figure 24. Municipal Plan Has Mapped Data

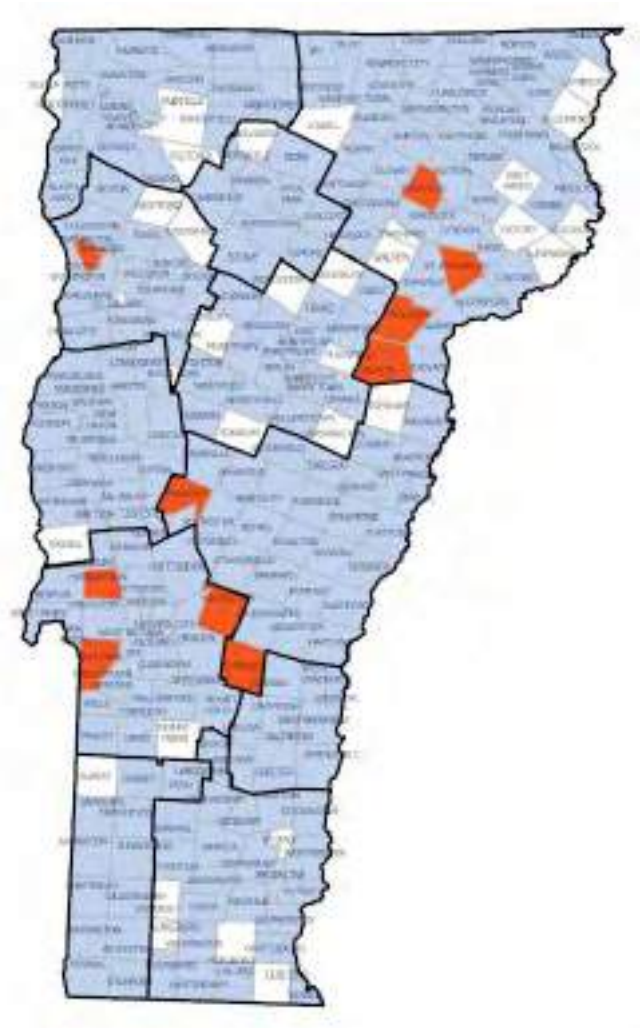
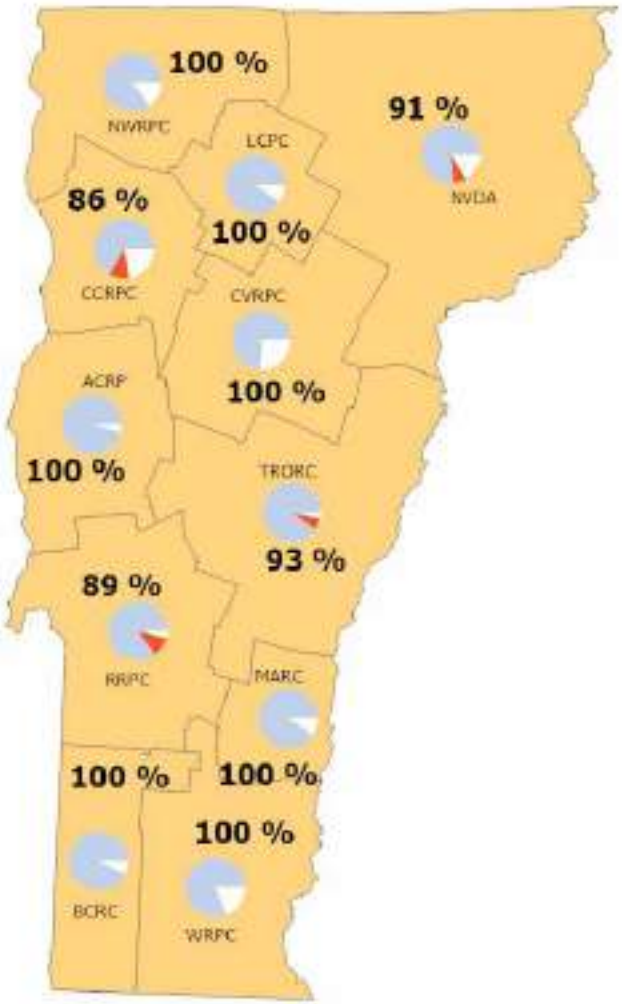


Figure 25. Municipal Plan Has Mapped Data by RPC



For these maps, we reviewed a subset of available adopted plans, omitting expired or draft municipal plans. As such, municipalities showing as white in this figure were not included in this study because they either did not have a municipal plan, or they did not have an adopted plan in 2020 when the study was conducted. In addition, some municipal plans were not publicly available and could not be included in this study. It is important to note that certain municipalities have updated the status or availability of their plans. These maps are best used to provide a general coarse level review of regional trends at the time of this study.

Legend for maps by town

Legend for maps by RPC

Figure 26. Municipal Plan Has Inventory

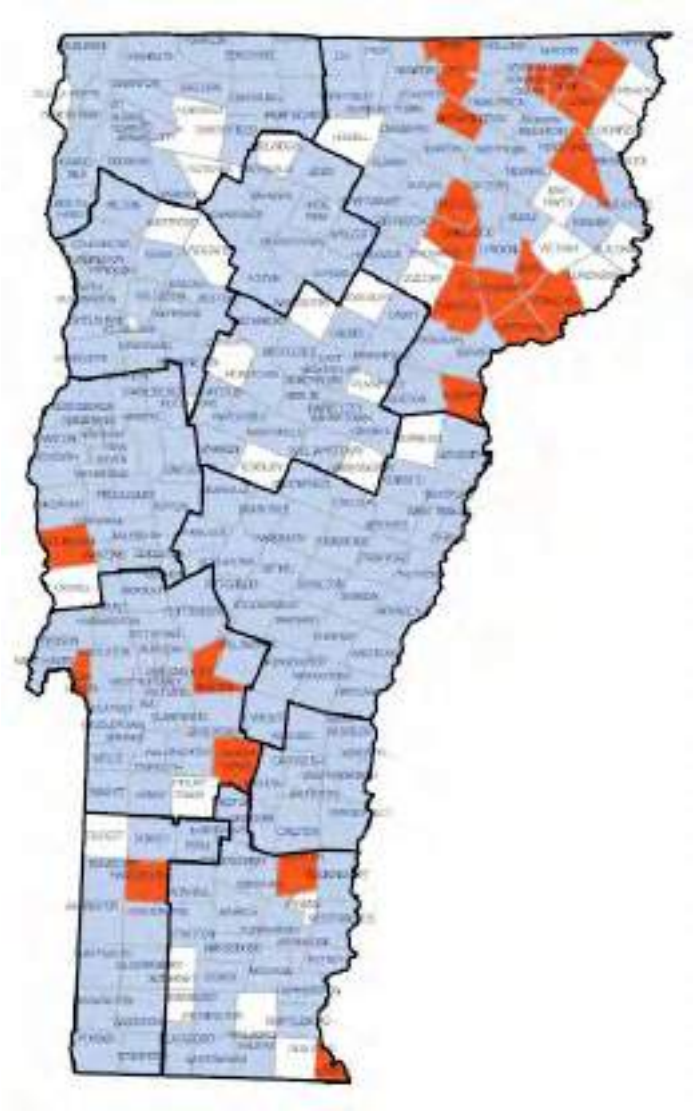
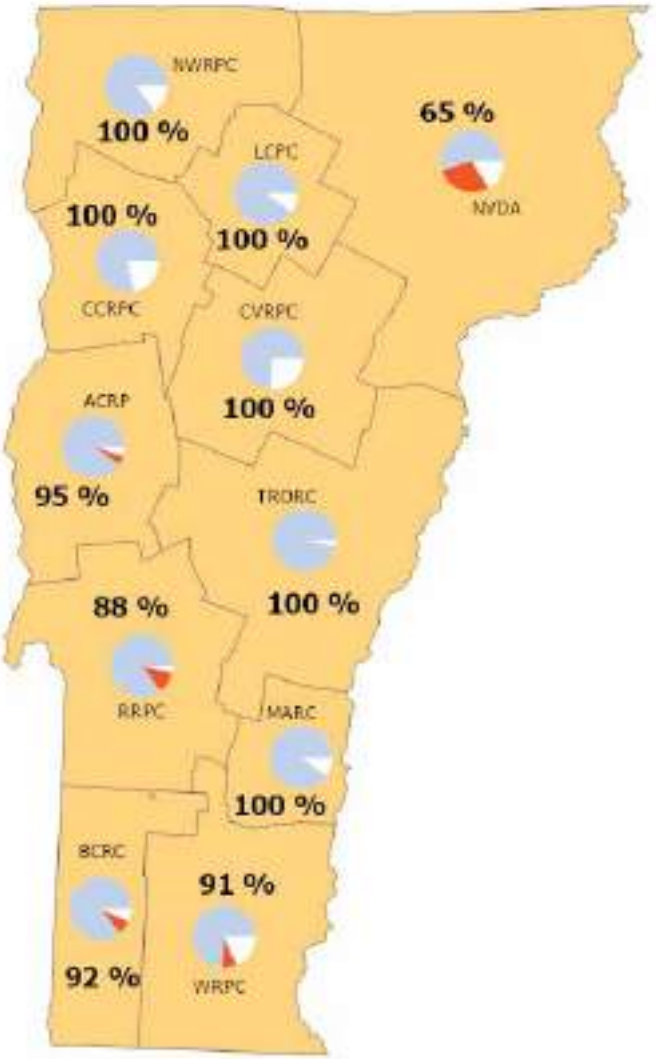


Figure 27. Municipal Plan Has Inventory by RPC



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Legend for maps by town

Legend for maps by RPC

Figure 28. Municipal Plan Recommends Non-Regulatory Policies

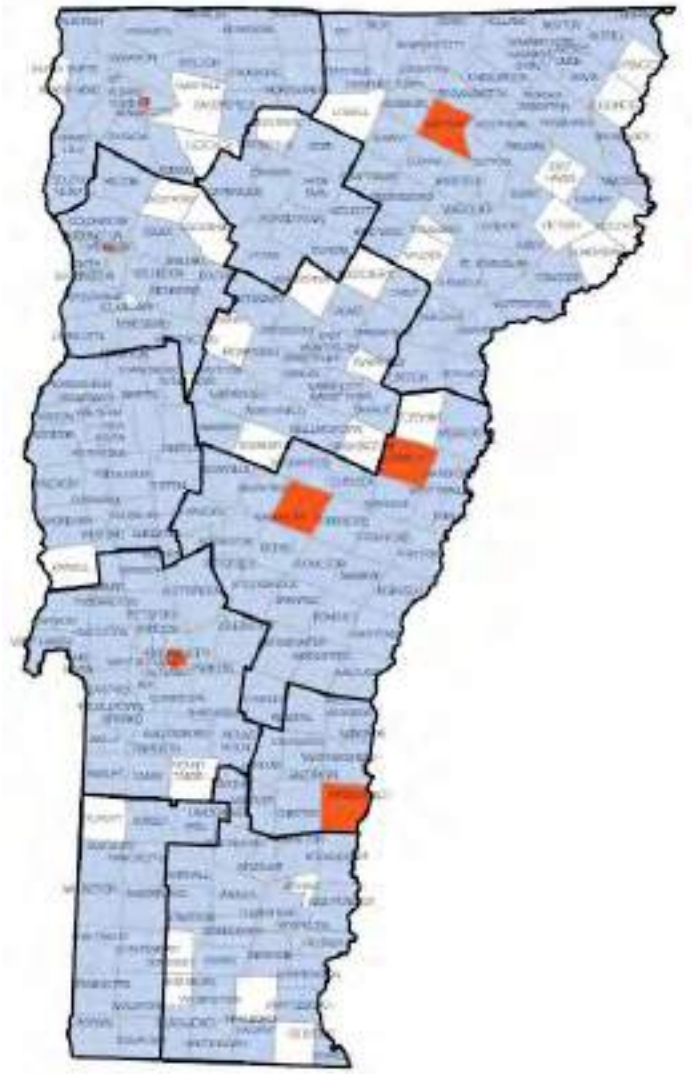
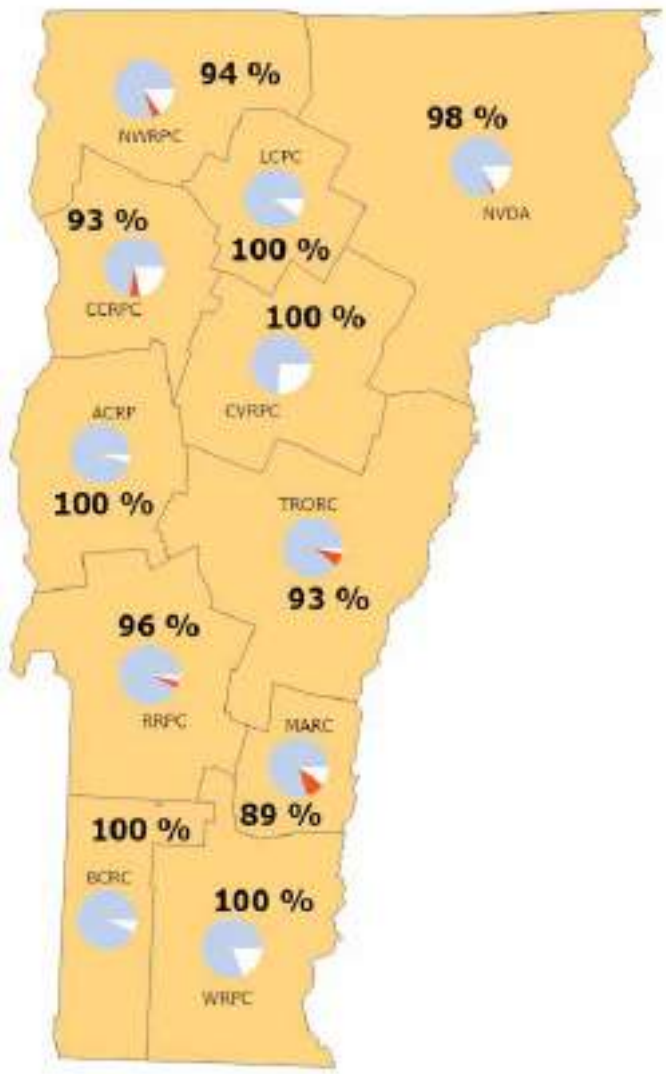


Figure 29. Municipal Plan Recommends Non-Regulatory Policies by RPC



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Legend for maps by town

Legend for maps by RPC

Figure 30. Municipal Plan Recommends Regulatory Policies

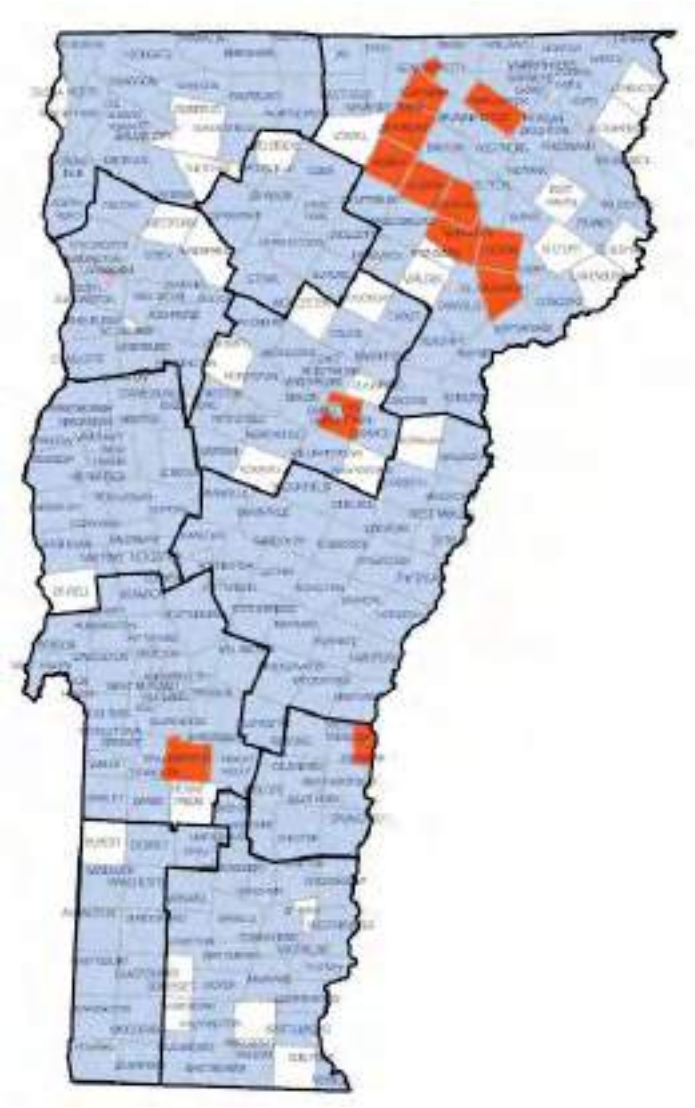
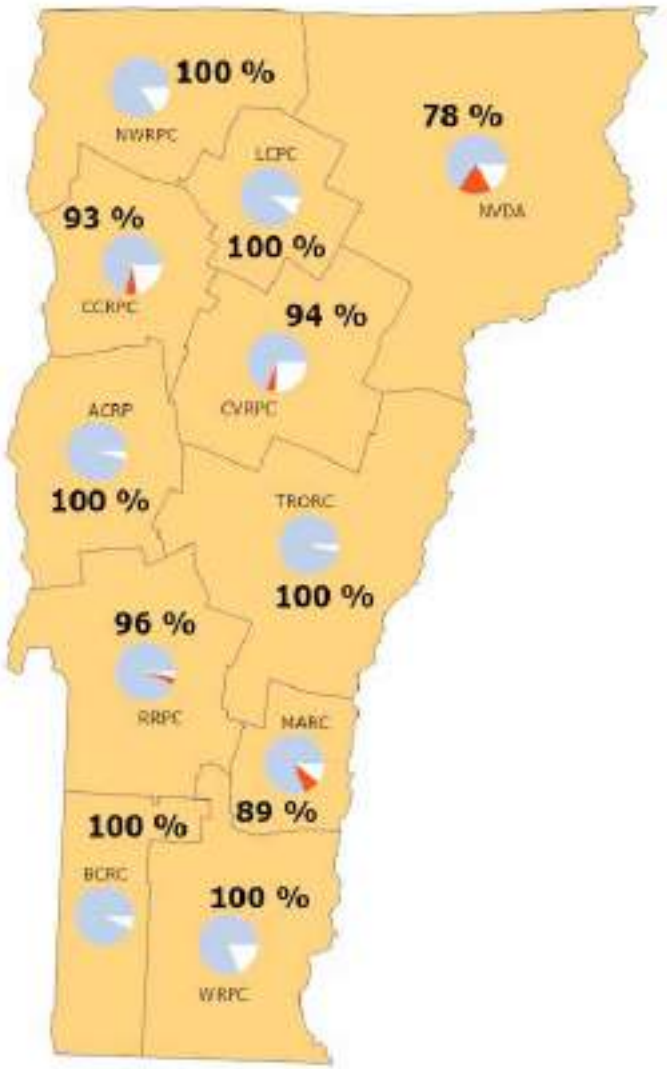


Figure 31. Municipal Plan Recommends Regulatory Policies by RPC



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Legend for maps by town

Legend for maps by RPC

Figure 32. Municipal Plan Addresses Forest Blocks

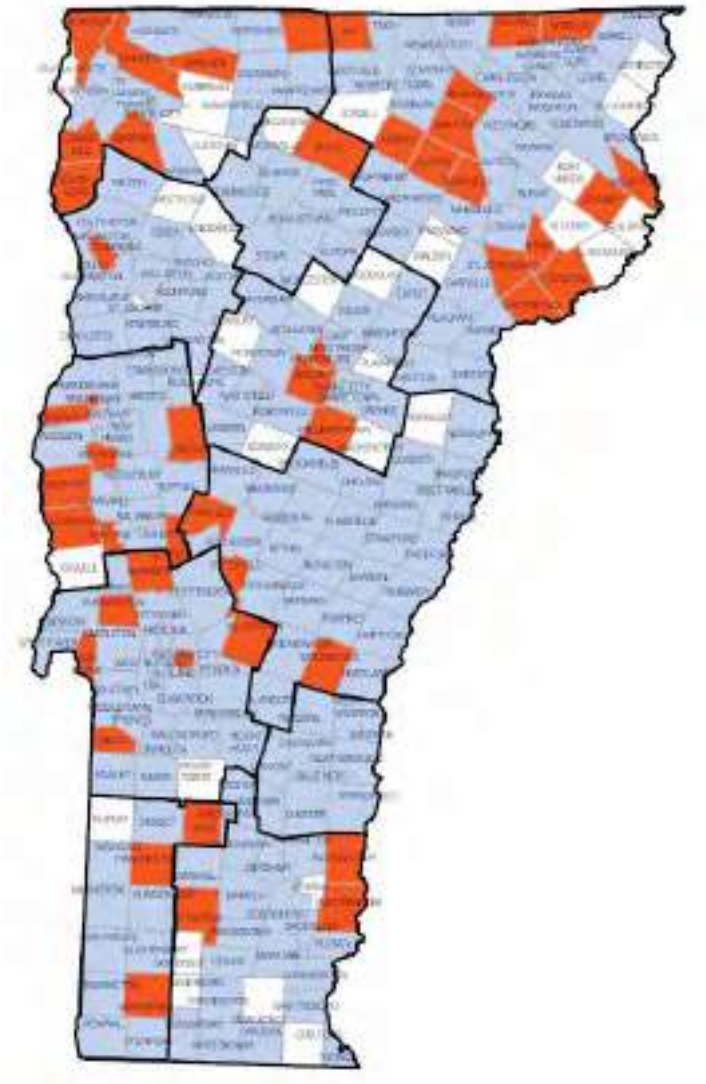
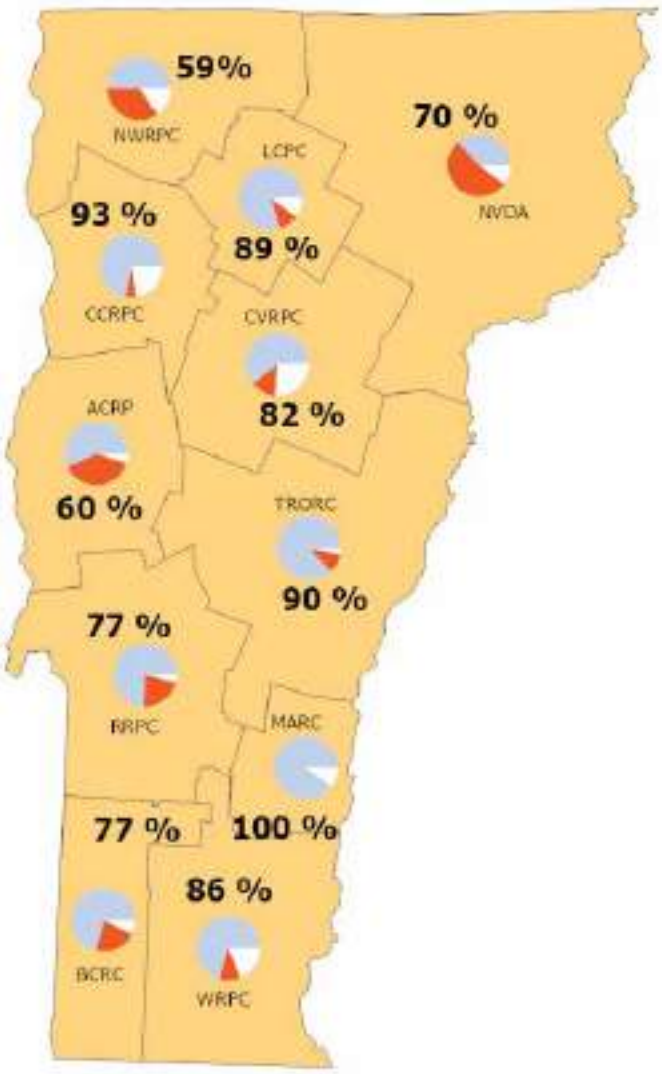


Figure 33. Municipal Plan Addresses Forest Blocks by RPC



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Legend for maps by town

Legend for maps by RPC

Figure 34. Municipal Plan Addresses Wildlife Corridors

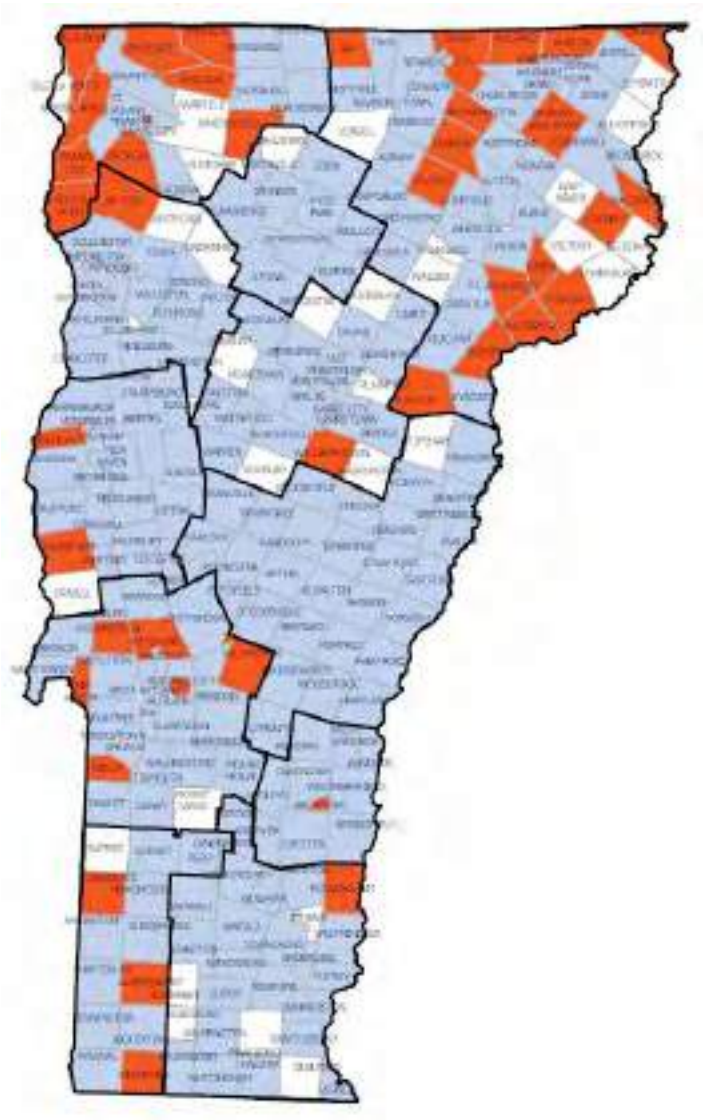
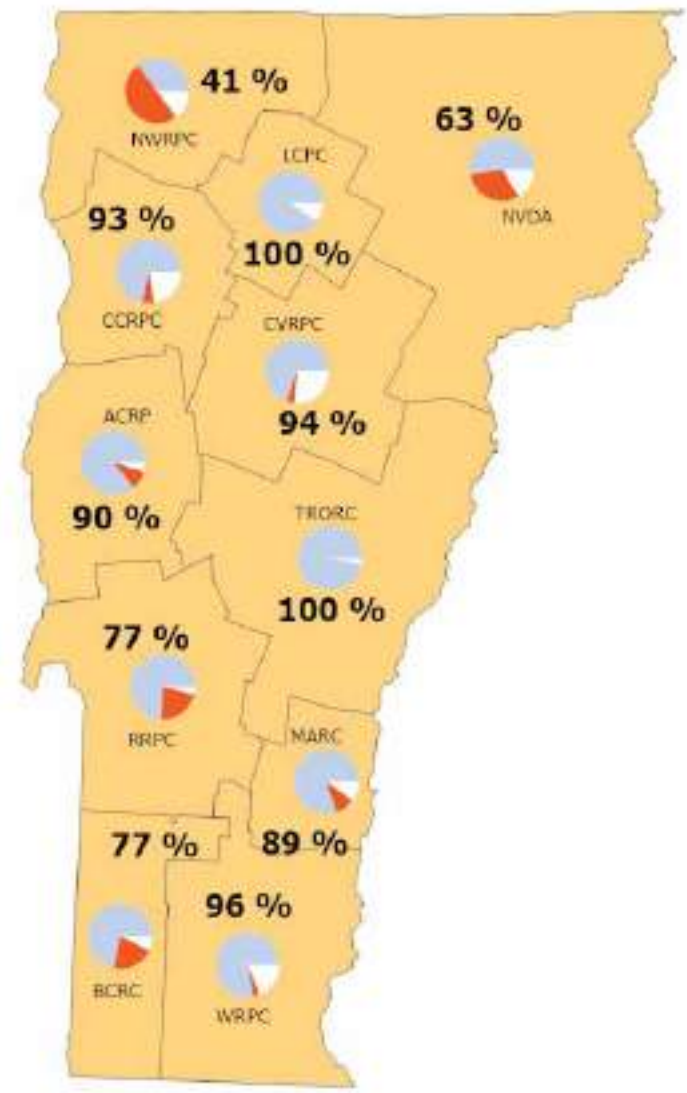


Figure 35. Municipal Plan Addresses Wildlife Corridors by RPC



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Legend for maps by town

- Yes
- No
- Not Reviewed

Legend for maps by RPC

- Yes
- No
- Not Reviewed

Figure 36. Municipal Plan Addresses Forest Fragmentation

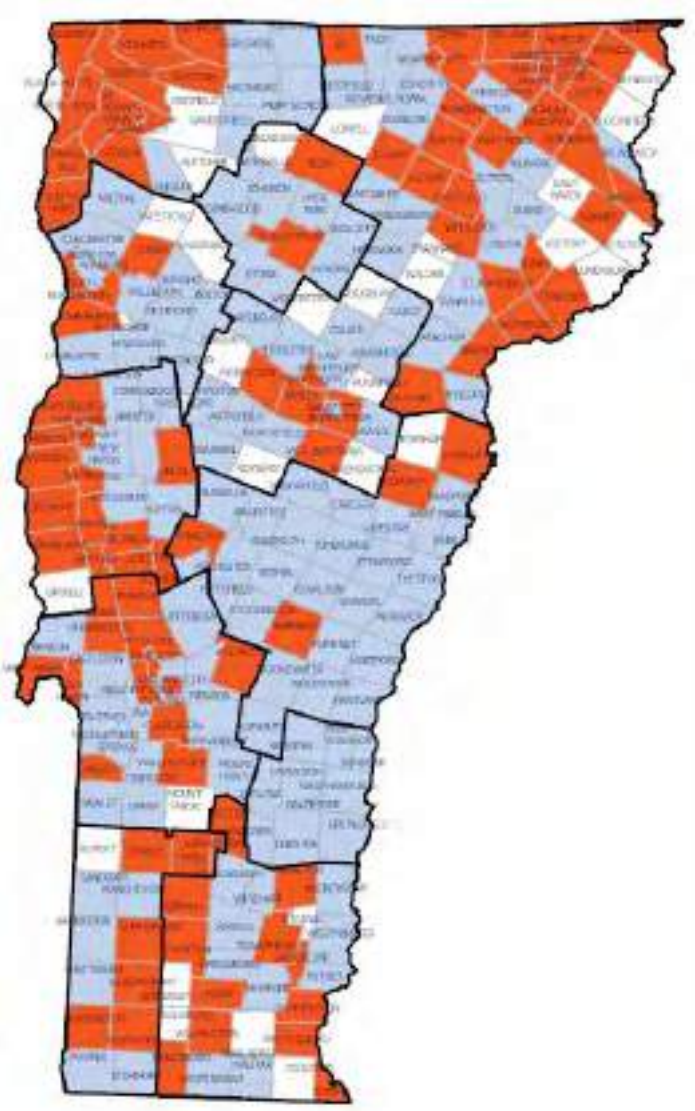
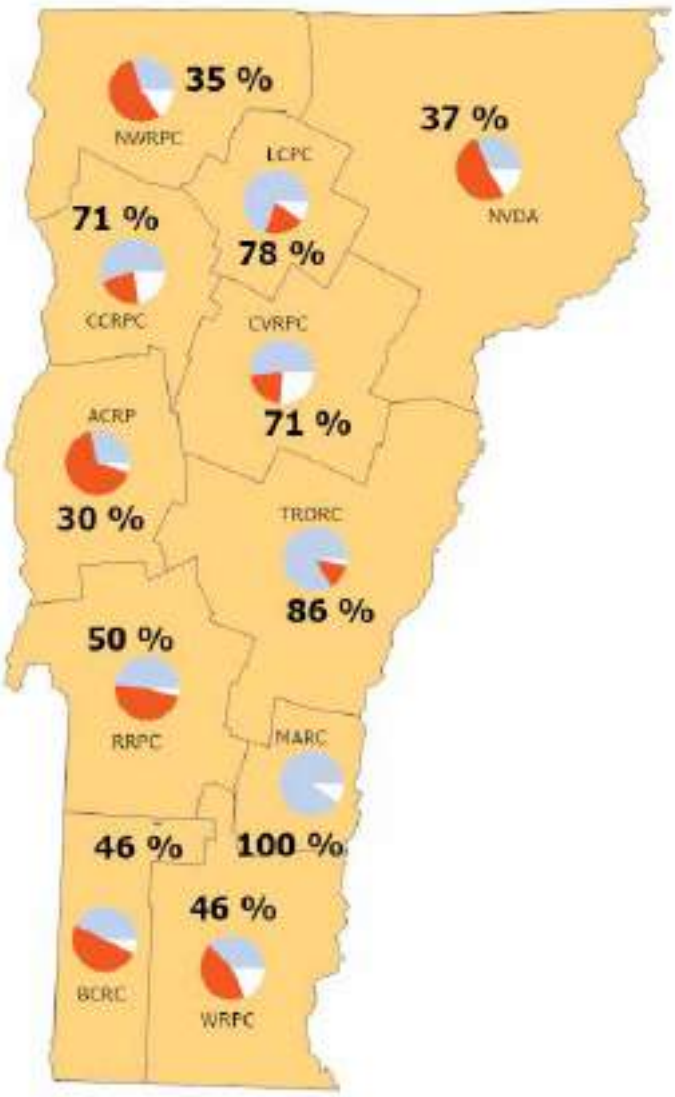


Figure 37. Municipal Plan Addresses Forest Fragmentation by RPC



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Legend for maps by town

Legend for maps by RPC

Figure 38. Town Has Zoning

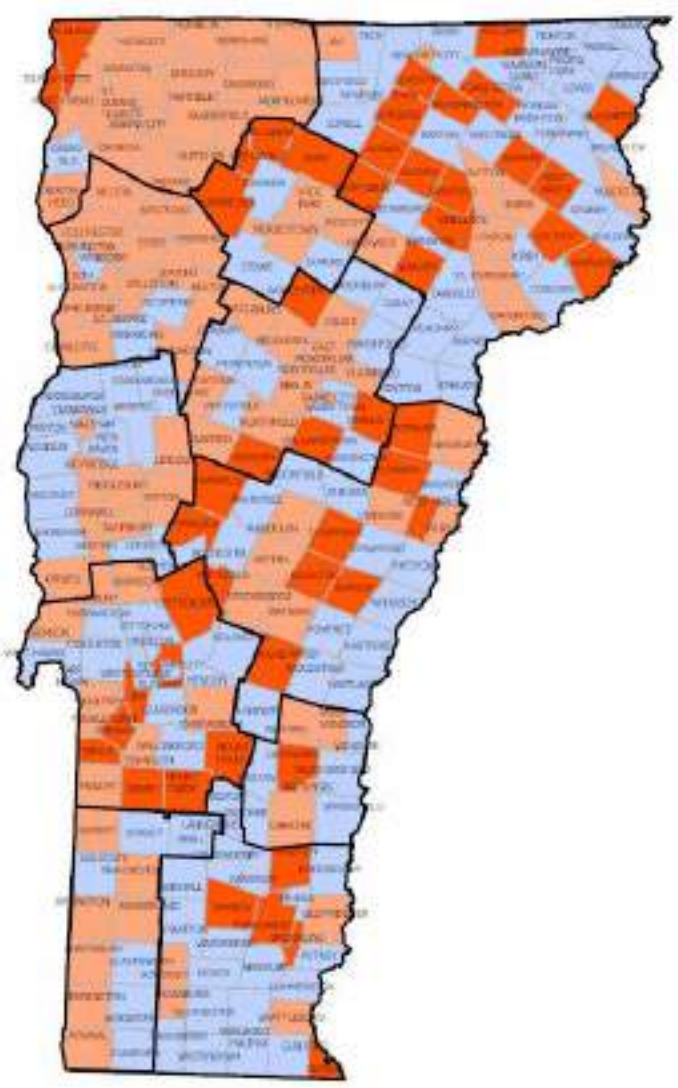
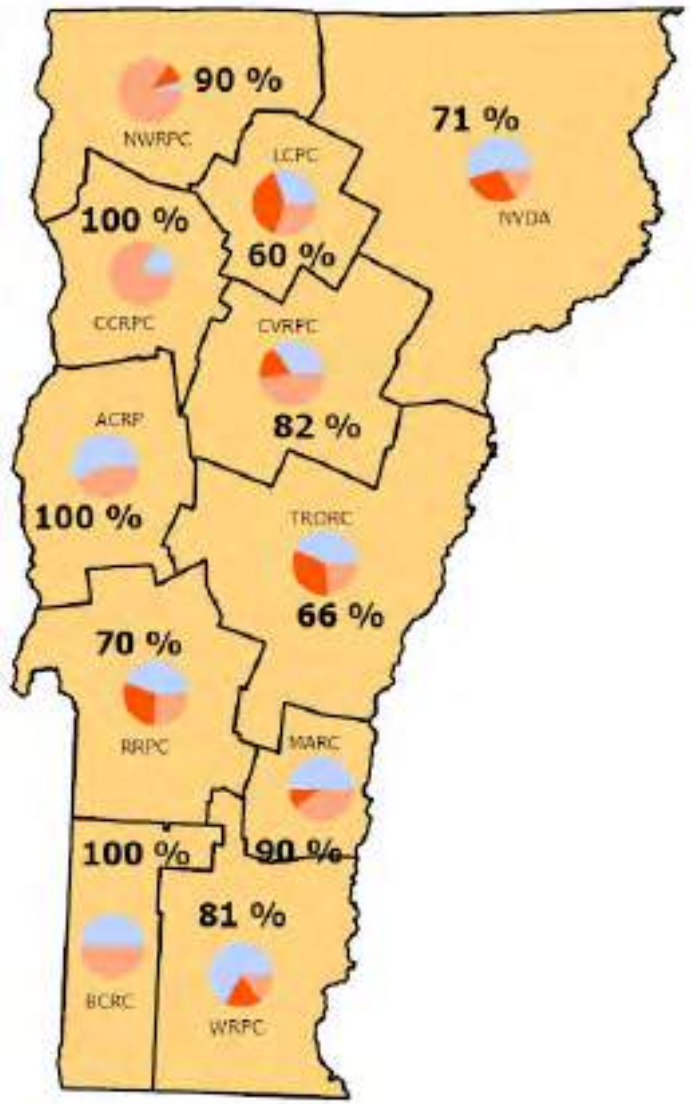
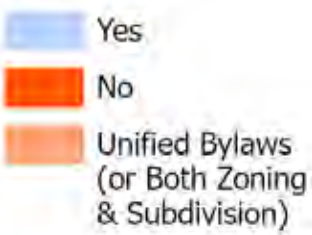


Figure 39. Town Has Zoning by RPC



For these maps, we reviewed all available adopted zoning bylaws. It is important to note that certain municipalities have updated the status of their approach to land use review. These maps are best used to provide a general coarse level review of regional trends at the time of this study.

Legend for maps by town



Legend for maps by RPC with unified bylaws

Figure 40. Town Has Subdivision Regulations

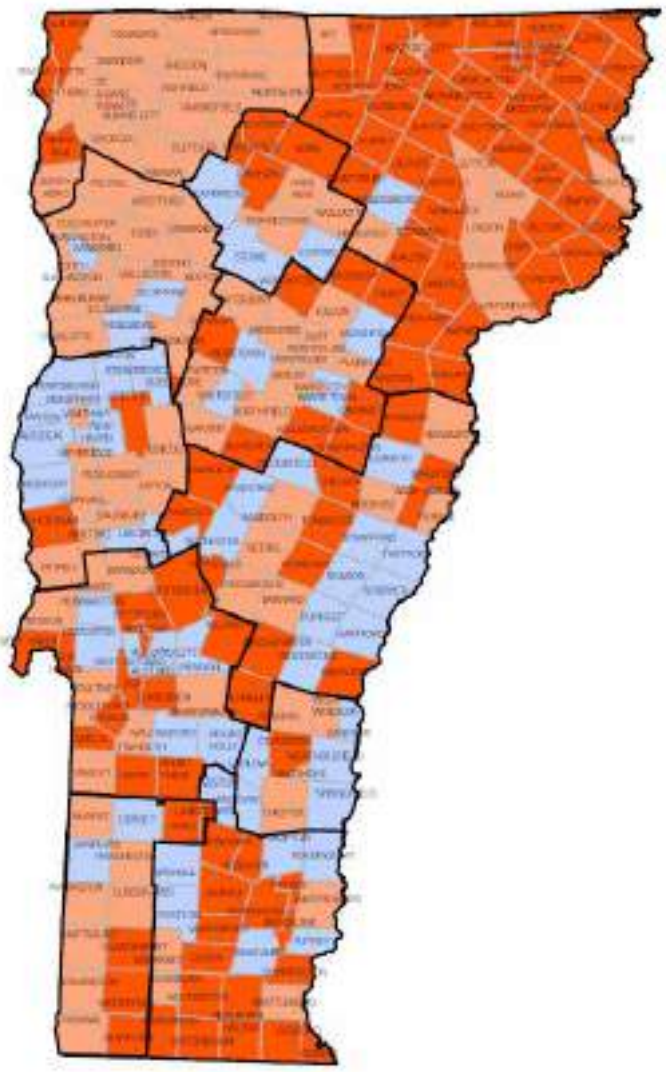
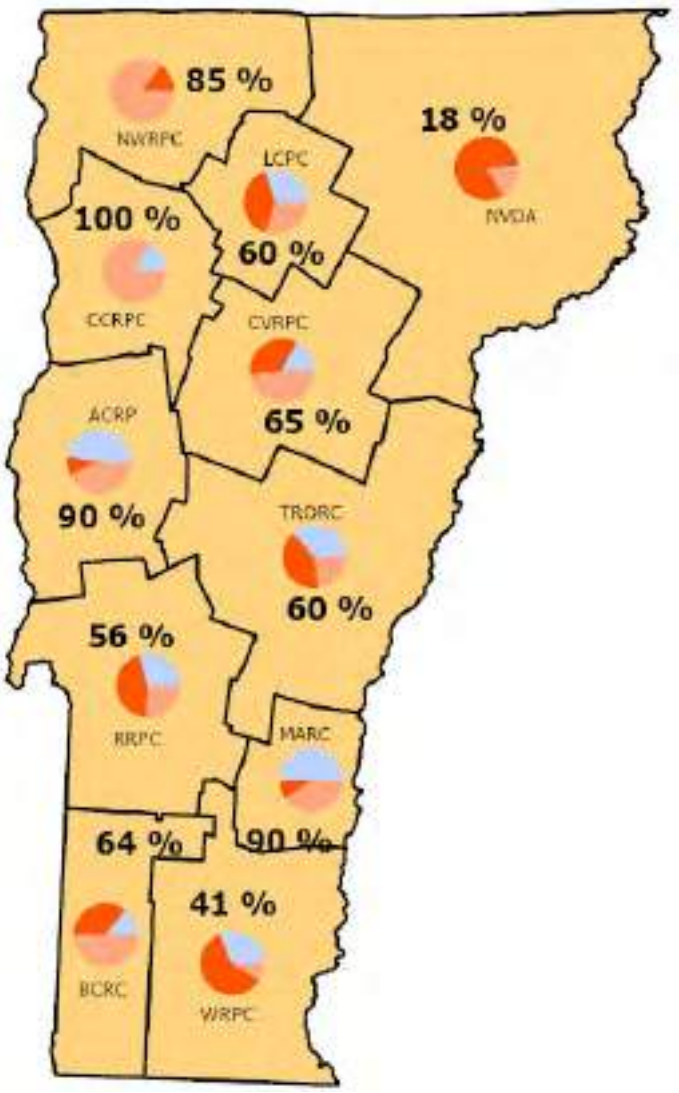


Figure 41. Town Has Subdivision Regulations by RPC



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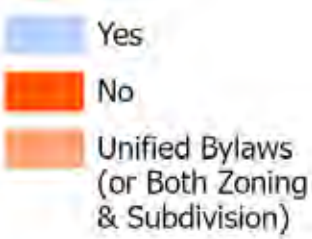
Legend for maps by town



Legend for maps by RPC with unified bylaws

Figure 42. General Use Standards Address Forest Fragmentation

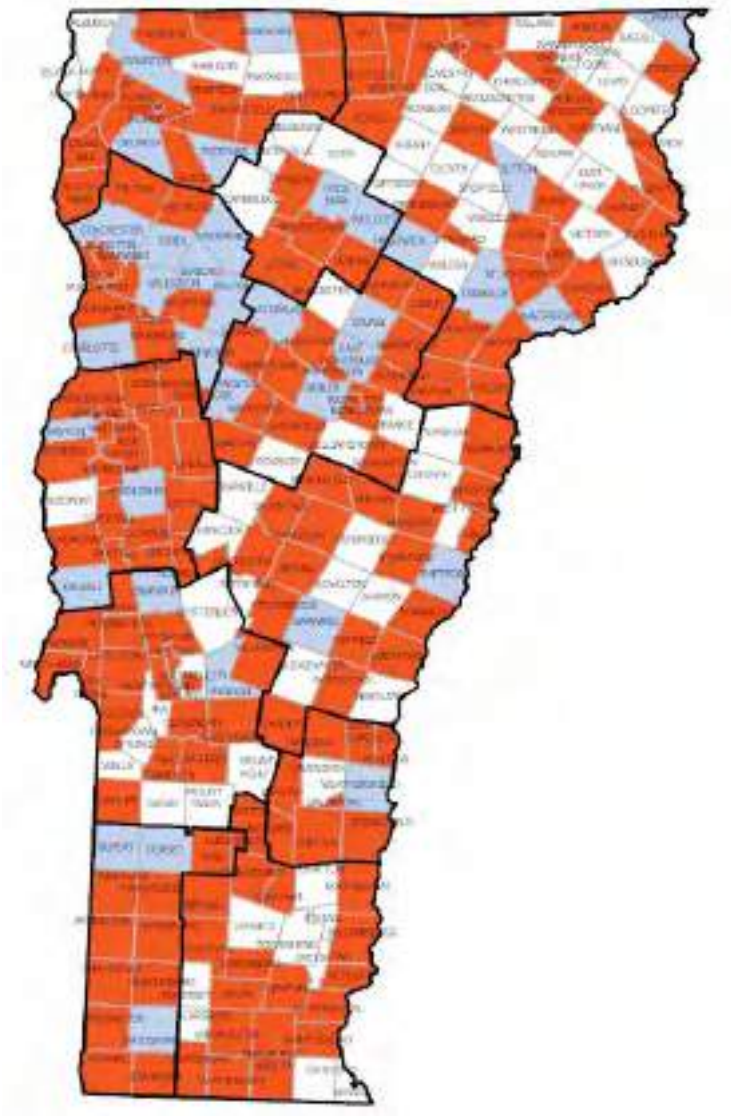
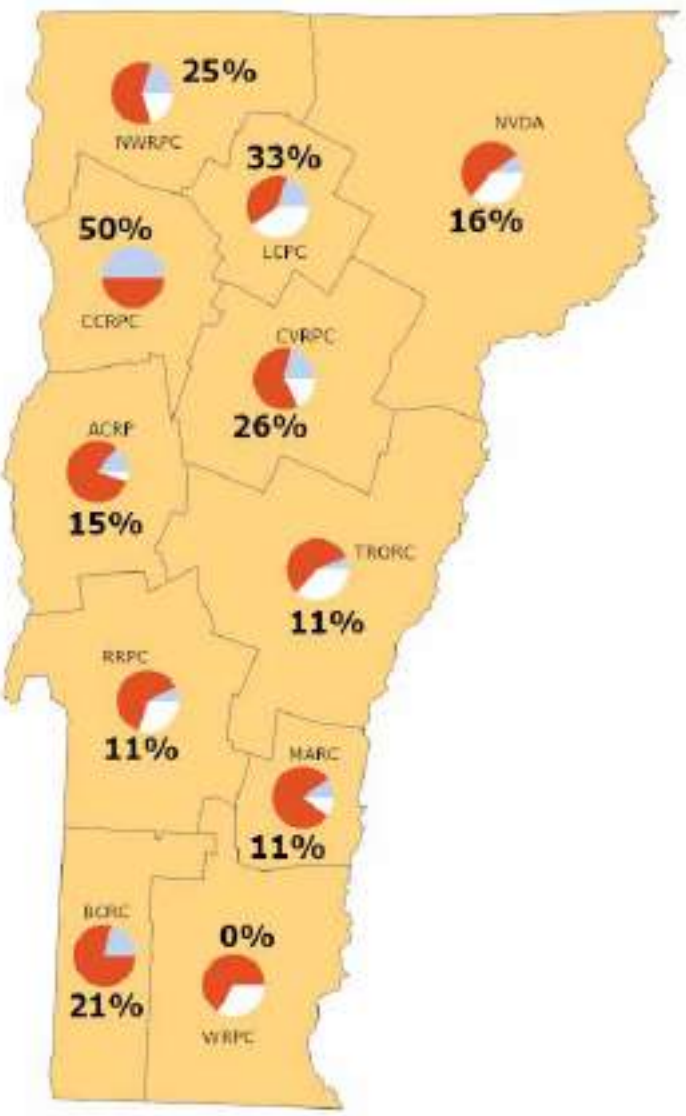


Figure 43. General Use Standards Address Forest Fragmentation by RPC



For these maps, we reviewed all available adopted zoning bylaws. As such, municipalities showing as white in this figure were not included in this study because they did not have zoning in 2020 when the study was conducted. It is important to note that certain municipalities have updated the status of their approach to land use review. These maps are best used to provide a general coarse level review of regional trends at the time of this study.

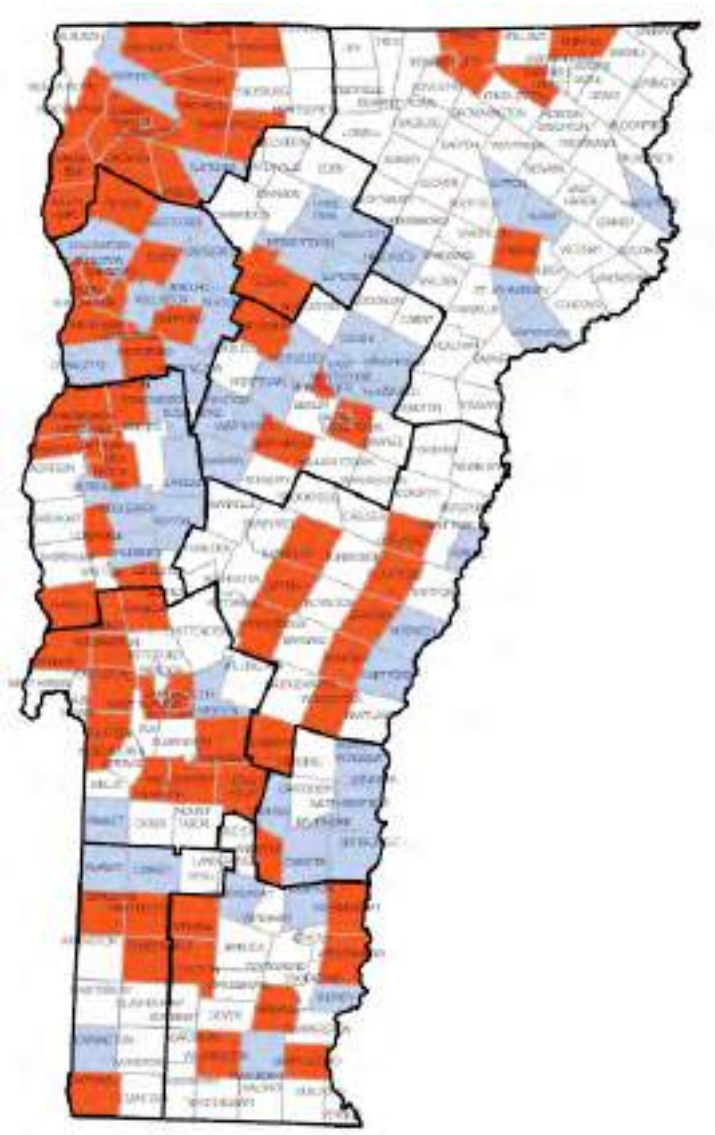
Legend for maps by town

- Yes
- No
- Not Reviewed

Legend for maps by RPC

- Yes
- No
- Not Reviewed

Figure 44. Subdivision Regulations Address Forest Fragmentation

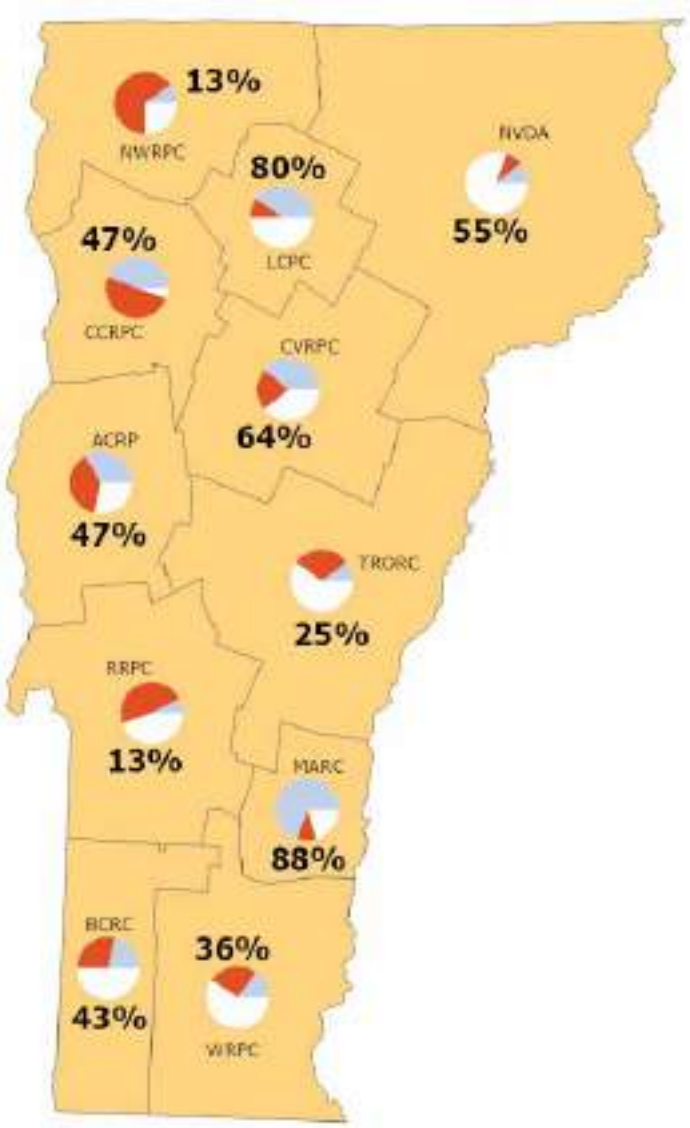


For these maps, we reviewed all available adopted subdivision regulations. As such, municipalities showing as white in this figure were not included in this study because they did not have subdivision regulations in 2020 when the study was conducted. It is important to note that certain municipalities have updated the status of their approach to land use review. These maps are best used to provide a general coarse level review of regional trends at the time of this study.

Legend for maps by town

- Yes
- No
- Not Reviewed

Figure 45. Subdivision Regulations Address Forest Fragmentation By RPC



Legend for maps by RPC

- Yes
- No
- Not Reviewed

Appendix A

Municipal Plan Metrics

General Plan Information Section	
2020 Project Status	Entries marked as "Exclude" should not be included in analysis, due to various factors such as expired plan, unknown status, etc.
Municipality	Name of municipality.
ID	Municipality's assigned unique identification number for study.
Reviewer	Name of person who conducted review.
Date of Review	Date the review was conducted.
RPC	Regional Planning Commission the town is located within.
Location-Source	Website link or source of the municipal plan document analyzed. Use links provided by the Regional Planning Commission where possible.
Municipal Plan Adoption Date	Date the municipal plan was adopted by the municipality. Often listed at the beginning of the plan or on the DHCD Planning Atlas: http://planningatlasdatabase.vermont.gov/Resources/Show-Resources-Table.aspx. Plans that were officially amended after their original adoption date were considered official for the purposes of this analysis.
Plan Expired	Is the plan expired? The plan expiration date is listed on the DHCD Planning Atlas or sometimes at the beginning of the municipal plan.
RPC Approved Plan	Has the plan been approved by the RPC? Listed on the DHCD Planning Atlas.
Draft Plan	Review the plan that is in effect & approved by the municipality but make a note if a new plan is being drafted. Plans will typically say if they are still in draft form.

General Town Information Section	
Planning Commission	Does the town have a planning commission?
Development Review Board	Does the town have a development review board?
Conservation Commission	Does the town have a conservation commission?
Establishment of Conservation Commission Discussed	Does the municipal plan discuss the establishment of a conservation commission?
Trails Committee	Does the town have a trails committee? Typically separate from a 'recreation committee' however it may also be listed as a 'recreational trails committee'.
Zoning Bylaw	Answer Yes, No, or Unified (if the zoning and subdivision regulations are unified in one document). The town adopted zoning regulations at the time of the survey. The most current information available from the Vermont League of Cities and Towns as well as the Vermont Department of Housing and Community Affairs and regional planning commissions was used to determine if municipalities had adopted land use regulations.
Subdivision Regulations	Answer Yes, No, or Unified (if the zoning and subdivision regulations are unified in one document). The town adopted subdivision regulations at the time of the survey. The most current information available from the Vermont League of Cities and Towns as well as the Vermont Department of Housing and Community Affairs and regional planning commissions was used to determine if municipalities had adopted land use regulations. It is important to check if subdivision bylaws are incorporated into the zoning bylaw, typically titled land use and development, or unified development, regulations.
Comments	As needed, relating to this section. If there are other related committees list them here.

Municipal plan Data Section	
Plan Includes-References Inventory Data GENERAL	The plan included any type of inventory related to natural resources (may include but not limited to NRCS soil surveys, ANR bear habitat and deeryard surveys, and the National Wetland Inventory).
Plan Includes-References State Data Sources	The plan included any state natural resource inventory. Examples might include state wetland inventories (VSWI), bear habitat, and Deer Wintering Area data.
Plan Includes-References Local Data Sources	The plan included or referenced any local natural resources data. Data sources could include local Natural Resources Inventories (NRIs), local water quality monitoring efforts, etc. All and any relevant locally generated data sources could be included.
Plan Includes-References FWD Conserving VT's Natural Heritage Guidebook	The plan specifically referenced or mentions, in the body of the text, the Conserving Vermont's Natural Heritage Guidebook, published by Vermont Fish & Wildlife.
Plan Includes-References FWD Mapping Vermont's Natural Heritage Guidebook	The plan specifically referenced or mentions, in the body of the text, the Mapping Vermont's Natural Heritage Guidebook, published by Vermont Fish & Wildlife.
Plan Includes-References Conservation Plan or Open Space Plan	The plan included or referenced a conservation or open space plan. The plan had to be incorporated into the municipal plan or referenced directly in the municipal plan. Treatment of "open space" in a general, non-specific way is not adequate to satisfy this criterion.
Plan Includes-References ANR BioFinder	The plan specifically referenced or mentions, in the body of the text, the ANR BioFinder database and mapping tool.
Plan Includes-References Act 171 Guidance Document	The plan specifically mentions or references in the body of the text, the Act 171 Guidance Document, published by the Vermont Agency of Natural Resources. Note that any plan drafted or adopted before the guidance document publication date of March 2018 will not reference this source.
Plan Includes-References other Data Sources Specified	List all relevant general, state, or local natural resources-related data here.
Comments	As needed, relating to this section.

Municipal plan Mapping Section	
Plan Includes Mapped Data	The plan included natural resource related mapped data (general land use maps, soil maps, or slope maps did not count). Examples might include: wetland habitat, bear habitat, deeryards, rare or threatened species habitat. Maps are embedded within the document of the municipal plan or attached as easily accessible appendices.
Maps Available with Municipal plan	Is mapped data specific to natural resources available online or with the municipal plan? No additional searching beyond the location of the plan itself was conducted; if maps were included at a different location note in comments.
Map Identifies Forest Data	The plan natural resources map(s) include or identify forest data. Broadly defined forest data (e.g., productive forest land, forest managed for forestry purposes, forest areas, etc.) accepted.
Map Identifies Habitat Connectors	The plan natural resources map(s) include or identify habitat connectors, connectivity corridors, or wildlife corridors.
Map Identifies RTE Species Habitat	The plan natural resources map(s) include rare/threatened/endangered species (state or federally listed) and/or associated habitat data.
Map Includes other Biological, Habitat, or Natural Heritage Inventory Data	The plan natural resources map(s) include specific natural resources data related to habitat. Simply delineating wetlands was not acceptable; specific habitat types such as deeryards, bear habitat, rare/endangered species habitat had to be identified and mapped.
Comments	As needed, relating to this section. Note if any town maps do not include GIS data.

Habitat Elements Section

Note: for each of the specific habitat types listed below, mapped elements do not meet these criteria; the habitat types must be specifically mentioned in the text of the plan within the context of wildlife habitat.

Mention Habitat	Broadly, the plan mentioned habitat in the context of wildlife.
Riparian Habitat	Ecosystems comprised of streams, rivers, lakes, wetlands, and floodplains, including all land directly affected by surface water. Mention of a floodplain or a river corridor without mention of wildlife habitat value will not suffice.
Vernal Pools-Seeps	Small, ephemeral pools that occur in natural basins within upland forests. Typically supporting a specialized assemblage of species that can include amphibians, insects, mollusks, and other vertebrates.
Shoreland Habitat	Land adjacent to and directly affected by surface waters from ponds or lakes. Must be discussed in context of value as wildlife habitat. Lacustrine shoreland habitat only – must specify beyond general riparian habitat.
Surface Waters-GENERAL	All areas inundated by water (rivers, streams, lakes, and ponds). Mention of rivers, streams, lakes, or ponds in relation to wildlife habitat will suffice.
Fisheries	Aquatic habitats which may include surface waters or wetlands that support fish species. References to fishing will not suffice; must refer to a specific fishery (e.g., trout, salmon, bass, perch, etc.).
Wetland Habitat	Areas with hydric soils, hydrology, and wetland plants. Must be discussed in reference to their value as wildlife habitat.
Forest Habitat	Must be specifically mentioned in the context of wildlife habitat. Mentioned solely of ownership/legal context (e.g., town forest, state forest, national forest) will not suffice.
Late Successional Forest Habitat - Mature	May be referred to as old forest, however simply mentioning GMNF wilderness area within the town does not meet this element; old forest/late successional forest must be specifically mentioned in the context of wildlife habitat.
Shrubland Habitat	Areas dominated by low, dense shrub vegetation. Separate from a grassland habitat or a meadow. Must be discussed in context with its value as wildlife habitat.
Grassland Habitat	Open lands dominated by grasses, sedges, and other low vegetation, with few trees or shrubs. Often associated with current or past agricultural practices. Must be discussed in context with its value as wildlife habitat.
Early Successional Forest Habitat	Habitat type including young trees and shrubs, often occupying recently disturbed sites. May also be referred to as young forest. Must be discussed in context with its value as wildlife habitat.
Deeryard Habitat	Areas of mature or maturing softwood cover, with aspects tending towards south, southeast, southwest, or even westerly. May also be referred to as deer wintering yard or deer wintering area.
Bear Habitat	May be referred to as critical bear habitat, or may refer to types of important bear habitat, such as mast stands, bear-scarred beech, spring feeding wetlands, or bear travel corridors.

Habitat Elements Section, *cont.*	
Waterfowl	Shoreland, riparian, wetland, or surface waters described as providing habitat for waterfowl (ducks, geese, mergansers, loons, etc.).
RTE Species	An area is described as providing habitat for either federally or state listed rare, endangered, or threatened species.
Species of Greatest Conservation Need (SGCN)	Plan directly references the term "species of greatest conservation need" or "SGCN" which is a status. May be mentioned in connection to state Wildlife Action Plan.
Critical or Rare/ Irreplaceable habitat in Act 250	An area is described as critical or rare/irreplaceable habitat within the context of Act 250 jurisdiction.
Large Blocks - Core Habitat	Large blocks, forest blocks, or core habitat are mentioned in the context of wildlife habitat in a narrative form in the municipal plan. Other related terms, such as contiguous habitat acceptable.
Travel Corridor	Travel corridors or migratory corridors are mentioned in the context of wildlife habitat in a narrative form in the municipal plan. Other terminology accepted for this category included: linkage, etc.
Wildlife Management Areas (WMAs)	Department of Fish and Wildlife owned properties managed to ensure excellent habitat conditions for a range of fish and wildlife. Usually directly referenced in plans, some plans may reference state-owned land generically that should be checked whether ownership is by Fish & Wildlife Department.
Other Habitat Specified	Any mention of wildlife habitat not associated with any of the previously designed terms. List these other habitat types in section comments.
Natural Community Type/ Occurrence Identified	The plan specifically mentioned at least one natural community. This included the mention of natural community types (such as cedar swamp, northern hardwood forest) as well as the specific mention of the term "natural community". A natural community is an interacting assemblage of organisms, their physical environment, and the natural processes that affect them. Plan may also refer to an actual occurrence on the ground in the town.
Enduring Features or Landscape Diversity Mentioned	The plan described specific geologic features in the context of the associated fauna and flora. Simply describing surficial geology without relating it to community ecology was not sufficient. Examples included calcareous cliffs with rare and endangered species, and talus slopes with associated species. Use of the specific terms 'enduring features' or 'landscape diversity' is sufficient.
Comments	As needed, relating to this section.

Habitat Concepts Section	
Is Habitat Placed in a Broad Context?	The plan broadly mentioned habitat, without specifying species or habitat types.
Importance-Relevance of Biodiversity-GENERAL	The plan described the importance of biodiversity or the impact of the loss of diversity. Generally, this did not have to be described in great depth but had to mention something beyond the word diversity. For example, "maintaining a diverse grouping of species is important for the health of forests."
Importance-Relevance of Biodiversity-WILDLIFE	The plan explicitly discussed biodiversity in the context of species.
Importance-Relevance of Species Extinction-GENERAL	The plan referred to the complete loss of an animal species. This could include local extirpation and does not explicitly refer to global extinction. Generally, the plan may have drawn connections between species extinction and impacts on human society.
Importance-Relevance of Species Extinction -WILDLIFE	The plan explicitly discussed how species extinction is negatively impacting wildlife.
Importance-Relevance of Species Reintroduction -GEN	The plan explicitly described or referred to planned reintroduction of native fauna as part of a planned management action. This could include re-stocking of native fish species to streams and water bodies.
Importance-Relevance of Invasive Species - GEN	Generally, the plan discusses the impact of invasive species on the human environment. The term "invasive" did not necessarily have to be mentioned. Referral to known invasive species (such as Eurasian milfoil and zebra mussels) was accepted.
Importance-Relevance of Invasive Species -WILDLIFE	Beyond mention of the term, the plan described the relative impact of the invasive species on native wildlife species and habitats.
Importance-Relevance of Climate Change	Beyond generally mentioning climate change (either historic or current anthropogenically induced), the plan referred to the impacts of climate change on wildlife species or habitat.
Importance-Relevance of Climate Change-Adaptation	The plan references the importance and relevance of species adaption to climate change and how local land use decisions may allow for adaptation.
Importance-Relevance of Connectivity for Climate Adaptation	The plan references the importance of landscape connectivity in allowing species to adapt to climate change by drawing a connection between climate and habitat connectors and/or forest blocks.
Importance-Relevance of Natural Landscapes in Climate Mitigation/ Resilience	The plan discusses the ability of habitat types, including but not limited to forests and wetlands, in mitigating the impacts of climate change through carbon sequestration and building resilience to the impacts of a changing climate.
Public Benefits of Habitat Mentioned	The plan specifically mentioned a public benefit in relation to wildlife or habitat. Benefits may include but are not limited to: multiple use, timber, maple syrup, hunting, fishing, trapping, viewing wildlife, viewing scenery, collecting, photography, education, spiritual, ecological, clean water, recreation, production, etc.

Habitat Concepts Section, *cont.*	
List Benefits	List examples of public benefits of habitat mentioned in the plan.
Comments	As needed, relating to this section.

Act 171 Section	
Act 171 Compliance Required?	Field auto calculated by formula based on the input date of plan adoption. Plans adopted after 1/1/2018 must comply with Act 171.
Plan Incorporates Some Elements of Act 171 - CATCHALL	Used as a catch-all category. Does the plan incorporate any of the elements of Act 171? Some plans adopted before Act 171 compliance required may include related elements, and were therefore still counted, even though not required.
Includes Narrative-Definition of Habitat-Forest Fragmentation	The plan includes a narrative or definition of habitat fragmentation or forest fragmentation.
Importance-Relevance of Habitat-Forest Fragmentation	The plan explicitly described some form of impact of habitat fragmentation. Simply mentioning habitat fragmentation was not sufficient, the plan had to relate habitat fragmentation to some consequence or describe a broader impact of wildlife species.
Includes Narrative/ Definition of Forest Blocks	The plan includes a narrative or a definition of an intact forest blocks. Exact language may vary; evaluate whether there appears to be intent by town to address concept.
Importance-Relevance of Intact Forest Blocks	The explicitly recognizes the importance or relevance of intact forest blocks or intact habitat within the context of wildlife species.
Describes Areas Proposed for Maintenance of Forest Blocks	The plan explicitly described—in narrative form—areas identified for management/maintenance of forest blocks. Must describe or identify a real place on the ground/within the town.
Includes Narrative/ Definition of Habitat Connector	The plan includes a narrative or a definition of a habitat connector. Exact language may vary; evaluate whether there appears to be intent by town to address concept.
Importance-Relevance of Habitat Connector	The plan explicitly recognizes the importance or relevance of habitat connectors, wildlife corridors, or travel corridors for wildlife species.
Describes Areas Proposed for Maintenance of Habitat Connectors	The plan explicitly described—in narrative form—areas identified for management/maintenance of habitat connectors. Must describe or identify a real place on the ground/within the town.
Policy to Minimize Forest Fragmentation	The plan generally described policies to minimize forest fragmentation. Used as a catch-all category—may include policies related to forest blocks, habitat connectors, or other elements. Capture those that focus on ecological concept of connectivity versus general smart growth policies.
Policy to Minimize Fragmentation and Promote Forest Blocks	The plan explicitly described policies to minimize forest fragmentation and promote the health, viability, and ecological function of forests in forest blocks. List these. Capture those that focus on ecological concept of connectivity versus general smart growth.
Policy to Minimize Fragmentation and Promote Habitat Connectors	The plan explicitly described policies to minimize forest fragmentation and promote the health, viability, and ecological function of habitat connectors. List these. Capture those that focus on ecological concept of connectivity versus general smart growth.

Act 171 Section, *cont.*	
Relevant Mapping Elements - CATCHALL	The plan map(s) (check future land use map, and/or other natural resource related maps) includes any Act 171 elements, including forest blocks, intact forest habitat, wildlife corridors, connectivity corridors, etc. Meant as a catch-all category.
Map Shows Forest Blocks	Map(s) in the municipal plan explicitly identifies forest blocks
Identify Forest Block Map	Note the name of the map(s) showing forest blocks
Map shows Habitat Connector Areas	Maps(s) in the municipal plan explicitly identifies wildlife connectivity areas.
Identify Habitat Connector Map	Note the name of the map(s) showing habitat connectors.
Comments	As needed, relating to this section.

Partnerships Section	
Coordination with Regional - State Protection Efforts	The plan specifically recommended coordination with state or regional partners for the purpose of protecting wildlife or wildlife habitat. This did not include plans that simply recommended coordination of general planning (e.g., on transportation).
Coordination with RPC-Neighboring Towns	The plan specifically recommended coordination with neighboring towns/ RPC for the purpose of the protection of wildlife or habitat. This did not include plans that simply recommended a broad coordination effort with other towns for general purposes. Included partnerships based on shared geography or collaborative efforts among closely related communities (e.g., Mad River Valley)
Coordination with FWD	The plan recommended that the town or citizens work with Vermont Fish & Wildlife Department for the protection or preservation of wildlife or habitat.
Coordination with Community Wildlife Program	The plan referenced the Vermont Fish & Wildlife Department's Community Wildlife Program or technical assistance provided by the program to the town or conservation commission in natural resources planning processes.
Coordination with VTRANS/Road Ecology Addressed	The plan recommends coordination with local officials and Vermont Agency of Transportation to reduce human-wildlife collisions and increase landscape connectivity. The plan may discuss working with road officials to provide appropriate signage or install structures to guide animals to cross in safer areas. The plan may also discuss upgrading road infrastructure to accommodate wildlife connectivity. This may include using full-width banks and natural, at-grade bottom substrates, and culvert upgrade/replacement to facilitate aquatic and terrestrial organism passage.
Coordination with Feds-GMNF	The plan recommended coordination with a federal organization such as NRCS or GMNF for the protection of wildlife or wildlife habitat.
References Technical Assistance Programs	The plan references state/federal programs or nonprofit organizations that are available to help landowners manage their natural resources (such as EQIP, NRCS assistance, Vermont Coverts, Vermont Woodlands Association, local Natural Resources Conservation District, etc.).
Coordination with Private Orgs - NGOs	Plan recommended coordination with a private organization (such as Keeping Track Inc., VLT, or other NGOs), for the protection of wildlife or wildlife habitat.
Identify Organization(s)	If the plan explicitly identified a private or non-government organizations to coordinate with, list those identified.
Comment	As needed, relating to this section.

Non-Regulatory Policies Section	
Inventory Recommended	The plan specifically recommended a local natural resources or wildlife habitat inventory.
Non-Regulatory Local Policies - CATCHALL	Broadly the municipal plan recommends or describes non-regulatory local policies for wildlife, habitat, or natural resource-related goals. Used as a catch-all. Can include general reference to conservation, such "land protection" that may not specify easement/acquisition. Ex: "work with landowners to permanently conserve their land."
Conservation Easements Recommended – Nat Res Specific	The plan generally suggested the use of conservation easements or the purchase of developmental rights for the protection of natural resources (open space included).
Conservation Easements Recommended - Wildlife Specific	The plan explicitly suggested the use of conservation easements or the purchase of developmental rights for the protection of wildlife and habitat.
Land Acquisition Recommended - Nat Res Specific	The plan generally suggested the use of land acquisition for the protection of natural resources.
Land Acquisition Recommended - Wildlife Specific	The plan explicitly suggested the use of land acquisition for the protection of wildlife and habitat.
Tax abatement – CATCHALL	The plan suggested the use of tax abatement programs for the protection of natural resources (including ag land) or wildlife and wildlife habitat. Following tax abatement metrics specifically teased out if the recommended program was the Use Value Appraisal Program, or another municipal tax abatement program.
Tax Abatement - Current Use - Nat Res Specific	The plan generally suggested the use of the Use Value Appraisal program for the protection of natural resources.
Tax Abatement - Current Use - Wildlife specific	The plan explicitly suggested the use of the Use Value Appraisal program for the protection of wildlife and habitat.
Tax Abatement - Other Municipal - Wildlife Specific	The plan generally suggested the use of local municipal tax abatement programs for the protection of wildlife and wildlife habitat.
Public or Landowner Education	The plan suggested public/landowner education for either the protection of natural resources or wildlife and habitat.
Encourages Enrollment in Certification Programs	The plan encourages residents to enroll in certification programs that promote long-term support for land management (e.g., Tree Farm).
Local Funding Recommended - Nat Res Specific	The plan recommended local funding for the general protection of natural resources. This was often in the form of conservation funds directed by municipal commissions for the acquisition of lands or the purchase of development rights.
Local Funding Recommended - Wildlife Specific	The plan recommended local funding specifically for the protection of wildlife and habitat. This was often in the form of conservation funds directed by municipal commissions for the acquisition of lands or the purchase of development rights providing wildlife habitat.

Non-Regulatory Policies Section, *cont.*	
Town Conservation Fund	Plan indicates the town has a conservation funding source. May be appropriated annually by vote at town meeting, allocated by the selectboard, a voter-approved tax, etc. Fund could go towards land conservation, stewardship expenses, administrative support, or other conservation commission related activities/ responsibilities.
Town Conservation Fund Source Specified	Does the plan identify the source/type of the conservation fund?
Town Conservation Fund Comments	If the source of the conservation fund is identified, list here. If an amount of funding is referenced or any other relevant information about the conservation fund is given, describe here.
References Carbon Markets	The plan discusses the opportunity of enrolling private land into carbon markets.
Pooling land for NR Management Recommended	The plan references the opportunity for landowners to pool together to coordinate land management and ensure consistency in conservation efforts. Example efforts include: Orange County Headwaters, Chittenden Uplands, Cold Hollow to Canada Woodlots.
Plan Encourages Estate Planning	The plan encourages landowners to engage in estate planning. The plan explicitly discusses the importance of estate planning as a means of long-term conservation of forestlands.
Invasive Species Control Program Discussed	The plan discusses establishment of an invasive species control program. May be coordinated through the Conservation Commission.
List Other Non-Regulatory Policies Not Captured	Record those policies that are relevant to this section.
Comment	As needed, relating to this section.

Regulatory Policies Section	
Regulatory Local Policies – CATCHALL	Broadly the plan recommends or describes regulatory local policies for wildlife or natural resource-related goals.
Site Review or Analysis with FWD Recommended	The plan recommended coordination with Vermont Fish & Wildlife for site review analysis. Site review analysis may be used to determine impacts to deeryard, bear, or RTE habitat within the context of proposed development.
References Vermont Wetlands Rules	The plan references the Vermont Wetlands Rules and/or refers to VT wetland classifications (Class I, II, III).
Buffer Zones Recommended	The plan recommended any type of buffer around wildlife habitat (deeryard, rare and endangered species), or surface waters (streams, lakes, ponds, wetlands).
Siting Standards Recommended	The plan recommended general siting standards for development. This did not mean explicitly recommending standards in land use regulations, but rather was more inclusive of any suggested siting of development (such as limiting development on steep slopes, or within a certain distance of any major water body).
Subdivision Regulations Recommended	Plan recommended subdivision regulations and specifically mentioned this in the municipal plan. Capture whether town recognizes value of subdivision regs in context of conservation.
Clustering of Development Recommended	The plan explicitly recommended clustered development. The term "high density" or recommending PUD/PRD was not included, unless the plan explicitly used the terminology "clustered".
Conservation District Recommended - Already Exists	The plan recommended a conservation district, or already has one in the municipal land use regulations and specifically mentioned it in the plan. Towns with such a district that do not include it in the plan would not be included.
Forest Reserve District Recommended - Already Exists	The plan recommended a forest reserve district, or already had one in the municipal land use regulations and specifically mentioned it in the plan. Towns with such a district that do not include it in the plan would not be included.
Established Town Forest	The plan describes an existing town forest.
Exploring Town Forest Establishment	The plan discusses establishing or the feasibility of establishing a town forest.
Wildlife Overlay District Recommended	The plan recommended a wildlife overlay district, or already has one in the municipal land use regulations and specifically mentioned it in the plan. Towns with such a district that do not include it in the plan were not included.
Other Natural Resource-Related District Specified	The plan mentions another natural resources-related district, beyond forest reserve or wildlife overlay (e.g., flood hazard, ridgeline, etc.).
List District(s)	List relevant districts from previous metric.
Protect - Develop Public Access	The plan explicitly recommended the protection, development, or enhancement of public access to habitat areas (forest, wetland, etc.) or open space areas.
Impact Fees Recommended	The plan recommended impact fees as a means of protection of wildlife or wildlife habitat.

Regulatory Policies Section, *cont.*	
Transfer of Development Rights Recommended	The plan recommended the transfer of development rights from sending to receiving areas as a tool for the protection of wildlife or habitat.
List Other Regulatory Policies Not Captured	Record those policies that are relevant to this section.
Act 250 - Wildlife Specific	The plan explicitly recommended that the municipal plan be used in Act 250. Intended to capture a town's intent to use the plan as part of the Act 250 process to specifically protect wildlife and habitat.
Section 248 - Wildlife Specific	The plan explicitly recommended that the municipal plan be used in Section 248. Intended to capture a town's intent to use the plan as part of the Section 248 process to specifically protect wildlife and habitat.
Comments	As needed, relating to this section.

Appendix B

Zoning and Subdivision Metrics

General Zoning Regulations

1. Is wildlife included in the purpose statement?
   a. Yes, No
   b. In the purpose statement of the zoning or land use regulations, is "wildlife" explicitly stated? (If not explicit but implied, leave a note in the comments section)

2. Do bylaws incorporate in municipal plan?
   a. Yes, No
   b. Are definitions from the municipal plan present, or is there a referral to the municipal plan for guidelines and enforcement of specific standards or developmental regulations?
   c. The incorporation of the municipal plan in some way increased the legal standing of the plan, enabling it in some way to be legally binding in relation to the specific developmental standard or regulation being discussed.

3. Are subdivision regulations incorporated?
   a. Yes, No
   b. The zoning regulations incorporated subdivision regulations. This was done in two ways:
      i. Adopting land-use regulations that include both zoning and subdivision regulations
      ii. The inclusion of subdivision regulations in the general standards or conditional use review of the zoning regulations.

Zoning Districts

Answer the following questions for Conservation District, Forest Reserve District, Water Resource District, Natural Resources Overlay District, Wildlife Overlay District, Fluvial Erosion/River Hazard

1. Do the zoning regulations describe this specific district?
   a. Yes, No
   b. Does the section of the zoning regulations dedicated to the conservation district explicitly mention wildlife, wildlife habitat, or the equivalent? (Does not include the mention of wildlife refuges) (Y/N)
   c. Does the district have specific density requirements?
      i. If so, what are these requirements?
   d. Does the district allow for single-family dwellings under any standard of use? (Y/N)
   e. Does the district allow for single-family dwellings under conditional use standards? (Y/N)
   f. What is the minimum lot size for this district?
      i. E.g. 50 acres, 5 acres, etc.
   g. Is there a district-specific review for wildlife? (Y/N)
      i. Specific requirements related to wildlife, beyond simply mentioning wildlife in the district description
   h. Does the district include design standards or provisions to address forest or habitat fragmentation? (Y/N)

Answer the following questions for Rural/Ag/Resource Residential District, Residential District, & Open Space

1. Does this municipality have this district? (Y/N)

2. If the district is mentioned, does the section of zoning regulations dedicated to this district explicitly mention wildlife, wildlife habitat, or the equivalent? (Y/N)
   a. (Does not include the mention of wildlife refuges)

3. Does the section of zoning regulations dedicated to this district explicitly mention forest or habitat fragmentation? (Y/N)

****Use the "Other Districts" cell to note any other districts which have any environmental relevance****

1. Refer to completed municipalities to get a gauge as to what 'other districts' are relevant

2. Refer to the purpose statements to determine the environmental relevance of said district

3. Include purpose statement and/or other relevant information about the district in the comment section that follows the other districts question

General and Specific Use

A mere mention of "steep slopes" or "telecommunications facility" is not enough to qualify as a specific standard - needs to have its own section dedicated to it.

1. In the conditional, general, or specific use standards, did the zoning regulations include a specific road standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

2. In the conditional, general, or specific use standards, did the zoning regulations include a specific habitat and forest fragmentation standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

3. In the conditional, general, or specific use standards, did the zoning regulations include a specific surface water protection standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

4. In the conditional, general, or specific use standards, did the zoning regulations include a specific steep slopes standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

5. In the conditional, general, or specific use standards, did the zoning regulations include a specific groundwater extraction standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

6. In the conditional, general, or specific use standards, did the zoning regulations include a specific telecommunications standard? (Y/N)
   a. Does the standard explicitly mention wildlife?
   b. Most often, towns that included telecommunication standards had a boiler-plate description of developmental standards derived by the FCC.

7. In the conditional, general, or specific use standards, did the zoning regulations include a specific renewable energy standard? (Y/N)
   a. Does the standard explicitly mention wildlife?
   b. Most often towns that included these standards used them as a means of preserving mountain ridgelines from wind energy development. Towns that included protection of renewable energy as a conditional use standard but did not have specific standards in place to do so were not included.

8. In the conditional, general, or specific use standards, did the zoning regulations include a specific wetlands standard? (Y/N)
   a. Does the standard explicitly mention wildlife?

9. In the conditional, general, or specific use standards, did the zoning regulations include a specific riparian buffer standard? (Y/N)
   a. Does the standard explicitly mention wildlife?
   b. What is the minimum buffer width difference?
   c. What is the maximum distance?
   d. Does the buffer description include a management prescription (i.e. a vegetated buffer of native species should be maintained)
   e. Use Mgt. Prescription Comments section for any additional information of note

10. In the conditional, general, or specific use standards, did the zoning regulations include a specific shoreline buffer standard? (Y/N)
    a. Does the standard explicitly mention wildlife?
    b. What is the distance of the buffer?
    c. Does the buffer include a management prescription?
       i. (i.e. a vegetated buffer of native species should be maintained)

In order to qualify as a riparian or shoreland buffer, the associated setback had to be applied throughout the entire municipality or a given district. Different buffer widths could be used depending on the district or the gradient of the stream bank. Buffers that were specific to a certain water body such as an individual stream or pond were also included as zoning regulation buffers.

Development Review

1. Do the zoning regulations explicitly include PUD or PRD developmental controls? (Y/N)
   a. The zoning regulations explicitly included either PUD or PRD developmental controls, this did not include other density control designs.

2. Mandatory
   a. Not mandatory if statement such as "developers are encouraged" is included

3. By scale e.g. # of lots

4. By District

5. Does the description/purpose statement of the PUD explicitly mention wildlife? (Y/N)

6. Does the description/purpose statement of the PUD explicitly mention conservation? (Y/N)

7. Is there a size triggering PUD standards? (Y/N)

8. Is there district specific review?

9. If stated, what is the minimum requirement for the proportion of open space in PUD/PRD developments?
   a. Example: 40%

Development Review Standards

1. Do the Zoning Bylaws have explicit conditional use standards? (Y/N)

2. Do the Zoning Bylaws include explicit site plan requirements? (Y/N)

3. Do the Development Review Standards mention wildlife? (Y/N)

4. Do the Development Review Standards mention natural resources? (Y/N)

5. Do the Development Review Standards mention fragmentation? (Y/N)

6. Does the site plan authorize review or consultation with FWD? (Y/N)

7. Does the site plan require an inventory of wildlife or wildlife habitat? (Y/N)
   a. This is an additional inventory beyond the general mapping requirements of a sketch plan in the subdivision plat review. For example, this would include an inventory of wetlands, as a wetland is a critical type of wildlife habitat. However, it would not include a general soil inventory beyond the NRCS soil survey commonly used by towns, as this would be a general natural resource inventory rather than an inventory specifically related to wildlife or wildlife habitat.

8. Is this inventory to be provided by the applicant? (Y/N)

9. And/Or by an independent professional? (Y/N)

10. And/Or By FWD? (Y/N)

11. Does the plan require an inventory reference specific to the municipality in which it is being implemented? (Y/N)
a. Example:

12. Is there a definition of wildlife habitat/refuge anywhere in the entire document? (Y/N)

13. Is there an inventory map reference anywhere in the entire document? (Y/N)
a. Example: Vermont Wetlands Survey, National Wetlands Survey

14. Is there mention of transferable development rights (TDRs) throughout the entire document? (Y/N)

Subdivision Regulations

1. Do the subdivision regulations contain an authority and purpose statement? (Y/N)

2. Does the authority and purpose statement mention wildlife? (Y/N)

3. Does the authority and purpose statement mention natural resources? (Y/N)

4. Do planning standards exist in the subdivision regulations? (Y/N)

5. Do the planning standards explicitly mention wildlife? (Y/N)

6. Do the planning standards explicitly mention natural resources? (Y/N)

7. List what they address
   a. Cite any relevant excerpts from the document
   b. Example: Preservation of Natural Features: "including but not limited to scenic landscapes, open spaces…should be preserved as far as possible by harmonious design to minimize the impact(s) of new development"

8. Do the subdivision regulations require mapping in subdivision minor or major plat reviews? (Y/N)

9. Did the mapping mention wildlife or wildlife habitat? (Y/N)
    a. Example: map must include all deeryards

10. Did the mapping include or mention natural resources? (Y/N)
    a. Example: map must include all wetlands

Sketch maps as part of minor and major plat reviews were included as a type of mapping. Mapping did not necessarily need to be completed by an independent professional.

11. Do the subdivision regulations include explicit road standards? (Y/N)

12. Do the subdivision regulation road standards mention wildlife (Y/N)

13. Do the subdivision regulation road standards mention natural resources? (Y/N)

14. Is Wildlife habitat defined anywhere throughout the subdivision regulations? (Y/N)
    a. Does not include definitions of wildlife management areas
    b. Does not include wildlife habitat that is defined in the zoning bylaws

15. If the subdivision regulations require a wildlife habitat inventory in the initial application, does it authorize/mandate review or consultation with the FWD? (Y/N)
    a. Is the consultation with FWD conducted by the applicant? (Y/N)
    b. And/or independent professional? (Y/N)
    c. And/or directly by FWD? (Y/N)

16. Throughout the subdivision regulations, is there a specific natural resources inventory referenced? (Y/N)
    a. If yes, specify which in next column
    b. Including general natural resource inventories such as the NRCS soil surveys, National Wetland Inventory, and more specific wildlife habitat inventories completed by the state or independent professionals

17. Throughout the subdivision regulations, is fragmentation addressed? (Y/N)
    a. If so, list what they are in the comments section

18. Is there a certain number of lots that need to be created to trigger subdivision review?
    a. If 2, just write “any subdivision”