Task 4 - Develop recommendations for fortifying other critical community infrastructure

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Critical Infrastructure

Definitions

- Vermont Infrastructure and Resilience Plan:

  Those public and private sector systems and assets, whether physical or virtual, that are so vital their incapacity or destruction would have a debilitating effect on the security, economy, public health or safety, environment, or any combination of these matters across any Federal, State, regional, territorial or local jurisdictions.

16 Critical Infrastructure Sectors:

Transportation	Dams	Emergency Services	Food and Agriculture
Communications	Financial	Critical Manufacturing	Information Technology
Energy	Chemical	Defense Industrial Base	Nuclear
Water	Commercial Facilities	Government Facilities	Healthcare and Public Health

PATHWAY: Statewide Conservation & Buyout Program

Establish a statewide conservation and buyout program (2018 State Hazard Mitigation Plan):

- Create a dedicated State fund to support the purchase or local match of hazard-prone properties and the purchase of easements to conserve river corridors, floodplains, and wetlands identified as key flood attenuation areas.
- Expand the eligibility criteria and increase funding for VHCB's conservation and buyout program, to address any flood-vulnerable structures.
- Fund ERAF for non-federal disasters in towns that have adopted floodplain and/or river corridor bylaws and to support the 25% non-federal match for buyouts and develop criteria for distribution when funding is limited.
- Create and maintain a database of tax-sale/foreclosed properties located within SFHA and State River Corridor maps to identify flood-vulnerable structures for removal.
- Develop a priority list and map of community-identified properties that have been damaged repetitively but are not on the FEMA Repetitive Loss (RL) or Severe Repetitive Loss (SRL) list to be used for buyout/conservation prioritization.
- Develop a Benefit/Cost Analysis methodology to facilitate buyouts in areas at risk from flood-related erosion and outside of FEMA-mapped Special Flood Hazard Areas.
- Flood Resilient Communities Fund:
  - Program is currently in development with funding from the American Rescue Plan Act

PATHWAY: Statewide Conservation & Buyout Program

Conservation Law Foundation suggested the following in their comment:

- A net gain of wetlands policy to increase Vermont's climate resilience, improve habitat, and to absorb atmospheric carbon.
- A stronger mitigation requirement for individual wetland permits, to require restoration of a substantial predetermined ratio (minimum 2:1) of degraded wetlands, or the creation of new functional wetlands to achieve an overall gain of wetlands.
- The Vermont In-Lieu Fee compensation program for wetland impacts should require funds to be spent on in-state wetland restoration projects to ensure that mitigation fees contribute towards Vermont's restoration targets and not those of neighboring states.

PATHWAY: Land Use & Building Codes

Locate new development outside of hazardous areas (2018 State Hazard Mitigation Plan):

- Develop a mechanism for tracking new structural development in the river corridor so development patterns can be tracked over time.
- Research reasonable steps developers can take to site new structural development outside of hazard-prone areas when the State is involved in funding, consistent with State river corridor standards and land use goals.

Develop resilient design and construction standards (2018 State Hazard Mitigation Plan):

- Develop sample building standards for resilient design and construction (for buildings, construction sites, transportation infrastructure, etc.).
- Audit existing building codes to ensure that standards account for anticipated climate change impacts to Vermont, including but not limited to increased temperatures extremes and precipitation.
- Create educational resources for contractors, municipalities and property owners on resilient design and construction techniques.
- Research how applicants can demonstrate they have taken reasonable steps to incorporate resilient design and construction in hazard-prone areas when the State is involved in funding, consistent with the objectives of the funding source.

PATHWAY: Local Infrastructure

Identify and protect vulnerable structures and critical infrastructure (2018 State Hazard Mitigation Plan):

- Require consideration of river corridors in the State permitting process for water and wastewater facility siting or improvement.
- Provide technical assistance to municipalities to assess the flood and erosion risks facing their drinking water and wastewater systems and identify potential mitigation improvements.
- Create a process for relocating or retrofitting at-risk mobile home parks at the time of sale or substantial rehabilitation using the DHCD's risk assessment tool.

Improve Dam Resilience (2018 State Hazard Mitigation Plan):

- Complete development and digitize all dam inundation maps for all high hazard dams and perform tabletop exercises for new Emergency Action Plans (EAPs), once generated.
- Develop a new Vermont Dam Inventory to better link data and digital inundation mapping, including more robust contact information for owners, ecological information and Emergency Action Plans (EAPs).
- Develop guidance documents/criteria for the security improvement of high hazard dams throughout Vermont.
- Utilize updated Dam Inventory to support the expansion of the Dam Removal Screening Tool beyond Champlain Basin.

Task 5 - Recommendations to expand the use of nature-based solutions to enhance landscape resilience in the built environment

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Rural Resilience & Adaptation

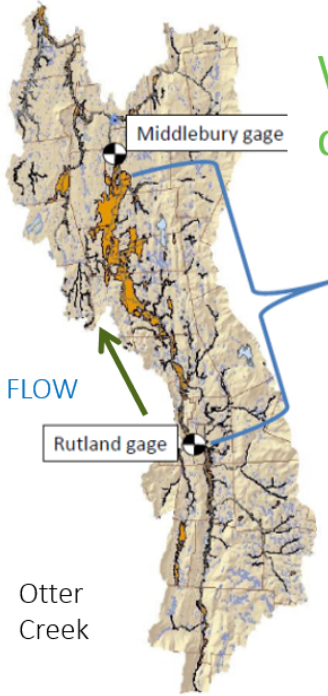
Definitions

- (1) “Adaptation” means reducing vulnerability and advancing resilience through planned and implemented enhancements to, or avoiding degradation of, natural and built systems and structures.
- (4) “Resilience” means the capacity of individuals, communities, and natural and built systems to withstand and recover from climatic events, trends, and disruptions.

WG Charge

- The Rural Resilience and Adaptation Subcommittee shall focus on the pressures that climate change adaptation will impose on rural transportation, electricity, housing, emergency services, and communications infrastructure, and the difficulty of rural communities in meeting the needs of its citizens.
- The Subcommittee shall:
  - (B) develop best practice recommendations specific to rural communities for reducing municipal, school district, and residential fossil fuel consumption; fortifying critical transportation, electricity, and community infrastructure; and creating a distributed, redundant, storage-supported local electrical system;

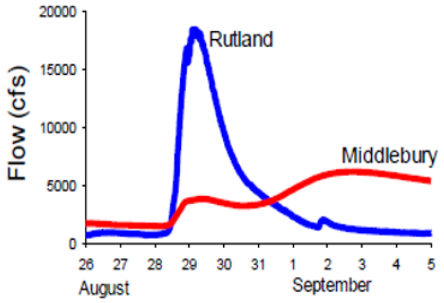
Wetlands & Floodplains at Work



Wetlands & floodplains protect downstream communities!

Floodplains

Wetlands



Hydrograph during Irene

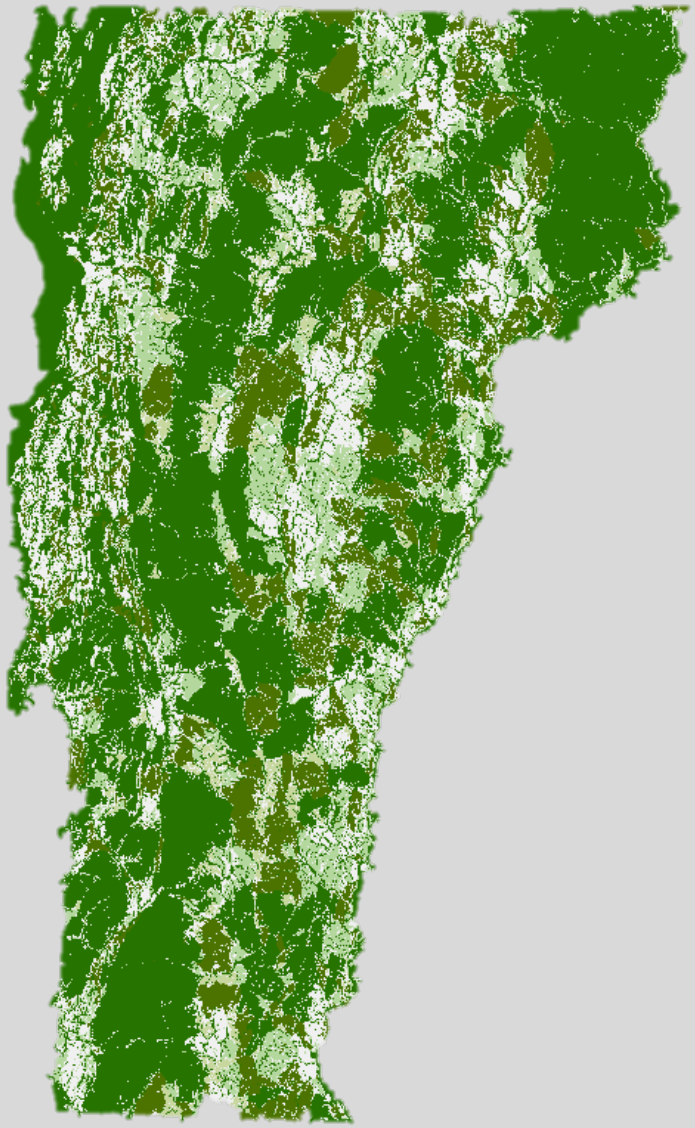
Nature Based Solutions

To affect the "Built Environment" strategies implemented largely in the less-built landscape

Trees or Forest?

A Continuum of Benefits

Vermont Conservation Design



BioFinder™

Designing a Resilient Future

Strategy to protect and enhance ***ecological function*** *into the future*

https://anr.vermont.gov/maps/biofinder

It's about *Pattern*

- 266 Municipalities in Vermont
- Each with its own Land Use Planning & Regulatory Authority
- 83% of the land is in private ownership

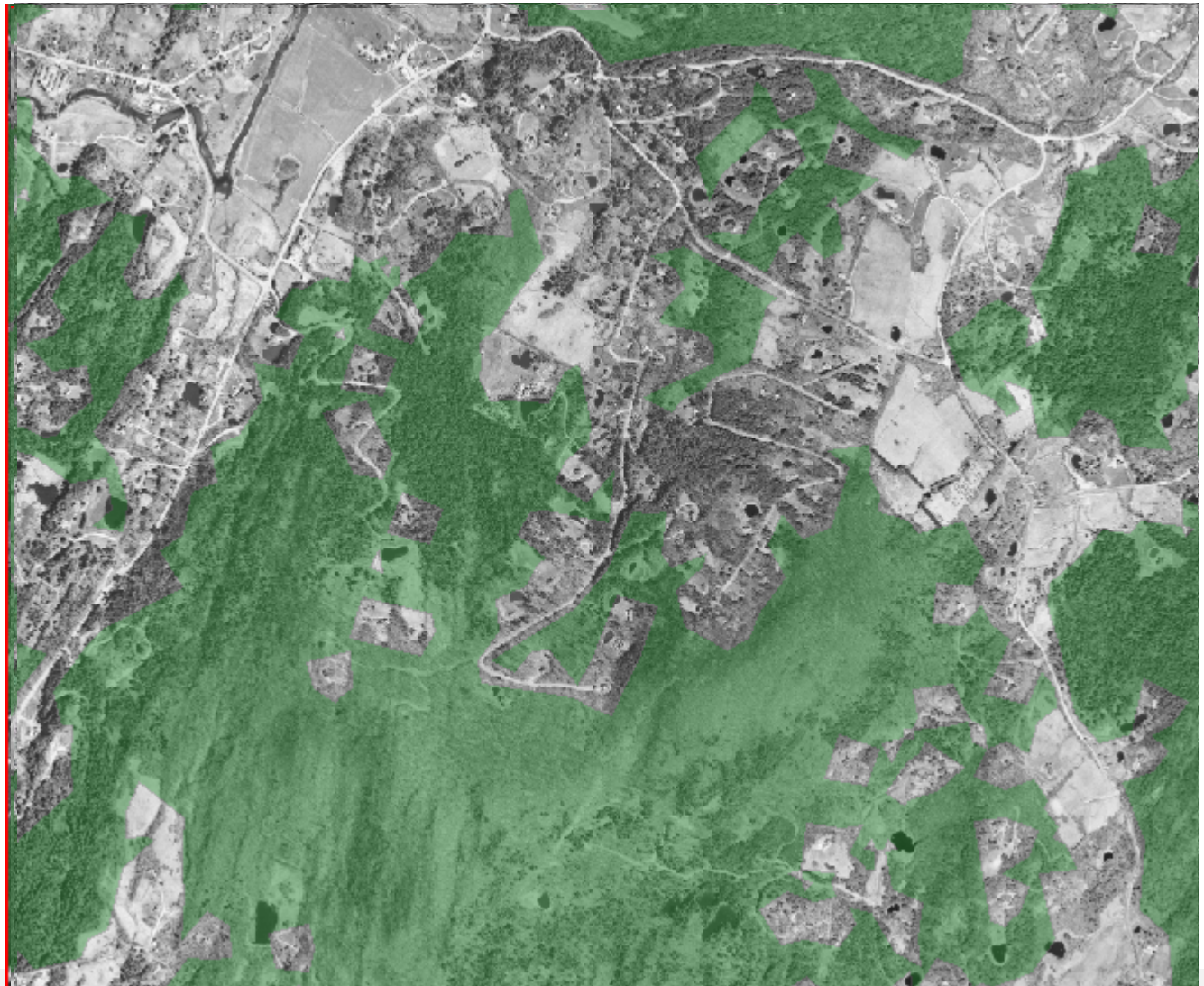
Sprawl

= dispersed, auto-dependent development outside of compact urban and village centers, along highways, and in rural countryside.

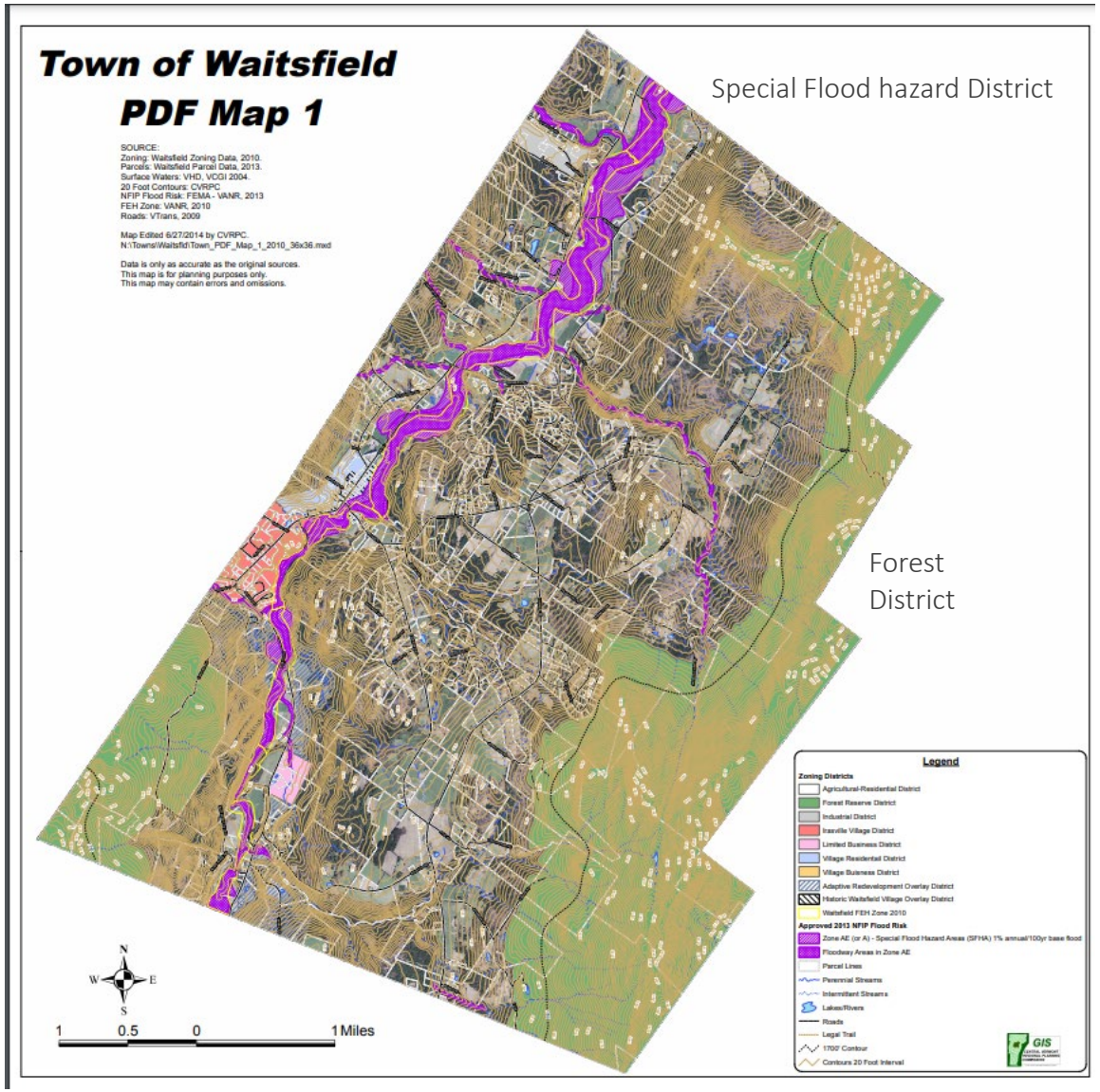
“Photos from Above and Beyond." Campoli, J., Humstone, E., & MacLean, A. 2002.

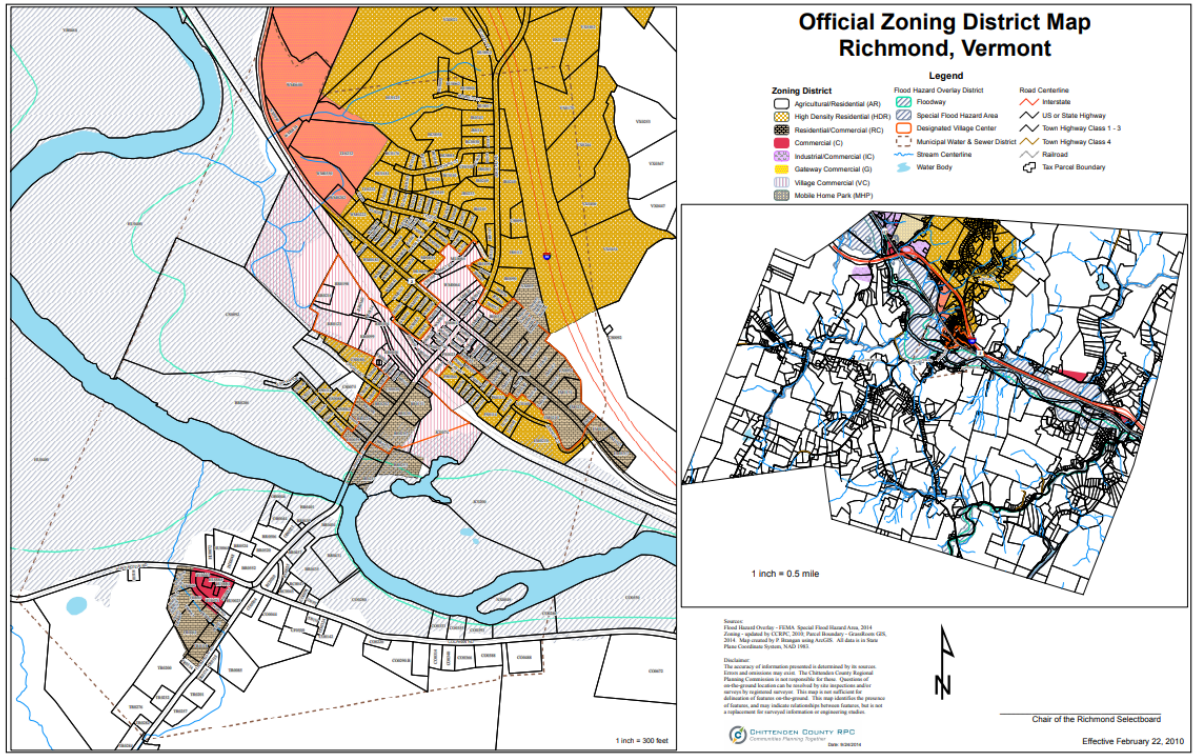
Losing Wildlife Habitat & Working Forest

- One of "America's most endangered places."
- Rate of development is 2.5 times rate of population growth.
- Losing an estimated 11,000 acres of forest / year.



Control Pattern through Planning & Regulation





Overlap with Ag & Ecosystems WG

Task 5D Charge

- Identify and develop initiatives, programs and strategies to **improve adaptation of Vermont's natural and working lands. This work should also consider nature-based solutions –and human impediments to those solutions –that build resilience in Vermont's communities**. '.

- Draft Pathways
- II. Equitably expand incentives, technical assistance, funding, and research to empower landowners and managers to implement climate-friendly forestry
- III. Develop and implement land use planning and regulations that incorporate climate change adaptation, resilience, and empowered community engagement
- IV. Promote shared understanding and implement practices that address natural hazard adaptation and resilience for the safety and survival of natural and human communities

Ag & Ecosystems - II - Equitably expand incentives, technical assistance, funding, and research to empower landowners and managers to implement climate-friendly forestry

- •Increase tree cover along road corridors through reduced mowing (allows for woody plant growth, reduces fossil fuel use/invasive species spread)
- •Expand Municipal Tree Planting efforts to increase urban tree canopy cover
- •Expand tree planting efforts on private land to promote restoration efforts to reforest riparian areas, wetland buffers, and degraded lands
- •Promote/incentivize climate-adaptation forestry practices to increase the resilience and adaptation capacity of forest ecosystems by providing a pay-for-practice incentive and funding climate-adaptation forestry training and resource development
- •Support forestland succession/estate planning efforts to reduce forest parcel subdivision and fragmentation
- •Incentivize management for ecosystem services through a tax credit system that compensates landowners/managers for maintaining or restoring ecosystem services
- •Bridge gap between Use Value Appraisal (UVA) ecologically significant treatment areas (ESTAs) and regular forest category to help build old forest structure
- •Offset ESTA enrollment cost to incentivize desired management practices

Ag & Ecosystems III - Develop and implement land use planning and regulations that incorporate climate change adaptation, resilience, and empowered community engagement

- Promote statewide landscape connectivity and forest blocks conservation planning through robust support of the Staying Connective Initiative and use of Vermont Conservation Design in state program prioritization frameworks
- •Increase proportion of conserved lands and waters (e.g.join the 30x30 initiative)
- •Develop and implement statewide zoning through revival of the State's Central Planning Office
- •Incentivize/prioritize development in growth areas/town centers
  - Achieve Compact Settlement through appropriate investment in water and wastewater infrastructure planning and siting
- •Invest transportation funding in improving flood resilience and aquatic & terrestrial connectivity
- •Develop an inventory of priority/critical headwater and floodplain storage areas, prioritize investments for restoration and protection in these areas, and use to inform Compact Settlement planning efforts
- •Create statewide groundwater resource maps, water use and water level data for use in water budgets for local areas to prepare for drought conditions
- Establish "climate resilience zones" informed by existing data, bolstered with new research/science, to identify locations that have high resilience potential for both the natural and built environments and to inform land use development
- Upgrade VT Wetlands Maps to more accurately inform planning efforts
- Further development of flood mapping/modeling tools for state and municipal use/planning
- Incentivize or mandate solar capacity on new buildings, as well as in previously-disturbed/developed areas

PATHWAY: Support Forest Pattern

- Use Vermont Conservation Design as our resilient and connected network to identify important forests and waters for conservation of all types.
- Support investigation of potential new state revenue sources to boost investment in forestland conservation and the sound stewardship of conserved lands (public and private).
- Adequately fund and support efforts to track the rate of forest fragmentation, parcelization and conversion of forestland in Vermont through updates to LIDAR mapping, maintenance of the VT Parcelization website, USFS FIA data, etc. Develop a leadership team and secure funding to improve coordination and the interplay of these tools to assist in the planning and tracking of targets to reverse forest loss and forest fragmentation.
- Support education efforts and additional capacity in the land trust community to achieve identified conservation targets – including the permanent conservation of smaller, but critical parcels for sustaining a resilient, connected landscape
- Support the implementation of the Intergenerational Transfer of Forestland Working Group's Recommendations in response to Act 171 of 2016.

PATHWAY: Support Forest Pattern through funding

- Provide funding for permanent conservation of 55,000 ac / yr each year 2021-2030 focused on areas within Vermont Conservation Design Highest Priority area
- Fully Fund Vermont Housing & Conservation Board each year
- Support adequate funding for the ongoing maintenance and improvement of Vermont Conservation Design and other efforts to maintain landscape connectivity and resilience.
- Adequately fund and support technical assistance and outreach programs (such as VHCB's Viability Program, Vermont Woodlands Association and VT Coverts programs, etc.) that assist landowners with successional planning to promote maintaining large intact forestland parcels.
- Support Staying Connected Initiative by funding for Vt agency membership in regional Staying Connected Initiative coordination

PATHWAY: Municipal Capacity Building

- Support Regional Planning Commissions through greater funding
- Create and fund one natural resource staff position at every Regional Planning Commissions to assist with implementation of climate policies and Act 171. Use the Transportation Planning Initiative as a model to fund RPC natural resource staff and support trainings with ANR and other partners.
- Boost capacity and resources for the establishment of new town forests, including covering acquisition, planning and stewardship costs, and addressing other barriers to town forest creation – e.g., additional financial incentives for landowners who donate lands as town forests.

PATHWAY: Land use planning and development review

- Develop and implement statewide zoning through revival of the State's Central Planning Office
- Compile a composite map of existing town zoning statewide
- Create a state Land Use Plan that guides development to growth areas, town centers and appropriate rural locations and limits development within ecologically sensitive / risk-prone areas.
- Incentivize/prioritize development in growth areas/town centers
  - Achieve Compact Settlement through appropriate investment in water and wastewater infrastructure planning and siting
- Add criteria to Act 250 to avoid, minimize and mitigate the fragmentation of intact forest blocks and connectivity areas. Modify Act 250 jurisdiction to review projects that have a high probability of fragmenting forests. Options include reinstating the road rule, applying jurisdiction in intact or high-ranking forest blocks, or lowering the threshold of subdivision lots that trigger review in intact forest blocks.
- Support smart growth policies and funding mechanisms that concentrate development in settled areas to help reduce development pressures on undeveloped forestland - e.g., boost funding for water supply and wastewater infrastructure in downtowns and village centers.
- Support and enhance technical assistance to municipalities to implement Act 171 planning to reduce the fragmentation of intact forest blocks, working forests, and habitat connectivity areas.
- Create a unique funding source (either through municipal planning grants or a separate program) to allow towns to engage with land use planning experts to implement Act 171 planning requirements.

Ag & Ecosystems -
IV - Promote shared understanding and implement practices that address natural hazard adaptation and resilience for the safety and survival of natural and human communities

- Expand forest road restoration efforts through expansion of funding to programs to fix old logging/forest roads (e.g. NRCS) by improving drainage or permanently closing them out
- •Provide incentives to restore or increase forested buffers in agriculture and other settings (e.g. through revisions to the RAPs to expand beyond water quality)
- •Protect and promote natural or restored river corridors through expansion of the river corridor easement program
- •Protect and promote natural or restored floodplains through expansion of the floodplain easement program
- •Expand the Flood Hazard and River Corridor (FHARC) rule to incorporate statewide jurisdiction and permitting for river corridors, as modeled by the State's Wetlands and Lakes & Ponds programs
- •Promote strategic dam removals through increased project funding and bolstering programmatic capacity to manage removal projects statewide for improved ecosystem health and community resilience
  - Develop multi-stakeholder Dam Removal Program
- •Consider revisions to and expansion of the Water Infrastructure Sponsorship Program (WISPr) to improve accessibility and use for restoration projects
- •Ensure opportunities for floodplain reconnection and NbSare considered a high priority in the Statewide Conservation & Buyout Program through incorporation of multi-stakeholder developed prioritization criteria
- •Support and fund research and design to strategically invest in floodplain reforestation efforts
- •Invest in reconnecting floodplains (e.g. removal of berms)
- •Incentivize water storage in natural areas to promote flood resilience and biodiversity through expansion of wetland easements to better compensate landowners/managers
- •Improve natural wetlands and wetland systems across the state through the development and implementation of a Net Gain wetlands policy
- •Mitigate legacy forest management practices that lead to fluvial erosion and degraded headwater storage
- •Create and implement a unified waters and wetlands buffer policy
- •Create and deploy a river corridor and floodplain buffers extension-type program that provides technical assistance for private landowners

Thank You