

FLOOD RESILIENCE

Background

In 2013 Vermont enacted Act 16, “An act relating to municipal and regional planning and flood resilience,” which amended 24 V.S.A. § 4382 - The plan for a municipality - adding to the requirements for a municipal plan a flood resilience plan that:

- (i) identifies flood hazard and fluvial erosion hazard areas, based on river corridor maps provided by the Secretary of Natural Resources pursuant to 10 V.S.A. 1428(a) or maps recommended by the Secretary, and designates those areas to be protected, including floodplains, river corridors, land adjacent to streams, wetlands, and upland forests, to reduce the risk of flood damage to infrastructure and improved property; and*
- (ii) recommends policies and strategies to protect the areas identified and designated under subdivision (12)(A)(i) of this subsection and to mitigate risks to public safety, critical infrastructure, historic structures, and municipal investments.*

Fluvial Erosion

Fluvial erosion means the erosion or scouring of riverbeds and banks during high flow conditions of a river. Most of the flooding damage experienced in Vermont is from the power of moving water causing the destruction of under-sized culverts and erosion of stream banks supporting roads and buildings. Providing a river the room it needs to slow the flow allows it to function as a responsive system and helps avoid repeated losses to public infrastructure and investments.

Erosion and deposition along a stream or river is natural. Efforts to stop this process in one place can make it worse in others. Rivers, streams, and their channels are changing constantly in response to the inputs of water, energy, sediment and debris that pass along them. A river is in geomorphic equilibrium when its water, energy, sediment, and debris are in balance.

In this condition a river is neither building up sediment in the channel nor losing sediment from its bed. Importantly, a river in equilibrium has not become overly deep and can continue to overflow onto its floodplains. The water that spills onto the floodplain slows down, and the velocity of the water still in the channel does not become excessively powerful. If the stream cannot spill out of its banks, the power of the trapped water increases, and it can either dig down, deepening the channel, or cut farther into the sides of the channel.

River Corridors and Floodplains

The River Corridor is the area that provides the physical space that the river needs to express its energy and meander without it having to dig down. The River Corridor includes a 50-foot buffer on either side of the fluvial erosion hazard area to prevent disturbance in this area and allow for bank stabilization.

A floodplain is the area where water flowing out over a river bank can spread out and slow down. The floodplain as defined by FEMA is the area that will be inundated by the flood event having a 1-percent chance of being equaled or exceeded in any given year, the 100-year flood.

Regulatory Flood Hazard Designations

There are two types of regulatory flood hazard designations and two sets of official maps that identify those flood hazards in Vermont: inundation hazard areas are identified by the Federal Emergency Management Agency Flood Insurance Rate Maps (FIRMs), while fluvial erosion hazard areas are identified by the VT Agency of Natural Resources (ANR) on River Corridor maps.

Dummerston has land, homes and businesses that are susceptible to the two types of flooding impacts inundation and fluvial erosion. Inundation flooding occurs during high water events on the Connecticut and West Rivers. Fluvial erosion occurs in areas both in and out of the flood hazard area (floodplain) as mapped by the Federal Emergency Management Agency (FEMA). Both inundation flooding and fluvial erosion are potential hazards along the Connecticut River, the West River and Canoe, Crosby, Salmon and Stickney Brooks, as well as along the streams that drain watersheds extending to town borders with Marlboro, Newfane, and Putney.

Inundation Hazard

Towns participating in the National Flood Insurance Program (NFIP) must regulate development in areas designated on the FIRMs that show the floodplain that FEMA has calculated would be covered by water in a 1% chance annual inundation event, also referred to as the 100 year flood or base flood. This area of inundation is called the Special Flood Hazard Area (SFHA). FIRMs may also show expected base flood elevations (BFEs) and floodways (smaller areas that carry more current). FIRMs are only prepared for larger streams and rivers. The Town of Dummerston has areas of inundation hazard flood risk mapped by FEMA.

Fluvial Erosion Hazard

A significant portion of flood damage in Vermont occurs outside of FEMA mapped floodplain areas and along smaller upland streams, as well as along road drainage systems that fail to convey the amount of water they are receiving. Vermont ANRs River Corridor maps show the area needed to address the fluvial erosion hazards, which may be inside of FEMA-mapped areas, but often extends outside of them. River Corridor maps delineate areas where the lateral movement of the river and the associated erosion may be more of the threat than inundation by floodwaters. Elevation or floodproofing alone may not be protective of structures in these areas, as erosion can undermine structures. ANR released statewide River Corridor maps in 2014. The Town of Dummerston has areas of River Corridor mapped by ANR.

Flood Hazard Regulation

Inundation

The Town participates in the National Flood Insurance Program and has adopted and enforces a Flood Hazard Bylaw. By doing so, property owners in Dummerston are able to obtain federal insured flood insurance at affordable rates and flood disaster assistance. The Flood Hazard Bylaw regulates development within the Special Flood Hazard Areas (SFHA) by imposing design standards that are intended to minimize property damage during flood events.

Erosion

To address Act 16, to protect citizens, infrastructure, and the environment, and to qualify for maximum Emergency Relief and Assistance Fund state match in the event of a disaster, Dummerston will adopt and administer River Corridor protection standards as part of its flood hazard area regulations.

Goals and Action Steps

This plan identifies flood hazards as the Special Flood Hazard Areas (SFHAs) shown on the NFIP FIRMs and identifies fluvial erosion hazard areas as those shown on the ANR River Corridor maps. This Plan designates both those identified areas as areas to be protected, including floodplains, river corridors, and land adjacent to streams, wetlands, and upland forests, to reduce the risk of flood damage to infrastructure and improved property. In addition, this plan incorporates by reference the town's Local Hazard Mitigation Plan approved under 44 C.F.R. 201.6. Finally, this plan recommends the following goals and Action Steps to protect the designated areas to mitigate risks to public safety, critical infrastructure, historic structures, and municipal investments.

Goal 1 — Enhance flood resilience through the protection and restoration of river corridors, floodplains, wetlands, and upland forested areas that attenuate and moderate flooding and fluvial erosion.

Action Steps

- a. The Town will update the Flood Hazard Area Regulations to include regulation of river corridors, and include provisions for advance notification of and specific limits on new development activities in identified flood hazard areas, fluvial erosion areas, and/or River Corridors (Planning Commission)
- b. The Town will regulate any new development in identified flood hazard areas, fluvial erosion hazard areas, and/or River Corridors to ensure that development does not exacerbate flooding and fluvial erosion, and extend these provisions to development activities that might increase the amount and/or rate of runoff and soil erosion from upland areas. (Zoning Administrator, Development Review Board)

Goal 2 — Encourage flood emergency preparedness and response planning.

Action step

- c. The Town will further pursue a flood resilience management approach by implementing its Local Hazard Mitigation Plan, Local Emergency Operations Plan, and other strategies for restoring the stream geomorphic equilibrium conditions and enhancing the emergency preparedness that will mitigate the risks to public safety, critical infrastructure, historic structures, and municipal investments. (Emergency Management Director, Selectboard)

Additional information is available at <http://floodready.vermont.gov/>.

