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Waterbury, Vermont Middle Winooski River Corridor Plan

1.0 EXECUTIVE SUMMARY

A stream geomorphic assessment of the Winooski River and tributaries was conducted by Bear Creek Environmental, LLC (BCE) under the direction of Central Vermont Regional Planning Commission and the Vermont Agency of Natural Resources (VANR) during the summer of 2014. Funding for the project was provided through the State of Vermont Ecosystem Restoration Program. A planning strategy based on fluvial geomorphic science (see glossary at end of report for associated definitions) was chosen because it provides a holistic, watershed-scale approach to identifying the stressors on river ecosystem health. The stream geomorphic assessment data can be used by resource managers, community watershed groups, municipalities and others to identify how changes to land-use alter the physical processes and habitat of rivers.

The Town and Village of Waterbury experienced major flooding in August 2011 and subsequent damage to infrastructure as a result of Tropical Storm Irene (TSI). As part of the long term plan to mitigate the impact of flooding, improve aquatic habitat, and increase river stability, Central Vermont Regional Planning Commission secured state funding to complete a Phase 2 stream geomorphic assessment within the mid-Winooski River watershed. The stream geomorphic assessment data will be used to help focus stream restoration and protection activities within the watershed and assist towns with flood resiliency planning.

The study encompassed approximately 31 miles of stream channel within 23 reaches on the Winooski River, the Little River, Graves Brook, Thatcher Brook, and two unnamed tributaries of Thatcher Brook. This stream geomorphic assessment facilitated the identification of major stressors to geomorphic stability and habitat conditions within the study area. The predominant stressor observed within the mid-Winooski watershed is stream channel straightening and corridor encroachment associated with the existence of roads and development. In many cases, this encroachment has limited floodplain access and has caused moderate to extreme channel degradation (lowering of the bed) resulting in sediment build up, channel widening, and planform adjustment (lateral movement). Numerous federal, state, and town highways were historically built into river valleys throughout the watershed, including critical travel routes such as Interstate 89, U.S. Route 2, Vermont Route 100, and the New England Central Railroad. Waterbury Village, a hub of economic and residential activity, lies within the Winooski River and Graves Brook valleys.

Despite the impact that development has had on the mid-Winooski River watershed, its surface waters have proven to be very resilient. Six miles of the study area were assessed in 2010,

before Tropical Storm Irene hit Central Vermont, which allowed for a comparison of pre- and post-flood conditions. Major changes in channel dimensions and processes were not observed, suggesting that extremely high flows during Tropical Storm Irene did not drastically change the morphology of these streams like it did in so many other places in Vermont. The mid-Winooski River watershed in Waterbury has many assets that mitigate some of its anthropogenic impacts. Undeveloped floodplains and extensive wetlands in Waterbury Center along Graves Brook, Thatcher Brook, and their tributaries provide tremendous storage of floodwaters and sediment. These areas allow raging floodwaters to disperse energy, drop out sediment, and slow down before reaching Waterbury Village, where development is dense along the banks of Graves Brook. It is of critical importance to protect these floodplains and wetlands upstream to mitigate future flooding and protect people and infrastructure.

Following Tropical Storm Irene, immense recovery efforts were undertaken to repair roads, buildings, and other infrastructure that were damaged by the flooding. Moving forward, it is important for communities to continually prepare for the next flood by taking steps to become more flood resilient. This report outlines several strategies that can be implemented on both site-specific and community-wide levels to mitigate flood damage and losses in the future.

The river corridor planning effort in the mid-Winooski River watershed is a continuous and collaborative process. The stream geomorphic assessment data collected in this study build on other data that have been collected throughout the Winooski River watershed in the past decade. Analysis of these data has aided the identification of major impacts and stressors and the development of projects to mitigate impacts, increase geomorphic stability, and improve aquatic habitat.

A list of 59 potential restoration, conservation, and flood resiliency projects was developed using the stream geomorphic assessment data collected within the study area. The projects fall within four primary categories:

Project Category	Number of Proposed Projects
Floodplain Improvement and Conservation	40
Public Safety Improvement	1
Stream Channel Improvement and Restoration	8
Structure Replacement/ Removal	10
Total Number of Projects	59

These projects provide flood resiliency measures to prepare communities for the next flood and strategies to restore riparian and instream habitat. Types of projects include river corridor easements, riparian buffer improvements, berm removals, bridge and culvert replacements, floodplain creation, and many more. Potential projects were prioritized based on several factors, including ease of implementation, cost, landowner interest, effectiveness, and site-specific factors. Further project development, including additional data collection, may be required for project design, permitting, and implementation.