


Draft Environmental Assessment

Middlebury River Flood Mitigation Project

Addison County, Vermont

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FEMA

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Reviewers please note:

The attached document is a DRAFT. Comments are encouraged and anticipated

TABLE OF CONTENTS

APPENDICES

LIST OF ACRONYMS

APE	Area of Potential Effect
ARA	Archaeological Resources Assessment
BMP	Best Management Practice
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FONSI	Finding of No Significant Impact
HMGP	Hazard Mitigation Grant Program
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
SHPO	State Historic Preservation Office
SMC	Stockbridge-Munsee Community
SRHP	State Register of Historic Places
USACE	U.S. Army Corps of Engineers
VT	Vermont

1.0 INTRODUCTION

The Town of Middlebury has applied for a FEMA (Federal Emergency Management Agency) hazard mitigation grant through the Hazard Mitigation Grant Program to restore and create additional floodplain storage in the Middlebury River between the Lower Plains Road bridge and the Ossie Road berm downstream. Repairs to existing flood control structures would also be completed. FEMA's Hazard Mitigation Grant Program provides funds to states, tribes and local communities after a disaster declaration to protect public and private property through various mitigation measures. The goal of the program is to reduce the need for future federal disaster assistance and to eliminate repetitive damages. Vermont Emergency Management is the state agency partner and the grant recipient for the Proposed Action, and the Town of Middlebury is the grant sub-recipient.

The Village of East Middlebury is located along the Middlebury River and over the past 90 years, the river has caused significant damages with documented costs at least eight times within the proposed project area. The Middlebury River has a history of overflowing its banks during major flood events and flowing along Route 125, causing erosion of the state highway and damage to buildings on Main Street. In 2008, the Lower Plains Road bridge was destroyed during a storm and replaced. The Grist Mill bridge regularly experiences scour downstream and sediment deposition upstream (6' deep and 3' high, respectively, after Tropical Storm Irene) and damage to bridge wingwalls and to the adjacent erosion control structure. After the 1989 flood, a localized minor flood reduction project was constructed between the backyards of houses along Ossie Road and the edge of the existing floodplain forest. This barrier has effectively prevented flooding of houses located in the floodplain to date, but it is currently vulnerable to erosion from the meandering river channel.

This Environmental Assessment is prepared in accordance with the National Environmental Policy Act (NEPA) and implementing regulations. The purpose of the Environmental Assessment is to analyze potential effects of the Proposed Action and Alternatives on the human environment, and to determine whether the proposed project warrants preparation of an Environmental Impact Statement or a FONSI (Finding of No Significant Impact).

2.0 PURPOSE AND NEED

The Town of Middlebury in its All-Hazards Mitigation Plan has identified risks associated with flooding and erosion of the Middlebury River in East Middlebury as a high priority for mitigation. Flooding and reoccurring flood damage impacts town bridges, roads, state highways and private residences in East Middlebury. The proposed mitigation project is needed to lessen flood risk to human health and improved property and infrastructure.

3.0 PROJECT LOCATION AND BACKGROUND

The Middlebury River Flood Mitigation project is in the Champlain Valley along the Middlebury River in the Village of East Middlebury, Vermont. (Appendix A, Document 1). East Middlebury is a densely developed village surrounded by forested hills to the east and south and open agricultural lands to the west and north. There are two town bridges located in the project area and the Vermont Route 125 bridges at the upstream and downstream ends of the village. There are approximately 425 residents in East Middlebury (Middlebury Town Plan).

The Middlebury River is a tributary of Otter Creek and drains an area of 63 square miles, or 40,207 acres with its headwaters on the west side of the Green Mountains in Ripton, VT. The upper watershed is typified by higher gradients and relatively narrow valleys, whereas the lower watershed is characterized by broad valleys and lower gradient stream beds. The Village of East Middlebury is in an alluvial deposition area where the river transitions from the very steep Middlebury Gorge to the lower gradient Champlain Valley. This is an area where the river would naturally deposit large amounts of sediment and have multiple channels, however, the river has been constrained by straightening, berms and hard armoring for decades through the village area, lengthening the transport zone of

boulders, gravel, woody debris and other sediment carried by the river from just downstream of the Lower Plains Road Bridge area to downstream of the Grist Mill Bridge area. An additional factor for flooding is the development of the Village of Ripton immediately upstream of Middlebury. The development of both Middlebury's and Ripton's depositional areas has reduced the area available for flood and sediment storage, thus increasing the rate and volume of water and sediment moving through the system during high flow events (Landslide 2008).

The Middlebury River Watershed was flooded during the major statewide flood events of 1927, 1938, and 2011 and it has also experienced numerous localized flood events which seem to be increasing in frequency. Localized floods have occurred in 1913, 1936, 1947, 1958, 1960, 1976, 1984, 1989, 1996, 1998, 2000, 2006, 2008, 2017 and 2019 (Underwood 2003). Until the late 1980's the conventional response to a flood event was to dredge, berm and hard armor the river "in place". These conventional channel management activities have resulted in the project area being entrenched and incised and consisting of over-widened sections that contain flows in the channel even during high flow events thus increasing erosion and risk to nearby property and infrastructure (Landslide 2008).

4.0 ALTERNATIVES

4.1 Alternative 1: No Action Alternative

There have been two significant flood events since Tropical Storm Irene, one in 2017 and another in 2019, both of which have resulted in significant erosion and deposition in the channel and adjacent floodplain and scour at the Grist Mill Bridge and the Ossie Road Berm. Sink holes have formed behind the Grist Mill Bridge floodwall suggesting that material is being moved from the river and pulled out from under the wall. If the No Action Alternative is chosen, scour and sink holes caused by high velocity flow would continue to threaten bridge infrastructure; it would not address the current need to reduce damages to bridges, roads and homes from flooding events.

4.2 Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative includes four primary components with design plans prepared for each component:

1. Removal of large sediment deposits from chute entrances and the top of large sand and gravel bars.
2. Armor select sections of the Ossie Road Berm and upstream berms that are eroding or are immediately prone to erosion.
3. Repair the existing flood wall to pre-Irene 2011 condition.
4. Extend the existing flood wall 150 feet downstream repairing it to the original 1927 condition (Appendix B, Document 1; MMI 2012, 2013a, 2013b and 2018).

1. Hydraulic modeling illustrates that reconnecting four flood chutes and removing the large sediment bars would decrease flood levels within the channel and reduce erosion potential along the riverbanks near houses at the edge of the river corridor. The sediment removal is estimated to provide flood relief for 1 to 3 large floods before the chute entrances refill. Specific sediment and gravel bar height thresholds that signal the need for sediment and gravel removal have been established based on the modeling. These sediment removal threshold limits are included in the plan set (Appendix B, Document 1 Sheet DE-1), and local reference elevations such as rebar rods or nails would be set as indicators of need for future maintenance dredging. The Town would monitor the elevations of the chute inlets so sediment cleanout can take place once the sediment buildup begins to increase flood risk.

2. Armor the Ossie Road berm with large stone to resist velocities from the predicted 100-year flood as shown in the hydraulic model. Armoring is proposed in three locations where flow is concentrated: 750 feet along the Ossie Road berm, 400 feet where the berm is being eroded along with the riverbank near the Goodro Lumber Company and 400 feet along the berm next to a flood chute upstream of the Grist Mill Road Bridge. The proposed alternative would also

armor a 100-foot gap in another berm along the river upstream of the Grist Mill Road Bridge where flood waters currently leave the channel.

The Ossie Road berm is reported to consist of a clay core with surrounding earth and small stones. Recent flooding has demonstrated that water flows along the toe of the Ossie Road Berm and causes localized scour. To prevent erosion a deep key is proposed near Goodro Lumber where the channel is down cutting and undermining banks and shallower keys are proposed in the other locations where down cutting is not taking place. A "key" or "keyway" is a footing of stone that is designed to resist scour. The depth and size of stone in the key have been proposed to reduce the risk of undermining. Sometimes this is referred to as a toe, but key implies that the deeper footing locks in the application.

3. The flood wall downstream of the Grist Mill Road Bridge would be repaired. The floodwall was undermined during Tropical Storm Irene and subjected to local scour during the July 2017 flood. Steel sheeting would be installed to stabilize the base of the floodwall and protect it from future undermining. Hydraulic modeling shows that the base of the flood wall is prone to erosion and ground anchors would also be installed to prevent the wall from tipping over.

4. A downstream portion of the Grist Mill flood wall failed in 2011. The wall has been temporarily stabilized several times with large stone since it failed. Rebuilding the failed portion of the wall is proposed to extend it 150 feet down stream to its original 1927 length.

The staging areas and access roads include temporary river crossings for access to all points for construction. Three (3) access roads are proposed:

1. Access to the downstream chutes and berm is proposed through the junkyard property. The access would connect Ossie Road (VT Route 116) to the river and pass by a residence and through the junkyard, for a length of approximately 420 feet. A temporary river crossing would be made using river cobble and gravel with three 24-inch culverts. No tree removal is anticipated at this access. For the access road construction, nearly 130 truckloads of stone armor would be imported at this location and 200 truckloads of sediment would be exported. It is estimated that 10 truckloads of large wood would be exported at this location.

2. Access is proposed at Goodro Lumber Company to reach the centrally located work areas. The access would pass through the lumber yard and head to the river at the southwest corner of the property, for a length of approximately 790 feet. A temporary river crossing would be made using river cobble and gravel with three 24-inch culverts. A few small trees may need to be removed at this access. Nearly 120 truckloads of stone armor would need to be imported at this location and 200 truckloads of sediment would be exported. It is estimated that 10 truckloads of large wood would be exported at this location.

3. Access to the flood chute area near Lower Plains Road is proposed near two residential properties. The access would pass between two houses and head south to the river, for an approximate distance of 350 feet. All work sites near Lower Plains Road would be reachable from this location. A few small trees may need to be removed at this access. Nearly 30 truckloads of stone armor would need to be imported at this location, and 20 truckloads of sediment and 10 truckloads of large wood would be exported at this location.

4.3 Alternative(s) Considered and Dismissed

4.3.1 Dismissed Alternative 1

The excavation of new floodplain immediately downstream of the Lower Plains Road Bridge was considered but dismissed. The Town owns a forested island in this area that is approximately 2.5 acres and the remaining land for the proposed floodplain creation is privately owned. Creating flood storage capacity upstream of Grist Mill Road bridge and the Ossie Road berm had definite benefits but there was concern raised by the Department of Fish and Wildlife over the removal of mature riparian vegetation and the private landowner was not interested in using their property for this purpose. The costs of this option were found to outweigh the benefits.

4.3.2 Dismissed Alternative 2

The original proposal set forth by the Project Proponent included a second access road at Goodro Lumber Company. This access would have been approximately 1,000 feet long, passing through the lumber yard before heading south through the forest where tree removal would be necessary. As part of the decision-making process, it was determined that impacts to ESA-listed bats and impacts to high-value riparian floodplain forest could be reduced without the second access while still meeting the purpose and need of the project.

4.4 Effect Evaluation

Effects include ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions which may have both beneficial and detrimental effects, even if on balance the agency believes that the effect would be beneficial (40 CFR 1508.8).

When possible, quantitative information is provided to establish potential effects; otherwise, the potential qualitative effects are evaluated based on the criteria listed in Table 4.0.1:

Table 4.0.1: Effect Significance and Context Evaluation Criteria for Potential Effects

Effect Scale	Criteria
None/Negligible	The resource area would not be affected, OR changes or benefits would either be non-detectable or, if detected, would have effects that would be slight and local. Detrimental effects would be well below regulatory standards, as applicable.
Minor	Effects to the resource would be measurable, but the effects would be small and localized. Detrimental and beneficial effects would be within or below regulatory standards, as applicable. Mitigation measures would reduce any potential detrimental effects.
Moderate	Effects to the resource would be measurable and have either localized or regional scale effects/benefits. Detrimental effects would be within or below regulatory standards, but historical conditions would be altered on a short-term basis. Mitigation measures would be necessary, and the measures would reduce any potential detrimental effects.
Major	Effects to the resource would be readily measurable and would have substantial consequences/benefits on a local or regional level. Detrimental effects would exceed regulatory standards. Mitigation measures to offset the detrimental effects would be required, though long-term effects to the resource would be expected.

Not all effect topics are applicable to either the No Action Alternative or the Proposed Action Alternative. The table below lists the resources that have been eliminated from the EA with reasoning.

Table 4.0.2: Resource Topic Eliminated and Reasoning

Resource Topic	Reason
Wild and Scenic Rivers Act	The project site is not near a wild and scenic river.
Safe Drinking Water Act	Project site is not located above a sole source aquifer nor would it affect one.
Coastal Zone Management Act	There are no coastal communities in the state of Vermont.
Coastal Barrier Resources Act	There are no Coastal Barrier Resource Units or Otherwise Protected Areas in the state of Vermont.
Magnuson-Stevens Fishery Conservation and Management Act	There is no Essential Fish Habitat designated in the state of Vermont.
Resource Conservation and Recovery Act and Comprehensive Environmental Response, Compensation, and Liability Act	There are no hazardous waste sites, producers or Superfund sites within or near project site, nor are there any downstream that could be affected by continued flooding and/or the proposed project.
Golden Eagles from Bald and Golden Eagle Protection Act	There are no Golden Eagles in New England, including Vermont.

5.0 AFFECTED ENVIRONMENT AND POTENTIAL EFFECTS

5.1 PHYSICAL RESOURCES

5.1.1 Geology and Soils

5.1.1.1 Existing Conditions

East Middlebury is located along the Middlebury River, west of the Green Mountains in the Lake Champlain Basin at an elevation of approximately 425 feet. The watershed spans two geographic regions of the state: the headwaters are located on the till-blanketed bedrock slopes of the Green Mountains while the remainder of the watershed is in the broad Champlain Valley. (Underwood 2003). The village is in a transition zone where the steep slopes of the Green Mountains give way to the flatter valley bottom and the river would naturally spread across the valley floor dissipating energy and depositing large quantities of sediment. However, the Middlebury River in East Middlebury has been managed to remain in the river corridor for at least 150 years.

Soils in the river corridor are cobbly, alluvial soils. Soils north of the river corridor are rated as prime agricultural but are largely in residential development. Soils south of the river corridor are statewide prime agricultural and are primarily forested and subject to a conservation easement.

The following table lists all the soil types in the project area.

Table 5.0.1: Soils in the Project Area

Soil Abbreviation	Soil Name
Le	LIMERICK SILT LOAM
StA	STETSON GRAVELLY FINE SANDY LOAM, 0 TO 5 PERCENT SLOPES
Wo	WINOOSKI VERY FINE SANDY LOAM
Co	COBBLY ALLUVIAL LAND
CtA	COLTON GRAVELLY SANDY LOAM, 0 TO 5 PERCENT SLOPES
CtB	COLTON GRAVELLY SANDY LOAM, 5 TO 12 PERCENT SLOPES
Co	COBBLY ALLUVIAL LAND
VgB	VERGENNES CLAY, 2 TO 6 PERCENT SLOPES
CtD	COLTON GRAVELLY SANDY LOAM, 12 TO 30 PERCENT SLOPES

5.1.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no construction and no direct effects to either soils or geology. Ongoing erosion would result in **moderate** effects to soils, but effects to geology would be **negligible**.

Alternative 2: Middlebury River Flood Mitigation Project

With the Proposed Action Alternative total ground disturbance would be 3.6 acres with 2.7 acres below ordinary high water on cobbly alluvial soils (Appendix B, Document 1). During the scoping process, coordination with the Natural Resource Conservation Service determined that the Proposed Action would not affect either prime soils or farmland of statewide importance (NRCS 2020). During construction sediment control structures (silt fence, straw bales, etc.) would be installed to reduce soil erosion and the movement of sediment into the river and all disturbed areas would be replanted to prevent soil erosion. Effects to soils would be **minor** and effects to geology would be **negligible**.

5.1.2 Air Quality

The Clean Air Act is a federal law that regulates air emissions from area, stationary, and mobile sources. Air quality standards have been enacted to protect public health and the environment. The standards include lead, nitrogen dioxide, ozone, carbon monoxide, sulfur dioxide, and particulate matter. Areas where the monitored concentration of a pollutant exceeds air quality standards are designated as non-attainment areas. Areas where all pollutants are below the standards are classified as attainment areas.

5.1.2.1 Existing Conditions

The proposed project area is located within an attainment area; pollutants in the air do not exceed air quality standards.

5.1.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no construction project and no construction equipment giving off emissions. Effects to air quality would be **none**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, temporary emissions would be expected from construction equipment during construction activities. Effects to air quality would be **negligible**.

5.1.3 Climate Change

Climate change refers to changes in Earth's climate caused by a general warming of the atmosphere caused by greenhouse gases, which are emitted by both natural processes and human activities, and their accumulation in the atmosphere influences temperature. Greenhouse gases include water vapor, carbon dioxide, methane, nitrous oxides, and other compounds. Climate change is capable of influencing species distribution, temperature fluctuations, sea level dynamics, and weather patterns.

5.1.3.1 Existing Conditions

Climate change has affected the entire state of Vermont, resulting in more frequent and more severe storms including East Middlebury (VTANR 2011 and 2020). The Town of Middlebury has been proactive in protecting East Middlebury Village by implementing setback requirements in the river corridor, purchasing conservation easements and land to mitigate the effects of flooding over time (Town of Middlebury Zoning Ordinance).

5.1.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would have no impact on climate change; there would be no additional heavy equipment exhaust emissions beyond the normal current and future use of heavy equipment within the project area. However, the project area would continue to be affected by more frequent flooding which is believed to be associated with climate change. Effects would be **none**.

Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative would have a negligible contribution to climate change from heavy equipment exhaust emissions necessary to complete the project. The effects from emissions would be reduced through best management practices for the use of heavy equipment, e.g. reduced idling time and the use of bio-diesel fuel. Effects would be **negligible**.

5.2 WATER RESOURCES

5.2.1 Water Quality

The Clean Water Act regulates discharge of pollutants into water under the shared responsibility of the U.S Army Corps of Engineers (USACE) and the EPA. Section 404 of the Clean Water Act establishes the USACE permit requirements for discharge of dredged or fill materials into Waters of the United States including traditional navigable waterways. USACE regulation of activities within navigable waters is also authorized under the Rivers and Harbors Act. Under the Section 402 of the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES), the EPA regulates both point and non-point pollutant sources, including stormwater and stormwater runoff. Activities that disturb one acre of ground or more are required to apply for an NPDES permit through the VT Department of Environmental Conservation which issues Construction Stormwater Discharge Permits as authorized by the EPA. A Section 401 water quality certification is required when obtaining a Clean Water Act Section 402 NPDES or 404 Dredge and Fill Permit.

5.2.1.1 Existing Conditions

The Middlebury River is a tributary of the Otter Creek which flows north and drains into Lake Champlain which is regulated by the U.S. Army Corps of Engineers under the Clean Water Act. The river is known locally as a high-quality water for fishing throughout the project area and for swimming and kayaking. The Village itself is served by a community drinking water system with homes outside of the Village relying on well water. Most of the project area is located within an aquifer recharge area for the East Middlebury Fire District 1 water system. There is no sole source aquifer designation within the project area.

5.2.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action alternative would result in minor effects to water quality from erosion of sediment into the Middlebury River from continued and more frequent flood events. No Action would not affect groundwater. Effects would be **minor**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative the project proponent would need a CWA 404 permit from USACE, a CWA 401 Water Quality Certificate and a Stream Alteration permit from Vermont Department of Environmental Conservation; the project proponent submitted an application to USACE on July 17, 2020. Most of the proposed work would be performed out of the active flowing water during low flows minimizing effects to water quality. Work that could not be performed out of the active flowing water may be subject to an In-Water Work Window that runs from July 1 through September 30 of any given year (VTDEC 2020b). Permits would also include requirements to control work in water and the use of sediment and erosion control Best Management Practices (BMPs). The Proposed Action Alternative would not affect groundwater and effects would be **minor**.

5.2.2 Floodplains

Executive Order (EO) 11988 Floodplain Management requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Each federal agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains in carrying out its responsibilities. FEMA uses the 8-Step decision-making process to evaluate potential effects on and mitigate effects to floodplains in compliance with EO 11988 and 44 CFR Part 9. The Agency of Natural Resources, Department of Environmental Conservation administers and regulates floodplains in Vermont in accordance with the National Flood Insurance Act and the National Flood Insurance Program.

5.2.2.1 Existing Conditions

The proposed project area is located within the river corridor and the Special Flood Hazard Area (100-year floodplain) per FEMA Flood Insurance Rate Map community map and panel number 500008 0014 A, dated 01/03/1985 (Appendix A, Document 2). No regulatory floodway has been designated. The proposed project area is a dynamic river corridor that floods frequently with large amounts of sediment and debris moving through and accumulating within the system; these river dynamics cause the main channel to migrate across the corridor regularly.

The project area also consists of a Sugar Maple Floodplain Forest. This type of forest is a high value community type in Vermont with clear evidence of flooding, but little recent alluvial deposits. The riparian forest is important for stabilizing the river shoreline, dissipating the energy of flood waters, and shading the river (VTF&W 2020b). Further discussion of the Sugar Maple Floodplain Forest can be found in the discussion regarding Vegetation in Section 5.3.2.

5.2.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, flood storage would remain limited and flooding would continue throughout and downstream of the project site causing damage to private property and public infrastructure along the river resulting in **moderate** effects to the floodplain. The buildup of sediment impacts existing flood control measures and could change the extent of the mapped floodplain.

Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative would reduce the risk of future flood damage by creating additional flood storage in the river channel and prevent erosion within the river corridor and outside of the river channel. Gravel and sediment bars and chutes selected for removal of sediment are scoured by high river flows frequently as evidenced by the lack of mature trees on them. All proposed sediment excavation would be below ordinary high water and outside of the wetted channel. Access to the river for heavy equipment to perform the proposed excavation would require the removal of mature trees within the sugar maple riparian floodplain forest and in the river corridor. Access would also involve adding temporary fill in the river corridor to allow for equipment access to each location proposed for work. A no rise analysis has been completed and demonstrates no rise in the base flood elevation anywhere in the community from this temporary fill. All fill would be removed when construction is complete. The Proposed Action Alternative would require a permit from the Town of Middlebury for work in the Special Flood Hazard Area. (VTDEC 2020a and Appendix C, Document 1).

Long-term, the proposed project restores some of the natural floodplain functions with the opening of the flood-chute entrances, but all other aspects of the proposed project repairs existing infrastructure and maintains the status quo on the Middlebury River. That said, through the restoration of natural floodplain functions, it is anticipated that that flood depths would be reduced from 5.2 feet to 4.0 feet during a flood equal to the July 2017 event (~20%), and that flood velocities in the main channel would be reduced by 15% - 30%. With the lower flood levels and velocities, the proposed alternative is expected to reduce overall flood damages 20% (Schiff 2020).

Effects to the floodplain would be **Moderate.**

5.2.3 Wetlands

Executive Order (EO) 11990 Protection of Wetlands requires federal agencies to avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or Indirect support of new construction in wetlands wherever there is a practicable alternative. Each federal agency shall provide leadership and shall take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. FEMA uses the 8-step decision-making process to evaluate potential effects on, and mitigate effects to, wetlands in compliance with EO 11990 and 44 CFR Part 9. The Agency of Natural Resources, Department of Environmental Conservation, administers and regulates wetlands in Vermont.

5.2.3.1 Existing Conditions

The U.S. Fish and Wildlife Service National Wetland Inventory identifies the project site as a riverine wetland: Cowardin classification code R2UBH (riverine, lower gradient perennial, unconsolidated bottom and permanently flooded) (NWI 2020, FGDC 2013). Additionally, the Vermont Agency of Natural Resources, Wetlands Program representatives conducted a site visit on May 4, 2020 to delineate wetlands as defined by state law and regulation, and to determine if a permit is required. In an email dated May 13, 2020 it was reported that while there are some wetland plants in a number of areas (Sycamore, red maple, dogwood and willow, Ostrich fern understory and invasive Honeysuckle) either the hydrology, soils or both were missing and therefore the project areas are not considered regulated wetlands, and no permit is required (VTDEC 2020b).

5.2.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, continued flooding and excessive sedimentation downstream from the project site could affect riverine wetlands. Currently, the main channel experiences low flow due to excess sediment and the flow being spread among channels. Effects would be **minor**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, reduced flood damage within the project area would protect downstream wetlands and facilitate improved hydrology for the riverine wetlands. Short-term wetland effects from construction activities would include the temporary placement of fill to facilitate heavy equipment access to gravel bar excavation sites and possible temporary river channel modifications to control flow. These actions would modify river flow in for a short period of time (2-3 weeks) and would have temporary effect on the riverine wetland ecosystem. Excavation of gravel and sediment bars and chutes would result in a longer-term beneficial effect to the riverine wetland ecosystem. Minor, short term, negative effects would result from the construction and not be significant in the context of this section of the river.

The chute cleanout is only proposed during low flows when the water is several feet below the excavation areas (Appendix B, Document 1 Sheet DE-1; VDEC 2020c). Effects to flowing water would be limited to the stream crossings that would be culverted and covered with river gravel from the excavation area. River effects should be low as excavators would only touch native channel bed while the crossing is being built from native river stone. Only then would trucks start to roll at high frequency but that would be above the existing riverbed. Excavation would take place in dry flood chutes and the top of sediment bars. There would be no habitat recovery needed other than the careful removal of the haul road in the channel.

Effects to wetlands would be **moderate**.

5.3 BIOLOGICAL RESOURCES

5.3.1 Wildlife and Fish

Wildlife in the area ranges from interior forest species, riparian and aquatic species to species that are adapted live in developed areas alongside of humans. The Middlebury River peak flow for a one-year event is approximately 900 cubic feet per second. The river supports robust populations of benthic-macro invertebrates and both native and stocked trout that make it a popular place for angling.

5.3.1.1 Existing Conditions

Terrestrial

There are two species of bat and five migratory birds identified in the USFWS online Information for Planning and Consultation tool (IPaC) as potentially affected by activities in this location (USFWS 2020a):

- Indiana bat (*Myotis sodalist*) – ESA-Listed Endangered
- northern long-eared bat (*Myotis septentrionalis*) – ESA-Listed Threatened
- Bald Eagle (*Haliaeetus leucocephalus*)
- Black-billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyz oryzivorus*)
- Canada Warbler (*Cardellina canadensis*)
- Wood Thrush (*Hylocichla mustelina*)

Aquatic

No aquatic species of concern were identified using IPaC (USFWS 2020a). The Vermont ANR Atlas identified the entire river corridor throughout the project area as “High Quality” for physical diversity and highest priority for conservation (VTANR 2020a). The Middlebury River has healthy populations of eastern brook trout, brown trout and rainbow trout that are supplemented by stocking by the VT Fish and Wildlife Department (USFS 2020).

5.3.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would result in continued flooding, erosion and accumulation of sediment in the river corridor which could potentially damage natural habitats causing a loss in wildlife. History shows that periodic dredging is necessary to maintain the human investments in East Middlebury. When this dredging occurs in the river channel, it disrupts aquatic habitat. Effects to fish and wildlife would be **minor**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, Vermont law limits work in a river corridor to minimize disturbance to fish reproduction. The In-Water Work window typically is from July 1 through September 31. The temporary stream crossings would be in place one to three weeks and would be sized to accommodate normal to low flows. The culverts would be slightly embedded so they would accommodate fish passage during normal flows. During the 1- year flood the crossings would be overtopped by 2.6 feet, and during the 2-year flood the crossings would be overtopped by 4.6 feet. If flooding is predicted, the crossings would be removed to prevent the culverts from washing downstream. Temporary crossings are to be constructed using native river cobble excavated from sediment bars included as part of the proposed work (MMI 2020b). Additionally, the In-Water work restrictions would not apply to the temporary stream crossings as long as the design allowed for fish passage at normal flows (VTDEC 2020c).

Effects from construction activities on fish and wildlife would be **minor.**

5.3.2 Vegetation

5.3.2.1 Existing Conditions

Vegetation in the project area is primarily native species growing in their natural habitat. Winooski very fine sandy loam is the mapped soil type north of the river in the project area; expected natural communities supported by this soil type include Silver Maple/Ostrich fern, River Mud Shore or Successional Floodplain Forest. A June 17, 2020 field inspection and mapping by Vermont Fish and Wildlife identified a Sugar Maple Floodplain Forest that was considerably larger than what was mapped back in 2012 (Appendix A, Document 5). This particular Sugar Maple Floodplain Forest is a large and important example of a rare natural community type in Vermont. In addition to their biological diversity functions as a rare natural community type, this forest would also be important to stabilizing the river shoreline, dissipating the energy of flood waters, and shading the river. Vermont Fish and Wildlife stated that "…these forests are currently in remarkable good condition" (VTF&W 2020b).

Executive Order 13112, Invasive Species, requires federal agencies, to the extent practicable, to prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health effects that invasive species cause. Invasive species prefer disturbed habitats and generally possess high dispersal abilities, enabling them to out-compete native species. Known invasive species identified in the river corridor include: Multiflora Rose (*Rosa multiflora*), Wild Parsnip (*Pastinaca sativa*).

5.3.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no tree removal activities and the Sugar Maple Floodplain Forest would have no effects other than natural succession. Flood events could cause erosion that undercuts vegetation along the streambank and lead to the establishment of opportunistic invasive species. Effects would be **negligible**.

Alternative 2: Middlebury River Flood Mitigation Project

Vermont Fish and Wildlife recommends that alteration of the Sugar Maple Floodplain Forest be avoided or strictly minimized for the Proposed Action Alternative. Any tree and vegetation clearing of the forest for access to the river would degrade the existing condition and ecological function. Additionally, disturbance and clearing would greatly

increase the chance for introducing nonnative invasive species into the floodplain forests. Floodplain forests are especially susceptible to invasive species colonization because of the presence of exposed alluvial soils (VTF&W 2020b). The Proposed Action Alternative was designed to minimize removal and disturbance of existing vegetation and was amended during the decision-making process to abandon one of the two proposed access routes behind Goodro Lumber to lessen impacts to the Floodplain Forest (See Section 4.3.2 - Dismissed Alternative #2). Areas where disturbance would occur would be revegetated with native plantings. USACE and VT ANR Stream Alteration permits would also have conditions related to preventing the spread of invasive species. Effects on vegetation would be **minor**.

5.3.3 Threatened and Endangered Species

The Endangered Species Act (ESA) provides for the conservation of threatened and endangered plants and animals and the habitats in which they are found. The lead Federal agency for implementing the ESA in Vermont is the United States Fish and Wildlife Service (USFWS). The law requires Federal agencies to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species. The law also prohibits any action that causes a "taking" of any listed species of endangered fish or wildlife. "Take" is defined in regulation (50 CFR 10.12) as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.

5.3.3.1 Existing Conditions

The project area lies within known summer habitat for the endangered Indiana bat (*Myotis sodalist*) and within approximately 0.5 miles from several documented roost trees for both Indiana bat and the threatened northern long-eared bat (*Myotis septentrionalis*). There are no bat hibernacula within 0.25 miles of the project area and there is no designated critical habitat in the project vicinity (USFWS 2020a, FEMA 2020a).

5.3.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, there would be no tree removal activities and no effect to ESA-listed species. Effects would be **none**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, tree removal activities for the access routes would affect ESA-listed bats. To avoid and minimize effects to Indiana bat and northern long-eared bat, FEMA would place a time of year restriction on the tree removal activities: tree removal activities would only occur during the period between November 1 and March 31 per recommendation by Vermont Fish and Wildlife and USFWS biologists (USFWS 2020a). Additionally, Vermont Fish and Wildlife biologists and the Project Proponent's contractor, Landslide, Inc., will conduct a site visit on August 25, 2020 to identify suitable roost trees along the paths of the proposed access roads. Ideally any suitable roost trees could be avoided, but if not, they would get flagged for removal outside the active bat season (April 1 through October 31).

Tree removal during the active bat season has the potential to harm (injure or kill) and harass ESA-listed bats if the bat is present during tree removal activities. Pregnant or nursing adult females and pups that cannot yet fly may be injured or killed if using a tree for roosting when it is felled. Early season cutting may injure or kill adult bats that have not recovered from hibernation and are low on energy reserves. Tree removal may also affect foraging adults that are building up fat reserves for the next hibernation season if foraging activities are interrupted and forcing individuals to search for new suitable habitat.

Because of the Indiana bats' strong site fidelity to their traditional summer colony areas and foraging habitat, tree removal outside the active bat season may still affect the species by removing suitable roost trees. If suitable trees are

removed by the proposed action it may increase the level of effort that bats migrating to their summer areas next season will need to exert to find new suitable trees for roosting.

Given that the Proposed Action Alternative would limit tree removal to the minimum amount necessary, conduct tree removal activities outside of the active bat season, and would perform a survey to limit and perhaps altogether avoid the removal of suitable trees, and the fact that the proposed tree removal will occur on the more developed north bank of the Middlebury River and not the heavily forested south bank, effects to ESA-listed bats are anticipated to be insignificant. The proposed project by design and location would have discountable and insignificant effects on bat hibernacula.

FEMA initiated consultation for northern long-eared bat on July 17, 2020 using the optional streamlined consultation framework for northern long-eared bat under the ESA's 4(d) rule. Per the consultation framework, FEMA was able to assume USFWS concurrence after 30 days on August 17, 2020 (USFWS 2020d). Consultation for Indiana bat was initiated August 10, 2020 and FEMA is expecting to receive concurrence from USFWS on FEMA's determination that the Proposed Action Alternative "may affect but not likely to adversely affect" ESA-listed bats (FEMA 2020b). Effects would be **minor**.

5.3.4 Migratory Birds

The Migratory Bird Treaty Act provides a program for the conservation of migratory birds that fly through lands of the United States. The lead Federal agency for implementing the Migratory Bird Treaty Act is the USFWS. The law makes it unlawful at any time, by any means or in any manner to take any part, nest, or egg of migratory birds. "Take" is defined in regulation (50 CFR 10.12) as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities.

5.3.4.1 Existing Conditions

All of Vermont is in the Atlantic Flyway, an important travel corridor for birds as they migrate north for summer and south for the winter. The Atlantic Flyway encompasses the eastern states and connects northern Canada to South America. It is the most developed of the four flyways in the United States making undeveloped areas along the route where birds can rest and live important to their survival (Ducks Unlimited 2020). E-bird has one Black- billed Cuckoo sighting on 5/27/2016 by Brendan Collins in the Jack Brown baseball field off Lower Plains Road. There are no sightings listed for the Bobolink, the Canada Warbler or Wood Thrush (E-Bird 2020).

5.3.4.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative flooding could disturb trees and nests used by migratory birds temporarily; however, they would likely return after the flood event. The potential effect is **negligible.**

Alternative 2: Middlebury River Flood Mitigation Project

Tree removal under the Proposed Action Alternative would remove some habitat for migratory birds however, tree removal has been minimized and the number of trees removed would not greatly affect their habitat. The reconnection of chutes and reduction of erosion would benefit fish habitat along the project area providing forage for predatory birds. The potential effect is **negligible**.

5.3.5 Bald Eagle

The Bald and Golden Eagle Protection Act prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" Bald and Golden Eagles, including their parts, nests, or eggs. Like the MBTA, the law makes it illegal for anyone to "take," possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any

migratory bird, or their parts, feathers, nests, or eggs. "Take" is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or any attempt to carry out these activities. Golden Eagle is not applicable in New England.

5.3.5.1 Existing Conditions

Coordination with VT Fish and Wildlife identified that the proposed project is approximately 5 miles from the nearest known Bald Eagle nest (VTF&W 2020a). This does not preclude the possibility of unknown nests or new nests in the project area. E-bird has no sightings of Bald Eagles in the project area (E-Bird 2020).

5.3.5.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative flooding and chronic emergency repairs could cause temporary disturbance to Bald Eagle behavior and would return to normal behavior post flooding. Effects would be **negligible**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, site preparation, tree clearing work and construction activities could cause temporary disturbance to Bald Eagle behavior if any were in the area. Bald Eagle behavior would return to normal post construction. Effects would be **negligible**.

5.4 CULTURAL RESOURCES

Federal agencies must consider the potential effects of their actions upon cultural resources prior to engaging in any undertaking. Cultural resources are defined as prehistoric and historic sites, structures, districts, buildings, objects, artifacts, or any other physical evidence of human activity considered important to a culture, subculture, or community for scientific, traditional, religious, or other reasons. One of the laws that codifies this obligation is Section 106 of the National Historic Preservation Act (NHPA), as amended and implemented by 36 CFR Part 800. The NHPA of 1966 defines a historic property as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register." Eligibility criteria for listing a property on the National Register of Historic Places (NRHP) are found at 36 C.F.R. Part 60. While the definition of a cultural resource under NEPA can be broader, FEMA regularly uses Section 106 to meet its obligations to consider effects to cultural resources. For this project, FEMA determined that it was appropriate to utilize its NHPA review to fulfill its NEPA obligations.

Cultural resources determined to be potentially significant under NHPA are subject to a higher level of review and federal agencies must consider the effects of their projects on those resources and consider steps to avoid, minimize, or mitigate those effects. To be considered significant, a cultural resource must meet one or more of the criteria established by the National Park Service (NPS) that would make that resource eligible for inclusion in the NRHP. The term "eligible for inclusion in the NRHP" includes all properties that meet the NRHP listing criteria, which are specified in the Department of Interior regulations Title 36, Part 60.4 and NRHP Bulletin 15. Sites that have not been evaluated at the time of the undertaking may be considered potentially eligible for inclusion in the NRHP and, as such, are afforded the same regulatory consideration as nominated properties.

5.4.1 Identification of APE, Cultural Resources and Consultation Process

FEMA considered effects to cultural resources within the Area of Potential Effect (APE) identified during the Section 106 process. Pursuant to 36 CFR 800.4(a)(1), the APE is defined as the geographic area(s) within which the undertaking may directly or indirectly affect cultural resources. For this undertaking, the APE included the specific areas of construction as well as areas to be utilized for access and staging.

The Vermont Agency of Commerce and Community Development, Division for Historic Preservation maintains a database of Vermont's historic properties which is regularly updated, in part on the basis of reports prepared by cultural resources professionals in advance of construction projects that are subject to State Historic Preservation Officer

(SHPO) review under state and federal laws. FEMA reviewed the Vermont Online Resource Center, State Register of Historic Places (SRHP) database, and NRHP to determine if there were previously identified cultural resources with the area of effect for this project. Historical aerial images and historic maps were also reviewed to assess the potential for eligible above-ground and below-ground resources within the project area.

FEMA initiated consultation for this project with the SHPO on July 5, 2015. In their August 5, 2015 response, SHPO recommended the completion of an Archaeological Resources Assessment (ARA), to which FEMA agreed. The ARA, dated June 16, 2017, recommended the completion of a Phase I archaeological survey. FEMA concurred with this recommendation, and sent this recommendation to the SHPO on July 19, 2017, to which the SHPO concurred on July 19, 2017.

After final design drawings were submitted to and reviewed by FEMA, FEMA continued consultation with the SHPO and initiated consultation with the Stockbridge-Munsee Community (SMC). FEMA sent a letter to the SHPO on June 26, 2018 and the SMC on June 29, 2018, again recommending the completion of a Phase I archaeology survey. SHPO concurred with this recommendation on July 9, 2019, and the SMC concurred on August 3, 2018.

After receiving the findings presented in the Phase I archaeological survey End of Fieldwork Letter, FEMA made a finding of "no historic properties affected" in letters to the SHPO and SMC dated March 15, 2019. SMC concurred with this finding on March 20, 2019, and SHPO concurred on April 2. 2019.

5.4.2 Historic Standing Structures

5.4.2.1 Existing Conditions

One known cultural resource was identified within the project area, the SRHP-listed East Middlebury Historic District. The district's architecture and village plan reflect the community's role as an early center of industry and transportation. The Village's industrial history began with the construction of a sawmill by Jonathan Foote in 1790. By the middle of the nineteenth century, the Village boasted an iron forge, tannery, shingle mill, sawmill, wagon works, a door and window sash factory, and a barrel stave factory. The Village is probably most well-known for its woodworking heritage, reflected in the Village's historic architecture. No new cultural resources were identified within the project area.

5.4.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, effects to historical standing structures would be **none**. As the Historic District is set back from the river, continued scouring would not negatively affect the Historic District within the reasonably foreseeable future.

Alternative 2:

Under the Proposed Action Alternative of dredging, armoring select sections of several berms, and repairs to and extension of an existing floodwall, additional effects to historical standing structures would be **none**. Although proposed access roads would be temporarily located within the boundaries of the East Middlebury Historic District, there would be no permanent physical or visual effects on buildings within the historic district. The only potential temporary effect would be vibration caused during construction. All work would occur well behind the rear of the properties along the river and behind a substantial tree line. Therefore, there would be no effect on the contributing properties within the East Middlebury Historic District, nor on the district as a whole.

5.4.3 Archaeological Resources

5.4.3.1 Existing Conditions

No previously identified prehistoric or historic resources were located within the area of effect for this project. No new prehistoric or historic resources were identified as a result of either the ARA or the Phase I archaeological survey.

5.4.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, additional effects to archaeological resources would be **none**. The Phase I archaeology survey determined the area was heavy with fill, as such, there is little chance for effects to any archaeological resources from continued scouring.

Alternative 2:

Under the Proposed Action Alternative of dredging, armoring select sections of several berms, and repairs to and extension of an existing floodwall, additional effects to archaeological resources would be **none/negligible.** Based on the results of the Phase I archaeological survey, the entire APE has been previously disturbed and there are no intact soils or archaeologically sensitive areas within the APE. As such, both the SHPO and SMC concurred with FEMA's determination of "no historic properties affected." Conditions would be placed on the project to address the potential for inadvertent discoveries.

5.5 SOCIOECONOMIC RESOURCES

5.5.1 Land Use and Planning

5.5.1.1 Existing Conditions

East Middlebury is a separate, state designated Village Center in the Town of Middlebury. It has approximately 425 residents, with residential being the primary land use within the Village. There is a post office, convenience store and gas station, preschool, church, two inns and a few professional offices in addition to the residential houses. Sarah Partridge Library and the Harold Curtiss Recreation Park are important community resources.

Land use north and west of the village is primarily agriculture and south and east is primarily forest land and subject to conservation easement. The Middlebury State Airport is one mile north of the Village. East Middlebury is zoned Medium Density Residential and Village Residential Commercial (Middlebury Town Plan; Appendix A, Document 6).

The project is in the Special Flood Hazard Area overlay that includes the 100-year flood and the State designated River Corridor (Middlebury Zoning Ordinance). Permits are administered through the Planning Office by the Zoning Administrator.

5.5.1.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, the effect of continued flooding on land use in the area would be **none**.

Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative would create greater flood storage in the area but would not change the current land use for both natural systems and the surrounding development. The effect would be **none**.

5.5.2 Noise

5.5.2.1 Existing Conditions

Noise is defined by the EPA as unwanted or disturbing sound. Current sources of noise in East Middlebury are car and truck traffic traveling through on VT Route 125, lawn mowing and leaf blowing. Additionally, the airport occasionally has a loud plane taking off overhead. Truck traffic tends to be during normal business hours with occasional disruptions during the night. The river is a constant, mostly pleasant natural sound though boulders rolling down stream can be loud and disturbing during flood events. A daycare facility is the only known sensitive noise receptor in the Village.

5.5.2.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

The No Action Alternative would not involve any construction and would not affect noise levels, traffic flow, or public services. Occasional flooding could temporarily increase noise levels from generators and emergency equipment in the area. Effects would be **negligible**.

Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative would not have a long-term effect on noise levels in the project area and the effect would be **negligible**. Construction equipment could increase noise levels at the project site but would be temporary and follow local noise control ordinances.

5.5.3 Transportation

5.5.3.1 Existing Conditions

East Middlebury is located at the intersection of U.S. Route 7, and VT Routes 125 and 116. Average Annual Daily Traffic on Route 125 in East Middlebury is 3,100 vehicles (Middlebury Town Plan). There is a bridge on State Route 7 west of the project area and a bridge on State Route 125 east of the project area. Two town bridges are in the project area: The eastern boundary of the project area is defined by the Lower Plains Road Bridge and the Grist Mill Bridge is within the project area.

5.5.3.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, flooding at the proposed project site and downstream could lead to a loss of the Grist Mill Bridge and cause temporary road closures and re-routing due to standing floodwaters and erosion damages or repairs. Effects would be **moderate**.

Alternative 2: Middlebury River Flood Mitigation Project

Construction activities from the Proposed Action Alternative would not close roads or cause significant extra traffic. Reduced flooding potential could reduce the amount of road closures during and after storm events. Effects would be **moderate**.

5.5.4 Public Services and Utilities

5.5.4.1 Existing Conditions

East Middlebury Village has above ground electrical, cable, and phone service. It has buried water and natural gas lines.

5.5.4.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Uunder the No Action Alternative, flooding could temporarily interrupt utilities in the project area and downstream. Effects would be **negligible**.

Alternative 2: Middlebury River Flood Mitigation Project

The Proposed Action Alternative would not interrupt utility services during construction and would mitigate against future utility damages from flooding. Effects would be **negligible**.

5.5.5 Public Health and Safety

5.5.5.1 Existing Conditions

East Middlebury is serviced by the Middlebury Police, whose office is located five miles north in downtown Middlebury. Emergency medical services are also located in Town, near the Porter Hospital. The Middlebury Fire Department has a satellite station in East Middlebury for rapid response to fire emergencies. There are fire hydrants in the Village.

5.5.5.2 Potential Effects and Proposed Mitigation

Alternative 1: No Action

Under the No Action Alternative, flooding could cause health and safety related issues including emergency vehicles blockage, loss of bridges and road and damage to homes. Effects to public health and safety would be **moderate to major**.

Alternative 2: Middlebury River Flood Mitigation Project

Under the Proposed Action Alternative, reduced flooding could reduce the amount of road closures during and after storm events and lessen the chance of health and safety issues, such as emergency vehicle blockage and increased emergency response times, loss of bridges and roads and damage to homes. Effects on public health and safety would be **moderate to major**.

5.5.6 Environmental Justice

EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires agencies to identify and address disproportionately high and adverse human health or environmental effects its activities may have on minority or low-income populations.

5.5.6.1 Existing Conditions

According to the 2010 U.S. Census data, East Middlebury, population 425, is in Census Tract 9607 which includes a population of 3,862. The median age is 47.6 and median household income is $48,875 with 11% of the population under the poverty level. The area is 2% Asian and 98% white. According to EJ Mapper there are no minority or low-income populations near or down river of project site (EPA 2020d).

5.5.6.2 Potential Effects and Proposed Mitigation

Because there are no minority or low-income populations near or down river of project site both the No Action Alternative and the Proposed Action Alternative would have **no effect** on Environmental Justice populations.

6.0 PERMITS AND PROJECT CONDITIONS

The project proponent is responsible for obtaining all required federal, state and local permits. While a good faith effort was made to identify all necessary permits for this Environmental Assessment, the following list may not include every approval or permit required for this project. Before, and no later than, submission of a project closeout package, the project proponent shall provide FEMA with a copy of the required permit(s) from all pertinent regulatory agencies.

1. US Army Corps of Engineers (Section 404)
2. Vermont Stream Alteration Permit
3. Vermont Department of Environmental Conservation (DEC) 401 Water Quality Certification
4. Soils erosion prevention BMPs during construction
5. In-water-work Time of Year Restriction
6. Tree Removal Time of Year Restriction
7. Local Floodplain Permit
8. FEMA No-Rise Certification
9. Tree removal Time of Year Restriction
10. Inadvertent discoveries conditions (archeological resources and human remains)
11. VTRANS Access permit (no Right of Way permit needed)
12. Town Fluvial Erosion (i.e. river corridor) Hazard Zone permit

7.0 AGENCY COORDINATION AND PUBLIC INVOLVEMENT

The following is a good faith effort to capture all coordination and consultation with state and federal partners:

- Consultation with State Historic Preservation Office and Stockbridge-Munsee Community dating back to July 2015. Most recent consultation was on March 15, 2019. Stockbridge-Munsee Community concurred on March 20, 2019, and the State Historic Preservation Office concurred on April 2. 2019.
- A site visit was held prior to drafting the Environmental Assessment on November 15, 2019. Representatives of the Army Corps of Engineers, Addison County Regional Planning Commission, Town of Middlebury and State River Management Program.
- Environmental Assessment "Scoping Checklist" distributed by FEMA to state and federal partner agencies on February 26, 2020. One comment was received regarding wetlands.
- Early Public Notice notifying the pubic of FEMA's decision to prepare an Environmental Assessment was published in the Addison County Independent (print) on March 9, 2020. No comments were received.
- Vermont Department of Environmental Conservation Wetlands Division completed a site inspection the week of May 4, 2020.
- VT Fish and Wildlife completed their site visit regarding the Sugar Maple Floodplain Forest on June 17, 2020.
- Coordination with VT F&W and consultation with USFWS for northern long-eared bat on June 17, 2020; concurrence assumed July 17, 2020.
- The Town applied for a Stream Alteration Permit from DEC River Management Program and was notified via email on June 30, 2020 that the application is administratively complete.
- Regular coordination with USACE regarding consultations and permitting beginning July 21, 2020.
- Coordination with VT F&W and Consultation with USFWS for Indiana bat on August 10, 2020; FEMA expects to receive concurrence on or around September 10, 2020.
- VT Fish and Wildlife will conduct a site visit on August 25, 2020 to identify and flag suitable roosting trees for bats.

The following documents the opportunities for the public to weigh in on the decision-making process. Many of these are placeholders in Draft EA and will be populated in the Final EA.

- Public Notice for availability of the Draft EA was posted on the Town of Middlebury's website at [link] and in The Addison County Independent newspaper. Public Notice posted on mm/dd/yyyy.
- The Draft EA was made available for public comment and can be viewed and downloaded at: [Web address here]
- The Draft EA could also be viewed in hard copy at the following location: [Location and address here]
- Organizations vested in project who will receive notification of publication:
    - New Haven River Anglers, who have been involved in discussions since Tropical Storm Irene;
    - Addison County Regional Planning Commission;
    - East Middlebury Fire District 1.

The comment period will end 15 days from the date of the legal notice publication, or distribution of print copies, whichever is later. Written comments can be emailed to david.robbins@fema.dhs.gov or sent to FEMA Regional Environmental Officer, 99 High Street, Boston, MA 02110. If no substantive comments are received, the EA will become final and a Finding of No Significant Impact will be signed. Substantive comments will be addressed as appropriate in Section 9 of the final EA and in the FONSI.

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VTDEC, 2020b. Email communication regarding Wetlands Program Determination between Zapata Courage, VT DEC Wetlands Program and Amy Sheldon, Landslide, Inc., dated May 13, 2020

VTDEC, 2020c. Email communication regarding in-water work window between Jaron Borg, VT ANR Rivers Engineers and Amy Sheldon, Landslide Inc., dated July 17, 2020.

VTF&W (VT Fish and Wildlife), 2020a. Email communication between E. Kuns, FEMA and D. Morin, VT Fish and Wildlife dated 2/6/2020.

VTF&W, 2020b. Email communication between E. Sorenson, VTF&W and A. Sheldon, Landslide, Inc., dated July 16, 2020.

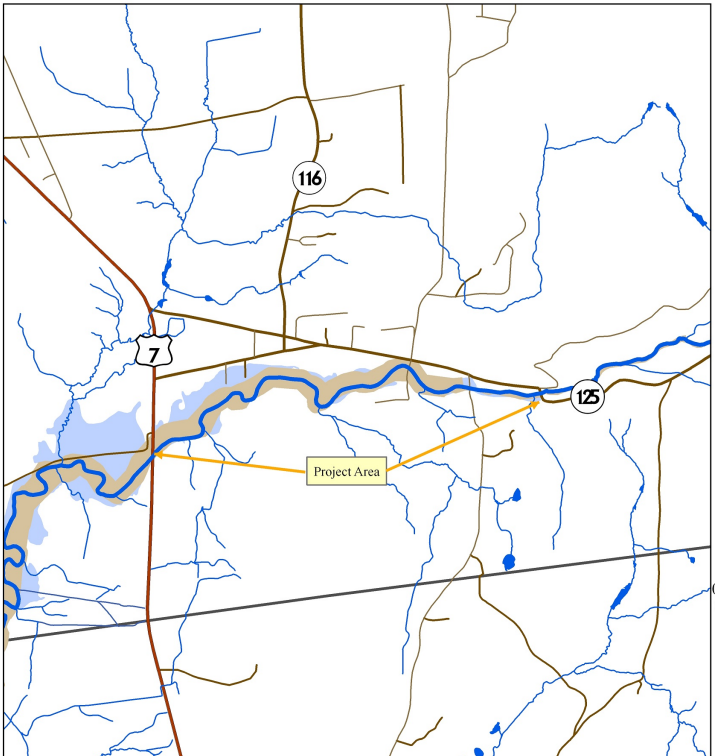
9.0 COMMENTS/RESPONSE

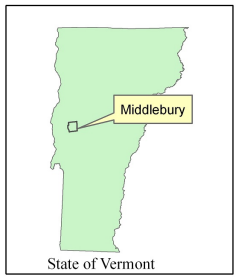
This section will be populated in the Final EA after this Draft EA is made available to the public and the 15-day comment period ends.

APPENDIX A:

Maps and Figures

Hazard Mitigation Grant Progam
Project Locator Map
East Middlebury, Vermont





Legend

- Surface Water
- Adopted Fluvial Erosion Hazard Zone
- FEMA Floodplain
- nhd polygon
- Town Boundary

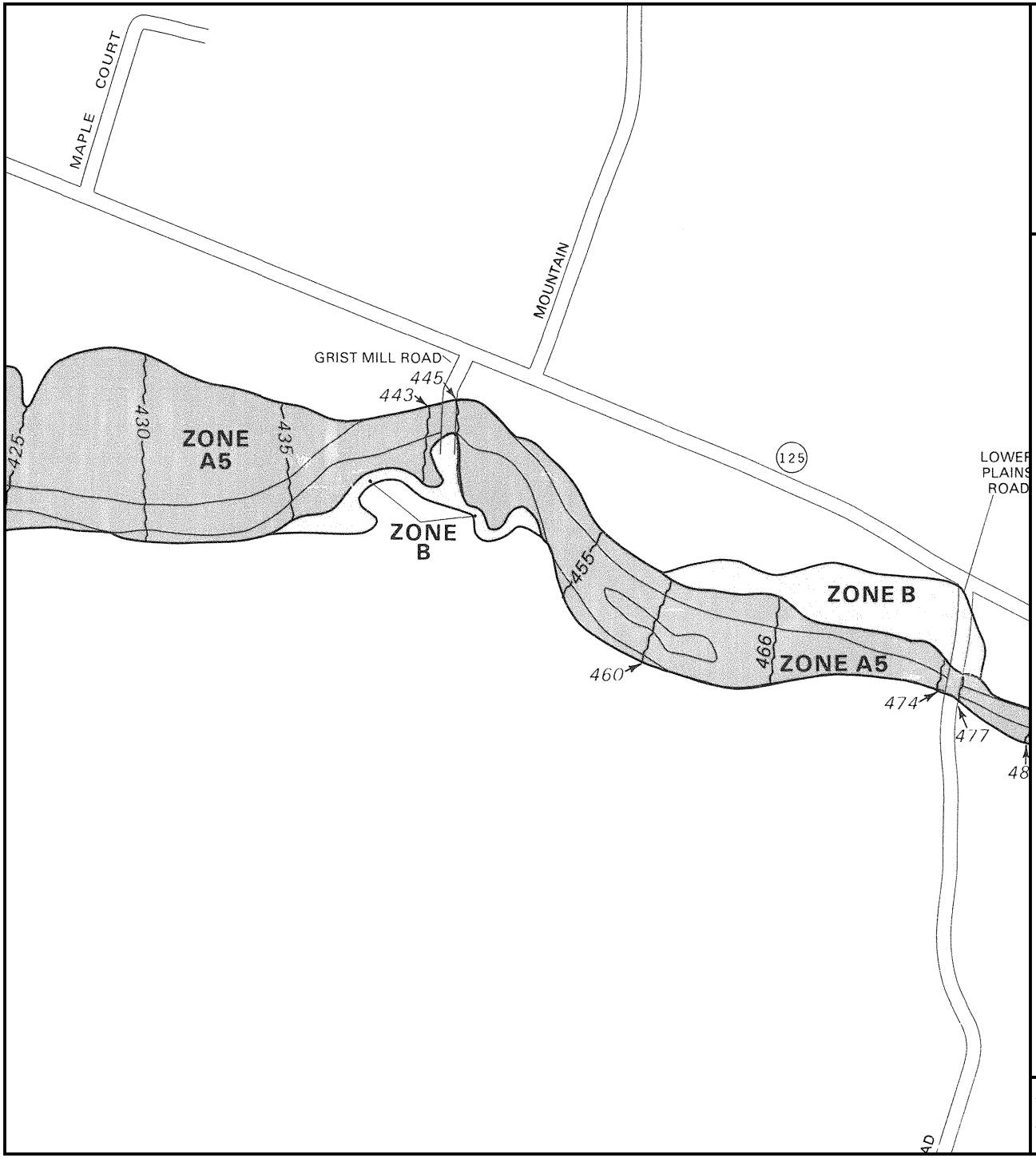
0 0.25 0.5 1 Miles

N W E S

Scale = 1:24,000
July, 2013

Map prepared by:

Landslide Natural Resource Planning
P O Box 311
East Middlebury, VT 05740



N

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

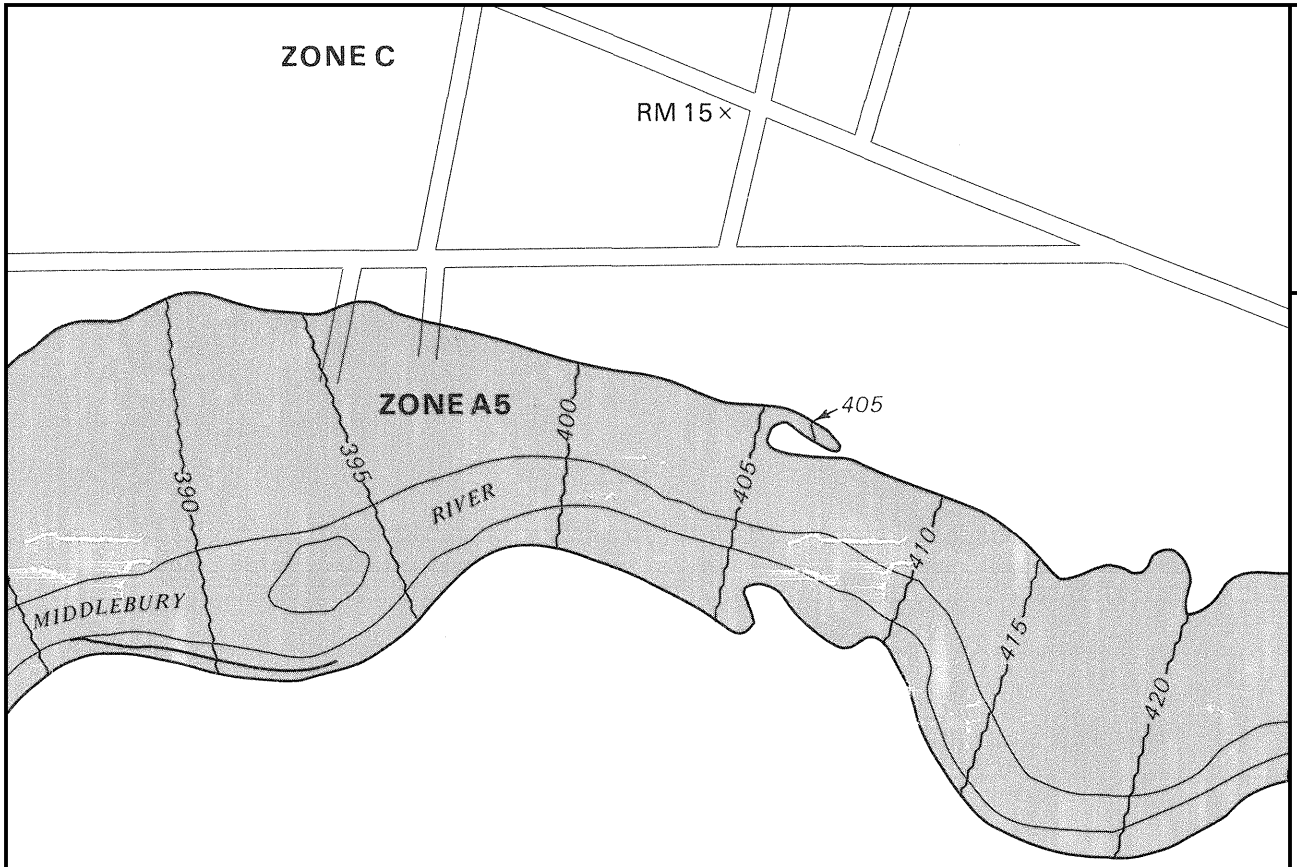
TOWN OF
MIDDLEBURY, VERMONT
ADDISON COUNTY

PANEL 14 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
500008 0014 A

EFFECTIVE DATE:
JANUARY 3, 1985

Federal Emergency Management Agency



N

APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
MIDDLEBURY,
VERMONT
ADDISON COUNTY

PANEL 14 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

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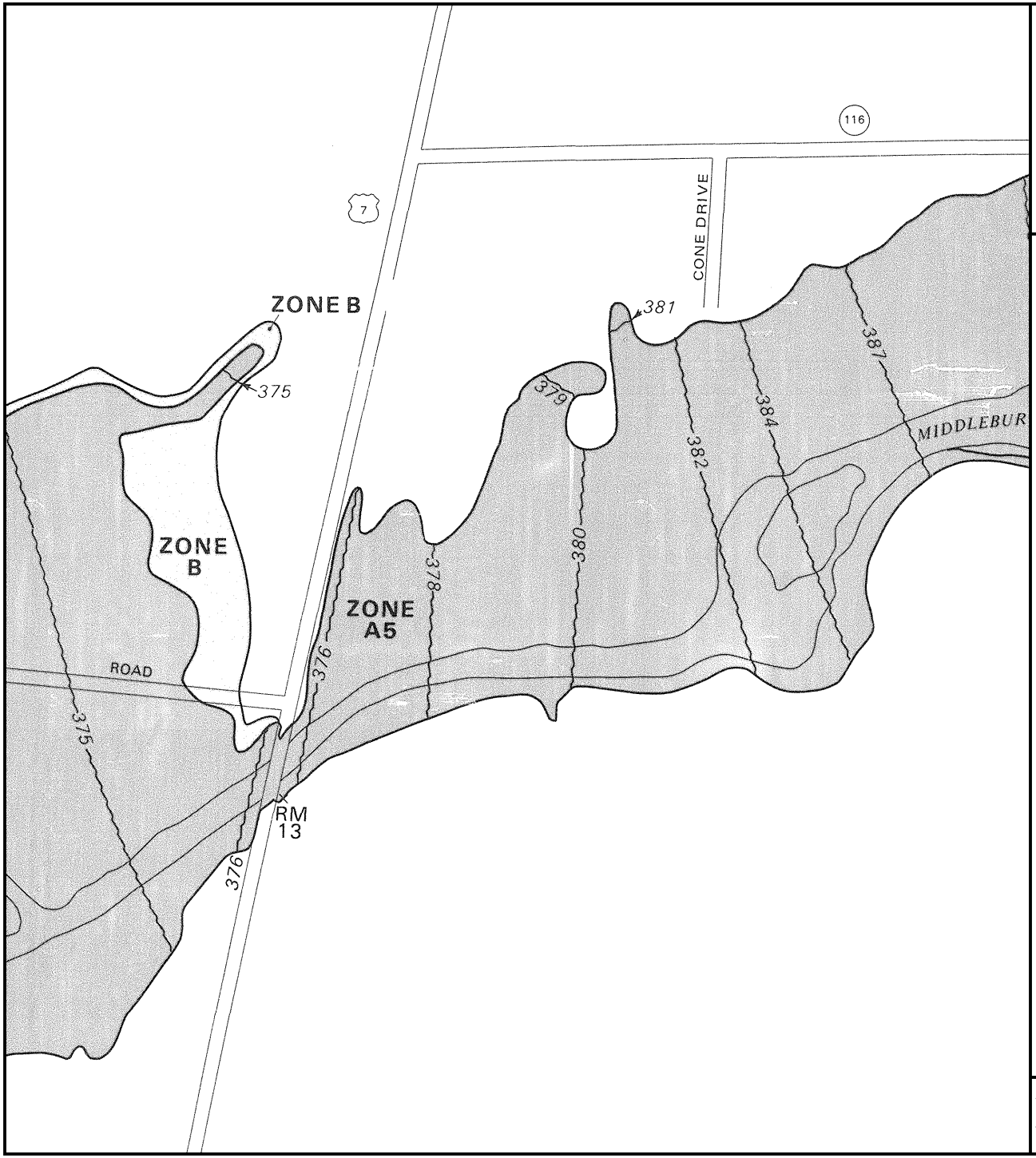
Federal Emergency Management Agency



APPROXIMATE SCALE

400 0 400 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWN OF
MIDDLEBURY,
VERMONT
ADDISON COUNTY

PANEL 14 OF 20
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
500008 0014 A

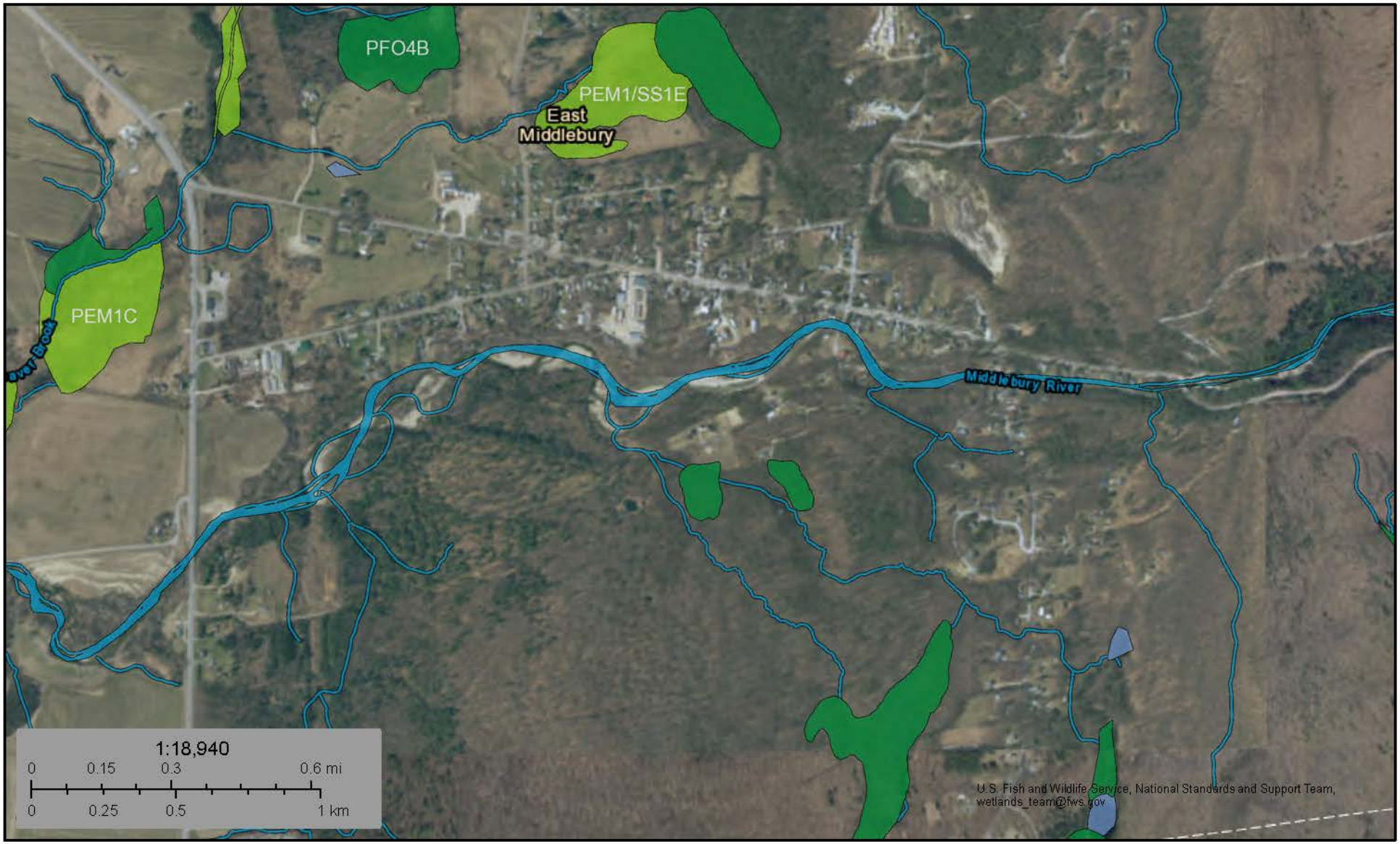
EFFECTIVE DATE:
JANUARY 3, 1985

Federal Emergency Management Agency

U.S. Fish and Wildlife Service

National Wetlands Inventory

Middlebury River Flood Mitigation



June 4, 2020

Wetlands

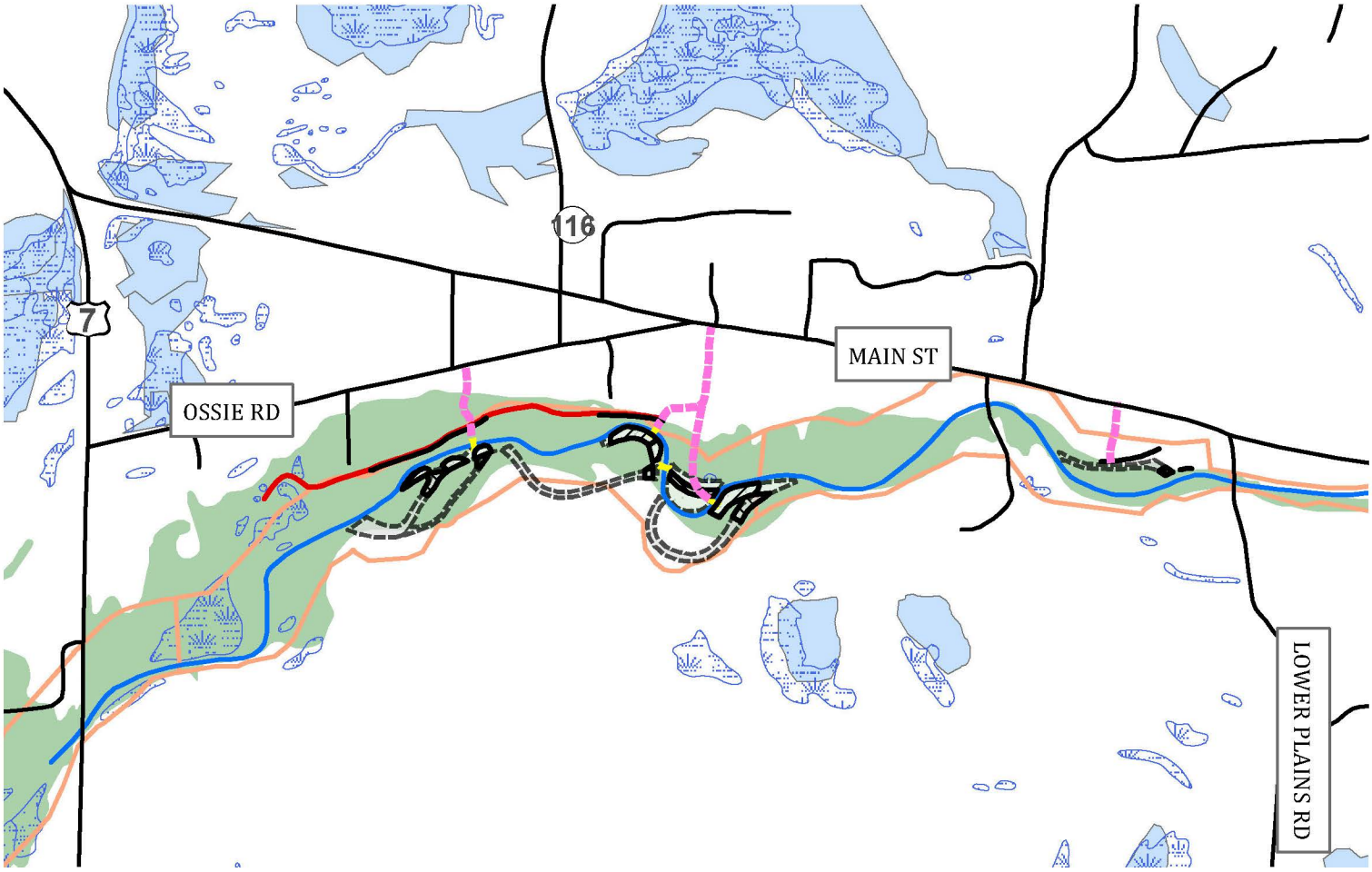
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Environmental Assessment Middlebury, Vermont

Wetlands, Floodplain, River Corridor



Legend

- Roads
- Existing Berm
- Proposed Stone Armor
- MiddRiver_Crossings
- MiddRiver-SiteAccess
- MiddRiver_Center Line_2017
- Bar_Scalp_v2
- Chute_Cleanout_v2
- Chutes2017_v2
- Sed_Bar_2017
- Middlebury Town Boundary
- VSWI Wetlands Advisory Layer
- VSWI Wetlands Class Layer
- Base Flood Elevation
- Fluvial Erosion Hazard Zone

April 2020

Landslide Natural Resource Planning
Linking people to their landscape

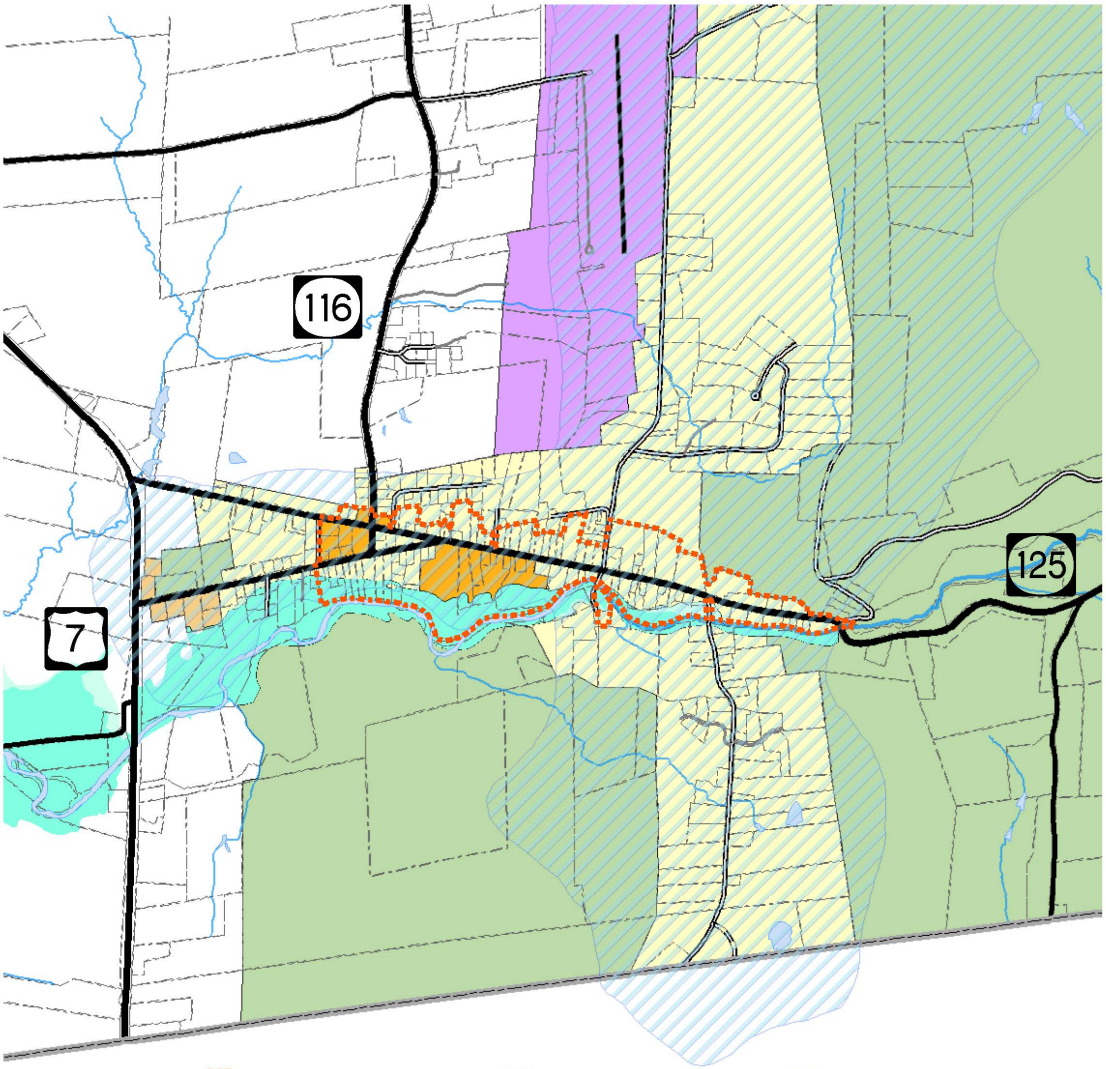
Scale 1:12,000

Source for Base Flood Elevation:
1987 FEMA Flood Study

N
W E
S


Middlebury River Floodplain Forests
VERMONT
FISH & WILDLIFE
Map prepared by Eric Sorenson
VT Fish and Wildlife Department
July 8, 2020
N
W
E
S
Sugar Maple Floodplain Forest
Feet
0 125 250 500 750 1,000
VCGI

Land Use Districts
East Middlebury



East Middlebury Designated Village
Wellhead/Source Protection Areas

(CBD) Central Business District
(GC) General Commercial District
(VRC) Village Res/Com District
(OFA) Office/Apartment District
(IND) Industrial District
(AIR) Airport District
(INS) Institutional District

(HDR) High Density Residential
(PHD) Protected Highway District
(MDR) Medium Density Residential
(AR) Agricultural/Rural District
(FOR) Forest District
(FLD) Flood Hazard Area

Sources:

Land Use :
Planning Commission changes proposed 6/28/2012 and adopted by the Select Board 12/11/2012.

Parcel Boundaries: Digitized from tax maps current as of April 1, 2011. Contact Town Clerk for current information.

Flood Hazard District: Includes Floodway and Flood Fringe from FEMA Flood Insurance Rate Map, 1985. Advisory 500 yr flood area shown in lighter color.

Wellhead/Source Protection Areas: Vermont Agency of Natural Resources.

0.5 0.25 0 Miles

N

Addison County
REGIONAL PLANNING COMMISSION

Adopted as part of Town Plan, 2012

APPENDIX B:

Project Documents and Designs

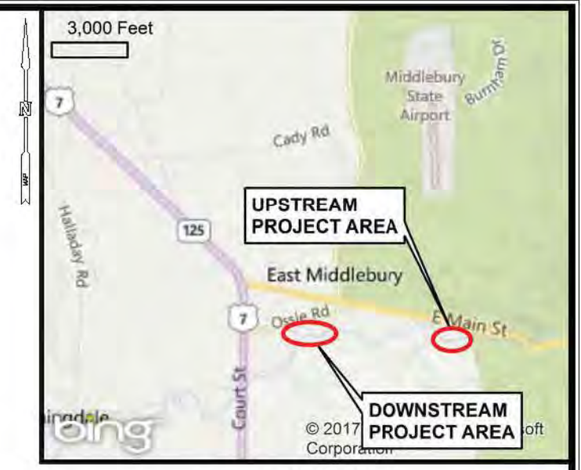
MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

PRELIMINARY DESIGN
JANUARY 11, 2018
REVISED: JANUARY 29, 2019
REVISED: AUGUST 3, 2020

PROJECT SITE VICINITY MAP:

0' 500' 1000'
0 1/2" 1"
SCALE 1" = 1000'



LOCATION MAP:
1" = 6,000 FT

PREPARED BY:

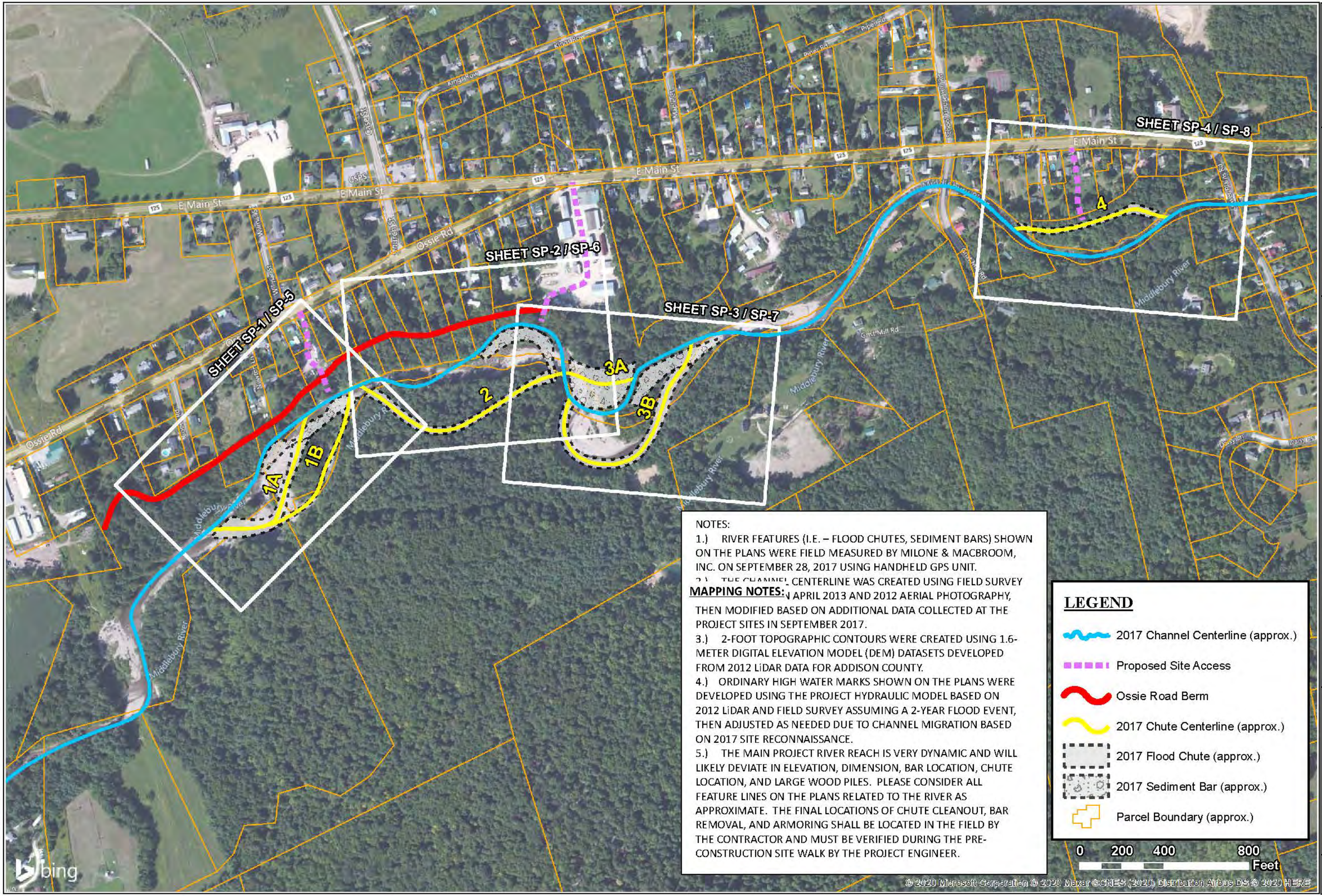
MILONE & MACBROOM®
1 South Main Street - 2nd Floor
Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mminc.com

PREPARED FOR:

TOWN OF MIDDLEBURY
94 MAIN STREET
MIDDLEBURY, VERMONT 05753

LIST OF DRAWINGS:

NO.	NAME	TITLE
01	---	TITLE SHEET
02	OV-1	OVERVIEW PLAN
03	SP-1	SITE PLAN - EXISTING CONDITIONS - CHUTE 1A / 1B
04	SP-2	SITE PLAN - EXISTING CONDITIONS - CHUTE 2
05	SP-3	SITE PLAN - EXISTING CONDITIONS - CHUTE 3A / 3B
06	SP-4	SITE PLAN - EXISTING CONDITIONS - CHUTE 4
07	SP-5	SITE PLAN - PROPOSED CONDITIONS - CHUTE 1A / 1B
08	SP-6	SITE PLAN - PROPOSED CONDITIONS - CHUTE 2
09	SP-7	SITE PLAN - PROPOSED CONDITIONS - CHUTE 3A / 3B
10	SP-8	SITE PLAN - PROPOSED CONDITIONS - CHUTE 4
11	DE-1	DETAILS
12	DE-2	DETAILS



NOTES:

1.) RIVER FEATURES (I.E. – FLOOD CHUTES, SEDIMENT BARS) SHOWN ON THE PLANS WERE FIELD MEASURED BY MILONE & MACBROOM, INC. ON SEPTEMBER 28, 2017 USING HANDHELD GPS UNIT.

2.) THE CHANNEL CENTERLINE WAS CREATED USING FIELD SURVEY

MAPPING NOTES: N APRIL 2013 AND 2012 AERIAL PHOTOGRAPHY, THEN MODIFIED BASED ON ADDITIONAL DATA COLLECTED AT THE PROJECT SITES IN SEPTEMBER 2017.

3.) 2-FOOT TOPOGRAPHIC CONTOURS WERE CREATED USING 1.6-METER DIGITAL ELEVATION MODEL (DEM) DATASETS DEVELOPED FROM 2012 LiDAR DATA FOR ADDISON COUNTY.

4.) ORDINARY HIGH WATER MARKS SHOWN ON THE PLANS WERE DEVELOPED USING THE PROJECT HYDRAULIC MODEL BASED ON 2012 LiDAR AND FIELD SURVEY ASSUMING A 2-YEAR FLOOD EVENT, THEN ADJUSTED AS NEEDED DUE TO CHANNEL MIGRATION BASED ON 2017 SITE RECONNAISSANCE.

5.) THE MAIN PROJECT RIVER REACH IS VERY DYNAMIC AND WILL LIKELY DEVIATE IN ELEVATION, DIMENSION, BAR LOCATION, CHUTE LOCATION, AND LARGE WOOD PILES. PLEASE CONSIDER ALL FEATURE LINES ON THE PLANS RELATED TO THE RIVER AS APPROXIMATE. THE FINAL LOCATIONS OF CHUTE CLEANOUT, BAR REMOVAL, AND ARMORING SHALL BE LOCATED IN THE FIELD BY THE CONTRACTOR AND MUST BE VERIFIED DURING THE PRE-CONSTRUCTION SITE WALK BY THE PROJECT ENGINEER.

LEGEND

- 2017 Channel Centerline (approx.)
- Proposed Site Access
- Ossie Road Berm
- 2017 Chute Centerline (approx.)
- 2017 Flood Chute (approx.)
- 2017 Sediment Bar (approx.)
- Parcel Boundary (approx.)

0 200 400 800 Feet

Engineering, Landscape Architecture and Environmental Science
MILONE & MACBROOM®
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Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mmInc.com

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.6M LiDAR DEM

PROJECT OVERVIEW MAP

MIDDLEBURY RIVER FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_OV1.mdx
1st Version: Jan. 11, 2018
Revision: Aug. 3, 2020
Scale: 1 in = 400 ft

OV-1

PLANTING NOTES:

1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.

2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.

3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.

VT River Corridor (Jan. 2, 2015)

FEMA Floodway (Digitized)

FEMA Zone A5 (Digitized)

Ordinary High Water

REINFORCE OSSIE ROAD BERM 1 WITH STONE ARMORNIG (STANDARD KEY) - SEE SHEET DE-2 FOR DETAILS

EXCAVATION NOTES:

1.) SEDIMENT REMOVAL SHALL OCCUR BY EXCAVATOR ONLY AND LOADED DIRECTLY INTO DUMP TRUCKS.

2.) NO WINDROWING OR USE OF BULLDOZERS SHALL BE ALLOWED WITHIN THE RIVER CORRIDOR.

CONSTRUCTION ACCESS / HAUL ROAD 1 - SEE SHEET DE-2 FOR DETAIL

SEDIMENT BAR REMOVAL AREA B - SEE SHEET DE-1 FOR DETAILS

SEDIMENT BAR REMOVAL AREA A - SEE SHEET DE-1 FOR DETAILS

PROPOSED TEMPORARY RIVER CROSSING 1 - SEE SHEET DE-2 FOR DETAIL

FLOOD CHUTE 1A

FLOOD CHUTE 1B

FLOOD CHUTE 1A CLEANOUT AREA -SEE SHEET DE-1 FOR DETAILS

FLOOD CHUTE 1B CLEANOUT AREA -SEE SHEET DE-1 FOR DETAILS

SEDIMENT BAR REMOVAL AREA C - SEE SHEET DE-1 FOR DETAILS

LEGEND

Proposed Site Access

Proposed Stone Armor

Proposed Bar Excavation

Proposed Chute Cleanout

0 40 80 160 Feet

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Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mminc.com

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.0M LiDAR DEM

SITE PLAN - PROPOSED CONDITIONS - CHUTE 1A / 1B

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI #: 5032-02-2
MXD: EMR-Prelim_SP5.mdx
1st Version: Jan 11, 2018
Revision: Aug 3, 2020
Scale: 1 in = 80 ft

SP-5

PLANTING NOTES:

1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.

2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.

3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.

EXCAVATION NOTES:

1.) SEDIMENT REMOVAL SHALL OCCUR BY EXCAVATOR ONLY AND LOADED DIRECTLY INTO DUMP TRUCKS.

2.) NO WINDROWING OR USE OF BULLDOZERS SHALL BE ALLOWED WITHIN THE RIVER CORRIDOR.

Goodro Lumber Company, Inc.

CONSTRUCTION ACCESS / HAUL ROAD 2 - SEE SHEET DE-2 FOR DETAIL

REINFORCE OSSIE ROAD BERM 2 WITH STONE ARMORNIG (DEEP KEY) -SEE SHEET DE-2 FOR DETAILS

PROPOSED TEMPORARY RIVER CROSSING 2 (TYP.) -SEE SHEET DE-2 FOR DETAILS

PROPOSED TEMPORARY RIVER CROSSING 3 (TYP.) -SEE SHEET DE-2 FOR DETAILS

SEDIMENT BAR REMOVAL AREA D - SEE SHEET DE-1 FOR DETAILS

SEDIMENT BAR REMOVAL AREA E - SEE SHEET DE-1 FOR DETAILS

FLOOD CHUTE 2

FLOOD CHUTE 2 CLEANOUT AREA -SEE SHEET DE-1 FOR DETAILS

MIDDLEBURY RIVER

Middlebury River

LEGEND

- Proposed Site Access
- Proposed Stone Armor
- Proposed Bar Excavation
- Proposed Chute Cleanout

- VT River Corridor (Jan. 2, 2015)
- FEMA Floodway (Digitized)
- FEMA Zone A5 (Digitized)
- Ordinary High Water

0 40 80 160 Feet

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www.mmminc.com

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.0M LiDAR DEM

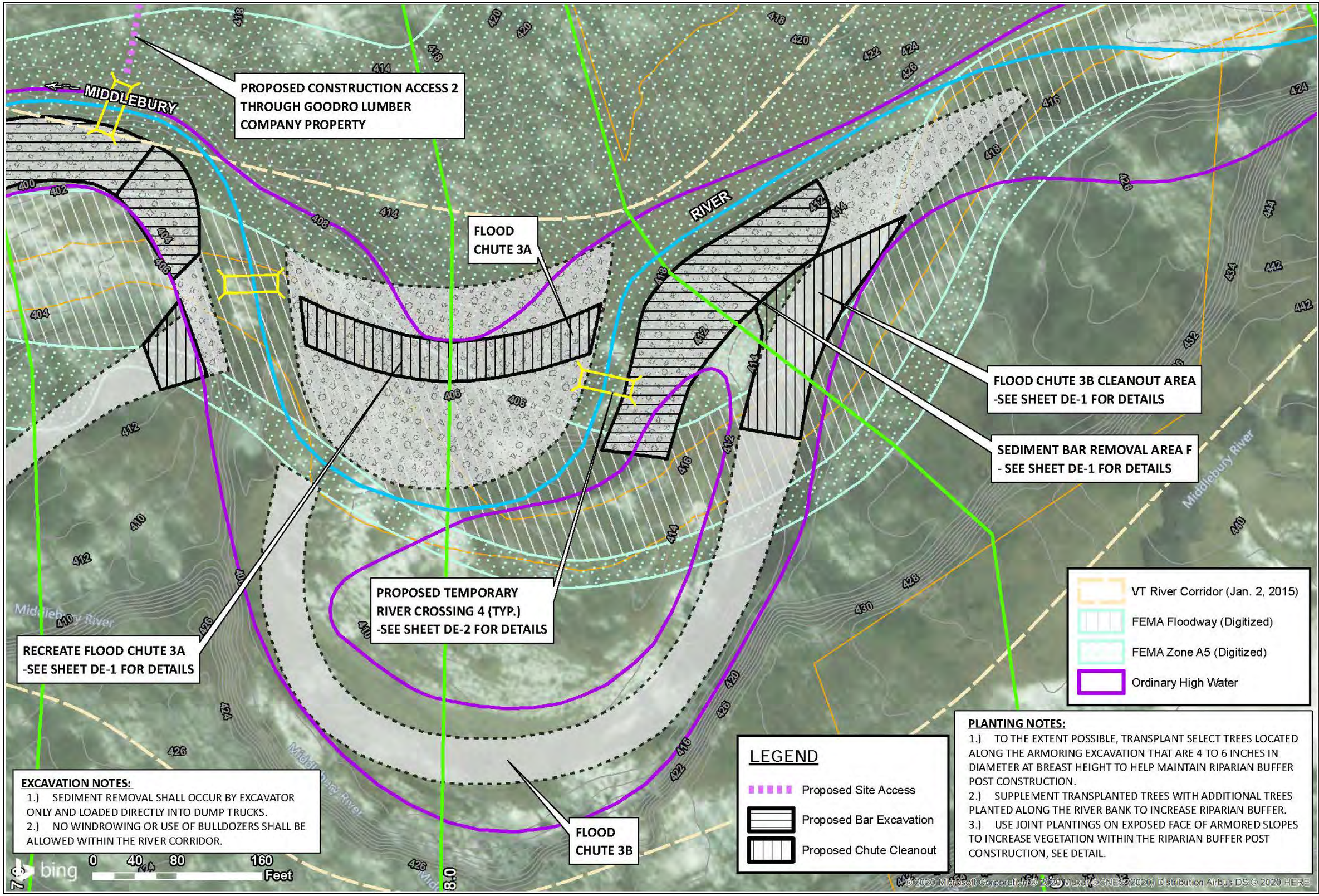
SITE PLAN - PROPOSED CONDITIONS - CHUTE 2

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_SP6.mdx
1st Version: Jan. 11, 2018
Revision: Aug. 3, 2020
Scale: 1 in = 80 ft

SP-6



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Waterbury, Vermont 05676
(802) 882-8335 Fax (802) 882-8346
www.mminc.com

SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.0M LiDAR DEM

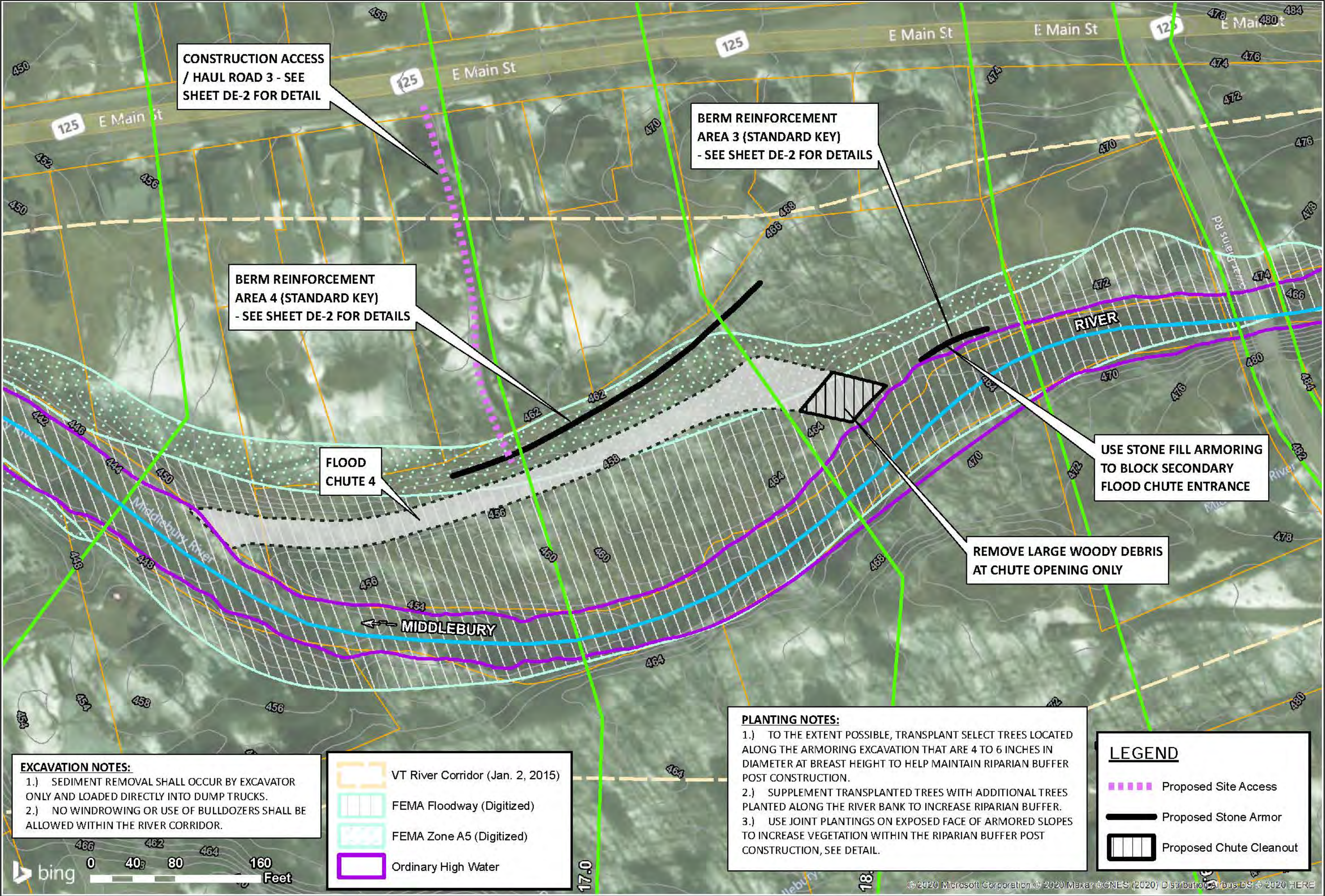
SITE PLAN - PROPOSED CONDITIONS - CHUTE 3A / 3B

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_SP7.mdx
1st Version: Jan. 11, 2018
Revision: Aug. 3, 2020
Scale: 1 in = 80 ft

SP-7



E Main St
125
CONSTRUCTION ACCESS / HAUL ROAD 3 - SEE SHEET DE-2 FOR DETAIL
BERM REINFORCEMENT AREA 3 (STANDARD KEY) - SEE SHEET DE-2 FOR DETAILS
BERM REINFORCEMENT AREA 4 (STANDARD KEY) - SEE SHEET DE-2 FOR DETAILS
FLOOD CHUTE 4
RIVER
MIDDLEBURY
USE STONE FILL ARMORING TO BLOCK SECONDARY FLOOD CHUTE ENTRANCE
REMOVE LARGE WOODY DEBRIS AT CHUTE OPENING ONLY
EXCAVATION NOTES:
1.) SEDIMENT REMOVAL SHALL OCCUR BY EXCAVATOR ONLY AND LOADED DIRECTLY INTO DUMP TRUCKS.
2.) NO WINDROWING OR USE OF BULLDOZERS SHALL BE ALLOWED WITHIN THE RIVER CORRIDOR.
VT River Corridor (Jan. 2, 2015)
FEMA Floodway (Digitized)
FEMA Zone A5 (Digitized)
Ordinary High Water
PLANTING NOTES:
1.) TO THE EXTENT POSSIBLE, TRANSPLANT SELECT TREES LOCATED ALONG THE ARMORING EXCAVATION THAT ARE 4 TO 6 INCHES IN DIAMETER AT BREAST HEIGHT TO HELP MAINTAIN RIPARIAN BUFFER POST CONSTRUCTION.
2.) SUPPLEMENT TRANSPLANTED TREES WITH ADDITIONAL TREES PLANTED ALONG THE RIVER BANK TO INCREASE RIPARIAN BUFFER.
3.) USE JOINT PLANTINGS ON EXPOSED FACE OF ARMORED SLOPES TO INCREASE VEGETATION WITHIN THE RIPARIAN BUFFER POST CONSTRUCTION, SEE DETAIL.
LEGEND
Proposed Site Access
Proposed Stone Armor
Proposed Chute Cleanout
0 40 80 160 Feet
© 2020 Microsoft Corporation © 2020 Maxar ©CNES (2020) Distribution Airbus DS © 2020 HERE

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(802) 882-8335 Fax (802) 882-8346
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SOURCE(S):
Parcel Data - VCGI
Aerial Photo - Bing Maps
Contour Data - 2012 1.6M LiDAR DEM

SITE PLAN - PROPOSED CONDITIONS - CHUTE 4

MIDDLEBURY RIVER
FLOOD MITIGATION PROJECT

EAST MIDDLEBURY, VERMONT

Map By: BMC
MMI#: 5032-02-2
MXD: EMR-Prelim_SP4.mdx
1st Version: Jan. 11, 2018
Revision: Aug. 3, 2020
Scale: 1 in = 80 ft

SP-8

APPENDIX C:

Supporting Documents

REGION 1

EXECUTIVE ORDER 11988 Floodplain Management

EXECUTIVE ORDER 11990 Protection of Wetlands

8-Step Decision Making Process (44 CFR Part 9)

TITLE: Middlebury River Flood Mitigation Project

LOCATION: Middlebury, Vermont along the Middlebury River (approximately 43.969245, -73.112897 to 43.970236, -73.093418)

BACKGROUND:

The Town of Middlebury in its All-Hazards Mitigation Plan has identified risks associated with erosion and flooding of the Middlebury River in East Middlebury as a high priority for mitigation. The proposed mitigation project is needed to prevent reoccurring flood damage to town bridges and roads, state highways and private residences in East Middlebury.

The Middlebury River is a tributary of Otter Creek and drains an area of 63 square miles, or 40,207 acres, with its headwaters on the west side of the Green Mountains in Ripton, VT. The upper watershed is typified by higher gradients and relatively narrow valleys, whereas the lower watershed is characterized by broad valleys and lower gradient stream beds. The Village of East Middlebury is in an alluvial deposition area where the river transitions from the very steep Middlebury Gorge to the lower gradient Champlain Valley. This is an area where the river would naturally deposit large amounts of sediment and have multiple channels, however, the river has been constrained by straightening, berms and hard armoring for decades through the village area; this lengthens the transport zone of boulders, gravel, woody debris and other sediment carried by the river from just downstream of the Lower Plains Road Bridge area to downstream of the Grist Mill Bridge area. An additional factor for flooding is the development of the Village of Ripton immediately upstream of Middlebury. The development of both Middlebury's and Ripton's depositional areas has reduced the area available for flood and sediment storage, thus increasing the rate and volume of water and sediment moving through the system during high flow events.

The Middlebury River Watershed was flooded during the major statewide flood events of 1927, 1938, and 2011 and it has also experienced numerous localized flood events which seem to be increasing in frequency. Localized floods have occurred in 1913, 1936, 1947, 1958, 1960, 1976, 1984, 1989, 1996, 1998, 2000, 2006, 2008, 2017 and 2019. Until the late 1980's the conventional response to a flood event was to dredge, berm and hard armor the river "in place". These conventional channel management activities have resulted in the project area being entrenched, incised and consisting of over-widened sections that contain flows in the channel even during high flow events thus increasing erosion and risk to nearby property and infrastructure.

DESCRIPTION OF PROJECT:

The Middlebury project proposal is for the restoration and creation of additional floodplain storage at the Middlebury River between the Lower Plains Road bridge and the bridge at Grist Mill Bridge Road in Middlebury, VT.

The proposal has four main components:

1. Remove large sediment deposits from chute entrances and the top of large bars.
    - Five (5) flood chutes areas would be reconnected and six (6) large sediment bars would be removed. The average depth of the chute removal is between two (2) to three (3) feet and the sediment bar removal ranges from two (2) to four (4) feet in depth. For each activity the intent is to remove woody debris and gravel material that is present above the 1-year flood elevation. Sediment removal in the chutes and sediment bars

range from 2,900 to 20,400 square feet. The volume of sediment removal for these areas ranges from 215 cubic yards to 2,326 cubic yards.

2. Armor select sections of the Ossie Road Berm and upstream berms.
   - The current scope of work defines three (3) distinct areas of hard armoring:
     - 750 linear feet along the Ossie Road Berm;
     - 400 linear feet near Goodro Lumber Company;
     - 400 linear feet downstream of the Lower Plains Road bridge;
   - The armoring would also include plugging a 100-foot gap in a berm along the river near Grist Mill Bridge Road where flood waters leave the channel.
3. Repair the existing flood wall.
   - Install ground anchors along the face of the wall to prevent the wall from tipping over and install steel sheeting along the base of the wall to reduce the risk of scour.
   - Reinstall existing rip rap.
4. Extend flood wall 150 feet downstream.
   - The current scope of work extends the floodwall west of Grist Mill Road for 150 feet and includes plans to repair the existing floodwall.

The staging areas and access roads include temporary river crossings for access to all points for construction. Three (3) access roads are proposed:

1. Access to the downstream chutes and berm is proposed through the junkyard property. The access connects Ossie Road (VT Route 116) to the river and passes by a residence and through the junkyard, for a length of approximately 420 feet. The temporary river crossing would be made using river cobble and gravel with two (2) to three (3) 24-inch culverts. No tree removal is anticipated at this access. For the access road construction, nearly 130 truckloads of stone armor would be imported at this location and 200 truckloads of sediment would be exported. It is estimated that 10 truckloads of large wood would be exported at this location.
2. Access is proposed at Goodro Lumber Company.
   - The access passes through the lumber yard and heads to the river at the southwest corner of the property, for a length of approximately 790 feet. The temporary river crossing would be made using river cobble and gravel with two (2) or three (3) 24-inch culverts. A few small trees may need to be removed at this access. Nearly 120 truckloads of stone armor would need to be imported at this location and 200 truckloads of sediment would be exported. It is estimated that 10 truckloads of large wood would be exported at this location.
3. Access to the flood chute area near Lower Plains Road is proposed near two residential properties. The access passes between two houses and heads south to the river, for an approximate distance of 350 feet. All work sites near Lower Plains Road would be reachable from this location. A few small trees may need to be removed at this access. Nearly 30 truckloads of stone armor would need to be imported at this location, and 20 truckloads of sediment and 10 truckloads of large wood would be exported at this location.

STEP 1: Determine whether the proposed action is in the 100-year floodplain, which includes the Coastal High Hazard Area (500-year floodplain for critical actions) and/or within a designated wetland.

Yes, the proposed action is in the 100-year floodplain as mapped by FIRM Community and Panel No: 500008 0014 A, Dated: January 3, 1985. The proposed action is also located within a Sugar Maple Floodplain Forest which is designated as a rare natural community by the Vermont Fish and Wildlife, Natural Heritage Inventory.

Is the action a functional dependent use (cannot perform its intended purpose unless it is located or carried out in proximity to water) or a facility or structure that facilitates open space use?

Yes, the proposed work is to repair scour, armor banks and repair a floodwall along the Middlebury River.

Determine whether the proposed action is within a designated wetland.

Yes, the proposed action would involve activities in a wetland. The U.S. Fish and Wildlife Service National Wetland Inventory identifies the project site as a riverine wetland: Cowardin classification code R2UBH (riverine, lower gradient perennial, unconsolidated bottom and permanently flooded). Additionally, the Vermont Agency of Natural Resources, Wetlands Program representatives conducted a site visit on May 4, 2020 to delineate wetlands as defined by state law and regulation, and to determine if a permit is required. In an email dated May 13, 2020 it was reported that while there are some wetland plants in a number of areas (Sycamore, red maple, dogwood and willow, Ostrich fern understory and invasive Honeysuckle) either the hydrology, soils or both were missing and therefore the project areas are not considered regulated wetlands, and no permit is required.

STEP 2 Notify the public at the earliest possible time of the intent to carry out an action in a floodplain and wetland. Involve the affected and interested public in the decision-making process.

The first public notice was part of the DR-4022-VT Initial Public Notice in the Brattleboro Reformer published on October 15, 2011. Early Public Notice for the preparation of the Environmental Assessment went out March 9, 2020. Public Notice was posted in the Addison Independent and ran for one day. FEMA also shared our Environmental Assessment Scoping Checklist with state and federal partners and received one comment from the Vermont Wetlands Program. The comment was to bring to the attention of the Project Proponent that permitting may be necessary before work can start.

STEP 3 Identify and evaluate practicable alternatives to locating the proposed action in a floodplain and wetland (including alternatives sites, actions and the "no action" option).

It is not practicable to locate the project outside the 100-year floodplain because the project proposal involves repairing and upgrading infrastructure within the floodplain to protect floodplain dependent structures (e.g. the Grist Mill Road bridge, Ossie Road, and homes along the Middlebury River); therefore, activity within the floodplain is not avoidable.

Alternative Options:

Alternative 1: No Action Alternative

Significant flood events have resulted in erosion and deposition in the channel and adjacent floodplain and scour at the Grist Mill Bridge and the Ossie Road Berm. Sink holes have formed behind the Grist Mill Bridge floodwall suggesting that material is being moved from the river and pulled out from under the wall. If the No Action Alternative is chosen, scour and sink holes caused by high velocity flow would continue to threaten the bridge, berms and other infrastructure. The No Action Alternative would not address the current need to reduce damages to bridges, roads and homes from flooding events.

Alternative 2: Proposed Alternative

The proposed alternative would reduce flood risk and elevations through the removal of large sediment deposits from flood-chute entrances and the top of large gravel/cobble bars, armor select sections of the Ossie Road Berm and upstream berms which protects Ossie Road and the homes along Ossie Road and repair and extend the existing floodwall at the Grist Mill Road bridge to protect the bridge and the homes behind the wall.

Alternative 3: Considered and Dismissed

The excavation of new floodplain immediately downstream of the Lower Plains Road Bridge was considered but dismissed. The Town owns a forested island in this area that is approximately 2.5 acres and the remaining land for the proposed floodplain creation is privately owned. Creating flood storage capacity upstream of Grist Mill Road bridge and the Ossie Road berm had definite benefits but there was concern raised by the Department of Fish and Wildlife over the removal of mature riparian vegetation and the private landowner was not interested in using their property for this purpose. The costs of this option were found to outweigh the benefits.

Alternative 4: Considered and Dismissed

The original proposal set forth by the Project Proponent included a second access road at Goodro Lumber Company. This access would have been approximately 1,000 feet long, passing through the lumber yard before heading south through the forest where tree removal would be necessary. As part of the decision-making process, it was determined that impacts to ESA-listed bats and impacts to the rare natural community riparian floodplain forest could be reduced without the second access while still meeting the purpose and need of the project.

STEP 4 Identify the potential direct and indirect impacts associated with the occupancy or modification of floodplains and the potential direct and indirect support of floodplain development that could result from the proposed action.

Long-term, the proposed project restores some of the natural floodplain functions with the opening of the flood-chute entrances, but all other aspects of the proposed project repairs existing infrastructure and maintains the status quo on the Middlebury River. That said, through the restoration of natural floodplain functions, it is anticipated that that flood depths would be reduced from 5.2 feet to 4.0 feet during a flood equal to the July 2017 event (~20%), and that flood velocities in the main channel would be reduced by 15% - 30%. With the lower flood levels and velocities, the proposed alternative is expected to reduce overall flood damages 20%.

Short-term impacts include temporary fill for the access roads to the river and geotextile fabric and gravel fill in the river corridor for access along the river. The fill would add approximately six inches of fill above current cobble and gravel elevations and would be entirely removed after construction. A no rise analysis has been completed and demonstrated that this fill would not elevate the base flood elevation anywhere in the community. Additionally, there would be tree removal within the riparian floodplain forest. Tree removal would be limited to the minimum amount necessary to allow for access to the project site: as a minimization measure the original design of four access routes was reduced to three to minimize impacts to the riparian forest.

The proposed alternative would not encourage additional development: the area between Ossie Road and the river is already built out and there is not room to further develop or expand Ossie Road. The proposed project would involve future maintenance of the flood chutes, berms and floodwalls, but again this would be the status quo and the Town is already maintaining this infrastructure.

STEP 5 Minimize the potential adverse impacts and support to or within floodplains and wetlands identified under Step 4, restore and preserve the natural and beneficial values served by the floodplain and wetlands.

Potential short- and long-term adverse impacts have been avoided and minimized through design measures and permitting conditions. As mentioned previously, the original design proposal of four access routes was reduced to three to during the decision-making process to minimize impacts. The reestablishment of the flood-chutes restores the natural function of the floodplain through this section of river.

Minimization measures include:

- The proposed project is a functionally dependent use (9.11(d)(1)(i)),
- a local certificate demonstrating no more than 1 foot of rise anywhere within the community is required and has been obtained (9.11(d)(4)),
- the proposed project as designed meets the criteria as being the only practicable alternative and would not cause harm to the floodplain (9.11(d)(5)),
- and the proposed project will be conditioned for a local floodplain permit demonstrating consistency with the NFIP (9.11(d)(6)).

STEP 6 Reevaluate the proposed action to determine first, if it is still practicable in light of its exposure to flood hazards or impacts on wetlands, the extent to which it will aggravate the hazards to others, and its potential to disrupt floodplain and wetland resources and second, if alternatives preliminarily rejected at Step 3 are practicable in light of the information gained in Steps 4 and 5. FEMA shall not act in a floodplain unless it is the only practicable location.

The purpose of the project is to mitigate flood damages within the community. The proposed project design provides flood mitigation and ecological restoration along the Middlebury River; flood hazards would be reduced and there would be a net improvement to wetlands. No other alternatives provide a cost-effective flood mitigation solution.

STEP 7 Prepare and provide the public with a finding and public explanation of any final decision that the floodplain and wetland is the only practicable alternative.

Public notice will be provided by FEMA and the Town as part of the Environmental Assessment process.

STEP 8 Review the implementation and post - implementation phases of the proposed action to ensure that the requirements stated in Section 9.11 are fully implemented.

The FEMA project grant will be conditioned for the Applicant to secure federal, state and local permitting for work in the floodplain and wetland: including a permit from the Local Floodplain Administrator. Documentation from a permitting authority that a permit is not required will also be accepted. Compliance with all federal, state and local permits will determined as part of the grant close-out process.

Prepared by:

This 8-Step Decision Making Document was prepared by the following FEMA EHP staff: David Robbins, Regional Environmental Officer, Eric Kuns, Senior Environmental Protection Specialist and Linda Hutchins, Environmental Protection Specialist.

APPENDIX D:

Finding of No Significant Impact (FONSI)