

Lewis Creek Flood Hazard Mitigation
8/1/2024

Alternative		Objectives							Recommended	Notes
ID	Description	Improve water quality	Improve floodplain connectivity	Improve habitat or aquatic organism passage	Reduce flood and erosion risk	Reduce comparative implementation cost	Reduce comparative maintenance cost	Avoid constraints		
1	Do nothing	NO	NO	NO	NO	BEST	NO	NO	NO	Lewis Creek causes flooding of properties, homes, and roads in the vicinity of Ireland Road, Hillsboro Road, and Route 116. The river transitions from a steep, narrow-valley setting to a flat, broad valley in this location. The river forms an alluvial fan, where extensive sediment deposition and channel adjustment are expected. Historic channel management and development patterns are not compatible with this natural condition.
2	Floodplain creation behind 340, 415, and 455 Ireland Road	BEST	BEST	NO	Better	Maybe	Better	Better	YES	A large swath of open space exists adjacent to Lewis Creek along Ireland Road, which is currently managed as lawn. The creek is disconnected from this land due to historic incision. Lower the land behind these three homes to provide floodplain access at the 10-year flood and higher. Size of floodplain is 2.0 acres.
3	Floodplain creation across from 103 Ireland Road (large)	Better	BEST	NO	Better	Maybe	Better	Better	NO	Undeveloped land exists on the eastern side of the creek, across from several homes built close to the river, where floodwaters first exit the main channel and flood properties. Lower the entire undeveloped area to provide floodplain access at the 2-year flood and higher. This area is currently forested with areas of wetland and historic floodchutes. Size of floodplain is 3.5 acres.
4	Floodplain creation across from 103 Ireland Road (small)	Better	BEST	NO	Better	Better	Better	Better	YES	Undeveloped land exists on the eastern side of the creek, across from several homes built close to the river, where floodwaters first exit the main channel and flood properties. Lower a portion of the undeveloped area closest to the creek to provide floodplain access at the 2-year flood and higher. This area is currently forested. Size of floodplain is 0.6 acres. Modeling shows flood mitigation benefits are similar to alternative 3 with less impact from clearing forested land.
5	Floodchute enhancement across from 103 Ireland Road	Maybe	Better	NO	Maybe	Better	Better	Better	NO	Undeveloped land exists on the eastern side of the creek, across from several homes built close to the river, where floodwaters first exit the main channel and flood properties. Historic floodchutes exist in this area. One of the two floodchutes is accessed only at high flows and the other one is currently inaccessible. Enhance floodchutes to receive more water. Two options modeled: lower land at the inlet of the floodchutes and the outlet of the inaccessible one (to 2-year elevation) and grade within inaccessible floodchute to lower high area; expand main floodchute to 50-foot width and lower inlet (to 2-year elevation).
6	Increase floodchute capacity along Shamrock Drive	Maybe	Better	NO	BEST	Better	Better	Better	NO	There are three main floodchutes (and additional flow paths) in a forested tract of land between Shamrock Drive and the creek. These floodchutes are frequently accessed by the creek. Enlarge the floodchutes to increase capacity and reduce flood risk to the adjacent homes. Modeling shows reduction of floodwater extent around adjacent homes.

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7	Floodplain creation at sugarhouse and 502 Route 116	BEST	BEST	NO	BEST	NO	Better	Better	NO	Relocate sugarhouse, buyout of 502 Route 116. Lower land adjacent to Lewis Creek to create low floodplain with additional storage to reduce flooding of adjacent homes and properties. Lower land to provide floodplain access at the 2-year flood and higher. Size of floodplain is 2.6 acres.
8	Overflow channel across Route 116	NO	Better	NO	Maybe	NO	Maybe	Maybe	NO	Water from Lewis Creek flows over the road at approximately the 25-year flood and higher in two locations between Ireland Road and Hillsboro Road. At higher flows, longer stretches of Route 116 are inundated and the road becomes impassable. Excavate overflow channel and install culvert to carry floodwaters under Route 116 and reduce inundation of the roadway.
9	Install overflow culverts along Route 116	NO	Better	NO	Maybe	NO	Maybe	Maybe	NO	Water from Lewis Creek flows over the road at approximately the 25-year flood and higher in two locations between Ireland Road and Hillsboro Road. At higher flows, longer stretches of Route 116 are inundated and the road becomes impassable. Install overflow culverts to carry floodwaters under Route 116 and reduce flooding of the roadway.
10	Berm removal upstream of Hillsboro Road	NO	Maybe	NO	Maybe	BEST	BEST	Better	YES	Historic berms exist along the west side of the creek just upstream of Hillsboro Road. These berms limit floodplain access at the 5-year and lower flood. Remove berms to improve floodplain connectivity across a wider range of flows. A house exists on the floodplain behind the berms but is set back approximately 300 feet.
11	Replace Hillsboro Road Bridge	NO	NO	NO	Maybe	NO	Maybe	Maybe	YES	The Hillsboro Road bridge has a 36 foot span and 5.2 foot rise. The bridge span is sized appropriately for the bankfull channel but the rise is low. Hillsboro Road overtops west of the bridge at the 10-year flood and above. Replace the bridge with a larger structure that can handle more floodwaters. The bridge also periodically experiences ice jamming, which causes flooding of upstream properties. Recommended in conjunction with floodplain creation (Alternative 16).
12	Install overflow culvert along Hillsboro Road	NO	Maybe	NO	Maybe	NO	Maybe	Maybe	NO	Hillsboro Road overtops due to floodwaters at the 10-year flood and higher, becoming impassable under some flow conditions. Add overflow channel and culvert under the road to convey floodwaters and reduce inundation of the road.
13	Bank stabilization along Route 116	Better	NO	Better	Better	Better	Maybe	Maybe	YES	Lateral and meander migration of Lewis Creek has led to dramatic and rapid change in planform between the Hillsboro Road and Route 116 culverts. The eroding western bank of the creek is only approximately 20 feet from the road embankment. The road is at risk of undermining if the bank continues to erode. Bank stabilization could be designed to also benefit aquatic habitat through the installation of root wads.
14	Replace Route 116 Bridge	NO	NO	NO	Maybe	NO	Maybe	Maybe	NO	The Route 116 bridge is appropriately sized but has poor channel alignment. Modeling shows floodwaters collecting east of Route 116 just north of the bridge. Replace the bridge with a larger structure and create floodplain benches through the new structure.

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15	Buyouts along Route 116, Shamrock Drive, and Ireland Road	Better	Better	NO	BEST	NO	BEST	BEST	YES	Numerous homes and properties experience periodic flooding as a result of high flows on Lewis Creek. Lower Ireland Road, Shamrock Drive, and part of Route 116 are located within an alluvial fan, an area where flooding and deposition of sediment are expected due to a dramatic drop in channel slope and increase in valley width.
16	Floodplain creation at Hillsboro Road Bridge	Better	BEST	NO	Better	Maybe	Better	Better	YES	Lower land around Hillsboro Road Bridge to allow deposition of sediment and debris and avoid clogging of the bridge. Provide more space for expansion of floodwaters to reduce overtopping of the road. Lower 2.1 acres of land to just below the 2-year flood elevation. Recommended in conjunction with bridge replacement.
17	Replace cattle pass culvert	NO	NO	NO	Maybe	NO	Maybe	Maybe	NO	A 7-foot cattle pass culvert exists just north of the Route 116 Bridge conveying livestock and a small drainage under the road. During floods, water flows out of Lewis Creek northward and backs up behind this culvert. Replace with larger structure to reduce impounding of floodwaters in this area.
18	Install overflow culvert along Ireland Road	NO	Maybe	NO	Better	NO	Better	Maybe	YES	Ireland Road overtops and water flows down the road from a tributary along Meehan Road. Install an overflow culvert near 103 Ireland Road to capture flow from the tributary and convey it under the road to reduce damage of the road and houses at the end of the road.
19	Floodplain creation from sugarhouse to Ireland Road	BEST	BEST	NO	BEST	NO	Better	Better	YES	Relocate sugarhouse, buyout of 4 properties. Lower land adjacent to Lewis Creek to create low floodplain with additional storage to reduce flooding of adjacent homes and properties. Lower land to provide floodplain access at the 2-year flood and higher. Size of floodplain is 6.3 acres.