# 2. Wetland and Watercourse Protection Measures (Sections 2.2-2.2.4)

Communities can increase their resilience to flooding by protecting watercourses, floodplains, wetlands, and the marine coast. An important first step is education and conversations with community stakeholders. Municipal, watershed, and coastal planning can be used to identify and prioritize community assets and establish non-regulatory strategies for conservation and for identification of the most suitable locations for community growth. In addition, municipalities can adopt local laws to define wetlands; and regulate activities that may affect floodplains, watercourses, marine coastal shorelines and freshwater and tidal wetlands and their buffers. These laws can address the need to absorb floodwater and reduce risk; and adjust to changes expected from increased precipitation, storm surges, and sea-level rise, such as the change in wetland character and function, inland migration of tidal wetlands, and increased risk of coastal flooding.

Watercourse and tidal flooding are both addressed in this chapter. Watercourse flooding is primarily caused by precipitation, while tidal or storm surge flooding is caused by inundation of seawater along the marine coast. During hurricanes, nor’easters, and other coastal storms the marine coast and its watercourses can be impacted simultaneously by tidal flooding, storm surge and precipitation.

Watercourse – A channel conveying water, such as a natural stream, river, or artificial channel.

Precipitation that is not absorbed by soil and vegetation is called stormwater runoff. Stormwater runoff is pulled by gravity into watercourse or drainage pathways that follow the topography, traveling towards a common waterbody within the watershed that could be as small as a pond or as large as an ocean. Flooding results when the flow of stormwater runoff is greater than the carrying capacity of nearby watercourses and waterbodies to which it drains.[[1]](#endnote-2)

Watercourse flooding usually involves a slow buildup of water and a gradual inundation of surrounding land. The presence of non-fragmented (intact) floodplains, wetlands, and forests contributes to a slower release of this stormwater buildup and helps to mitigate damaging peak flows. However, flash flooding, a quick overflow with high water velocities, can result from a combination of short-term intense precipitation events, presence of steep slopes, a short drainage, and a high proportion of impervious surfaces (e.g., buildings, roads, and parking lots) unable to absorb stormwater runoff.[[2]](#endnote-3)

The extent of associated damage and risk from flooding is related to how land has been developed. As forests, wetlands, and natural areas are increasingly replaced by impervious surfaces, the land's natural ability to store and absorb precipitation decreases and stormwater runoff increases. In addition to the direct threat to homes and buildings, development in floodplains also displaces vegetation that naturally absorbs flood energy and stabilizes banks. The effect of these changes is to increase the severity of flooding.[[3]](#endnote-4) Coupled with changing weather patterns, increased runoff into watercourses can change watercourse hydraulics and cause stream channels to erode. Channel instability poses threats to the built environment along watercourse corridors. Continued development also threatens the resiliency of coastal areas.

The following sections describe various local law techniques and approaches that steer development away from hazardous areas and from natural features that reduce flood risk.

# 2.2 Watercourse Protection

Watercourses are natural or artificial channels conveying water, including streams and rivers, are integral parts of the landscape that carry water and sediment from headwaters to downstream lakes, estuaries, and the ocean. Watercourse conditions are intimately connected to land uses in the watershed – the land area draining to a particular stream or waterbody. The areas bordering the watercourse -- riparian areas and floodplains – are particularly influential to the health of the waterbody.

Streams naturally migrate over time and maintain a balance with their contributing watersheds based on stream slope, flow, and the size and quantity of the sediment particles moved by the stream. Land use changes in the stream’s watershed that result in increased runoff or sediment loads will upset that balance and may result in extensive erosion and sedimentation and increased flood risk, threatening property and infrastructure.[[4]](#endnote-5) In addition to land use impacts, stream and river systems throughout New York have been significantly modified in ways that may increase flood risk:

* Straightened stream channels and those cut off from their floodplains by berms allow water to move more rapidly, which can increase its destructive power.
* Human modifications to streams and floodplains for controlling flood waters, such as levees, culverts or bulkheads, are expensive and high-maintenance, and may have negative unintended consequences for both natural habitat and human structures.
* Culverts that are too small for flood flows may clog with debris, causing flooding.
* Stream bank stabilization on one property to address threatening erosion problems may increase risk to other properties.
* Increased development in a watershed increases impervious surfaces, which increases runoff, potentially contributing to flood flows.

Definitions

Riparian areas are the lands and other areas bordering streams, rivers, lakes, marine shorelines, and other aquatic systems. These areas may include stream banks, uplands, lakeshores, wetlands, and floodplains.

Riparian buffers are vegetated areas next to water resources that protect water resources from nonpoint source pollution and provide bank stabilization and aquatic and wildlife habitat. The formal definition of riparian buffer is diverse and depends on the individual or group defining the term.

Floodplains are areas subject to flooding from an adjoining waterway. The National Flood Insurance Program uses floodplain delineations to prepare Flood Hazard Maps and Special Flood Hazard Areas.

The risk of flooding and erosion can be reduced by ensuring that water has area commensurate with anticipated volume to flow in the stream channel, floodwaters can access the floodplain, and the stream has adequate area to move following its natural dynamics. Maintaining or restoring naturally-vegetated floodplains and other stream buffers can reduce streambank erosion and sediment from entering watercourses, as well as help to slow and store floodwaters. For more detailed information on how watercourses, floodplains, and riparian buffers reduce flood risk, consult “Using Natural Resources to Reduce Risk of Flooding and Erosion in New York.[[5]](#endnote-6)

Watercourse protection is ideally accomplished within a watershed context. Watersheds and most streams and rivers span multiple municipalities and may require intermunicipal planning approaches to achieve desired outcomes, like reducing flood impacts. At the municipal scale, zoning and other land use tools such as conservation subdivisions (see *Basic Land Use Tools for Resiliency* Chapter) can be used throughout the watershed to conserve natural areas contributing to stream health and resilience. To reduce flood risk, municipalities should consider limiting development in the floodplain. (See *Management of Floodplain Developmen*t Chapter.)

State and federal regulation of streams is limited. New York State regulates the alteration of the bed and bank of “protected” streams. Protected status is based on designation of streams for human uses such as drinking, swimming, or fishing. The beds of navigable streams are regulated by the federal Army Corps of Engineers (USACOE). No state or federal regulation limits development in stream buffers or riparian areas. Many communities use their police powers to protect additional streams and require development setbacks from streams.

Benefits of Buffers

When left in a natural state, riparian buffer areas provide many critical functions for a healthy stream. The trees, shrubs, grasses, and other plants provide a natural transition between the water and the adjacent land that slows surface runoff, provides temporary flood storage, filters sediment and contaminants, reduces streambank erosion, and serves as critical wildlife habitat. In contrast, lawns and other maintained landscape areas generally provide little buffering benefit and can contribute to stream impairment by the overuse of fertilizer and pesticide chemicals.

What streams to protect

Municipalities have options when defining which watercourses to protect through local regulations. Some municipalities refer to perennial and/or intermittent streams that are portrayed on a map, such as the 7.5' USGS topographic quadrangle. (Several examples from New York State are listed in the table at the end of this section.) The Town of Coxsackie used a broad definition of watercourse in its natural resource protections standards, which includes headwater streams as well as lakes and ponds:

Any natural or artificial, intermittent, seasonal or permanent, and public or private water body or water segment. A water body is intermittently, seasonally or permanently inundated with water and contains a discernible shoreline and includes ponds, lakes and reservoirs. A watercourse includes rivulets, brooks, creeks, streams, rivers and other waterways flowing in a definite channel with bed and banks and usually in a particular direction.

Small streams and waterbodies are often overlooked. However, scientific evidence clearly shows that healthy headwaters — tributary streams, intermittent streams, and spring seeps — are essential to the health of larger stream and river ecosystems. Watercourse protection to reduce flood risk should apply to smaller streams, because reducing risks upstream will also reduce risk for downstream rivers and lakes. Small headwater streams are more vulnerable because they respond most dramatically to changes in nearby land uses and tend to be located on the steepest sloping and erosion-prone lands. Small streams and tributaries also often have the highest quality aquatic and terrestrial habitats and thus can benefit the most from riparian buffer protection.

Watercourse Maps and Headwaters

Some communities choose to protect streams that are identified on a map, most often those on a U.S. Geological Survey (USGS) topographic map. Keep in mind that all maps have inherent inaccuracies. USGS maps and data available from the NYSDEC omit many small streams and waterbodies, so relying on those maps may leave headwaters unprotected. On-site investigation is necessary to verify the presence of watercourses that might meet regulatory thresholds, such as intermittent streams that flow on a seasonal basis. The local law should define these smaller streams since they may not appear on a map, for example:

Intermittent Stream: Surface water drainage channels with definite bed and banks in which there is not a permanent flow of water. Intermittent streams may be represented as a dashed line on United State Geological Survey 7.5 Minute Quadrangle maps.

Watercourse Setbacks and Buffers

Most local watercourse protection laws require development setbacks, or buffers, on streams that prescribe distances between certain activities and the watercourse. A buffer is a strip of undisturbed native vegetation bordering a stream or river, or wetland. The trees, shrubs and plants, and grasses in the buffer provide a natural and gradual transition from terrestrial to aquatic environments. They slow the overland flow of water and act as a sponge, soaking up runoff from rainstorms and slowly releasing it to the stream. Protection or restoration of vegetated buffers along streams and rivers reduces the impacts of watershed stormwater runoff, as well as riverine flooding and erosion.

The width of a setback or buffer depends on the type of resource to be protected. For example, absorbing floodwaters from large storm events and protecting habitat requires a wider buffer width than if the objective is simply to preserve the integrity of the streambank. To determine the appropriate width for a vegetated riparian buffer, municipalities should consider the width of the floodplain, channel stability, slope, adjacent wetlands, wildlife corridors, the area of land draining into the waterbody, and existing land use and structures.[[6]](#endnote-7) The table below shows several recommended minimum buffer widths for common stream management objectives. [[7]](#endnote-8)

|  |
| --- |
| Recommended Minimum Buffer Width for Common Stream Management Objectives[[8]](#endnote-9) |
| Purpose of Buffer | Minimum Width of Buffer |
| Bank Stabilization  | 98 - 164 feet |
| Retain Nitrogen and Phosphorous to Protect Water Quality | 16 – 295 feet |
| Prevent Erosion (Sediment Input) | 32 – 393 feet |
| Wildlife Habitat | 98 feet – 5249 feet |
| Flood mitigation | 65 – 492 feet |

A number of methods can be used to assign buffers widths to watercourses in local laws:

Fixed width. The first option is a fixed-width buffer, which is the most-used by municipalities because it is the simplest to administer. One width may apply to all waterbodies, or the requirements can vary depending on the watercourse. For example, the Town of New Paltz has a 200-foot buffer along the Wallkill River, a 100-foot buffer along all other perennial streams, and a 50-foot buffer along intermittent streams. Fixed-width buffers are a one-size fits all approach that will be more than adequate in some situations and inadequate in others.[[9]](#endnote-10)

Variable width. Because every stream, parcel, and land use are different, a second option is the variable width approach, which is tailored to site-specific conditions such as slope and intensity of land use. While more science-based, it requires individual site evaluation and may be more difficult to administer.[[10]](#endnote-11)

Flexible fixed width. A third option is flexible fixed-width buffers, where municipalities determine a standard width and specify criteria for expanding or contracting the buffer, such as to include the 100-year flood plain, undevelopable steep slopes, and/or adjacent wetlands, headwater stream networks, or critical habitats. [[11]](#endnote-12)

Streamway setback. A fourth option is the streamway setback, which is a calculated distance adjacent to a stream that provides space for the stream to migrate and allows for natural changes in width, depth, slope and channel meander pattern, and moves development away from the highest risk areas.[[12]](#endnote-13)

When establishing local laws that promote, establish and protect buffers, it is important to consider the point from which the buffers should be measured. Fixed and variable width buffers are generally determined by measuring inland perpendicular from either the top of bank or the top of slope, depending on the stream channel characteristics. Buffers could also be defined as including the bed and bank of the stream, and measurements adjusted accordingly.

Local watercourse laws may go beyond buffer requirements and regulate activities in the watercourse itself. Town of New Paltz, for example, regulates activities within the stream channel as well as the buffer.

Some municipalities define zones within buffers and allow different activities in each zone. An example of this approach is the Model Stream Overlay District in this document, which defines a primary riparian buffer where uses are more restricted than in the secondary riparian buffer.

The following table is a summary of the techniques illustrated in this section that can be used to protect watercourses.

|  |  |
| --- | --- |
| Technique | Description |
| Local Watercourse Law | A resource-specific law designed to address the gap in existing state or federal stream protection by regulating activities within unprotected watercourses and lands adjacent to all watercourses. This is usually the most comprehensive approach because it applies to more streams and is more than a setback. |
| Stream Overlay District | An overlay district that adds standards to the base use and area requirements of underlying zoning. The difference from a local watercourse law is its application only to the district as defined on the official zoning map, such as an area along a specific stream.  |
| Stream-Related Zoning Standards | Standards within a zoning law that apply to all lands with certain natural resource constraints. They can be used simply to require setbacks on streams and can require a permit for a range of activities in within streams. They may also be used as performance standards. |
| Simple Watercourse Setbacks | A standard setback of specified width from the centerline of any watercourse as defined in the zoning. Simple setbacks are typically only building setbacks that apply to certain projects before the planning board. |

The following chart illustrates how municipalities have applied the various local law techniques to regulate watercourses and buffer areas. All the illustrations are more protective than existing state or federal regulations; however, they each provide differing levels of protection. The key differences are in their applicability; i.e., which streams and buffers they protect, and how they define the land uses or management activities that are subject to the regulations. All the techniques are flexible and exempt specific types of activities from regulation (e.g., agricultural operations or collecting firewood).

| Local Watercourse Protection Approach | Regulated Watercourses | Regulated Buffer | Applicability | Technique |
| --- | --- | --- | --- | --- |
| Town of Pawling (NY) Freshwater Wetlands and Watercourse Protection Law[[13]](#endnote-14) | Any natural or artificial, permanent or intermittent, public or private waterbody or water segment, such as ponds, lakes, reservoirs, rivers, streams, brooks, waterways or natural drainage swales. | 100 ft as measured from the top of the bank of the watercourse | A permit is required for all activities identified in Section 111-4 of the Town of Pawling law. | Local Watercourse Law |
| Town of New Paltz (NY), Wetlands and Watercourse Protection Law[[14]](#endnote-15)  | Any natural, permanent, seasonal, or intermittent channel or water segment, rivers, streams, brooks, naturally occurring impoundments within such channels or other waterways that are contained within, flow through, or border on the town. Artificial water segments, such as swales and ditching, are excluded. | 200 ft buffer for Wallkill River100 ft buffer for perennial watercourse50 ft buffer for intermittent watercourse | A permit is required for all activities identified in Section 139-8 of the Town of New Paltz law. | Local Watercourse Law |
| Town of Philipstown (NY), Freshwater Wetlands and Watercourses Law[[15]](#endnote-16) | Rivers, streams, brooks, ponds, lakes, reservoirs and waterways, whether running constantly or intermittently, which are delineated on the current edition of the United States Department of Interior, Geological Survey, 7.5 Minute Series (Topographic) maps bearing the date 1981 (Peekskill Quadrangle), 1981 (West Point Quadrangle) and 1979 (Oscawana Lake Quadrangle), covering the Town of Philipstown; and any other streams, brooks and waterways which are contained within, flow through, or border on the Town of Philipstown, and any additional streams, brooks and waterways which are delineated on the map as defined in section 93-4 of this law. | 100 ft from the mean high-water mark, measured horizontally | A permit is required for all regulated activities listed in Section 93-5 of the law. | Local Watercourse Law |
| Town of Poughkeepsie (NY), Aquatic Resource Protection Law[[16]](#endnote-17) | Any watercourse which appears as a solid blue line on the 2003 Aquatic Resources Map of the Town. | 50 ft buffer for Wappinger Creek25 ft for all other watercourses | A permit is required for all activities identified in Section 116-5 of the Town of Poughkeepsie law. | Local Watercourse Law |
| Local Watercourse Protection Approach | Regulated Watercourses | Regulated Buffer | Applicability | Technique |
| Town of New Castle (NY), Wetlands Law [[17]](#endnote-18) | Any natural or artificial, permanent or intermittent, public or private surface water body or surface water segment, such as ponds, lakes, reservoirs, rivers, streams, brooks or waterways  | 100 ft | A permit is required for all activities identified in Section 137-3 of the Town of New Castle law. | Local Watercourse Law |
| Model Stream Overlay District for the Moodna Creek Watershed Intermunicipal Council (NY) [[18]](#endnote-19) | The full length and width, including the bed and banks, of any watercourse that has a channel which periodically or continuously contains moving water. Excludes constructed drainage-ways, except modified natural streams. | Four options: 2 are fixed width (100 and 200 ft), the other options expand fixed width with floodplains, wetlands, and steep slopes; different activities are regulated in the primary and secondary buffers | To be defined by the municipality; apply to all proposed actions requiring [defined] approval | “Stream” Overlay District |
| City of Newburgh (NY), Waterbody Protection Overlay District[[19]](#endnote-20) | The overlay district consists of lands within 100 feet of 9 identified waterbodies, including the Quassaick Creek and Hudson River, as well as several lakes and ponds. | 100 ft for principal structures50 ft for accessory structures larger than 200 sq ft  | Site plan review is required to clear, fill, dredge, excavate, deposit materials, and for all construction activities.  | Stream Overlay District |
| Town of Coxsackie (NY), Natural Resource Protection Standards[[20]](#endnote-21) | Any natural or artificial, intermittent, seasonal or permanent, and public or private water body or water segment. A water body is intermittently, seasonally or permanently inundated with water and contains a discernible shoreline and includes ponds, lakes and reservoirs. A watercourse includes rivulets, brooks, creeks, streams, rivers and other waterways flowing in a definite channel with bed and banks and usually in a particular direction. | 150 ft for Hudson River100 ft for perennial streams (solid blue line on USGS map)50 ft for intermittent streams (broken blue line on USGS map)25 ft all other watercourses | Exempts development improvements to single-family or two-family residential lots in single lot ownership; or a minor subdivision. | Zoning Standards |

| Local Watercourse Protection Approach | Regulated Watercourses | Regulated Buffer | Applicability | Technique |
| --- | --- | --- | --- | --- |
| Town of Wallkill (NY), Shawangunk Kill Corridor Preservation Overlay District (NY)[[21]](#endnote-22)  | The Shawangunk Kill Corridor, as described on the Town’s Zoning Map. | Manufacturing and Industrial uses: 250 ftCommercial uses: 200 ft Residential uses: varies from 65-100 ft based on the fixed edge of the watercourse at full flow  | All uses are prohibited except those exempted in Section 249-105 of the Town of Wallkill law. Special permits for Marinas for non-powered boats, public and private boat entry points, Structures or uses required for the operation of a public utility, such as utility rights-of-way and crossings and Decks for restaurants and in existing cleared areas. in Section 249-107. | Stream Overlay District |
| Town of Ulysses (NY) Zoning Law[[22]](#endnote-23) | Watercourses that carry water for at least 6 months of the year. | Residential areas: 50 ftIntermittent streams: 50 ftPerennial streams in areas of more intense use: 50 ft, and may be increased by up to 50% should the Planning Board find it necessary to minimize impacts  | Projects that require building permits or planning board approval. | Simple Setbacks |
| Town of Woodstock (NY), Wetland and Watercourse Protection Standards[[23]](#endnote-24)  | Any natural, artificial, permanent, seasonal, or intermittent, public or private water segment, such as rivers, streams, brooks, or other waterways that are contained within, flow through, or border on the Town of Woodstock. A watercourse contains a discernible channel, bed, and/or banks and usually flows in a particular direction. Artificial water segments, such as swales and ditching shall not be considered a regulated watercourse, provided they do not discharge directly into a naturally occurring wetland water body or watercourse. | 30 to 100 ft depending on the upstream drainage area and the slope of the land, according to "Applicable Watercourse Buffer" map (with default of 30 ft in all other cases) | A permit is required for all activities listed in Section 260-34C of the Town of Woodstock law. | Zoning Standards |

RESOURCES

*Westchester County: A guide to Aquatic Buffers.* (2007). Westchester County Soil and Water Conservation District [[24]](#endnote-25)

*Conservation Thresholds for Land Use Planners*. (2003). Washington, D.C: Environmental Law Institute. [[25]](#endnote-26)

Kusler, J. (2016). *Model “Riparian” Protection Ordinance*. Berne, NY: Association of State Wetland Managers.[[26]](#endnote-27)

Kusler, J. (2009). *Model Ordinances for Regulating Wetlands, Riparian Habitats, and Stream Buffers*. Berne, NY: Association of State Wetland Managers.[[27]](#endnote-28)

*Model Stream Overlay District Developed for the Moodna Creek Watershed Intermunicipal Council.* (2014). Moodna Creek Watershed Intermunicipal Council Outreach and Education Committee and the Orange County Planning Department.[[28]](#endnote-29)

# 2.2.1 Simple Watercourse Setbacks

Some level of watercourse protection can be achieved through a standard tool of zoning – a setback requirement. This is a simple technique that prevents building too close to streams and waterbodies. The size of the setback could be increased for environmentally sensitive areas (e.g., lake shore and conservation districts), or areas of more intensive uses (e.g., industrial and business districts). Setbacks typically have limited applicability. In this example, the setbacks only apply in certain districts.

USAGE

Amend the sections in the municipal zoning law that describe the lot area and yard requirements of a zoning district to add a provision related to stream setbacks. Definitions of “stream,” “stream protection buffer,”” watercourse,” and “wetland” should be added to the definition section of the zoning law, and standards for vegetative buffers added to the design standards section of the zoning law.

ADAPTED FROM THE FOLLOWING SOURCE

Town of Ulysses (NY) Zoning Law, Article IV – Definitions, Article XX – Design Standards, Section 20.6.2 Stream Protection Setback[[29]](#endnote-30)

LANGUAGE

*Add the following definitions to the zoning law:*

Bank: That land area immediately adjacent to and which slopes toward the bed of a watercourse and which is necessary to maintain the integrity of the watercourse.

Stream: A watercourse that carries water for [*insert number of months, Town of Ulysses uses six*] months or more throughout a year. The edge of the stream is the bank of the stream or the top edge of the embankment if the stream is more than ten feet below the grade of the surrounding embankment.

Stream Protection Buffer: A strip of land on each side of a stream intended to provide several important societal services, including flood reduction, erosion control, groundwater filtration, surface water quality improvement and wildlife habitat. The buffer shall consist of the area included in a stream protection setback and be divided into three sections: streamside, middle, and outer.

Watercourse: A permanent or intermittent stream or other body of water, either natural or man-made, which gathers or carries surface water.

Wetland: Lands, including submerged lands, saturated by water at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. For the purpose of this local law, wetlands are limited to those lands that meet any of the following criteria: are categorized as wetlands by the New York State Department of Environmental Conservation; have been documented and mapped as part of an officially adopted community wetlands inventory; or meet the U.S. Army Corps of Engineers’ definition of a wetland.

*Add a stream protection setback standard to each zoning district description:*

Stream protection setback [*residential areas*]. No buildings or other structures, or parking areas, shall be located within [*insert number of feet, Town of Ulysses uses 50*] feet from the edge of a stream or wetland, as defined in Section [*insert number of definition section of zoning law]*.

OR

Stream protection setback [*areas of more intense use*]. No buildings or other structures, or parking areas, shall be located within [*insert number of feet, Town of Ulysses uses 100*] feet from the edge of a stream or wetland, as defined in Section [insert number of definition section of zoning law]. With the exception of stream crossings, no roadways shall be located within [*insert number of feet, Town of Ulysses uses 50*] feet from the edge of a stream or wetland. Structures near streams may also be subject to additional design standards as described in Section [*insert section number for design standards for stream protection setbacks*.]

OR

Stream protection setback [e*nvironmentally sensitive areas*]. No buildings, structures, paved areas, or storage of construction equipment or machinery shall be located within [*insert number of feet, Town of Ulysses uses 50*] linear feet of the edge of any stream, and [*insert number of feet, Town of Ulysses uses 100*] feet of any wetland. The [*insert name of review board*] may increase the area of such protected buffer area by up to 50% if it determines that such an increase is necessary to protect water quality or to minimize or mitigate the impacts of erosion and sedimentation.

*Add a design standard*:

Section X. Stream Protection Buffer.

A. Stream Protection Buffer required. Healthy stream sides that are vegetated with native woody trees and shrub plants provide flood reduction, erosion control, groundwater filtration, surface water quality improvement, and wildlife habitat. Therefore, commercial properties and all properties in the [*insert zoning districts that this will apply to, such as environmental overlay districts that are being considered for new development or building upgrades and that encompass or adjoin a stream or creek*] are required to maintain and protect the existing vegetated streamside habitat in the area included in a stream protection setback (i.e., a Stream Protection Buffer), during and after construction, and must restore vegetation in the Stream Protection Buffer consistent with the requirements of Paragraph B where such vegetation has been removed.

B. Required vegetation. Vegetation in a Stream Protection Buffer shall consist of native tree and shrub species, tolerant of the conditions of flooding and soil saturation that are typical of such habitats, and generally designated as Obligative Wetland (OBL), Facultative (FAC), Facultative Wetland (FACW), or Facultative Upland Species (FACU) in the U.S Army Corps of Engineers National Wetland Plant List.[[30]](#endnote-31) Vegetation shall be planted in a manner consistent with the following within the Stream Protection Buffer:

(1) The streamside section, intended to protect the physical and ecological integrity of the stream ecosystem, should consist of approximately twenty feet of vegetation consistent with undisturbed mature forest directly adjacent to the bank.

(2) The middle section, intended to protect water quality and the stream ecosystem, should consist of approximately fifteen feet of actively growing forest in which periodic thinning is permitted.

(3) The outer section, intended to filter runoff from adjacent land and encourage sheet flow of runoff into the buffer, should consist of approximately fifteen feet of native woody and herbaceous vegetation to increase the total width of the buffer; native grasses and forbs are acceptable.

RESOURCES

Strong, K. (2008). *Conserving Natural Areas and Wildlife in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York’s Hudson River Valley.* Ithaca, NY: New York Cooperative Fish and Wildlife Research Unit, Cornell University, and NYS Department of Environmental Conservation, Hudson River Estuary Program. [[31]](#endnote-32)

*Stream Processes: A Guide to Living in Harmony with Streams*. (2016). Horseheads, NY: Chemung County Soil and Water Conservation District.[[32]](#endnote-33)

*Westchester County: A Guide to Aquatic Buffers*. (2007). Westchester County Soil and Water Conservation District.[[33]](#endnote-34)

# 2.2.2 Stream-Related Zoning Standards

Supplemental zoning standards can be adopted as additional requirements to underlying zoning district provisions to establish setback buffer areas and restrictions to activities within those buffers. Among the purposes of these standards is to retain areas of annual flooding, floodplains, and wetlands in their natural state to the maximum possible extent to preserve water quality and protect water retention, overflow, and natural functions.

The example below defines streams to be protected based on United States Geological Survey Topographical Maps (7.5 minute series), with solid blue lines representing perennial streams and broken blue lines representing intermittent streams.

The example was modified to promote stormwater management using practices compatible with buffer protection, rather than stormwater practices that require substantial construction resulting in a larger impact, such as stormwater ponds.

USAGE

Incorporate the supplemental zoning standards into the performance standards section of a municipal zoning law. It would be applicable everywhere in the municipality where resources falling under the definition of “watercourse” exist.

ADAPTED FROM THE FOLLOWING SOURCE

Town of Coxsackie (NY) Zoning Law, Article VI Natural Resource Protection Standards, Section 201-48[[34]](#endnote-35)

LANGUAGE

Section X. Watercourses

A. Definitions. The following definitions shall apply to this section.

(1) Buffer: A designated area along the perimeter of a wetland, fish or wildlife habitat, or other area regulated on a seasonal or permanent basis so as to minimize or mitigate the impact of adjacent activities, such as human related-disturbances.

(2) Watercourse: Any natural or artificial, intermittent, seasonal or permanent, public or private water body or water segment. A watercourse is intermittently, seasonally or permanently inundated with water and contains a discernible shoreline, including waterways flowing in a definite channel with bed and banks and usually in a particular direction. Watercourses include ponds, lakes and reservoirs rivulets, brooks, creeks, streams, rivers and other waterways.

(3) Watercourse Buffer: The Watercourse Buffer is a buffer area surrounding a watercourse that is intended to protect the watercourse from human activity and other encroachment associated with development.

(4)Agricultural: The raising of crops, animals and animal products; forestry; other commonly accepted agricultural operations for commercial purposes, including the sale of products grown on the premises.

B. Watercourse buffer areas. These standards shall apply to any activities proposed within Watercourse Buffers, which shall exist upon:

(1) All land within 100 feet horizontal distance of the center line of any perennial stream as designated by a solid blue line on United State Geological Survey Topographical Maps (7.5 minute series).

(2) All land within 50 feet horizontal distance of the center line of any intermittent stream as designated by a broken blue line on United States Geological Survey Topographical Maps (7.5 minute series).

(3) All land within 25 feet horizontal distance of the center line of any other watercourse.

|  |  |
| --- | --- |
| Watercourse Feature | Buffer |
| Perennial Stream | 100 feet |
| Intermittent Stream | 50 feet |
| Other Watercourses | 25 feet |
| Mean High Tide Mark of Tidal River | 150 feet |

(4) All lands within 150 feet horizontal distance of the mean high tide mark of the [*insert name of river*] or the tidal portions of its tributaries.

C. General standards. It is the objective of these standards to promote the establishment of heavily vegetated areas of native vegetation and trees in order to reduce the impacts of stormwater runoff, reduce sedimentation, and increase infiltration and base flows in the [*City/Town/Village*]'s Watercourses. All lands within a designated Watercourse Buffer defined above shall be left in an undisturbed, naturally vegetated condition. Supplemental planting and landscaping with appropriate species of vegetation necessary to achieve these objectives shall be permitted.

The specific standards for the vegetation and maintenance of Watercourse Buffers are as follows:

(1) The clearing of trees that are not dead, heavily damaged by ice storms or other natural events, or diseased; and the clearing of any other vegetation other than invasive species, is prohibited.

(2) Any areas within a Watercourse Buffer not occupied by a structure, whose vegetation is removed or disturbed during development or other human activities, shall promptly be seeded with a naturalized mix of grasses rather than standard lawn grass. If such disturbance to the buffer area impacts tree or shrub species, the disturbed area shall promptly be restored using the same species of trees and shrubs, unless those species were invasive species, in which case native trees and shrubs shall be used.

(3) Watercourse Buffers shall not be mowed more than once per calendar year after vegetation establishment. Mowing of buffer areas shall not be undertaken until after August 15th of each year in order to reduce impacts to ground nesting species. Mowing related to agricultural activities is exempt from this requirement.

(4) The creation of lawns consisting of cultivated and mowed grass within Watercourse Buffers is prohibited.

(5) Snow storage areas designated pursuant to site plan review shall not be located within Watercourse Buffers, unless the applicant can demonstrate that there is no reasonable alternative location for snow storage on the same property, and the site plan and/or stormwater treatment system incorporates measures to reduce the potential for erosion and contaminated runoff entering the associated watercourse as a result of snow melt, such as infiltration areas or enhanced buffer vegetation.

(6) Agriculture, horticulture and forestry, including the keeping of livestock, is permitted, provided that any building or structure associated with such uses is located outside the watercourse buffer. Livestock-based agricultural operations should minimize livestock impacts within the Watercourse Buffer to the maximum extent possible.

(7) Encroachments necessary to rectify a natural catastrophe for the protection of the public health, safety and welfare are permitted. Such encroachments shall be undertaken so as to minimize the impact and every reasonable effort shall be made to restore the site after the activity is completed.

(8) Encroachments are permitted as necessary for building, maintaining, or improving public facilities in those cases where there is no practicable alternative to encroaching upon the Watercourse Buffer.

(9) Public recreation paths located at least ten feet from the bank of the watercourse are permitted. Outdoor recreation facilities are permitted provided any building or structure (including parking and driveways) associated with such use is located outside the watercourse buffer.

(10) The following green infrastructure practices for stormwater management, as described in Chapter 5 of the New York State Stormwater Management Design Manual,[[35]](#endnote-36) (SWDM) may be permitted in the Watercourse Buffer as long as such facilities and practices are designed and built consistent with the criteria as set forth in the SWDM:

5.1.1 Preservation of Undisturbed Areas

5.1.2 Preservation of Buffers

5.1.3 Reduction of Clearing and Grading

5.1.4 Locating Development in Less Sensitive Areas

5.1.5 Open Space Design

5.3.1 Conservation of Natural Areas

5.3.2 Sheetflow to Riparian Buffers

(11) Where there is no feasible alternative method for providing safe access and where the roadway or access drive is located at least 10 feet from the bank of the watercourse, a roadway or access drive is permitted for the purpose of gaining access to land on the opposite side of the Watercourse Buffer or providing safe access to an approved use.

(12) Utility structures, including power, telephone, cable, sewer and water, [*insert if desired, gas or oil pipelines, having a diameter of \_\_ or less*] are permitted, so long as encroachment is limited to the minimum extent necessary, and there is no feasible alternative for providing or extending utility services.

A model local law from the Huron River Watershed Council provides an exemption for construction of a single-family residence that is part of a plat for subdivision or approved site plan prior to the date the new provision is adopted, including the usual appurtenances, provided that:

(a) Based on the size, shape or topography of the property, it is not reasonably possible to construct a single-family dwelling without encroaching upon the riparian buffer area;

(b) The dwelling conforms to all other zoning regulations;

(c) Septic tanks or drain fields are not located within the riparian buffer area;

(d) The dwelling avoids to the maximum extent practicable disturbance of the riparian forest buffer area.

D. Preexisting structures. Expansion and construction of preexisting structures within a Watercourse Buffer may be approved by the [*insert name of review board*] as a [*special use/conditional use*], provided the requirements of the underlying zoning district, *[delete if not applicable]* the requirements in the [*City/Town/Village*] Flood Damage Prevention Law, and the following standards are met:

(1) The structure to be expanded or reconstructed was originally constructed prior to the adoption of these standards. For purposes of these regulations, expansion includes the construction of detached accessory structures, including garages and utility sheds.

(2) The expanded or reconstructed structure does not extend any closer, measured in terms of horizontal distance as defined in Paragraph B, than the closest point of the structure prior to its expansion or improvement.

(3) The total footprint area of the expanded or reconstructed structure shall not be more than fifty percent larger than the footprint of the structure lawfully existing on the date of the adoption of these standards. For purposes of these regulations, reconstruction includes but is not limited to razing the existing structure and/or foundation and constructing a new structure in accordance with the provisions of the underlying zoning district regulations and this section

(4) An erosion control plan for construction is submitted by a licensed engineer or other qualified professional (i.e., certified professional in erosion and sediment control) detailing the controls that will be put in place to protect the associated watercourse.

(5) A landscaping plan showing plans to preserve, maintain and supplement existing trees and ground cover vegetation in the Watercourse Buffer is submitted and the [*city/town/village*] [*insert name of review board*] finds that the overall plan will provide a visual and vegetative buffer for the lake and/or stream.

E. Watercourse alteration and relocation. The alteration, relocation or culverting of a watercourse shall only be permitted following the review and approval of the Planning Board. In reviewing applications to alter, relocate, or culvert a watercourse, the Planning Board shall be authorized to invoke reasonable technical review, at the applicant's expense, by a suitable professional in hydrology or geomorphology, and/or to rely on the issuance of a stream disturbance permit (Article 15 of the New York Environmental Conservation Law) issued by the New York State Department of Environmental Conservation.

The [*insert name of review board*] shall deny an application to alter, relocate, or culvert a watercourse unless it finds that such activity:

(1) is necessary to accomplish a clear public purpose or objective;

(2) will not reduce the ability of the watercourse to adequately carry or store floodwaters;

(3) will not have an adverse impact on downstream or upstream water quality;

(4) will not adversely affect the use and enjoyment of adjacent properties; and

(5) will not affect adversely the habitat value of the watercourse or the areas or wetlands immediately adjacent thereto.

F. Inspection. The Code Enforcement Officer may enter upon the lands or waters for the purpose of inspection to determine compliance with this section.

# 2.2.3 Watercourse Overlay District

Overlay districts may be established to protect streams, establish buffer areas, and restrict activities within buffers. Such districts are geographically limited and defined on a zoning map. The standards included in an overlay district are in addition to the density, area, and use requirements of the underlying zoning district.

The example which follows is from a model local law created for the Moodna Creek Watershed Intermunicipal Council in Orange County, New York. A stream is broadly defined in this model, and includes intermittent as well as permanent streams, although the definition excludes constructed drainage-ways, including water bars, swales, and roadside ditches, unless they were constructed by channelizing or otherwise modifying a natural stream, wetland, or waterbody of any kind.

There are four different buffer width options, all of which have primary and secondary areas with different standards. Options A and C are fixed width buffers; options B and D allow buffers to expand to cover the floodplain and riparian wetlands. The example is applicable to regulated activities in all land use approval processes, including approvals for subdivisions, site plans, building permits and variances.

Stream buffer widths contained in the model law were determined using scientific guidance set forth in Conservation Thresholds for Land Use Planners, published by the Environmental Law Institute in 2003, and Conservation Buffers: Design Guidelines for Buffers, Corridors, and Greenways, published by the United States Department of Agriculture in 2008.

One of the uses described as permitted within the buffer area is limited tree cutting, forestry or vegetation management done pursuant to plans by certain professionals. The local law states that any harvesting must furthermore be done in accordance with the *New York State Forestry Best Management Practices for Water Quality – BMP Field Guide*, which is available from the NYS Department of Environmental Conservation.[[36]](#endnote-37)

USAGE

Identify the area(s) of the municipality that would be included in the Watercourse Overlay District and prepare a map showing those areas as an overlay to the municipal zoning map. Amend the section of the municipal zoning law that establishes zoning districts to include the new overlay district.

ADAPTED FROM THE FOLLOWING SOURCE

Stream Corridor Overlay Model Local Law (2014), Developed for the Moodna Creek Watershed Intermunicipal Council by the Council’s Outreach & Education Committee with technical assistance from the Orange County (NY) Planning Department[[37]](#endnote-38)

LANGUAGE

Section X. Watercourse Overlay District

A. Findings.The [*City Council/Town Board/Village Board of Trustees*] of the [*city/town/village*] hereby finds that the encroachment of development activities into stream corridors could create a public and private nuisance, degrade the natural environment, and be harmful to the public health, safety and welfare. Such activities can increase the risk of flooding in the stream corridor, damage water quality in the surface waters within and downstream of the [*city/town/village*], harm the aesthetic qualities of the [*city/town/village*], damage wildlife and vegetative habitat, pose additional threats to rare, threatened and endangered species that depend on riparian habitats, and tend to depreciate the value of properties in the [*city/town/village*]. The [*City Council/Town Board/Village Board of Trustees*] finds that these problems can be diminished by applying a primary and a secondary riparian buffer to all stream corridors within the [*city/town/village*] in keeping with the standards established in this local law.

C. Purpose.The purpose of this Section is to establish requirements for creating and maintaining buffers to protect the water quality in the streams of the [*city/town/village*] and the natural environment around them, thereby protecting public health, safety and welfare in this [*city/town/village*]. This Section promotes the prevention of sediment, nutrient and pollutant loads from entering streams by maintaining stream buffers measured from the top of the stream bank with a width to be determined by the conditions adjacent to the stream corridor. Research has shown that the distances set forth within this local law are effective at filtering nutrients and pollutants to protect water quality. Additionally, creating buffers for structures and improvements from highly erodible streams will help minimize future property damage and other impacts associated with streambank erosion. Although it is not mandated in this Section, the [*city/town/village*] strongly encourages landowners to maintain stream buffers of 330 feet from the top of stream bank on undeveloped land, where feasible, in order to protect wildlife and vegetative habitat.

D. Definitions. As used in this Section, the following terms shall have the meanings indicated: [*Alternatively, these definitions may be incorporated into the list of other zoning definitions. Make sure they are consistent with existing definitions*.]

Bank: the lateral confines of a stream, river, or other watercourse that contain the normal flow of the watercourse.

Buffer: land on each side of a stream that shall be left vegetated to provide riparian corridor functions. Buffers are measured horizontally from the top of the stream bank in a direction directly perpendicular to the bank and in the horizontal plane.

Development Activities: the construction, reconstruction, conversion, structural alteration, relocation, or enlargement of any structure or improvement that requires a permit or approval from the [*City/Town/Village*], including that intended for agricultural use; and any mining excavation, landfill, or land disturbance, including grading and filling.

Green Infrastructure Practices: stormwater management practices that maintain or restore natural stormwater flow pattern by allowing the water to permeate slowly into the ground and be used by plants. Green infrastructure practices generally incorporate higher functioning site design and low-impact development design techniques.

Highly Erodible Soils: Soils that have a maximum potential for erosion that equals or exceeds eight times the tolerable erosion rate.[[38]](#endnote-39)

Improvement: alterations to the land that enhance the utility or value of the site and/or any structures thereon.

Intermittent Stream: surface water drainage channels with definite bed and banks in which there is not a permanent flow of water (and may be represented as a dashed line on United State Geological Survey (USGS) 7.5 Minute Quadrangle maps). Sometimes referred to as “ephemeral stream.”

Impervious Surface: any paved, hardened or structural surface including, but not limited to, buildings, dams, decks, driveways, parking areas, patios, streets, swimming pools, tennis courts, walkways, and other non-permeable structures and improvements. Impervious surfaces include compacted shale, gravel, and packed dirt, as well as other materials that become impervious when compacted.

Parcel: a designated tract or area of land established by plat, subdivision, or as otherwise permitted by law, to be separately owned, used, developed, or built upon.

Perennial Stream: a stream that typically flows continuously throughout the year in a natural or man-made channel (which may be represented as a solid blue line on United States Geological Survey (USGS) 7.5 Minute Quadrangle maps).

Pollutant: dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials other than those regulated under the Atomic Energy Act of 1954 as amended (42 U.S.C. § 2011 et seq.), heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal and agricultural waste discharged into water. [[39]](#endnote-40)

Riparian: of, inhabiting or situated on the bank of a natural course of water such as a river.

Steep Slope: any slope of 15% grade or greater.

Stream: the full length and width, including the bed and banks, of any watercourse that has a channel which periodically or continuously contains moving water and has a defined bed, and has banks that serve to confine water at low to moderate flows (and may be represented as either a solid or dashed blue line on United States Geological Survey (USGS) 7.5 Minute Quadrangle maps). For the purpose of this Local Law, constructed drainage-ways, including water bars, swales, and roadside ditches, are not considered streams, unless they were constructed by channelizing or otherwise modifying a natural stream, wetland, or water body of any kind.

Structure: anything constructed or erected on or under the ground or upon another structure or building.

Tolerable Erosion Rate: The maximum rate of soil erosion that is equaled by the rate of soil development, thus allowing an equilibrium between the amounts of soil lost and gained. Values for allowable soil loss for different soil types may be found in Section II of the Field Office Technical Guide (FOTG) for the County of [*insert name of county*] maintained by the Natural Resources Conservation Service of the U.S. Department of Agriculture.

Top of Stream Bank: the primary edge of the ordinary high water mark, or break in slope for a watercourse that maintains the integrity of the watercourse.

Undeveloped Land: A parcel of land that does not contain residential and/or commercial structures that have been issued certificates of occupancy or the equivalent from the *City/Town/Village* Code Enforcement Officer. Land that contains structures constructed without valid building permits or other approvals, and/or which have not been issued a certificate of occupancy or the equivalent shall be considered to be undeveloped.

Wetlands: lands, including submerged lands, saturated by water at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. For the purpose of this local law, wetlands are limited to those lands that meet any of the following criteria: 1) are categorized as wetlands by the New York State Department of Environmental Conservation (NYSDEC); 2) have been documented and mapped as part of an officially adopted community wetlands inventory; and/or 3) meet the U.S. Army Corps of Engineers’ definition of a wetland.

E. Applicability. This Section shall apply to all proposed actions requiring approval by the [*insert name of approval authority, such as code enforcement officer or Planning Board*]. The Riparian Buffer Area, both Primary and Secondary, shall be acknowledged and displayed graphically on all plans and relevant materials that are submitted to the [*city/town/village*] as part of any land use approval process, including approvals for subdivisions, site plans, building permits and appeals for variances. These requirements do not supersede or replace any greater applicable requirements established under state, federal or local law.

F. Protection requirements for perennial streams. The required buffer shall be established for all development activities, as defined in Paragraph D, that occur in proximity to perennial streams with additional considerations for wetlands, highly erodible soils, 100-year floodplains and steep slopes. The buffer shall be subdivided into a Primary Riparian Buffer and a Secondary Riparian Buffer that protects overall water quality by limiting development in accordance with the adjacent land’s ability to filter sediment, nutrients and other pollutants. The buffer will provide stability to the stream and stream bank. The minimum total buffer width for all perennial streams is [*insert minimum size based on protection options in F(2)*] as measured from the top of the stream bank. There is no established maximum buffer width.

The [*city/town/village*] shall require the delineation of any applicable Primary or Secondary Riparian Buffers on all subdivision plats, site plan applications, special permits, special approval and variance applications, building permit applications, and excavation or fill permit applications, even in the event that a stream is not located within the subject parcel but the Primary Riparian Buffer and/or the Secondary Riparian Buffer is located on the subject parcel. This delineation shall be subject to review and approval by the appropriate board or officer. Said delineation shall also be referenced in any deed for any parcel located wholly or partly within any Primary or Secondary Riparian Buffers, which shall state that:

The premises hereby conveyed are subject to a Primary and/or Secondary Riparian Buffer established pursuant to the “Watercourse Overlay Local Law of the [*City/Town/Village of \_\_\_\_\_\_*], as shown on [*plat or other map or permit*] recorded in the Office of the County Clerk on [*insert date*] in [*book/page/file/drawer*].” Prior to any soil-disturbing activity requiring a permit or approval by the [*city/town/village*], the Primary Riparian Buffer and Secondary Riparian Buffer shall be clearly delineated on site and shall be left undisturbed or otherwise protected throughout the construction phase.

(1) Riparian Buffer Area. [*Select one of the following options*]

*[Protection Option A]* The Riparian Buffer will begin at the top of the stream bank and extend a minimum of 100 feet horizontally measured in a direction directly perpendicular to the stream bank in a horizontal plane. The Buffer area will be subdivided into a Primary Riparian Buffer extending 50 feet from the stream bank, and a Secondary Riparian Buffer extending 50 feet from the outward boundary of the Primary Riparian Buffer.

OR

*[Protection Option B]* The Riparian Buffer will begin at the top of the stream bank and extend a minimum of 200 feet horizontally measured in a direction directly perpendicular to the stream bank in a horizontal plane. The Buffer area will be subdivided into a Primary Riparian Buffer extending 100 feet from the stream bank, and a Secondary Riparian Buffer extending 100 feet from the outward boundary of the Primary Riparian Buffer.

OR

*[Protection Option C]* The Primary Riparian Buffer will begin at the top of the stream bank and extend a minimum of 100 feet horizontally measured in a direction directly perpendicular to the stream bank in a horizontal plane. The Buffer area will be divided into a Primary Riparian Buffer extending 50’ from the stream bank and a Secondary Riparian Buffer extending 50’ from the outward edge of the Primary Riparian Buffer. Should a wetland or a 100-year floodplain exist at least partially within the Secondary Riparian Buffer, the entirety of that area will be included within the Secondary Riparian Buffer and will be subject to the restrictions afforded to the Secondary Riparian Buffer. Should a steep slope or highly erodible soils exist partially within the Secondary Riparian Buffer, that steep slope or highly erodible soil area up to a maximum of 400 feet from the stream bank shall be included within the Secondary Riparian Buffer.

OR

*[Protection Option D - Recommended for all Class A streams.]* The Riparian Buffer will begin at the top of the stream bank and extend a minimum of 200 feet horizontally measured in a direction directly perpendicular to the stream bank in a horizontal plane. The Buffer area will be divided into a Primary Riparian Buffer extending 100’ from the stream bank and a Secondary Riparian Buffer extending 100’ from the outward edge of the Primary Riparian Buffer. Should a wetland or a 100-year floodplain exist at least partially within the Secondary Riparian Buffer, the entirety of that area will be included within the Secondary Riparian Buffer and will be subject to the restrictions afforded to the Secondary Riparian Buffer. Should a steep slope or highly erodible soils exist partially within the Secondary Riparian Buffer, that steep slope or highly erodible soil area up to a maximum of 400 feet from the stream bank shall be included within the Secondary Riparian Buffer

(2) Primary Riparian Buffer

(a) Purpose. The function of the Primary Riparian Buffer is to protect the physical and ecological integrity of the portion of the riparian corridor in closest proximity to the stream through protection and enhancement of the vegetation. Vegetation provides erosion protection, shade, leaf litter, woody debris, wildlife habitat, and filtering of sediment, nutrient and pollutant loads to the stream.

(b) Permitted Uses. Development and use within the Primary Riparian Buffer are restricted to the following uses, which in aggregate may modify or cause adverse impacts to no more than 10% of the entire Primary Riparian Buffer unless more area is necessary for the protection of human health, public utility usage, or public infrastructure.

(i])Benches or seating;

(ii) Implementation of educational and scientific research activities that enhance or otherwise do not negatively impact the composition or health of the existing vegetation;

(iii) Flood control structures, bioretention areas or other green infrastructure stormwater management practices, and stream bank stabilization measures approved by the Orange County Soil and Water Conservation District, U.S. Natural Resource Conservation Service, U.S. Army Corps of Engineers, or NYSDEC;

(iv) Maintenance of roadways or impervious surfaces existing at the time of the adoption of this provision;

(v) Culverts or other stream crossings necessary to construct a driveway, transportation route, or public utility structures necessary to provide access or utility service to a parcel, which are designed to minimize negative impacts to the stream and Primary Riparian Buffer;

(vi) Public water supply infrastructure, including wells, public wastewater outfall structures, and associated pipes;

(vii) Public access and water-dependent public recreational facilities, including boat ramps, docks, foot trails leading directly to the stream, fishing platforms, and overlooks;

(viii) Public sewer lines and/or other utility easements.

(ix) Techniques to remove invasive species;

(x) Non-paved recreational trails no wider than 10 *(Additional Protection Option: 5)* feet that either provide access to the stream or are part of a continuous trail system running roughly parallel to the stream;

(xi) Storage of nonmotorized recreational watercraft measuring less than 15 feet in length;

(xii) Use of temporary erosion control measures, including but not limited to silt fencing, that are installed, maintained and removed after site stabilization is completed according to *New York Standards and Specifications for Erosion and Sediment Control*, most current version;

(xiii) Limited tree cutting, forestry or vegetation management done in accordance with a Forest Stewardship Plan prepared by the Department of Environmental Conservation, a forester who is certified by the Society of American Foresters or such successor organization as is later created, or a Cooperating Consulting Forester with the New York State Department of Environmental Conservation. Any harvest must furthermore be done in accordance with the *New York State Forestry Best Management Practices for Water Quality – BMP Field Guide*. Vegetation management may not compromise the integrity of the stream bank or negatively impact the function of the Primary Riparian Buffer. Tree cutting within 25 *[Additional Protection Option: 50]* feet of the top of stream bank is prohibited. Any such activity must retain at a minimum 60% *[Additional Protection Option: 95%]* of the preexisting tree canopy in the Primary Riparian Buffer at all times. Notwithstanding the foregoing, removal of trees in any location shall be permitted where such trees pose an imminent threat to property or public safety.

(3) Secondary Riparian Buffer

(a) Purpose. The function of the Secondary Riparian Buffer is to filter sediment, nutrients and pollutants in runoff and slow the rate at which runoff enters the Primary Riparian Buffer.

(b) Permitted Uses. Uses within the Secondary Riparian Buffer are restricted to the following:

(i) All uses permitted in the Primary Riparian Buffer;

(ii) Minor recreational structures and improvements to allow passive recreation in the Secondary Riparian Buffer such as decks, picnic tables, playground equipment, and small concrete slabs, which each may not exceed 200 square feet in area, and which in aggregate may occupy no more than 10% of the Secondary Riparian Buffer area on the parcel;

(iii) Fences, provided such structures do not impede floodwaters;

(iv) Landscaping, planting or routine maintenance activities that do not encroach upon or negatively impact the Primary Riparian Buffer.

G. Prohibited Activities in the Riparian Buffer. The following activities are explicitly prohibited in both the Primary and Secondary Riparian Buffers.

(1) Storage or placement of any hazardous materials, including any sewage system. All sewage systems, including drain fields and raised systems, must be located a minimum of 100 feet from a perennial stream. [*For additional protection, change to 150 feet.*]

(2) Knowing or unknowing introduction of invasive vegetative species that may impact vegetation present within the stream corridor. For a listing of invasive vegetation to avoid, refer to the NYSDEC List of Prohibited and Regulated Invasive Species in 6 NYCRR Part 575 and the NYSDEC Division of Materials Management Bureau of Pest Management. If invasive or nuisance species are present on your property, NYSDEC may have developed a protocol to combat that species. Refer to the NYSDEC website for additional information.

(3) Waste storage and disposal, including but not limited to disposal and/or dumping of snow and ice, recyclable materials, manure, hazardous or noxious chemicals, used automobiles or appliances, and other abandoned materials.

(4) Any combination of permitted or exempt activities that may compromise or alter more than 10% of the combined Primary and Secondary Riparian Buffer area that lies within a parcel.

(5) Mining or removal of soil, sand and gravel, and quarrying of raw materials.

(6) Widening, straightening or otherwise altering the beds or banks of streams, except where the NYSDEC has issued a permit expressly allowing such activities on the parcel.

(7) Application of herbicides, pesticides, fertilizers, or other chemicals that contain hazardous substances, as defined in 6 NYCRR Part 597.

(8) Parking of motorized vehicles, including watercraft.

(9) Construction or replacement of private wells within 100 feet of perennial streams.

(10) Altering habitat of threatened or endangered species, as defined at 6 NYCRR Part 182.

H. Protection Requirements for Intermittent Streams. Although seasonal or temporary in nature, ephemeral and intermittent streams provide the same ecological and hydrological functions as perennial streams by moving water, nutrients, and sediment through watersheds. These streams provide hydrological connections across the landscape, absorb high volumes of water during storm events and other high-water flows to reduce erosion and improve water quality. For those streams classified as intermittent, only the Primary Riparian Buffer shall apply, and it shall be measured in the same manner as provided for a perennial stream in Paragraph F(1) of this Section. All provisions applicable to the Primary Riparian Buffers for perennial streams shall apply to intermittent streams.

Farm Operations

1 NYCRR Part 391.1(c) defines farm operation as the land and on-farm buildings, equipment, and practices which contribute to the production, preparation and marketing of crops, livestock and livestock products as a commercial enterprise.

I. Exemptions. The following activities are exempt from the requirements of this Section:

(1) Agricultural activities on parcels that meet New York State Department of Agriculture and Market’s definition of a farm operation at 1 NYCRR Section 391.1(c).

(2) Repair or maintenance of any lawful use of land that was approved for such parcel on or before the effective date of this Local Law, or if no approval was required for such use, was lawfully in existence as of said date.

[*If incorporating as a separate article in the municipal code, include sections on administration and enforcement, as well as severability. See the Moodna Creek Watershed model for sample language.]*

RESOURCES

*New York State Standards and Specifications for Erosion and Sediment Control (Blue Book)*. (2005). NYS Department of Environmental Conservation.[[40]](#endnote-41)

# 2.2.4 Local Watercourse Law

Many New York municipalities have found local watercourse laws to be an effective technique to fill the gaps in state and federal protection. The example below regulates activities in watercourses as well as a 100-foot buffer measured horizontally from the top of the bank. It requires a permit for construction of structures, roads, and driveways; and for filling, dredging, grading, polluting, damming, or any other activity that may affect the functions of wetlands, watercourses and buffer areas defined in the law.

USAGE

A standalone local law, and often combined with wetland and waterbody protection.

ADAPTED FROM THE FOLLOWING SOURCE

Town of Pawling (NY) Chapter 111: Freshwater Wetlands and Watercourse Protection[[41]](#endnote-42)

LANGUAGE

*Refer to Section 2.1.4 Local Freshwater Wetland Law. The introduction to Section 2.2: Watercourse Protection has guidance on defining the watercourses to be protected, defining the regulated buffer, and determining which activities require a permit.*

# Endnotes

1. Elevated Residential Structures, FEMA 54 (1984). Retrieved 6/1/18 from <http://www.fema.gov/media-library-data/20130726-1509-20490-6744/fema54.pdf> [↑](#endnote-ref-2)
2. Ibid. [↑](#endnote-ref-3)
3. Ibid. [↑](#endnote-ref-4)
4. Chester County (PA) Watershed Primer Part 3: Streams and Riparian Buffers. Retrieved 6/1/18 from <http://www.chesco.org/2089/Watershed-Primer-Part-3---Strms-RpBuffer> [↑](#endnote-ref-5)
5. Using Natural Resources to Reduce Risk of Flooding and Erosion in New York. NYS DEC, NYS DOS, 2018. ADD LINK WHEN AVAILABLE [↑](#endnote-ref-6)
6. Vermont League of Cities and Towns. Creating an Effective Riparian Buffer Ordinance (2007). Municipal Assistance Center Technical Paper #2. Montpelier, VT. Retrieved 6/1/18 from <http://www.hinesburg.org/stormwater/vlct-riparianbuffer-techpaper-2007.pdf> [↑](#endnote-ref-7)
7. Hawes, Ellen and Smith Markelle, Riparian Buffer Zones: Functions and Recommended Widths (2005). Retrieved 6/1/18 from <http://eightmileriver.org/resources/digital_library/appendicies/09c3_Riparian%20Buffer%20Science_YALE.pdf> [↑](#endnote-ref-8)
8. Kennedy, C., Wilkinson, J. B., Balch, J., & Environmental Law Institute (2003). *Conservation thresholds for land use planners*. Washington, D.C: Environmental Law Institute. [↑](#endnote-ref-9)
9. *River Banks & Buffers, Guidance for Communities in Northern New Jersey Watersheds*, No.7. North Jersey Resource Conservation and Development (2002). Retrieved 6/1/18 from <http://northjerseyrcd.org/wp-content/uploads/2010/03/7_Guidance_for_Community.pdf> [↑](#endnote-ref-10)
10. Ibid [↑](#endnote-ref-11)
11. Ibid [↑](#endnote-ref-12)
12. For additional information about streamway setbacks and river meandering, see the Vermont Agency of Natural Resources’ River Corridor Protection Guide, written by Mike Kline and Kari Dolan (2008). Retrieved 6/1/18 from <http://anr.vermont.gov/sites/anr/files/co/planning/documents/guidance/River%20Corridor%20Protection%20Guide.pdf> [↑](#endnote-ref-13)
13. Town of Pawling (NY) Wetland and Watercourse Law. Retrieved 6/1/18 from <http://ecode360.com/6968447> [↑](#endnote-ref-14)
14. Town of New Paltz (NY) Wetlands and Watercourse Protection Law. Retrieved 6/1/18 from <http://ecode360.com/9168154> [↑](#endnote-ref-15)
15. Town of Philipstown (NY) Freshwater Wetlands and Watercourses Law. Retrieved 6/1/18 from <http://ecode360.com/6317362> [↑](#endnote-ref-16)
16. Town of Poughkeepsie (NY) Aquatic Resource Protection Law. Retrieved 6/1/18 from <http://ecode360.com/6321213> [↑](#endnote-ref-17)
17. Town of New Castle (NY) Wetlands Law. Retrieved 6/1/18 from <http://ecode360.com/11774386> [↑](#endnote-ref-18)
18. Moodna Creek Watershed Intermunicipal Council (NY), Model Stream Overlay District (2014). Retrieved 6/1/18 from <http://waterauthority.orangecountygov.com/PROJECTS/MOODNA_CREEK_WATERSHED/Model%20Local%20Law%20Stream%20Corridor%20Mgmt.pdf> [↑](#endnote-ref-19)
19. City of Newburgh (NY) Waterbody Protection Overlay District. Retrieved 6/1/18 from <http://ecode360.com/30538880> [↑](#endnote-ref-20)
20. Town of Coxsackie (NY) Natural Resource Protection Standards. Retrieved 6/1/18 from <http://ecode360.com/13876388> [↑](#endnote-ref-21)
21. Town of Wallkill (NY) Shawangunk Kill Corridor Preservation Overlay District. Retrieved 6/1/18 from <http://ecode360.com/30555215> [↑](#endnote-ref-22)
22. Town of Ulysses (NY) Municipal Code, Chapter 212 Zoning. Retrieved 6/1/18 from <https://www.ecode360.com/28859962> [↑](#endnote-ref-23)
23. Town of Woodstock (NY) Wetland and Watercourse Protection Standards. Retrieved 6/1/18 from <http://ecode360.com/109422> [↑](#endnote-ref-24)
24. *Westchester County: A guide to Aquatic Buffers.* (2007). Westchester County Soil and Water Conservation District. Retrieved 6/1/18 from: <https://planning.westchestergov.com/images/stories/stormwater/aquaticbuffersguide.pdf> [↑](#endnote-ref-25)
25. *Conservation Thresholds for Land Use Planners*. (2003). Washington, D.C: Environmental Law Institute. Retrieved 6/1/18 from <https://www.eli.org/sites/default/files/eli-pubs/d13-04.pdf> [↑](#endnote-ref-26)
26. Kusler, J. (2016). *Model “riparian” Protection Ordinance*. Berne, NY: Association of State Wetland Managers. Retrieved 6/1/18 from: <https://www.aswm.org/pdf_lib/model_riparian_protection_ordinance_kusler_030916.pdf> [↑](#endnote-ref-27)
27. Kusler, J. (2009). *Model Ordinances for Regulating Wetlands, Riparian Habitats, and Stream Buffers*. Berne, NY: Association of State Wetland Managers. Retrieved online from: <https://www.aswm.org/pdf_lib/model_ordinance_1209.pdf> [↑](#endnote-ref-28)
28. *Model Stream Overlay District Developed for the Moodna Creek Watershed Intermunicipal Council.* (2014). Moodna Creek Watershed Intermunicipal Council Outreach and Education Committee and the Orange County Planning Department. Retrieved 6/1/18 from <http://waterauthority.orangecountygov.com/PROJECTS/MOODNA_CREEK_WATERSHED/Model%20Local%20Law%20Stream%20Corridor%20Mgmt.pdf> [↑](#endnote-ref-29)
29. Town of Ulysses (NY) Municipal Code, Chapter 212 Zoning. Retrieved 6/1/18 from <https://www.ecode360.com/28859962> [↑](#endnote-ref-30)
30. U.S Army Corps of Engineers, State of New York 2014 Wetland Plant List. Retrieved 6/1/18 from <http://rsgisias.crrel.usace.army.mil/nwpl_static/data/DOC/lists_2014/States/pdf/NY_2014v1.pdf> [↑](#endnote-ref-31)
31. Strong, K. (2008). *Conserving Natural Areas and Wildlife in Your Community: Smart Growth Strategies for Protecting the Biological Diversity of New York’s Hudson River Valley.* Ithaca, NY: New York Cooperative Fish and Wildlife Research Unit, Cornell University, and NYS Department of Environmental Conservation, Hudson River Estuary Program. Retrieved 6/1/18 from <https://www.dec.ny.gov/docs/remediation_hudson_pdf/hrebch.pdf> [↑](#endnote-ref-32)
32. *Stream Processes: A Guide to Living in Harmony with Streams*. (2016). Horseheads, NY: Chemung County Soil and Water Conservation District. Retrieved 6/1/18 from <http://www.stcplanning.org/usr/Program_Areas/Water_Resources/StreamProcessesGuide.pdf> [↑](#endnote-ref-33)
33. *Westchester County: A Guide to Aquatic Buffers*. (2007). Westchester County Soil and Water Conservation District. Retrieved 6/1/18 from <http://planning.westchestergov.com/images/stories/stormwater/aquaticbuffersguide.pdf> [↑](#endnote-ref-34)
34. Town of Coxsackie (NY) Natural Resource Protection Standards. Retrieved 6/1/18 from <http://ecode360.com/13876388> [↑](#endnote-ref-35)
35. New York State Stormwater Management Design Manual. Retrieved 6/1/18 from <http://www.dec.ny.gov/docs/water_pdf/swdm2015entire.pdf> [↑](#endnote-ref-36)
36. New York State Forestry Best Management Practices for Water Quality – BMP Field Guide, NYS Department of Conservation. Retrieved 6/1/18 from <http://www.dec.ny.gov/docs/wildlife_pdf/yfiforestrybmp.pdf> [↑](#endnote-ref-37)
37. Moodna Creek Watershed Intermunicipal Council (NY), Model Stream Overlay District (2014). Retrieved 6/1/18 from <http://waterauthority.orangecountygov.com/PROJECTS/MOODNA_CREEK_WATERSHED/Model%20Local%20Law%20Stream%20Corridor%20Mgmt.pdf> [↑](#endnote-ref-38)
38. The maximum potential erosion rate for any given soil can be determined by using the following formula: R\*K\*LS/T < 8, where R= rainfall, K= erodibility value of the soil, LS= the slope factor, and T= the tolerable erosion rate; factors K, LS, and T are established by the Natural Resources Conservation Service. Highly erodible soils must be verified in the field; a list of highly erodible soils is available from the Orange County Soil and Water Conservation Service. [↑](#endnote-ref-39)
39. Definition of “pollutant” from the federal Clean Water Act, 40 CFR 122.2. [↑](#endnote-ref-40)
40. *New York State Standards and Specifications for Erosion and Sediment Control (Blue Book)*. (2005). NYS Department of Environmental Conservation. Retrieved 6/1/18 from <https://www.dec.ny.gov/chemical/29066.html> [↑](#endnote-ref-41)
41. Town of Pawling (NY) Wetland and Watercourse Law. Retrieved 6/1/18 from <http://ecode360.com/6968447> [↑](#endnote-ref-42)