

Beaverdam Creek/Rochester Creek Critical Environmental Area

Town of Olive, Ulster County, New York

Critical Environmental Areas

New York State law authorizes municipalities to designate Critical Environmental Areas within the municipal boundaries to alert people to places that deserve special attention in the course of land use planning, regulatory reviews of development projects, and decisions about development and conservation.

A Critical Environmental Area (CEA) is a geographic area with exceptional character with respect to one or more of the following:

- a benefit or threat to human health;
- a natural setting such as fish and wildlife habitat, forest and vegetation, open space, and areas of important aesthetic or scenic quality;
- agricultural, social, cultural, historic, archeological, recreational, or educational values; or
- an inherent ecological, geological, or hydrological sensitivity that may be adversely affected by any change (6 NYCRR 617.14[g]).

A CEA is adopted by the municipal legislative body and then registered with the State of New York. The CEA designation carries no land use restrictions, but simply raises awareness about the important features contained within the CEA—such as wildlife habitat, water resources, unusual landforms, or scenic vistas—and requires consideration of potential impacts to the quality of those features during the review of a major new land use or other action (such as new legislation) in the State Environmental Quality Review process.

Beaverdam Creek/Rochester Creek CEA

A Town of Olive working group, including members of the Olive Conservation Advisory Council, staff of an environmental consulting firm, and a local cultural NGO, proposed the establishment of the Beaverdam Creek/Rochester Creek Critical Environmental Area (CEA) to promote the protection of surface water, groundwater, and wildlife habitats in the stream corridors. The CEA encompasses a 1700-foot-wide zone along the two streams and their tributaries.

Beaverdam Creek rises below the Wagon Wheel Notch between High Point and Little Point, gathering water below the gorge at the Samsonville Road crossing [where does the stream actually begin?], and running generally south for four miles before joining Rochester Creek near the southern corner of the town. Rochester Creek begins in western Marbletown, runs ca. 2.2 miles through the Town of Olive and, after the junction with Beaverdam Creek, continues south through the Town of Rochester another 6.5 miles before emptying into the Rondout Creek.

Both streams and the main tributary to Beaverdam Creek—[name of stream draining Beaver Lake]—are all classified as A(T) by the NYS Department of Environmental Conservation (NYSDEC). The “A” classification signifies that the best uses are for drinking water supply, and the “(T)” classification means that, because of the cool, clear conditions, the streams may support trout. There are extensive wetland complexes bordering all three streams and smaller wetlands set apart from the streams.

The stream corridors are underlain by an unconsolidated aquifer, an area where groundwater is stored in sand and gravel deposits. The water in such aquifers is abundant and easily accessible for domestic wells, but may also be especially susceptible to contamination from activities on the surface because the coarse sands and gravels are less effective at filtering than are the finer mineral deposits in other parts of the landscape. The coarse deposits also make these aquifer areas especially important for replenishing groundwater from rainwater and snowmelt. Measures to promote groundwater recharge and protect groundwater from contamination are important everywhere, but particularly in areas overlying unconsolidated aquifers.

A large portion of these stream corridors lie within forest patches that score in the 90th percentile and higher in the Forest Condition Index, based on measures of size, fragmentation, connectivity, stressors, habitat value, and carbon sequestration compared to other forests of the Hudson Valley (NYNHP, NYSDEC, and Cornell University 2019). Forests are not only important wildlife habitats but are also key to protecting the quantity and quality of water in streams, ponds, and groundwater.

Streams and stream corridors are essential components of regional ecosystems, and are part of the scenic landscapes so loved by the people of Olive. The stream floodplains and associated wetlands act to absorb floodwaters and attenuate downstream flooding. Clean-water streams like Beaverdam and Rochester creeks have diverse and abundant invertebrates—stoneflies, mayflies, dragonflies, mollusks, crayfish—that support the fishes, salamanders, turtles, and the rest of the aquatic community, as well as the terrestrial animals that use streams intermittently. Streams are essential habitat areas for American beaver, river otter and American mink. Many bat species forage over stream corridors, ponds, and wetlands, where flying insects are often abundant. A rare dragonfly has been found in ponds of these corridors, a terrestrial animal of conservation concern has been found in the Rochester Creek corridor, and the high elevation of the Beaverdam Creek has been designated an “Area of Known Importance” for another rare terrestrial animal species. The forests bordering streams provide important habitat for many other plants and animals, including some species of conservation concern that are known to occur in Olive, such as Louisiana waterthrush and red-shouldered hawk. Intact habitat areas along these streams also offer safe movement corridors from low-to-high elevations and south-to-north movement corridors that may benefit wildlife seeking cooler habitats in the warming climate.

The 1700-ft-wide CEA corridor encompasses a broad buffer zone to protect the streams, ponds, wetlands, and groundwater, and the habitats that are used by stream-associated wildlife.

The purpose of the CEA designation is to help ensure the persistence of the unusual clean, coolwater stream conditions, the quality and quantity of water held in the underlying aquifer, and the riparian habitats.

Threats

- **Tree removal:** Maintaining intact forests is usually the best way to promote groundwater recharge, supply clean water to streams, and maintain high-quality habitats for wildlife, along with the many ecosystem services that forests provide to the human community. Clearing of forests along streambanks and at the perimeters of wetlands and pond reduces shade and often leads to increased water temperatures and streambank erosion. Clearing in floodplains may also reduce the capability of the floodplain to absorb and slow floodwaters.
- **Cutting of trees and shrubs** during the nesting season (e.g., spring through mid-summer) disrupts the activities of nesting songbirds, raptors, and other tree-dependent wildlife, and cutting during the period April through October can disrupt roosting bats.
- **Compaction and other disturbance of the forest floor** (as by large equipment) damages the soil structure, and reduces the capability of the soils to absorb rainwater and snowmelt. It can also harm amphibians, small mammals, and the diverse soil invertebrates and microbes that support a healthy and resilient forest community.
- **Forest alteration:** Disruption of forest vegetation or disturbance of the forest floor can reduce the capability of the forest to capture rainwater and snowmelt, recharge groundwater, and maintain the soil biota that promotes a healthy and resilient forest community.
- **Forest fragmentation** by roads, driveways, yards, utility corridors, and buildings divides the forests into smaller blocks that may be unsuitable for area-sensitive wildlife species—such as nesting songbirds that require large habitat areas and are sensitive to human contact or disturbances. Forest fragmentation makes the (formerly) deep interior forest areas newly accessible to songbird nest predators (such as raccoons and domestic cats) and to brood parasites (such as the brown-headed cowbird) whose activities are ordinarily confined to open areas and forest edges. Smaller patches of forest have more forest “edge” habitat with higher light and noise levels and infestations of non-native plant species. Roads and other developed areas dividing forests can also act as significant barriers and hazards to wildlife movement, and many animals avoid breeding near human activities.
- **Infestations of the hemlock woolly adelgid** in the coming years may kill most of the hemlocks that border these streams and may dramatically affect the habitat conditions of the corridors and the streams, and possibly the water management capabilities of the forest.
- **Impervious surfaces:** Roads, driveways, parking lots, roofs, and other impervious surfaces (including compacted soils) prevent infiltration of rainwater and snowmelt to the soils; can lead to rapid runoff of surface water, soil erosion, siltation of streams, elevated stream water temperatures, and reduced groundwater recharge; and are often sources of contamination of surface water or groundwater—e.g., from de-icing salts, petroleum hydrocarbons, and heavy metals.
- **Other forms of pollution** can arrive in streams as direct discharge or in sheet or channelized runoff from agricultural fields or lawns carrying fertilizers and pesticides that degrade the quality

of water and habitats, and harm non-target plants, animals, fungi, and soil microbes that support ecosystem functions.

- **Water withdrawals:** Direct water withdrawals from the stream, or over-extraction of groundwater can deplete the stream water volumes and adversely affect the stream biota which depend on normal seasonal volumes and flow patterns.
- **Recreational use** or other kinds of repeated and frequent uses can lead to trampling, littering, soil erosion, and noise disturbance to nesting or roosting birds and other wildlife.

Recommendations

Below are recommendations for actions that will help to protect the streams, groundwater, and riparian habitats, and the benefits they provide to the human community and to wildlife. Many of these recommendations can be applied when landowners or town agencies are in the early stages of planning or reviewing new land uses or land development within the CEA, or when the town is considering new land use legislation.

- **Avoid direct disturbance of streams, streambanks, or pond shores.**
- **Conserve broad, well-vegetated stream buffers,** wherever possible.
- **Prevent siltation, warming, and other forms of stream or pond pollution.**
- **Avoid or minimize applications of de-icing salts, fertilizers, and pesticides.**
- **Prevent over-extraction of streamwater or groundwater.**
- **Maintain intact forests** wherever possible. Minimize disturbance of soils and vegetation in the stream corridors, and especially within 200 feet of a stream or pond edge to help maintain cool water temperatures and volumes, prevent erosion, and protect wildlife habitat.
- **Avoid fragmenting large forests** in and near the stream corridors with new roads, driveways, yards, utility corridors, and other developed features. Locate new development distant from streams and near forest edges to leave the forest interiors intact wherever possible.
- **If recreational access points and trails are provided, locate and design them carefully** to protect streams, streams pools, wetlands, and the sensitive soils, vegetation, and wildlife of the stream corridors.

Town of Olive

Beaverdam Creek/Rochester Creek Critical Environmental Area (proposed)

