

Appendix F. Example Riparian Buffer Ordinance (courtesy Montgomery County, PA Planning Office)

MODEL ORDINANCE RIPARIAN CORRIDOR CONSERVATION DISTRICT

Section 1. Legislative Intent.

In expansion of the Declaration of Legislative Intent and Statement of Community Development Objectives found in Sections 101 and 102 of Article I of this ordinance, it is the intent of this article to provide reasonable controls governing the conservation, management, disturbance, and restoration, of riparian corridors under authority of Article I, Section 27 of the Pennsylvania Constitution, Act 247 the Municipalities Planning Code as amended, and other Commonwealth and federal statutes, in conformance with the goals of the Comprehensive Plan, Open Space and Environmental Resource Protection Plan, and the following objectives:

- 1.1 Improve surface water quality by reducing the amount of nutrients, sediment, organic matter, pesticides, and other harmful substances that reach watercourses, wetlands, subsurface, and surface water bodies by using scientifically-proven processes including filtration, deposition, absorption, adsorption, plant uptake, and denitrification, and by improving infiltration, encouraging sheet flow, and stabilizing concentrated flows.
- 1.2 Improve and maintain the safety, reliability, and adequacy of the water supply for domestic, agricultural, commercial, industrial, and recreational uses along with sustaining diverse populations of aquatic flora and fauna.
- 1.3 Preserve and protect areas that intercept surface water runoff, wastewater, subsurface flow, and/or deep groundwater flows from upland sources and function to remove or buffer the effects of associated nutrients, sediment, organic matter, pesticides, or other pollutants prior to entry into surface waters, as well as provide wildlife habitat, moderate water temperature in surface waters, attenuate flood flow, and provide opportunities for passive recreation.
- 1.4 Regulate the land use, siting, and engineering of all development to be consistent with the intent and objectives of this ordinance and the best-accepted conservation practices, and to work within the carrying capacity of existing natural resources.

The legislative intent section provides the rationale for the regulation, including the applicable power to do so. This will demonstrate that the regulation is reasonable and related to a defensible public purpose. The authority to protect riparian corridors is contained within the Pennsylvania Constitution and the MPC (Secs 301b, 603b5, 603d, 604(1), and 605(2)).

The intent section also recognizes the scientifically-proven and published benefits of riparian corridors.

The Commonwealth of Pennsylvania has invested over a billion dollars in water quality protection over the last two decades. Protection of riparian corridors helps to advance this large public investment.

The majority of land within a watershed is drained by the smaller 1st and 2nd order streams. Therefore, regulation of riparian corridors must focus upon all streams within a watershed and not just the larger more apparent creeks and rivers.

- 1.5 Assist in the implementation of pertinent state laws concerning erosion and sediment control practices, specifically Erosion Control, of the Pennsylvania Clean Streams Law, Act 394, P.L. 1987, Chapter 102 of the Administrative Code (as amended October 10, 1980 Act 157 P.L.), Title 25, and any subsequent amendments thereto, as administered by the Pennsylvania Department of Environmental Protection and the Montgomery County Conservation District.
- 1.6 Conserve natural features important to land or water resources such as headwater areas, groundwater recharge zones, floodway, floodplain, springs, streams, wetlands, woodlands, prime wildlife habitats, and other features that provide recreational value or contain natural amenities whether on developed or undeveloped land.
- 1.7 Work with floodplain, steep slope, and other requirements that regulate environmentally sensitive areas to minimize hazards to life, property, and riparian features.
- 1.8 Recognize that natural features contribute to the welfare and quality of life of the [Municipal] residents.
- 1.9 Conserve natural, scenic, and recreation areas within and adjacent to riparian areas for the community's benefit.

There are other laws of the Commonwealth that this ordinance complements which should be referenced.

Depending on a municipality's goals for corridor preservation, recreational opportunities may exist and should be mentioned as part of the regulations intent.

The ordinance should reference other existing municipal regulations regarding natural resource preservation.

Section 2. Application an Width Determination of the District

- 2.1 Application. The Riparian Corridor Conservation District is an overlay district that applies to the streams, wetlands, and waterbodies, and the land adjacent to them, as specified in the following table:

Scientific research has demonstrated that the benefits of riparian corridors are maximized when they extend at least 75 feet from the streambank.

Surface Water Feature	Minimum Corridor Width
A. Perennial Streams: <u>All</u> perennial streams identified in the Soil Survey ¹ . (Perennial streams are shown as solid lines on the Soil Survey maps.)	Zone 1: Minimum width of 25 feet from each defined edge of the watercourse at bank full flow, measured perpendicular to the edge of the watercourse.

Zone one should be a minimum of 25 feet from the streambank and consist of undisturbed forest and vegetation in order to stabilize the streambank, shade the stream, and provide food for aquatic organisms.

Surface Water Feature	Minimum Corridor Width
	<p>Zone 2: Minimum width of 50 feet from the outer edge of Zone 1, measured perpendicular to the edge of Zone 1, or equal to the extent of the 100-year floodplain³, or 25 feet beyond the outer edge of a wetland along the stream, whichever is greater. (Total <u>minimum</u> width of Zones 1 & 2 = 150 feet plus the width of the stream.)</p>
<p>B. Intermittent Streams: Intermittent streams identified in the Soil Survey¹ or any stream otherwise identified on the applicant's plan that have an upstream drainage area of 75 acres or more². (Intermittent streams are shown as dotted and dashed lines on the Soil Survey maps.)</p>	<p>Zone 1: Minimum width of 25 feet from each defined edge of the watercourse at bank full flow, measured perpendicular to the edge of the watercourse. Zone 2: Minimum width of 50 feet from the outer edge of Zone 1, measured perpendicular to the edge of Zone 1, or equal to the extent of the 100-year floodplain³, or 25 feet beyond the outer edge of a wetland along the stream, whichever is greater. (Total <u>minimum</u> width of Zones 1 & 2 = 150 feet plus the width of the stream.)</p>
<p>C. Other Streams: All other streams with an upstream drainage area of less than 75 acres², including intermittent streams identified in the Soil Survey¹.</p>	<p>Zone 1: Minimum width of 25 feet from the centerline of the watercourse, measured perpendicular to the centerline of the watercourse, or equal to the extent of the 100-year floodplain³, or 25 feet beyond the outer edge of a wetland along the stream, whichever is greater. (Total <u>minimum</u> width of 50 feet). Zone 2: Does not apply.</p>
<p>D. Wetlands and Waterbodies Wetlands not located along a stream, and waterbodies, where the wetland and/or waterbody is greater than 10,000 square feet in area.</p>	<p>Zone 1: Minimum width of 25 feet from the outer edge of the wetland or waterbody, measured perpendicular to the edge. For wetlands located at the edge of a waterbody, the measurement shall be made from the outer edge of the wetland. Zone 2: Does not apply.</p>

Zone Two is the Aouter edge≡ of the corridor and allows for infiltration of runoff, filtration of sediment and nutrients, and nutrient uptake by plants.

The following notes should accompany the chart:

¹Soil Survey shall mean the most recent edition of the Soil Survey of Montgomery County.

²Upstream drainage area shall be measured from the where the stream exits the applicant's site.

³100-year floodplain is identified on the Flood Insurance rate Map (FIRM) prepared by FEMA, or as calculated by the applicant where FEMA data does not apply.

Steep slopes are often found adjacent to waterways and may

2.2 Zone Designation Adjustments for Steep Slopes.
Where steep slopes in excess of 25 percent are located within 75 feet of a stream identified in 2.1, A or B, above, the area of steep slopes shall be designated as Zone One consistent with the following:

- A. If the extent of the steeply sloped area is more than 75 feet, the Zone 1 designation shall extend to 75-feet or to the full extent of the steeply sloped area within the corridor if Zone 1 extends greater than 75 feet as may be required in Section 2.1.C. Zone 2 shall not be required except as may be required in 2.1, A or B for floodplains.
- B. If the extent of the steeply sloped area is less than 75 feet, the Zone 1 designation shall extend to the limit of the steeply sloped area, and the width of Zone Two shall be adjusted so that the total corridor width (Zone 1 plus Zone 2) will be that required in 2.1 A, B, or C.

2.3 Identification and Width Determination.
The applicant shall be responsible for the following:

- A. Identifying the watercourses, wetlands, and/or waterbodies on and abutting the applicant's site, and locating these features accurately on the applicant's plans.
- B. Initial width determination of the riparian corridor(s) in compliance with Section 2.1, herein, and for identifying these areas on any plan that is submitted for subdivision, land development, or other improvements that require plan submissions or permits. The initial determination(s) shall be subject to review and approval by the [Municipal] Planning Commission, with the advice of the [Municipal] Engineer.

Section 3. Uses Permitted in the Riparian Corridor Conservation District

The following uses are permitted by right in the Riparian Corridor Conservation District in compliance with the requirements of this Article:

3.1 Zones One and Two: At least half of any required yard setback area, for any individual lot, must be entirely outside of the Riparian Corridor Conservation District.

reduce the infiltration and filtering benefits of the buffer.

Providing a Zone 1 designation to the steeply sloped areas will afford greater protection for existing vegetation. Maintaining vegetation on steep slopes is especially critical for reducing erosion and sedimentation.

This ordinance requires the applicant to designate the riparian corridor on the subdivision or land development plan. This requirement is similar to the way wetlands and floodplains are designated.

The uses permitted within each zone are directly related to the specific benefits the zone provides and should be tailored to the community's goals.

To ensure usable yard area is provided, at least half of all yard setbacks shall be outside the riparian corridor. For Zone One to function properly it should remain

3.2 Zone One:

A. Open space uses that are primarily passive in character shall be permitted to extend into the area defined as Zone One, including:

1. Wildlife sanctuaries, nature preserves, forest preserves, fishing areas, passive areas of public and private parklands, and reforestation.

2. Streambank stabilization.

B. Forestry operations approved by the Montgomery County Conservation District.

C. Corridor crossings:

1. Agricultural crossings by farm vehicles and livestock.

2. Driveways serving one or two single-family detached dwelling units, provided the mitigation requirements of Section 7.2 are satisfied. The corridor crossing standards of Section 8 should be considered during design of the driveway.

3. Driveways serving more than two single-family detached dwelling units, or roadways, recreational trails, railroads, and utilities, provided the mitigation requirements of Section 7.2 and the corridor crossing design standards of Section 8 are satisfied.

relatively undisturbed. Therefore, the by-right uses are generally passive and allow for the implementation of streambank stabilization techniques to minimize erosion.

To sustain and encourage agricultural operations, crossings for farm vehicles and livestock are permitted by-right.

Invariably, driveways, roads, and other types of corridor crossings will be required and are permitted by-right provided specific mitigation and design standards are satisfied.

3.2 Zone Two

A. Open space uses including wildlife sanctuaries, nature preserves, forest preserves, passive areas of public and private parklands, recreational trails, and reforestation.

B. Agricultural uses conducted in compliance with methods prescribed in the Department of Environmental Protection's Erosion and Sediment Pollution Control Manual, March 2000, as amended.

The main purpose of Zone Two is to impede the flow of runoff, allowing increased infiltration to filter out nutrients for uptake by plants.

Existing agricultural uses should be allowed to continue, as long as best-management practices are implemented.

C. Corridor crossings:

1. Agricultural crossings by farm vehicles and livestock.
2. Driveways serving one or two single-family detached dwelling units, provided the mitigation requirements of Section 7.2 are satisfied. The corridor crossing standards of Section 8 should be considered during design of the driveway.
3. Driveways serving more than two single-family detached dwelling units, or roadways, recreational trails, railroads, and utilities, provided the mitigation requirements of Section 7.2 and the corridor crossing design standards of Section 8 are satisfied.

E. Residential accessory structures having an area equal to or less than 225 square feet.

F. Forestry operations approved by the Montgomery County Conservation District.

G. Passive use areas such as camps, campgrounds, picnic areas, and golf courses. Active recreation areas such as ballfields, playgrounds, and courts provided these uses are designed in a manner that will not permit concentrated flow of stormwater runoff.

H. Centralized sewer and/or water lines and public utility transmission lines running along the corridor. When proposed as part of a subdivision or land development, the mitigation requirements of Section 8.2 shall be satisfied. In all cases, these lines shall be located as far from Zone One as practical.

The standards for accessory structures should be tailored to be consistent with existing municipal regulation.

The main purpose of Zone Two is to slow runoff. Therefore, concentrated runoff flow should be prevented. This may be particularly important if impervious surface is introduced into Zone Two.

Section 4. Uses Specifically Prohibited in the Riparian Corridor District

Any use or activity not authorized within Section 3, herein, shall be prohibited within the Riparian Corridor Conservation District and the following activities and facilities are specifically prohibited:

- 4.1 Clearing of all existing vegetation, except where such clearing is necessary to prepare land for a use permitted under Section 3.1, herein, and where the

Denudation of the buffer area is prohibited unless it is done to allow for construction of a permitted use, such as a utility crossing, provided the uses are constructed and revegetated

effects of these actions are mitigated by re-establishment of vegetation, as specified under Section 8.1, herein.

according to ordinance specifications.

- 4.2 Storage of any hazardous or noxious materials.
- 4.3 Use of fertilizers, pesticides, herbicides, and/or other chemicals in excess of prescribed industry standards or the recommendations of the Montgomery County Conservation District.
- 4.4 Roads or driveways, except where permitted as corridor crossings in compliance with Section 3, herein.
- 4.5 Motor or wheeled vehicle traffic in any area not designed to accommodate adequately the type and volume.
- 4.6 Parking lots.
- 4.7 Any type of permanent structure, including fences, except structures needed for a use permitted in Section 3, herein.
- 4.8 Subsurface sewage disposal areas.
- 4.9 Sod farming.
- 4.10 Stormwater basins, including necessary berms and outfall facilities.

The ordinance should specifically prohibit uses that may inevitably lead to erosion, sedimentation, pollution, and general disturbance of the corridor, which may not be reasonably mitigated. Once again, this section should be modified to meet the goals of the municipality.

Section 5. Nonconforming Structures and Uses in the Riparian Forest Corridor District

Nonconforming structures and uses of land within the Riparian Corridor Conservation Overlay District shall be regulated under the provisions of Article VII, Nonconforming Status, herein, except that the one-year time frame for discontinuance shall not apply to agricultural uses which are following prescribed Best Management Practices for crop rotation.

Structures and uses that legally exist prior to adoption of this ordinance, which will no longer be permitted, are considered nonconforming. It is important to recognize these instances, regulate their expansion, and determine abandonment.

Section 6. Boundary Interpretation and Appeals Procedure

- 6.1 When an applicant disputes the Zone 1 and/or 2 boundaries of the Riparian Corridor or the defined edge of a watercourse, surface water body, or wetland, the applicant shall submit evidence to the [Municipality] that shows the applicant's proposed boundary, and provides justification for the proposed boundary change.

There may be disputes about the extent of the corridor on specific properties. This section provides the applicant with the opportunity to justify a change in the boundary location.

boundary change.

6.2 The [Municipal] Engineer, and/or other advisors selected by the [Governing Body] shall evaluate all material submitted and provide a written determination within 45 days to the [Governing Body], [Municipal] Planning Commission, and landowner or applicant.

Similar to other zoning appeals, further disputes should be handled by the zoning hearing board.

6.3 Any party aggrieved by any such determination or other decision or determination under this section may appeal to the Zoning Hearing Board under the provisions of [existing Zoning Hearing Board Article] of this ordinance. The party contesting the location of the district boundary shall have the burden of proof in case of any such appeal.

Once lands start being preserved, and a contiguous system of lands begin to form, some degree of regular inspection will be necessary. The inspection will determine landowner compliance with the ordinance provisions.

Section 7. Inspection of Riparian Corridor Conservation District

7.1 Lands within or adjacent to an identified Riparian Corridor Conservation Overlay District will be inspected by the [Municipal] Code Enforcement Officer when:

- A. A subdivision or land development plan is submitted.
- B. A building permit is requested.
- C. A change or resumption of nonconforming use is proposed.

7.2 The district may also be inspected periodically by the Code Enforcement Officer and/or other representatives designated by the [Governing Body] for compliance with an approved restoration plan, excessive or potentially problematic erosion, hazardous trees, or at any time when the presence of, or possibility of, an unauthorized activity or structure is brought to the attention of [Municipal] officials.

Vegetation is one of the key ingredients to a healthy and useful corridor. Therefore, to encourage and aid in the establishment of the riparian corridor, specific riparian plantings should be required as part of the site's general landscaping.

Section 8. Management of the Riparian Corridor District

8.1 Riparian Corridor Planting. Re-establishment of forest cover and woodland habitat shall be required consistent with the requirements of the landscape regulation within the [Municipal] Subdivision and Land Development Ordinance.

When development encroaches upon the riparian corridor, the function of the corridor is compromised and mitigation will be required.

- 8.2 Mitigation Measures. Uses permitted in Section 3 involving corridor crossings or other encroachment within the riparian corridor shall be mitigated by increasing the width of the corridor as replacement for the area lost due to the encroachment or disturbance, so that the total corridor area (land area within Zone One and Zone Two) for each applicable side of the stream or watercourse is equal to that required by Section 2.1.

A "buffer averaging" approach adds width to portions of the buffer to offset reductions in width due to corridor crossings or other types of disturbance.

Corridor area is the product of the corridor width required by Section 2.1 and the total length for each applicable side of the stream or watercourse for which a riparian corridor is being established. Perimeter shall be used in place of length for determining wetland buffer area. The increased width shall be spread throughout the corridor to the maximum extent possible. For stream and watercourses, the increased width shall be applied along the length of the stream in blocks of 1,000 feet or more, or the full length of the corridor on the affected property, whichever is less.

While the need for corridor crossings is inevitable, the number and design of these crossings should be controlled in order to protect the integrity and functionality of the riparian corridor to the greatest extent possible.

Section 9. Corridor Crossings Standards

- 9.1. Corridor Crossing Criteria. All corridor crossings permitted under Sections 3.1 or 3.2, herein, shall incorporate, as required, the following design standards.
- A. The width of the right-of way should not be greater than the minimum right-of-way width required by the [Municipal] Subdivision and Land Development Ordinance.
 - B. Crossings should be designed to cross the riparian corridor at direct right angles to the greatest extent possible in order to minimize disturbance of the corridor.
 - C. Corridor crossings should be separated by a minimum of 1,000 feet of buffer length.
 - D. Bridges should be used in place of culverts when crossings would require a 72-inch or greater diameter pipe. When culverts are installed they should consist of slab, arch, or box culverts and not corrugated metal pipe. Culverts should also be designed to retain the natural channel bottom to ensure the passage of water during low flow or dry weather periods.

Section 10. Use of Technical Terminology

Technical terminology used in this article shall be interpreted to have the meanings used by recognized sources and experts in the fields of forestry, woodland or meadow management, streambank protection, wetlands management, erosion and sedimentation control, or other relevant fields.

Integration of the Riparian Corridor Conservation Overlay District into the municipal zoning ordinance should be complemented by the adoption of specific landscape standards within the municipal subdivision and land development ordinance.

Model Landscape Standards for Subdivision and Land Development Ordinance:

A. Purpose & Application

In areas within the Riparian Corridor Conservation District as defined in Section ### of the [Municipal] Zoning Ordinance, the edge of water features and stream corridors should be in forest cover to further the ecological and environmental benefits, as stated in the Riparian Corridor Conservation Overlay District (RCC). To promote re-establishment of forest cover and woodland habitat, new tree plantings shall be implemented in Zone One wherever existing trees do not meet the minimum tree planting requirements.

The required plantings will help to enhance or re-establish a vegetated riparian buffer, maximizing water quality benefits.

B. Planting Requirements

1. New trees shall be planted at a minimum rate of 15 feet on center or one tree per 225 square feet in staggered rows or an equivalent informal arrangement within the area defined as Zone One by the RCC.
2. New trees shall be a variety of sizes ranging from a minimum 4 to 5 foot branched whip to an approximate 1 1/2 " balled and burlapped planting stock.
3. New tree plantings shall be composed of native tree species.
4. Tree plantings shall be located along the streambank to provide shade for the stream, soil erosion control and stormwater benefits, according to accepted streambank restoration practices.
5. Existing trees within Zone One shall be preserved and retained. Existing tree cover should be surveyed and inventoried to assess the need for any new plantings. Existing tree species included on the noxious/invasive plant species list, Appendix C, may be removed where conditions warrant.

Plantings installed as part of the subdivision and land development process will provide visual cues to future property owners by providing a distinction between the riparian corridor and the remaining lot area.

If the riparian corridor is to be ultimately managed by numerous private owners, the municipality should provide or arrange for continued education of property owners regarding the benefits of riparian corridors and proper management and stewardship.