

Natural Resources Conservation Service  
Conservation Practice Standard

**FILTER STRIPS / AREAS**  
Code 393 (Acres)

**DEFINITION**

A strip or area of herbaceous vegetation situated between cropland, grazing land, or disturbed land (including forest land) and environmentally sensitive areas.

**PURPOSE**

1. To reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in runoff.
2. To reduce dissolved contaminant loadings in runoff.
3. To serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391.
4. To restore, create or enhance herbaceous habitat for wildlife and beneficial insects.
5. To maintain or enhance watershed functions and values.

**CONDITIONS WHERE PRACTICE APPLIES**

This practice applies (1) in areas situated below cropland, grazing land, or disturbed land (including forest land) (2) where sediment, particulate organic matter and/or dissolved contaminants may leave these areas and are entering environmentally sensitive areas; (3) in areas where permanent vegetative establishment is needed to enhance wildlife and beneficial insects, or maintain or enhance watershed function. This practice applies when planned as part of a conservation management system.

**CRITERIA**

**General criteria applicable to all purposes.**

1. Filter strips shall be designated as vegetated areas to treat runoff and are not part of the adjacent cropland rotation.
2. Overland flow entering the filter strip shall be primarily sheet flow. Concentrated flow shall be dispersed.
3. State listed noxious weeds will not be established in the filter strip and will be controlled if present.
4. Filter strip establishment shall comply with local, state and federal regulations.
5. Vegetation. A grass or a grass/legume mixture suited to the site and planned purpose shall be used. Suitable grass and grass/legume mixtures are listed in the Seeding Table 4 found in Section IV, Appendix A, FOTG.
6. Location / Layout (Placement). The filter strips must be located/placed in such a way to receive runoff from the contributing area as "sheet flow" and not as concentrated flow. To the maximum extent possible, filter strips shall be on the contour so as to intercept runoff as "sheet flow". This may require some grading or detailed survey and layout. The filter strip does not necessarily need to be placed next to the stream; but rather where it can most effectively perform its function.
7. Establishment and Site Preparation. See Appendix A - Seeding Tables, Section IV, FOTG.

**Additional criteria to reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff**

1. **Filter Strip Flow Length.** (Measured from where sheet flow enters the filter strip and continuing in the direction of flow through the filter strip) Filter strip flow length shall be determined based on field slope percent and length, and filter strip slope percent, erosion rate, amount and particle size distribution of sediment delivered to the filter strip, density and height of the filter strip vegetation, and runoff volume associated with erosion producing events. The minimum flow length for this purpose shall be 20 feet for filter strip slopes < 5%. The minimum flow length shall be 30 feet for filter strips slopes > 5 % or with an average contributing watershed slope > 10%. Flow length (strip width) can be adjusted above the minimum to fit local field irregularities and alignments. Filter strips shall not exceed 300 feet of flow length (strip width).
2. **Filter strip location requirements:**
  - a) The filter strip shall be located along the downslope edge of a field or disturbed area. To the extent practical it shall be placed on the approximate contour. Variation in placement on the contour should not exceed a 0.5% longitudinal (perpendicular to the flow length) gradient.
  - b) The ratio of the drainage area to the filter strip area shall be less than 60:1 for Ohio conditions.
  - c) The average annual sheet and rill erosion rate above the filter strip shall be less than 10 tons per acre per year.
3. **Vegetation and Establishment.** The filter strip shall be established to permanent herbaceous vegetation consisting of a single species or a mixture of grasses, legumes and/or other forbs adapted to the soil, climate, and nutrients, chemicals, and practices used in the current management system. Species selected shall have stiff stems and a high stem density near the ground surface. Stem density shall be such that the stem spacing does not exceed 1 inch. See Appendix A, Section IV FOTG, for acceptable seeding mixtures for the planned purposes.

**Additional criteria to reduce dissolved contaminant loadings in runoff**

1. The criteria given in "Additional criteria to reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in runoff" also apply to this purpose.
2. Filter strip flow length required to reduce dissolved contaminants in runoff shall be based on management objectives, contaminants of concern, and the volume of runoff from the filter strip's drainage area compared with the filter strip's area and infiltration capacity. The flow length determined for this purpose shall be in addition to the flow length determined for reducing sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff. The minimum flow length for this purpose shall be 30 feet PLUS the flow length to reduce sediment, particulate organics, and sediment-adsorbed contaminant loadings in runoff.

**Additional criteria to serve as Zone 3 of a Riparian Forest Buffer, Practice Standard 391**

1. Except for the location requirements, the criteria given in "Additional criteria to reduce sediment, particulate organics, and sediment adsorbed contaminant loadings in runoff" also apply to this purpose.
2. **Concentrated Flows.** If concentrated flows entering Zone 3 are greater than the filter strip's ability to disperse them, other means of dispersal, such as spreading devices, must be incorporated.

**Additional criteria to restore, create, or enhance herbaceous habitat for wildlife and beneficial insects**

1. **Filter Flow Length.** If this purpose is intended in combination with one or more of the previous purposes, then the minimum criteria for the previous purpose(s) must be met. Additional filter strip flow length devoted to this purpose must be added to the length required for the other purpose(s) if the plant density will be less than required for the above criteria.
2. **Location.** Any addition to the flow length for wildlife or beneficial insects shall be added to the downhill slope of the filter strip. Vegetation to enhance wildlife may be added to that portion of the filter strip devoted to other purposes to the extent they do not detract from its primary functions.
3. **Plant Species.** Plant species selected for this purpose shall be for permanent vegetation adapted to the wildlife or beneficial insect population(s) targeted. Density of the vegetative stand established for this purpose shall consider targeted wildlife habitat requirements and encourage plant diversity. Dispersed woody vegetation may be used to the extent it does not interfere with herbaceous vegetative growth, or operation and maintenance of the filter strip. See Appendix B, Section IV FOTG, for a listing of trees and shrubs that are suitable to incorporate as part of a filter strip for this purpose.
4. The filter strip shall not be mowed during the nesting season of the target wildlife (generally March through July 15<sup>th</sup>).
5. Livestock and vehicular traffic in the filter strip shall be excluded during the nesting season of the target species.

**Additional criteria to maintain or enhance watershed functions and values**

1. Filter strips shall be strategically located to enhance connectivity of corridors and non-cultivated patches of vegetation within the watershed.
2. Filter strips should be strategically located to enhance aesthetics of the watershed.
3. Plant species selected for this purpose shall be for establishment of permanent vegetation.

**CONSIDERATIONS**

1. Filter strips should be strategically located to reduce runoff, and increase infiltration and ground water recharge throughout the watershed.
2. Filter strips for the single purposes of wildlife/beneficial insect habitat or to enhance watershed function should be strategically located to intercept contaminants thereby enhancing the water quality of the watershed.
3. To avoid damage to the filter strip consider using vegetation that is somewhat tolerant to herbicides used in the upslope crop rotation.
4. Consider using this practice to enhance the conservation of declining species of wildlife, including those that are threatened or endangered.
5. Consider using this practice to protect National Register listed or eligible (significant) archaeological and traditional cultural properties from potential damaging contaminants.
6. Filter strip size should be adjusted to a greater flow length to accommodate harvest and maintenance equipment.
7. The site should have adequate drainage to achieve its intended purpose(s).

8. Select grass or grass/legume mixtures that provide satisfactory secondary benefits for wildlife cover, pasture, or hay for livestock.
9. Filter strips and filter areas on slopes of less than 5% are most effective.
10. Filter strips and filter areas should be considered as only a component of an overall system to manage runoff, water quality, and other concerns.
11. A shallow furrow on the contour across a filter strip or filter area can help reestablish "sheet flow".
12. Ensure easements (maintenance right-a-ways, above and below ground utilities) are considered in the planning and layout of the filter strips and filter areas.
13. If edge of field or stream-side vegetative areas are the primary purpose consider the NRCS Standard 386 - Field Borders as your design standard.
14. Do not apply buildup amounts of fertility unless the fertility levels are very low. The filter strip or infiltration area will be receiving nutrients from the runoff or wastewater.

### **PLANS AND SPECIFICATIONS**

Based on this standard, plans and specifications shall be prepared for each specific field site where a filter strip will be installed. A plan includes information about the location, construction sequence, vegetation establishment, and management and maintenance requirements.

Specifications will include:

1. Length, width, and slope of the filter strip to accomplish the planned purpose (length refers to flow length across the filter strip).
2. Species selection and seeding or sprigging rates to accomplish the planned purpose
3. Planting dates, care, and handling of the seed to ensure that planted materials have an acceptable rate of survival
4. A statement that only viable, high quality, and regionally adapted seed will be used
5. Site preparation sufficient to establish and grow selected species

The minimum documentation requirements for this practice are outline on the last page of this practice.

**OPERATION AND MAINTENANCE**

1. For the purposes of filtering contaminants, permanent filter strip vegetative plantings should be harvested as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.
2. Control undesired weed species, especially state-listed noxious weeds.
3. Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, reseed disturbed areas, and take other measures to prevent concentrated flow through the filter strip
4. Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip.
5. To maintain or restore the filter strip's function, periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed. If wildlife habitat is a purpose, destruction of vegetation within the portion of the strip devoted to that purpose should be minimized by regrading only to the extent needed to remove sediment and fill concentrated flow areas.
6. After September 1st do not mow or harvest the grasses or grass/legume mixtures to allow for a good cover to establish prior to winter.
7. Maintain all easements and right-a-ways.
8. For CRP filter strips and other filter strips with desired wildlife purposes delay mowing or harvests until after July 15<sup>th</sup>.

**References:**

National NRCS Practice Standard – Filter Strip 393

The Ohio State University Fact Sheet AEX 706 – Handling Milking Center Wastewater to Avoid Pollution  
Tables: Section IV, Appendix A & B, Section IV FOTG

Jobsheet: National Conservation Practice Jobsheet – Filter Strips 393

<b>Practice Documentation For:</b> <i>Filter Strip - 393</i>
<b>The following documentation must be in the case folder or engineering subfolder.</b>
<b>Practice Planning</b>
<ol style="list-style-type: none"> <li>1. Is the practice part of a conservation plan?</li> <li>2. Have the purpose(s) for the practice been identified?</li> <li>3. Is the location of the practice identified on a map or plan drawing?</li> </ol>
<b>Practice Design</b>
<p>Have the following design criteria been addressed?</p> <ol style="list-style-type: none"> <li>1. Filter Strip Location.</li> <li>2. Drainage area and slope of the contributing area.</li> <li>3. Type of vegetation compatible with soils, site and purpose.</li> <li>4. Filter strip flow length (width).</li> <li>5. Seeding mixture, seeding rate, time and method of seeding.</li> <li>6. First year establishment management.</li> <li>7. Acres planned.</li> </ol>
<b>Practice Installation / Application</b>
Does the practice meet the minimum criteria for the planned purpose(s)?
<p>Have the following criteria been documented in the assistance notes or practice jobsheet?</p> <ol style="list-style-type: none"> <li>1. Species of vegetation established.</li> <li>2. Quality of the seeding.</li> <li>3. Acres established.</li> <li>4. Length and width of the filter strip.</li> </ol>
<b>Practice Deficiencies</b>
If applicable, have the practice deficiencies been communicated with the decisionmaker?
<b>Practice Maintenance</b>
<p>Have the following maintenance actions been communicated to the decisionmaker?</p> <ol style="list-style-type: none"> <li>1. Harvesting schedule as appropriate to encourage dense growth, maintain an upright growth habit, and remove nutrients and other contaminants that are contained in the plant tissue.</li> <li>2. Control undesired weed species, especially state-listed noxious weeds.</li> <li>3. Prescribed burning may be used to manage and maintain the filter strip when an approved burn plan has been developed.</li> <li>4. Inspect the filter strip after storm events and repair any gullies that have formed, remove unevenly deposited sediment accumulation that will disrupt sheet flow, reseed disturbed areas, and take other measures to prevent concentrated flow through the filter strip</li> <li>5. Apply supplemental nutrients as needed to maintain the desired species composition and stand density of the filter strip.</li> <li>6. Periodically regrade the filter strip area when sediment deposition at the filter strip-field interface jeopardizes its function, and then reestablish the filter strip vegetation, if needed.</li> <li>7. Grazing shall not be permitted in the filter strip unless a controlled grazing system is being implemented. Grazing will be permitted under a controlled grazing system only when soil moisture conditions support livestock traffic without excessive compaction.</li> </ol>
<b>Other Comments:</b>