DRAFT

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

HEDGEROW PLANTING

(Ft.)

CODE 422

This standard is currently under revision and will be available by January 2006. For additional information, contact Mike Zeman, State Biologist, at mike.zeman@tn.usda.gov.

DEFINITION

Establishment of dense vegetation in a linear design to achieve a natural resource conservation purpose.

PURPOSE

Providing at least one of the following conservation functions:

- Food, cover, and corridors for terrestrial wildlife.
- To intercept airborne particulate matter.
- To reduce chemical drift and odor movement.
- Living fences.
- Boundary delineation.
- Contour guidelines.
- Screens and barriers to noise.
- Improvement of landscape appearance.

CONDITIONS WHERE PRACTICE APPLIES:

This practice applies wherever it will accomplish at least one of the purposes stated above.

CRITERIA

General Criteria Applicable to All Purposes

Hedgerows shall be established using woody plants producing erect stems attaining average heights of at least 3 feet and persisting well over winter.

Plants selected must be suited and adapted to the soils, climate, and conservation purpose.

No plant listed by the State (*Tennessee Exotic Pest Plants in Tennessee – 2004*) as a noxious weed or invasive exotic pest shall be established in a hedgerow. Shrubs and small trees currently listed in Tennessee as invasive exotic pest plants include the tree of heaven, mimosa, autumn olive, Chinese privet, common privet, several species of bush

honeysuckle, princess tree, multiflora rose, Japanese barberry, burning bush, Japanese privet and bicolor (*Lespedeza bicolor*).

The practice shall be protected from livestock grazing and trampling to the extent necessary to ensure that it will perform the intended purpose(s).

Site preparation, establishment, planting dates, spacing, planting methods, and care in handling and planting of the plant materials shall be in accordance with practice standard Tree/Shrub Establishment (612).

Competing vegetation shall be controlled until the hedgerow becomes established. Control shall continue beyond the establishment period, if necessary.

All planned work shall comply with Federal, State, and local laws and regulations.

Additional Criteria for Wildlife Food, Cover, and Corridors

Establish at least two species of native vegetation with the exception of approved shrub lespedeza hedgerows. Shrub lespedeza hedgerows consisting of VA-70 (Lespedeza japonica) or Amquail (Lespedeza thunbergii) may be established as monoculture plantings due to the maintenance requirements of periodic mowing or nutrient management in order to retain the quality of the stand.

Selected plants shall provide cover and/or food to support the landowner's wildlife objectives.

Minimum hedgerow width at maturity shall be 15 feet. Hedgerows shall consist of a minimum of two rows of plants.

In plantings adjacent to small watercourses, the plantings shall be site-adapted, large enough at maturity, and installed close enough to shade the watercourse for the majority of daylight hours.

Use Exclusion (472) will be used to exclude livestock from all plantings.

Additional Criteria for Reducing Particulate Matter Movement (Dust, Soil, Soot, Smoke, Organic Chemicals)

Establish a minimum of three rows with at least two species consisting of both short and tall growth habit.

The hedgerow will be oriented as close to perpendicular to the prevailing wind direction as possible during the season of the highest expected particulate matter movement. Generally in Tennessee, the prevailing wind direction will be from the southwest during the cropping season.

Hedgerow density on the upwind side shall be at least 50 percent at maturity.

Hedgerow density adjacent to the particulate source shall be at least 65 percent at maturity.

Hedgerows shall be of sufficient height to affect wind velocities when reducing dust or organic chemicals in areas of concern (e.g., farmsteads). Wind velocities may be reduced up to 50 percent for a distance approximately ten times the height of the tallest plants in the hedgerow.

Additional Criteria for Reducing Odor Movement and/or Chemical Drift

Establish a minimum of three rows with at least two species consisting of both short and tall growth habit.

Orientation of the hedgerow shall be as close to perpendicular to the prevailing wind direction during the period of concern, and between the source of the odor or chemical drift and the sensitive areas.

Hedgerows shall be located on the prevailing upwind side of the odor-producing area and the chemical application area.

Tree and shrub species used shall have foliar and structural characteristics that optimize interception, adsorption, and absorption of airborne chemicals or odors. Height "layering" of multiple rows of species shall be done to direct wind currents up and above sensitive areas. Layering shall consist of low dense shrubs on outside rows with taller shrubs or trees in the middle rows. The distance across the odor-producing or chemical application area shall be less than five times the maximum height of the tallest species in the rows at plant maturity.

Additional Criteria for Living Fences

Selected plants shall attain a size adequate to create a barrier to contain livestock or humans, as needed.

If the purpose is to contain livestock, selected plants shall not be poisonous or hazardous to animals.

Additional Criteria for Boundary Delineation

Hedgerows shall be aligned along boundaries of fields or forestlands to differentiate land management units.

Additional Criteria for Contour Guidelines

Hedgerows shall be aligned so they provide permanent contour markers supporting implementation of Contour Farming (330) or Stripcropping (585). Refer to those conservation practice standards for alignment criteria.

Additional Criteria for Screens and Noise Barriers

Hedgerows shall be located where they most completely obstruct a line of sight or offensive sound.

Selected plants shall attain a height and fullness sufficient to break the line of sight at all desired times of the year or baffle sound. Screens designed to obstruct view during winter shall contain low evergreen limbs, high stem counts, multiple offset rows, or a combination of these.

Additional Criteria for Improvement of Landscape Appearance

The hedgerow design shall meet the aesthetic objectives of the landowner.

Plants shall be selected based on the landowner's preferences for flowering, fruit, fall colors, and growth habit.

CONSIDERATIONS

General

Hedgerows can be planned in combination with other practices to develop complete conservation systems that enhance

landscape aesthetics, reduce soil erosion, improve sediment trapping, improve water quality, and provide wildlife habitat.

Hedgerows following land contours create meandering lines on the landscape, produce a natural appearance, and increase the availability of “edge" wildlife habitats.

For wildlife, hedgerows containing a mixture of native shrubs and small trees provide greatest environmental benefits. Larger trees should be scattered, rather than the dominant plants in the hedgerow. Table 1 provides a partial list of recommended woody plant materials considered suitable for hedgerows.

Consider mixing different species within each row for diversification.

Use of bareroot and containerized seedlings will accelerate hedgerow development.

Consider the amount of shading a hedgerow will provide at maturity. Shading may impact growth of adjacent plants, microclimate, and aesthetics.

Limiting renovation events to one-third of a hedgerow’s length or width will prevent sudden elimination of the practice’s wildlife habitat function.

Periodic root pruning can reduce nutrient and water robbing from adjacent cropland, and serve to control the undesired expansion of root suckers.

Hedgerows should be a mixture of fast and slow growing species to provide timely benefits and longevity.

Wildlife Food, Cover, and Corridors

Hedgerows can provide travel lanes or corridors that allow wildlife to move safely across a landscape when connected to larger patches of habitat.

Hedgerows may be naturally regenerated across open areas by disking the desired width strip, setting fence posts in a staggered line every 20 feet and stringing twine 3 feet above the ground for bird perching.

Two or more corridor connections between habitat patches are better than one. Multiple paths protect against disturbance and disruption of wildlife movement. Generally, wider corridors accommodate more wildlife use.

Linking fragmented habitats may increase wildlife use of an area by making otherwise inaccessible habitat available. This may be especially valuable to smaller, less mobile species.

In grassland ecosystems, hedgerows may adversely affect area-sensitive nesting birds by fragmenting habitat patches and increasing the risk of predation.

Hedgerows can complement the availability of naturally occurring wildlife foods.

Hedgerows can provide wildlife with cover for feeding, loafing, nesting, and caring for young.

Dense or thorny shrub thickets provide songbirds with important nesting sites and a refuge to escape predators.

Establishment of evergreen plants provides year-round concealment and thermal cover for wildlife.

Establishment of herbaceous vegetation, especially native warm season bunch grasses, along the edges of a hedgerow can further enhance the habitat functions of a hedgerow.

Installation of artificial nest boxes with predator guards can encourage cavity-nesting birds and small mammals to utilize a hedgerow.

Screens and Noise Barriers

From eye level, hedgerows reduce the line of sight across open areas, concealing objects behind them from view.

Consider the design from viewpoints on both sides of the screen.

Locate noise barriers as close to the source of noise as possible.

Combination of shrubs and/or trees can create more effective screens than single species plantings.

Evergreens provide foliage that can maintain a screen's year-round effectiveness.

Improving Landscape Appearance

Consider plants' seasonal display of colors on bark, twigs, foliage, flowers, and fruit.

Consider plants' growth habits (outline, height, and width).

Water Quality and Quantity

Water quality benefits may arise from:

- Arresting sediment movement and trapping sediment-attached substances.
- Infiltration and assimilation of plant nutrients.
- Water cooling effects resulting from increased shade on small watercourses.

Water quality benefits may be considerably enhanced with the use of perennial herbaceous vegetation along the edges.

A hedgerow will increase surface water infiltration by improving soil structure around its root zone; however, evapotranspiration may reduce ground water recharge benefits.

PLANS AND SPECIFICATIONS

Plans and specifications for this practice shall be prepared for each site. Plans and specifications shall be recorded using approved specification sheets, job sheets, or narrative documentation in the conservation plan or other acceptable documentation.

Specifications shall include, but not be limited to, the following:

1. Plan map showing the location of the practice.
2. A sketch map showing the planting patterns to be used.
3. Plant species to be used and numbers of each.
4. Land preparation to be performed.
5. Liming/fertilization requirement.
6. Planting rates, dates, and spacing.

7. Control of competition needed for establishment.

OPERATION AND MAINTENANCE

Supplemental planting may be required when survival is too low to produce a continuous hedgerow.

Vegetation shall be protected from unwanted fire and grazing throughout its lifespan.

Pests shall be monitored and controlled.

Periodic applications of nutrients may be needed to maintain plant vigor.

Renovation activities shall be scheduled to prevent disturbance during the wildlife nesting season (April 15 to August 15). Renovation techniques may include prescribed burning, use of herbicides, or by mechanical means.

Mature hardwood trees should be thinned to renovate mid-story shrubs, vines, and understory plants, when crown closure and excessive shading occurs.

REFERENCES

Brandle, James R. and Sherman Finch. How Windbreaks Work. University of Nebraska Extension EC91-1763-B. 4 pp.

Haaland, Dr. Ron. 1998. "Hedgerows: The Backbone of Habitat." Alabama Wildlife Magazine Archives. 3 pp.

Lewis. Thomas A. 1997. *Backyard Habitat: Using an Agricultural Relic to Create a Wildlife Haven*. National Wildlife Federation. 2 pp.

National Biology Handbook, Part 614.4, "Conservation Corridor Planning at the Landscape Level." Natural Resources Conservation Service. August 1999.

Sargent, M.S. and Carter, K.S., Ed. 1999. Managing Michigan Wildlife: A Landowner's Guide. Michigan United Conservation Clubs, East Lansing, MI. 297 pp.

Southeast Exotic Pest Plant Council. *Tennessee Exotic Pest Plants in Tennessee – 2004*. Report from the Tennessee Exotic Pest Plant Council. 4 pp. http://www.tneppc.org.

NRCS, TN
December 14, 2005

Table 1. Partial list of recommended woody plants suitable for hedgerow development.

Plant Species	Landscape Position	Primary Application	Recommended Spacing (Ft.)	Approximate No. per Acre
Spicebush	Moist Lowland	Wildlife Cover/Food	8 x 8	680
Indigobush	Varied	Wildlife Cover/Food	8 x 8	680
Chokecherry	Upland	Wildlife Cover/Food	8 x 8	680
Wild (American) Plum	Upland	Wildlife Cover/Food	8 x 8	680
Chickasaw Plum	Upland	Wildlife Cover/Food	8 x 8	680
Southern Crabapple	Upland	Wildlife Cover/Food	12 x 12	302
Washington Hawthorne	Upland	Wildlife Cover/Food	12 x 12	302
Flowering Dogwood	Upland	Wildlife Cover/Food	12 x 12	302
Silky Dogwood	Moist Lowland	Wildlife Cover/Food	8 x 8	680
Gray Dogwood	Moist Lowland	Wildlife Cover/Food	8 x 8	680
Sawtooth Oak (Non-native)	Varied	Wildlife Cover/Food	20 x 20	109
Pin Oak	Varied	Wildlife Cover/Food	20 x 20	109
Cherrybark Oak	Varied	Wildlife Cover/Food	20 x 20	109
Nuttall Oak	Varied	Wildlife Cover/Food	20 x 20	109
Northern Red Oak	Upland	Wildlife Cover/Food	20 x 20	109
Shrub Lespedeza* (Non-native)	Upland	Wildlife Cover/Food	3 x 3	4,840
Eastern Red Cedar	Upland	Screening/Cover	12 x 12	302
Virginia Pine	Upland	Screening/Cover	12 x 12	302
White Pine (Non-Native)	Upland	Screening/Cover	12 x 12	302

* VA-70 (Lespedeza japonica) and Amquail (Lespedeza thunbergii) are approved for this standard and may also be seeded at the rate of 12 pounds per acre.