



- Adjacent waterbody use and fish habitat condition
- Upland conditions and practices affecting riparian functions
- Soil qualities (texture, depth, moisture content, etc.)
- Stream channel type and relationship to floodplain
- Connection to upstream and downstream habitat or to other nearby wildlife cover
- Width of area and ability to accommodate desired wildlife species
- Special wildlife resources (e.g., threatened or endangered species)

Design Considerations

Fish and wildlife design considerations in Northern Plains agricultural landscapes include (1) buffer width; (2) wildlife habitat value of plants; (3) plant selection to create non-uniform vegetative structure; (4) placement of plants within buffer; (5) adjacent land uses; (6) opportunities to link the riparian area with other wildlife habitats and (7) appropriateness of woody versus grass vegetation.

Native woodlands in the Great Plains consisted of corridor forests and scattered woody vegetation along streams and rivers, and around lakes and wetlands. Native woody species in the Northern Great Plains tolerate or have adaptations for the climatic extremes of the northern prairie ecosystem. Soil survey and historical records should be referenced to decide whether to plant grass or woody plants in riparian project areas.

Wildlife responses to width of riparian forest buffers are not well understood; consequently, recommended widths vary widely among species. However, there is a minimum width needed to protect adjacent aquatic habitat. In the Northern Plains, buffer strips should be a minimum of 50 ft. wide for first and second order streams and 100 ft. wide for

Part I. Potential Wildlife Uses

This supplement provides design and management options for land users and planners seeking to enhance riparian forest buffers for wildlife. All waterways from small creeks to major rivers have a riparian zone or floodplain. These areas are periodically flooded and represent a transition zone between upland and aquatic habitats.

Riparian forest buffers established next to streams, lakes, ponds, seeps, or wetlands potentially provide many benefits to immediate and downstream aquatic habitats. These improvements to aquatic habitats may include improved water quality, cooler water temperatures, reduced soil erosion, stabilized stream banks, improved floodplain function and recharge of groundwater aquifers.

Properly functioning riparian areas are highly productive systems. Productivity of these areas is sustained by high inputs of leaf litter and periodic flooding which facilitates the rapid breakdown of litter and recycling of nutrients. The connection that riparian areas provide between upland and aquatic habitats and the structural diversity of vegetation caused by frequent disturbances further contribute to the high use of riparian habitats by wildlife.

Properly designed and maintained riparian forest buffers may serve as breeding habitat, important travel, or migration corridors for wildlife, shelter in winter, and critical resting and refueling stops for migratory birds.

Part II. Planning and Design Considerations

Site Considerations

- Landowner's wildlife objectives
- Watershed objectives



larger streams. Where woody plants are appropriate, buffers should be designed with herbaceous, shrub, and tree zones.

Tall trees with spreading canopies that are planted stream-side will provide shade, leaf litter, and large woody debris to the stream. Selection of multiple native woody species and irregular placement of plants within zones is preferable to planting single species in rows.

Maintenance Considerations

The amount of maintenance required and the method used to maintain the vegetation of the riparian forest buffers depends on the fish, wildlife, and habitat goals; tree insect and disease issues; and weather. Riparian forest buffers are vulnerable to adverse impacts caused by upland management practices. The best place to address these impacts is in the uplands at the point of origin, rather than at the edge of the buffer. Because of its importance for filtering surface run-off, maintenance of the herbaceous zone must be done carefully.



Timing of maintenance of shrub and tree zones is critical if nesting or migratory birds use the buffer. To minimize disturbance to nesting forest birds and avoid tree insect and disease problems, prune and thin from October through April.

To encourage use by cavity nesters, allow dead and dying trees to remain. If removal is necessary, then do so selectively retaining a minimum of one snag every 200 feet. Nest boxes that are properly sized for desired species may be erected.

Part III. Recommended Shrubs and Trees

Develop the species for planting as appropriate for the soils and windbreak suitability group, using the tree and shrub species approved for this practice in the *South Dakota Technical Guide*. Be certain to check the compatibility of species that are to be planted adjacent to one another.



Part IV. Specifications Sheet

Use form SD-CPA-26, *Wildlife Habitat Management*, to document the wildlife species that the land user wishes to benefit and to document how and where the species' required habitats are to be established and/or maintained. Follow specification requirements for the practice "Riparian Forest Buffer," as outlined in the *South Dakota Technical Guide*, using form SD-CPA-6, *Tree Planting*.

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