RIPARIAN BUFFER PLAN FOR PROPOSED AGRICULTURAL LANDS

CUYAHOGA VALLEY NATIONAL PARK
NATIONAL PARK SERVICE
U.S. DEPARTMENT OF THE INTERIOR

March 28, 2002

Recommended:

_____ _____
Superintendent Date
Cuyahoga Valley NP

Approved:

_____ _____
Regional Director Date
Midwest Region

Introduction

This plan outlines an approach to protect the river and stream resources and their values in Cuyahoga Valley National Park (CVNP) by establishing protective riparian buffers. This plan complements the Wetland Protection Plan for Proposed Agricultural Lands (NPS 2002), which prescribed protective buffers for non-flowing wetlands (i.e., marshes, hillside seeps, vernal pools, isolated wetlands etc.).

Riparian Buffer Protection Guidance

NPS Management Policies (NPS 2001, Section 4.6.6) state that the NPS will "manage watersheds as complete hydrologic systems, and will minimize human disturbance to the natural upland processes that deliver water, sediment, and woody debris to streams" and "….will achieve the protection of watershed and stream features primarily by avoiding impacts to watershed and riparian vegetation, and by allowing natural fluvial processes to proceed unimpeded."

The most practical on-the-ground method to avoid impacts to riparian vegetation and maintaining natural processes is through the establishment of protective riparian buffers.

Rivers and streams are also often considered wetlands by the NPS (*sensu* Cowardin et al. 1979). NPS Management Policies (NPS 2001, Section 4.6.5) and Executive Order 11990 "Protection of Wetlands" direct the NPS to minimize and mitigate the destruction, loss or degradation of wetlands; preserve, enhance and restore the natural and beneficial values of wetlands; and avoid direct and indirect support of new construction in wetlands unless there are no practicable alternatives and the proposed action includes all practicable measures to minimize harm to wetlands. NPS policies for implementing the Executive Order 11990 in CVNP are found in Director's Order 77-1 "Wetland Protection" and the associated Procedural Manual. The NPS has developed a Wetland Protection Plan for Proposed Agricultural Lands (NPS 2002) in CVNP which established protective buffers for non-flowing wetlands. This plan provides a similar, but somewhat different protocol specifically for river and stream resources.

Importance of Riparian Buffers

Riparian buffers are vegetated areas beside rivers and streams that help reduce the adverse impacts that adjacent land use may have on water resources. Excellent reviews of the roles of riparian buffers and recommended buffer sizes are available (Desbonnet et al. 1994, Wenger 1999).

Buffers protect aquatic systems by moderating the effects of storm water runoff by stabilizing soils, filtering harmful substances, reducing sedimentation and nutrient input, and moderating water level fluctuations and flooding. Forested buffers shade waters thereby moderating temperatures and oxygen levels for aquatic wildlife. Indeed, riparian buffer areas are not only protective and serve as a transition zone between two different habitats, they also provide unique wildlife habitat that is more diverse than those surrounding it. Riparian buffers can also act as effective corridors for wildlife movement.

Additionally, riparian buffers increase the aesthetics and recreational opportunities a water resource may offer.

In Cuyahoga Valley National Park, many of the areas historically and currently considered ideal for agricultural use are located near streams and rivers. Establishing effective riparian buffers that protect the water resources and wildlife habitat but yet allow for limited agricultural use will help maximize the natural and cultural values of these areas.

Effective Buffer Zones

The effectiveness of buffer zones depends greatly upon the specific site conditions (e.g., slope, soil type and existing buffer vegetation and quality) and the potential for impact (e.g., sedimentation rates would be different for conventional plowing versus seasonal haying). However, some basic recommendations are common in the literature (e.g., Wenger 1999):

- All intermittent, perennial, and ephemeral streams and watercourses should be buffered.
- Buffer zone recommendations of 50-foot minimum are most common. Buffers of 100 feet are usually recommended. Buffer sizes increase with increased drainage area. Buffers of at least 300 feet are needed to protect habitat for interior forest species. Buffers extend from each edge of the watercourse.
- Buffer zones should include a consideration of slope, generally incrementally adding width for each 1% of slope. Slopes greater than 25% should not be counted as part of a buffer.
- Buffers zones should extend to the edge of 100-year floodplains.
- Buffers should include and extend beyond adjacent wetlands. Wetland areas should not be counted as part of a buffer.
- Existing impervious surfaces should not count as part of a buffer.
- A three-zone buffer is sometimes prescribed in multiple-use areas and areas adjacent to agriculture to allow some limited use of riparian land while preserving buffer functions (Welsch 1991, Connecticut River Joint Commission 1998). Zones from the watercourse include undisturbed forest alongside the stream, transitioning into managed forest where some disturbance is permitted, and then a grassed strip where seasonal grazing or mowing may occur.
- Buffer zones that are currently of poor quality due to recent impacts should be restored whenever possible. Prescribing set-backs without stabilizing vegetation will not protect water resources.

Additionally, several local agencies and groups provided written recommendations and many others participated in a Riverbank Workshop hosted by the park in April 1999 (e.g., Ohio EPA, Friends of the Crooked River, ODNR, USDA NRCS, Summit Co. SWCD). The Cuyahoga RAP and Cuyahoga Soil and Water Conservation District provided

additional recommendations that were incorporated into the buffer recommendations for smaller drainages.

Buffer Recommendations

Incorporating many of these suggestions, CVNP will establish or maintain buffers to areas adjacent to agricultural areas that are to be farmed or mowed. As with other NPS riparian buffer plans (e.g NPS 1998), these recommendations seek to assure that ideal buffers are used to the extent feasible, while acknowledging the constraints that arise from the NPS responsibility to manage for multiple uses in the riparian zone. Additionally, the structure of the developed landscape and historical value of agricultural lands in the Cuyahoga River floodplain provide substantial challenges to riparian buffer zone establishment. However, the following protocol has been developed to best protect riparian areas within this context.

The following policies will be followed (and are visually represented in Figure 1):

1) Apply buffers to all watercourses: intermittent, perennial, and ephemeral streams.
2) Establish base width: buffer width recommendations will start using the following basic widths based on drainage area:

Drainage Area (sq. mi)	**Base Width (ft.)**	**Examples (sq. mi. drainage)**
0.5	50	Small intermittent streams, unnamed upper tributaries
0.5 - 20	75	Haskell Run (1.3), Langes Run (3.9), Columbia Run (5.4)
20+	120	Yellow Creek (30+), Tinkers Creek (50+), Furnace Run (50+), Cuyahoga River (800+)

3) Add width based on slope: Add 2 feet to the base width for each 1% of slope.
4) Exclude impervious surfaces and slopes greater than 25%: Buffers are extended by the width of these areas as they do not provide effective buffer function.
5) Include adjacent wetlands: Wetlands should be included within riparian buffers but are also not counted as part of the base riparian buffer width. Wetlands near the outer edge of established riparian buffers should also be buffered to ensure that wetlands are protected. Buffers to wetland areas should follow protocols outlined in the CVNP Wetland Protection Plan for Agricultural Lands (NPS 2002).
6) Assign use zones to buffer when applicable: As no agricultural use of forested areas are currently planned, only two use zones may be prescribed (i.e., no Managed Forest zone will be assigned). Riparian buffers strips may be managed as a two-zone system only when:
   - 50-75 feet of forest already extends from the edge of a watercourse, and

- the outer 25 feet of the recommended buffer has not already moved into a shrub/scrub or forest stage (i.e., it is currently cultivated or mowed or is characterized as largely herbaceous).

In these situations, the outer 25 feet of the buffer area may be managed as a grazing area, haying area or mow area provided that no-till seeding, rotational grazing practices, and no fertilizing occurs in this zone. In some instances, the planting of certain shrubs that can be harvested might be permitted in this zone as well.

7) Restore buffer zones: After designating buffer areas, the restoration of forest, shrub and herbaceous layers may be required if poor conditions exist. A Riparian Restoration Plan will be developed to assess current buffer quality and implement any required improvements.

References

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Desbonnet, A., Pogue, P. and N. Wolf. 1994. Vegetated buffers in the coastal zone: A summary review and bibliography. Providence RI: University of Rhode Island.

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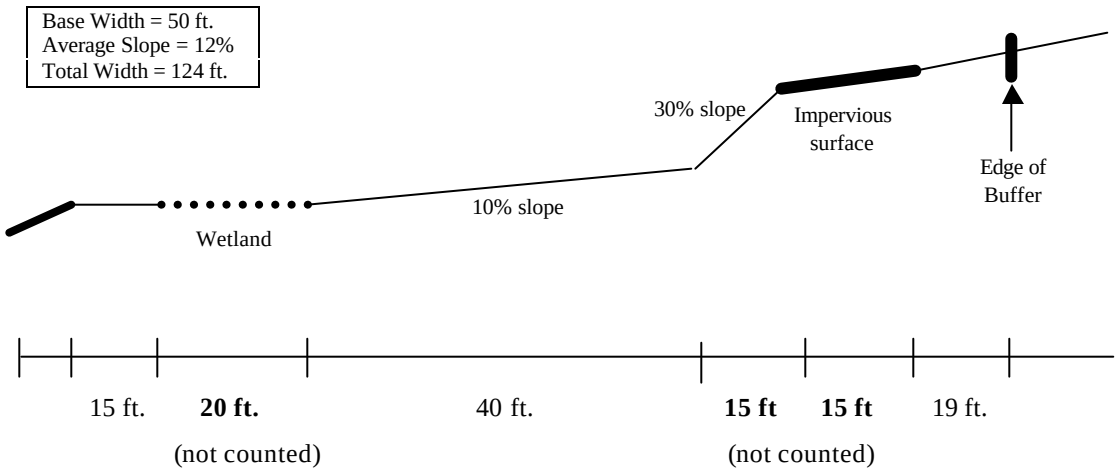
Figure 1. Assigning a base width buffer with various adjustments.



Assume the watercourse in question requires a 50-foot buffer based on drainage area. Base width is adjusted by adding 2 ft. for each 1% slope (74 ft.). Areas of wetland and impervious surfaces are excluded from the buffer width calculation (50 ft) for an established buffer of 124 ft. In this simple example it is assumed that the small wetland alone requires no greater buffer size than the 89 ft. afforded by the prescribed riparian buffer.