Preserving Stream Corridors Mitigates Erosion, Pollution

By Alan D. Wood

Golf courses, like most outdoor recreation facilities, can be highly compatible with restoring and maintaining natural stream corridors. Riparian corridors, normally including most of the floodplain, are complex ecosystems that require a balance among several factors: hydrology, geomorphology and biology. In layman’s terms, that’s water, ground and plant and animal life.

If we remove all these components from a stream, by building a concrete channel, for example, we are left with a lifeless waterway, which is not aesthetically appealing, nor environmentally friendly. Unfortunately, a typical natural stream corridor, which in most climate zones includes trees and shrubs, is not always compatible with outdoor recreation, such as golf, which requires some open spaces.

In Photo 1, we see a course with a beautiful vista of snow-capped mountains. However, to have that vista and allow for low drives across the stream in the foreground, all the trees and shrubs were removed from the stream corridor. Not only does this destroy the riparian ecosystem and detract from the visual appeal, but it also opens the door for severe erosion of the streambank soils. Other courses want an English garden look with grass mowed down to the water’s edge (Photo 2), again removing the protection that deep-rooted vegetation provides from erosion.

However, streambanks can be maintained with vegetation and/or “hard” materials which simultaneously promote a natural ecosystem and allow for the activities on a golf course. In Photo 3, wildflowers and shrubs have been planted among some large rocks to be both aesthetically pleasing and erosion-resistant. Where needed for visibility or ball flight, the shrub varieties can be selected from among those with a naturally low-growing height (e.g., chokeberry, silky dogwood, dwarf willow and spirea) or can be pruned to maintain a specific height. (For a complete list with applications, see NRCS’s Streambank and Shoreline Protection at www.info.usda.gov/CED/ftp/CED/EFH-Ch16.pdf)

In areas where rock is difficult to obtain, large woody material, such as rootwads, can be installed in streambanks to resist erosion along with grasses or until live woody vegetation can be established. Photo 4 shows rootwads, constructed of two logs (one with the rootball still attached) and buried into the streambank (to prevent floating away). Low shrubs have been planted between the rootwads to re-establish woody vegetation.

Although shrubs can be planted from rooted cuttings or nursery stock, soil-bioengineering uses “unrooted” cuttings of species, such as willows and red-osier dogwood, to establish woody shrubs along the streambank. During dormancy, live-stakes or whips of the plant stems can be
Grass mowed to the streambank often begins unsightly erosion.

Streambank rocks and plantings can prevent erosion, stop unnecessary mowing and provide aesthetic appeal.

Rootwads stabilize the streambank while letting riparian shrubs to establish.

Although “hard materials” such as rocks and rootwads are needed on high-velocity streams, vegetation alone can be utilized on slow-moving waterways. However, it is best to use nongrass species, if for no other reason than to remind the mowing staff NOT to mow right up to the stream edge. In areas with year-round growing seasons, wildflower mixtures can serve this purpose as well as being aesthetically pleasing. In colder climates, obligate (wetland) plants, such as cattails, can be visually pleasing and provide erosion resistance, even during dormant periods, as seen in Photo 6 (page 62).

Obviously, the best vegetation to maintain along the stream corridor is that which naturally occurred prior to human activities, such as large trees and shrubs. Even where a course layout requires a fairway to cross a stream, a window can be created through the tree line where only low shrubs are still maintained, as seen in Photo 7 (page 62).

By keeping the plants and wildlife necessary for a healthy riparian ecosystem, other important factors such as shade and nutrient uptake are provided. The former is important to prevent heating of the stream water (which is not good for most fish species); not to mention the appreciation of golfers on a hot afternoon. The latter can be important on a golf course where high amounts of fertilizer are needed to maintain durable, attractive grass. The stream-edge buffer plants can intercept any excess nutrients and utilize them for growth, instead of allowing them to enter the stream as pollution.

Many landscape architects are knowledgeable with riparian corridor plantings that can complement a golf course. Additional information can be obtained from state and federal agencies, such as USDA’s Natural Resources Conservation Service, which has several helpful references (page 62), as well as conservationists and engineers that can assist with plantings and streambank structures. As we all try to improve the quality of our natural envi-

Stream-edge buffer plants can intercept any excess nutrients and use them for growth, instead of allowing them to enter the stream as pollution.
Soil-bioengineering after three years provides riparian cover and hides a rock toe.

Even dormant cattails can stabilize the banks of a slow-moving stream.

A fairway window through a treed riparian corridor provides a challenge for drives across a stream.

Continued from page 85

vironment, outdoor recreational facilities such as parks and golf courses, can easily be a partner by restoring and maintaining good stream corridors.

Alan Wood’s current emphasis is on stream restoration activities. He completed a Ph.D. in agriculture and biological engineering at Penn State University in 2004. Wood started his career with the Soil Conservation Service in 1970 in Maryland, and from 1978 to 1985 was a design engineer for SCS in Albuquerque, N.M. Since 1985, he has been the state project engineer for NRCS in Pennsylvania, where he has worked on numerous flood control, mine reclamation and pollution-control projects.

REFERENCES

TURFGRASS TRENDS
SECTION STAFF
Managing Editor Curt Harler 440-238-4556; 440-238-4116 (fax) curt@curtharler.com
Golfdom Staff Contact David Frabotta 216-706-3758; 216-706-3712 (fax) dfrabotta@questex.com

INDUSTRY ADVISORS
Jerry Quinn  
John Deere
Chris Derrick  
Agrium Advanced Technologies
Scott Welge  
Bayer Environmental Science
Carmen Magro  
Floratine

EDITORIAL REVIEW BOARD
Dr. Rick Brandenburg  
N.C. State University
Dr. Vic Gibeault  
University of California
Dr. Garald Horst  
University of Nebraska
Dr. Richard Hull  
University of Rhode Island
Dr. Eric Nelson  
Cornell University
Dr. A.J. Powell  
University of Kentucky
Dr. Eliot C. Roberts  
Rosehall Associates
Dr. Pat Vittum  
University of Massachusetts

CONTACT US:
Web site: www.turfgrassrends.com
Reprints: TurfgrassTrends@reprintbuyer.com