Article 87

Technical Note #8 from Watershed Protection Techniques. 1(1): 22

Persistence of Wetland Plantings Along the Aquatic Bench of Stormwater Ponds

Shenot (1993) evaluated the persistence of wetland plantings along the aquatic bench of three stormwater ponds two to three years after they were initially planted. Each pond had been planted with six to eight species of wetland plants in single-species clusters at an average density of four plants/square meter. Two of the three ponds were extended detention ponds. In those ponds, the aquatic bench was subject to periodic inundation by as much as three to six feet of runoff, as well as incidental loading of trash and debris.

Shenot reported that 82% of the planted species persisted in the ponds after two to three years. However, the persistence of planted species within individual planting clusters was somewhat lower (68%). As indicated in Table 1, several wetland species showed both persistence and a significant rate of spread (pickerelweed, arrowhead, softstem bulrush, and common three-square). Other species showed good persistence but a low rate of spread across the bench (sweet flag and wild rice). In particular, wild rice achieved high local densities (433/m^2) and was extensively utilized by wildlife.

Other species (arrow arum and lizard's tail) did not survive in most planting cells. The persistence of planted species appeared to be inversely related to the frequency and depth of inundation caused by extended detention. Other factors thought to contribute to poor survivorship were poor inorganic soils, steep bench slope, and predation by ducks.

Shenot also enumerated the 35 to 80 wetland plant species that became established as volunteers within the wetland planting clusters. Although exotic grasses, smartweed, and cattails were present, many of the most numerically abundant species were rushes, sedges, and other native wetland plants (Table 2).

Cattails, which are notorious for invading and dominating shallow water, had established themselves in 50% of the planting clusters, but were present in relatively low densities (three plants per square meter). Shenot concluded that planting clusters were a useful method to improve the quality and diversity of the aquatic bench, both for existing ponds and newly-constructed ponds. Longer-term monitoring will be needed, however, to determine the ultimate trajectory and composition of the planted wetland community along the aquatic bench of stormwater ponds.

—TRS

Table 1: Relative Persistence of Eight Species of Wetland Plants on the Aquatic Bench (Shenot, 1993)

	Persistence	Spread
Sweetflag *(Acorus calamus)*	Good	Limited
Arrow arum *(Peltandria virginia)*	Poor	None
Pickerelweed *(Pontederia cordata)*	Good	Moderate
Arrowhead *(Saggitaria latifolia)*	Excellent	Excellent
Lizard's tail *(Saururus cernus)*	Poor	None
Common three square *(Scirpus americanus)*	Good	Excellent
Soft stem bulrush *(Scirpus validus)*	Excellent	Good
Wild rice *(Zizania aquatica)*	Excellent	Limited

Table 2: Top 10 Volunteer Species Recorded at the Three Ponds (Shenot, 1993)

1.	Various exotic grasses (*Graminea*)	75%
2.	Soft rush (*Juncus effusus*)	55%
3.	Fox sedge (*Carex vulpinoides*)	33%
4.	Other sedges (*Carex sp.*)	33%
5.	Smartweeds (*Polygonum sp.*)	33%
6.	Most many-flowered aster (*Aster spp.*)	30%
7.	False nettle (*Boehmeria cylindrica*)	30%
8.	Rice cutgrass (*Leersia oryzoides*)	30%
9.	Va. bugleweed (*Lycopus virginicus*)	30%
10.	Spike rush (*Eleocharis spp.*)	22%

Defined as percentage of stations where the species was recorded as one of the five most numerically dominant species at the station. N = 40.

Reference

Shenot, J. 1993. *An Analysis of Wetland Planting Success at Three Stormwater Management Ponds in Montgomery Co., MD.* M.S. Thesis. Univ. of Maryland. 114 pp.