

Reed Canarygrass Guidance

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This guidance provides strategies to minimize the long-term cost of managing reed canarygrass on western Washington mitigation sites.

Historical Treatment of RCG Issue

Reed canarygrass (*Phalaris arundinacea*) (RCG) is a major herbaceous component in many western Washington basins. This aggressive grass is adapted to withstand a variety of hydrologic regimes, soil conditions, and to a certain extent, solar exposure (Antieau 1998, Reinhardt and Galatowitsch 2004). In the past, regulators required a performance standard limiting RCG cover to 10 percent on mitigation sites. The widespread use of this outdated and unreasonably-low RCG target led to the perceived “failure” of many otherwise functionally successful wetland mitigation sites, causing major financial and public perception implications for the Washington State Department of Transportation (WSDOT). Consequently, WSDOT mitigation reports should not contain a 10 percent RCG threshold standard.

Recent Research

USDA-NRCS (2001) found that complete eradication of RCG is usually not feasible. Other current research describes how created wetlands are affected by vegetation growing on adjacent properties. Reinhardt and Galatowitsch (2004) found that even with intensive management using the most effective control measures, recolonization from seed (either from the on-site seed bank or off-site dispersal) will occur. This makes long-term RCG control very difficult. Ashworth et al. (2006) found that plant community species richness in newly established emergent wetlands was primarily determined by the off-site species pool. Other studies (Azous et al. 1998, Maurer et al. 2003) suggest RCG is almost impossible to eradicate for any length of time on a mitigation site surrounded by a RCG monoculture.

Consonant with this research, regulators have recently recognized the difficulty in maintaining a low percent cover threshold for RCG. The Washington State Department of Ecology, Environmental Protection Agency Region 10, and the U.S. Army Corps of Engineers Seattle District issued joint guidance in the form of *Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance, Version 1* (Ecology et al. 2006). This joint guidance suggests that the 10 percent cover threshold need not be applied, unless the site has little or no RCG. This guidance further states that these determinations will be made on a case-by-case basis. Regulators have been allowing more realistic, higher RCG cover thresholds (25-30%) on mitigation sites in areas where RCG is widespread.

A New Approach

Based on the joint guidance (Ecology et al. 2006), recent research mentioned above, and years of experience with RCG control (Buis personal communication; WSDOT 2001, 2002a, 2002b, and 2005), WSDOT suggests that a new approach is warranted. When there is an existing off-site source of RCG, the best use of resources is to:

1. Omit RCG targets from performance measures and standards, and instead
2. Provide functions-based performance measures and standards linked to the intended goals and functions of the mitigation site, and
3. Provide commitments of specific RCG control strategies in the following sections of the mitigation report:
 - a. design and construction, and/or
 - b. contingency and site management plans.

In other words, WSDOT proposes that, in lieu of punitive RCG threshold values, regulators enforce functions-based performance measures and standards, along with specific, pro-active control strategies in the design and construction, contingency plan, and site management strategies.

This model takes into account the previously mentioned RCG research and guidance, and prevents mitigation sites that are set up for “failure” due to unachievable RCG performance measures and standards. The approach also ensures regulators that agreed-upon control measures to prevent the growth and spread of RCG will be carried out as part of the mitigation report’s design and construction strategies, contingencies, and/or site management plan. Corps regulators appear open to this new approach, and Ecology regulators are showing more flexibility on this issue.

Specific RCG Strategies

WSDOT proposes that, instead of RCG threshold performance values, regulators enforce pro-active design and construction, contingency plan, and site management strategies that discourage the growth and spread of RCG.

Functions-based Performance Measures Strategies

Research shows that matching the performance measures and standards to the intended functions of the mitigation site provides a more accurate gauge of site success. A Society of Wetland Scientists position paper (2001) on performance standards found that performance criteria should focus more on wetland function to mend the “gap between what has been called ‘compliance success’ and ‘functional success’.” Corps of Engineers’ guidelines also calls for performance criteria to address functional replacement of wetlands (Streever 1999). Replacing wetland function may be achieved, even if a prescribed vegetation composition is not. Conversely, even if a certain vegetation list is attained, functions may not be replaced. Therefore wetland function should be considered when creating mitigation goals and performance criteria, as well as evaluating success (NRC 2001). In particular, if a site achieves its goals and

objectives (e.g. provides wildlife habitat with good cover and structure in the woody species canopy), it is not necessary to insist on the site meeting low RCG cover standards.

Design and Construction Strategies

Combining strategies is the most effective means of controlling RCG (USDA-NRCS 2001). Design and construction strategies that restrict RCG establishment are based on 1.) pre-construction herbicide applications, 2.) creating unfavorable conditions for RCG re-establishment, and 3.) rapid establishment of dense cover by woody species. Pre-mitigation herbicide application is a significant control measure of choice given its low cost and effectiveness, particularly at or just after flowering (Antieau 1996, USDA-NRCS 2001, Tu 2004). Perry et al. (2004) found that amending mitigation soils with a minimum of 20 percent carbon by weight deters RCG re-establishment following initial herbicide applications. Adding carbon has the effect of reducing high nitrogen (nutrient) levels. This produces conditions that favor native species rather than Reed canarygrass (Smukler et al. 2003, Tu 2004). Shading has been shown to be “highly effective” in controlling RCG (Antieau 1996, USDA-NRCS 2001, Tu 2004). Installing fast-growing, flood-tolerant native woody species at a high density provides long-term passive RCG control (USDA-NRCS 2001, Celedonia 2002, Tu 2004). Finally, installing mulch across an entire site provides additional benefits by controlling RCG re-establishment (Antieau 1996), moisture retention for the installed woody vegetation, and a source of carbon detrimental to RCG, as previously discussed.

Contingency and Site Management Strategies

Following completion of the mitigation site construction, RCG control can be implemented as part of the site management activities, as necessary. However, management activities intended to minimize RCG may have a detrimental ecological impact on a mitigation site. To address RCG, WSDOT mows, hand weeds, and/or applies herbicide using a spray wand or wicking apparatus. Each method risks inadvertent harm to desirable mitigation plantings: plants may be trampled or cut during mechanical control measures, and mortality may occur from herbicide over-spray. The result of each method can potentially be just as damaging to the plantings as competition from RCG. During the monitoring period, WSDOT site managers also evaluate the potential benefit of RCG management against the potential temporal loss of wildlife habitat functions by creating disturbance during the breeding season of numerous species.

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