Draft RIPARIAN PLANTING PROTOCOLS

Last updated June 19, 2008. For questions, contact: David Primozich at Primozich@verizon.net.

Introduction

The Oregon Department of Environmental Quality (DEQ), working with other partners, established a precedent in Clean Water Services' NPDES permit for defining temperature credits based on riparian restoration plantings on the Tualatin River. Shade credits are determined using Department of Environmental Quality's (DEQ) Shade-O-Later model to predict the thermal benefit of increased shade provided by restoration plantings. Credits are defined as modeled temperature reductions measured in kcal/day that would be generated from restoration plantings at full maturity.

Approach to Credit Generation for the Willamette River Basin

The process used in the Tualatin River thermal credit program can be modified for application in the Willamette basin. The Willamette TMDL developed and used various modeling tools for evaluating riparian shade, including the Heat Source model for some of the tributaries, and the CE-QUAL-W2 model for several major tributaries downstream of the Corps reservoirs. These models can be used to evaluate the benefits of increased riparian shade for other tributary and river reaches.

Both the spreadsheet developed by Clean Water Services for its annual thermal credit verification and reporting to DEQ and the DEQ-approved program for the Tualatin River have been adapted for use within the Willamette basin. The Willamette Partnership-developed credit calculator includes screening and detailed evaluations of thermal credits applicable to wetlands, riparian shade, wastewater reuse, and flow augmentation types or restoration activities.

This document provides 1) minimum riparian revegetation requirements for projects to be eligible to generate credits, and 2) voluntary guidance and recommendations for successful riparian revegetation based on Clean Water Services' early experience with thermal credits, but with modifications for to the broader Willamette basin.

Minimum Riparian Revegetation Requirements

To generate credits[1]:

1. All plant materials must come from Willamette Valley seed sources below 1,500 feet

[1] **These items are in other places in the Willamette temp protocol, but shouldn't be forgotten.** In order to qualify, projects must 1) be able to generate credits to offset thermal load within NPDES permits under the Willamette Temperature TMDL, and 2) maintain the viability of projects credits for the required life of the credit..

2. Plantings must be based on appropriate plant community determined by local reference site
3. The site must support a minimum of 1,600 stems per acre (average) at project year five
4. The site must have no more than 20 percent non-native cover (average) at project year five
5. The site may have no fewer than five woody species and no single species may represent more than 50 percent of the woody plants at project year five
6. Neither trees nor shrubs shall represent less than 20 percent of the total stems per acre at project year five
7. The stream connected to the site must have perennial flow

Monitoring reports describing progress toward these eligibility criteria shall be submitted to the Ecosystem Credit Registry registry on an annual basis. If annual reports indicate that a site is unlikely to meet year five performance standards, the credit seller shall make efforts to improve site conditions. If those efforts are made in good faith, but performance standards are still not met, the seller will have the option of 1) substituting credits from another appropriate site, 2) purchasing credits from the insurance pool, or 3) negotiating another agreement between the buyer, seller, DEQ, and any other relevant parties[2].

[2] This does not imply that the negotiations are an alternative to other options or that they will necessarily be successful.

Elements of a successful riparian shade restoration project

Woody Plant Density Recommendations

Although woody plant stem densities vary widely among Willamette Valley plant communities, the recommended range from Tualatin Basin projects is between 2,000 and 2,600 stems per acre. Formulae for calculating densities are as follows:

tree stems = square footage of planting area x 0.01
shrub stems = square footage of planting area x 0.05

These formulae are intended to be used as a guide and stem density should be modified to reflect site conditions and target community types.

Considerations for Establishing Native Riparian Plant Communities

Site Conditions

Hydrology

a. Consider the frequency and duration of water inundation. Divide the planting area into hydrologic zones based on elevation. Most sites include one or more of the following planting zones with respect to hydrology during the growing season:
   Wet - standing or flowing water/nearly constant saturation; anaerobic soils
   Moist - periodically saturated; anaerobic and/or aerobic soils
   Dry - infrequent inundation/saturation, if any; aerobic soils

Soils

a. Unless soils are heavily compacted, tilling and disking disturb soils and are generally unnecessary for successful revegetation
b. Rocky fill or heavily disturbed soil may be removed and replaced with native soil to create appropriate conditions for planting[3]

Weeds and Site Context

a. Consider site preparation and future maintenance needs in light of characteristics of current vegetation
b. Consider the current and potential influences of areas surrounding site and select boundaries and all-season access points that facilitate maintenance

Plant Materials and Planting

a. One to two-year old bare root seedlings yield excellent results at most sites.[4] Containerized plants may be used, but practitioners report higher costs and inconsistent results with containerized stock
b. Cuttings from native *Salix, Cornus, Spiraea* and *Lonicera* shrubs can effectively supplement bare root plantings, especially on steep streambanks
c. Native grass and forb seed can help with erosion and weed control. Small-stature native grasses are recommended to prevent excessive competition with planted trees and shrubs for moisture and sunlight

[3] Contact your local SWCD for more information about appropriate soil sources.

[4] See www.plantnative.org for a listing of local Oregon nurseries

d. Bare root seedlings should be protected from freezing and drying during lifting, transport and planting
e. Planting in curved rows at regular spacing intervals can facilitate maintenance
f. Planting season with bare root plants typically lasts from late January to mid-March. Fall and spring plantings are also possible if using containerized stock
g. Plan to inter-plant at approximately 25 percent of original planting numbers in project year two

Plant protection

a. Consider potential for herbivory by beaver, nutria, deer, elk and voles
b. Before using plastic plant protectors and bamboo stakes, consider potential for loss due to flooding and to vandalism along trails
c. In grassy areas, consider spring ring spray for vole protection and moisture conservation. Voles will not likely girdle plants unless they are under the cover of grass.
d. In areas with beaver activity, be prepared to replant

Maintenance

a. Visit site regularly
b. Minimum maintenance on most sites includes one spring ring spray, one summer mow or cut and one fall spot spray.
c. The need for irrigation can usually be avoided in a typical summer with proper plant selection and placement and good grass control (e.g., moisture conservation ring spray) around plants. A 25 percent inter-plant of lost plants in project year two is often more cost-effective than irrigation.