A Technique for Producing Riparian Plants for Nevada[1]

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Abstract-- A brief overview of riparian, planting as it occurs in Nevada and then describes a method the nursery is using to produce plants for use in constructed wetland creation.

INTRODUCTION

Water is an important commodity in Nevada. Increasing importance is being placed on the conservation and enhancement of riparian areas through out the great basin. The Nevada Division of Forestry has produced woody plant material for use in bank stabilization and habitat projects for many years. Biotechnical slope and bank stabilization is frequently employed in the mountain areas to reduce runoff and erosion of steep banks. These techniques are described by Leiser and others.[3] The technology for the production of the woody vegetation types is available. However, seed may not be available commercially for some species and certain cooperators require site specific collection. These challenges must be faced by the nursery manager. Do you want to collect seed? Are there commercial collectors available? Will the cooperator gather seed or cuttings for the plant material needed? There is a market developing for these kind of contracts.

The term riparian has related to water ways, streams, rivers, lakes and tidal marshes. The new wetlands regulations now require mitigation for destruction of marshes, bogs, seeps, swamps, and wet meadows as well. Plant materials for these projects are not readily available. Juncus, Carex, cattails and the like just have not previously been utilized.

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[3]Gray. D and Leiser, A. 1982 Biotechnical Slope Protection And Erosion Control, Van Nostrand Reinhold Company.

The best plan for revegatating a wetland is to salvage all the material before the disturbance begins but this is sometimes not possible. Even then, keeping the salvage material viable requires a holding place and is labor intensive. Producing plug plants of those species is seen as an alternative (maybe the only one for projects that are actually wetland creation). The seed technology is not yet developed for these species, nor is it commercially available.

When asked if we could produce material for a specific project we found that information was scarce. The following is a discussion of what we have done.

THE PROJECTS

The Lake Tahoe basin is a recreation area that has been heavily developed. Early development was too often on filled meadows or cut slopes. Run off and erosion led to degradation of the clear alpine waters. Recent efforts to reduce sedimentation have led regulatory agencies to introduce management practices to clean up or infiltrate run off. Engineering projects include curb and gutters, rip-rap, gabian walls and sedimentation ponds.

Agencies are now actively rejuvenating and improving stream channels. Fill areas are being dug out and regraded to restore the Stream Environment Zone or SEZ. Compatible vegetation is being replanted to enhance both the function as a filter and the aesthetics. Willows, aspen, cottonwood, chokecherry, and dogwood are some of the woody vegetation being used.

The natural meadow is a very diverse plant community. Ecologists believe that the corresponding plant types are essential to make the meadow system work.

THE METHOD

We had done some digging and division of Carex plants, just to get an idea of what the root system was like, how big or small they could be cut, and how fast they would grow. Eight inch deep post hole size plugs were cut from a mature meadow and put into a gallon nursery containers. These were transported to the nursery and watered. They recovered from the uprooting within two weeks and began new growth.

We wanted to make divisions to plant into 1 1/2 inch diameter leach tube containers. As we hacked up the root masses with a knife it was apparent that the rhizomatous root system was extensive and the crowns were delicate. Ripping them from the crown down through the root ball was the only way to make separations each about three-quarters of an inch in diameter The soil from the meadow was sticky and heavy making cutting difficult. We decided not to wash all the soil from the roots and simply squeezed a plug to fit the tube container, We wanted some soil innoculant because we did not know if these species were mycorrhizal. We then hand planted into the cells using our regular potting mix to fill below and around the plug. We placed these into the greenhouse and followed a heavy watering regime.

The plants greened up and began growing slowly. We were surprised to find many seeds germinating in the soil that was placed in the cell. There apparently is a large seed reserve in the meadow soil. These turned out to be serial species, annual and perennial, that were not apparent in the mature meadow. This really suggests that stockpiling of soil for top dressing after projects could add these pioneers and diversity to the site. As the plants matured at least 25 varieties were identified by taxonomists.

The plugs were allowed to grow out for thirty or more days, we then wanted to divide these plants as they had multiple tops and extensive root systems. Plants were removed from the containers and horizontal cuts through the plug were made with a paper cutting board. We tried for 2 or more divisions depending on the species and the habit of growth. Those divisions were placed on a sleeve, soil was added, and the plugs were replanted into cells. Table 1 shows the number of divisions made and the approximate dates. This project was worked in around the normal nursery schedule. We did not know how long it would take to make dividable plugs. The carex and grasses really started to grow as temperatures in the greenhouse increased throughout the summer

SPECIES COMPOSITION OF WETLAND PLANT MATERIALS

Carex nebraskensis
C. rostrata
C. athrostachya
Bistorta bistortoroides
Potentilla gracilis
Taraxacum Officinale
Poa pratense
Muhlenbergia richardsonis
Cerastium vulgatum
Juncus balticus
J. encifolius
Stellaria longipes
Triflorum
T. repens
Epilobium glaberrimum
Penstemon rhydbergii
Geum macrophyllum
Descurrania pinnata
Sysimbrium altissimum
Mimulus guttatus
Phleum pratense
Festuca rubra
Descampsia caespitosa
Kelloggia galiodes
Gallium triflorum

Table 1.--Division of wetland sod to plugs.

Date	Activity	#Divided	#Obtained
2/03/90	Sod to Plugs	375 Gal	4312 s/c
7/21/90	Sod to Plugs	500 Gal	5500 s/c
8/15/90	Plugs to Plugs	4312 s/c	8188 s/c
8/30/90	Total Surviving s/c		13688 s/c
6/07/91	Plugs to Plugs	13688 s/c	24000 s/c
8/03/91	Plugs to Plugs	24000 s/c	32000 s/c

CONCLUSIONS

Wetland plants can be divided from material collected on site and transported to the nursery, the process of dividing the material is labor intensive and it takes some studying of the root habits of the particular species to determine how small to make the separations. Once material is growing in cells division becomes easier and faster. We found that small divisions took longer to reach dividable size and that losses were greater as the smaller pieces had fewer shoot or root initials and the transplant stress was increased. Larger divisions 3 to 5 cu. in. of soil arid root mass with tops only slightly pruned when necessary to prevent top heaving or canopy development made the fastest regrowth. Field evaluation of performance will help to identify species that establish quickly and provide critical area cover the soonest.