View From a Wetland

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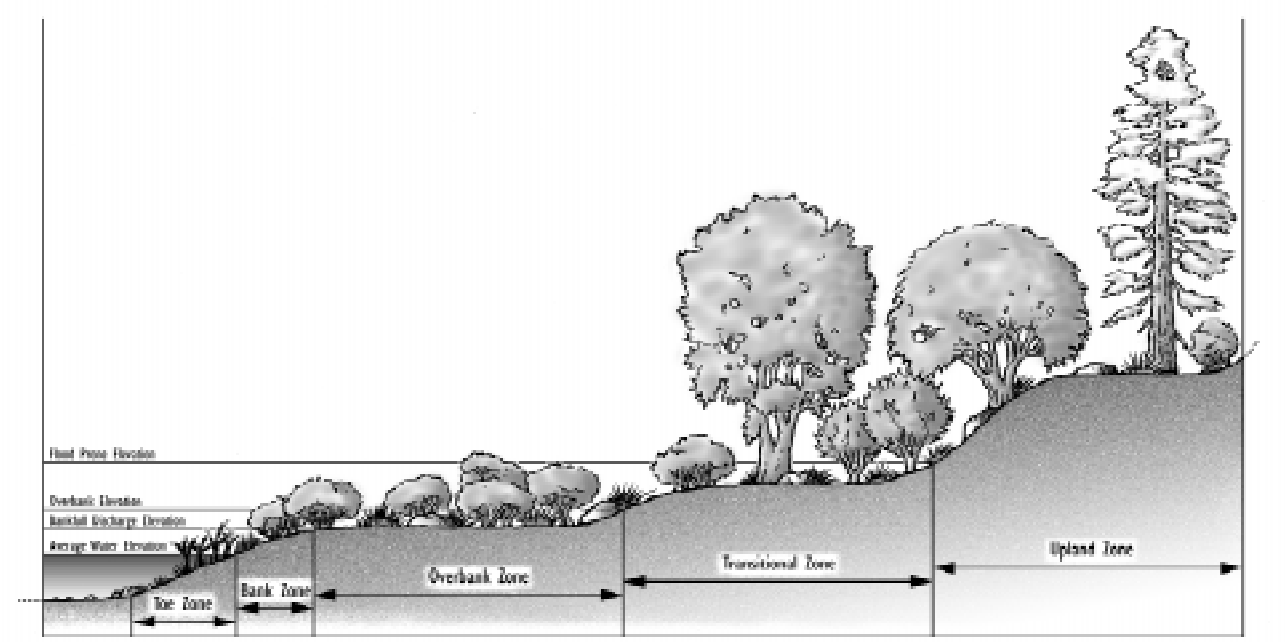

Riparian Planting Zones

Introduction

This newsletter is part of our continuing effort to provide useable information to the public on wetland and riparian management. This is the fifth issue since the project was established in 1991.

Riparian/wetland Project

Our project mission is to introduce performance-tested ecotypes to the public seed and plant market and document technical information for the establishment of wetland and riparian herbaceous and woody plants. The Project has collected several riparian and wetland plant species in four ecoregions within our Service Area in the arid and semi-arid West. We have released 24 performance tested wetland plant ecotypes of six different species so far.

Riparian Planting Zones

Establishment of riparian plant species depends on proper selection of species, plant material procurement and handling, planting location, and establishment techniques (Hoag 1993). The success of a project is dependent on the complete integration of these steps. When planning a project, it is important to observe the existing vegetation and their respective locations in relationship to the stream and water table (***Riparian Planting Zones***). Attempt to match the potential native woody species at the project site. Note that not all riparian sites will have woody species (i.e. low gradient meadow streams). If the project area does not have woody

plant species and it should, a reference site similar to the project site should be located. Attempt to match as close as possible the hydrology where the different species normally grow when planting the project site. This is the biological benchmark one is striving to create. Plants with flexible stems and rhizomatous root systems are usually located from the water-line to the top of the bank zone. Larger shrubs are found from the bank zone to the overbank zone and beyond. Tree species are usually found above the overbank zone in the transitional zone and the upland zone. Wetland herbaceous species can be found throughout the streambank cross section, although most emergent aquatics will be found in the toe zone (Bentrup and Hoag, 1998).

(Note: additional information on riparian planting zones can be obtained from Idaho Techinical Note 32 - *User's Guide to Description, Propagation and Establishment of Native Shrubs and Trees for Riparian Areas in the Intermountain West* and *Plant Materials for Riparian Revegetation* by Hoag and Landis in USDA Forest Service National Proceedings of the Forest and Conservation Nursery Associations for 1999.)

Riparian Ecology and Restoration Workshops

As part of our technology transfer program, we have developed a two-day Riparian Ecology, Restoration, and Management Workshop. The first day is devoted to the classroom where we cover basic concepts, riparian zone vegetation, planning alternatives, plant acquisition, and bioengineering techniques. The second day is spent in the field where course participants classify the site and install a series of bioengineering structures on an eroding section of stream.

Each year we conduct several of these workshops in different parts of our service area. If you are interested in attending one of them, contact Pat at the PMC for the next scheduled workshop. If you would like us to put on a workshop in your area and you have about 30 people, who would attend the training, contact Chris and we will see what we can do.

Internet Addresses of Note

Bioengineering Technical Drawings – http://www.wcc.nrcs.usda.gov/wtec/soilbio.html, http://www.wcc.nrcs.usda.gov/wtec/revetments.html, http://www.wcc.nrcs.usda.gov/wtec/instream.html

These are technical drawings that were done by the old WNTC. They are still being maintained in the WATERSHED TECHNOLOGY ELECTRONIC CATALOG on the National Water and Climate Center web site. Detailed and downloadable GIF pictures, specifications, details, and applications are found here.

Deadman Anchors for Revetments

In October, 1999, we held a riparian workshop at Sheridan Creek which is a tributary of Island Park Reservoir about 20 miles south of the Montana state line in the NE corner of Idaho. For this workshop, we had a backhoe available to complete some of the bank shaping for the brush mattress and to install deadman anchors to hold the Juniper revetments against the bank. A deadman anchor is an 8-10 inch diameter log about 2 feet long that has a wire cable wrapped around its middle. It is placed parallel to the water in a hole dug about 2-4 feet into the bank (depending upon the soil). The hole is filled in while the wire is held out at a 45º angle. The deadman wire can be used to replace the other more expensive earth anchors. There are positive and negative aspects to deadman anchors so each situation needs to be examined individually.

Monitoring and Maintenance are a MUST

This year I returned to several bioengineering sites that I worked on in the past few years. One observation that I have made is that a couple of the sites have had some damage from debris hanging up on the planting. This has caused the water to flow directly into the bank. As a result, small areas of bank erosion have occurred. By monitoring the planting during the spring runoff, debris could have been removed which would have allowed the plants to become better established and better able to withstand the erosive force of the water.

Always ensure with any project that you attempt, you have identified 1) who will do the monitoring and the maintenance, 2) where the money will come from to pay for this person(s), and 3) that this identified person(s) has time actually allocated in his schedule for this monitoring and maintenance activity. In this way, there are no excuses as to why the monitoring and maintenance does not get done.

Plant Multiple Stems In Each Hole

Probably the most expensive part of planting is digging the hole. If we can increase the chances of the plant material placed in the hole will survive, then the cost/benefit ratio will be much better. We have been experimenting with planting multiple stems in a single hole for several years now. We started with the Stinger and comments from some of the Stinger users. The main comment was that they could not find sources of large diameter stems in their areas. What we did was take 3-5 one inch diameter stems and tie them together about every foot up the stem with thin wire or string. These stems were the same length as the large diameter

stems, i.e. to get deep enough to reach well into the soil base under the rip-rap (if you are planting into rock rip-rap) and also deep enough to reach the low summer water table. We pushed this bundle into the hole just like we did with a large diameter cutting. By tying the bundle together, we created a rigid length that would not bend as the Stinger started to exert pressure on it in the push phase of planting. Our establishment success rate was equal to if not higher than with the large cuttings.

A couple of things to watch out for include: 1) the more stems you put into the bundle, the less likely the interior stems will have good soil to stem contact, and 2) steer away from stems that are smaller in diameter than 0.75 inches because the bundle will still be to flexible. A diameter of 1-2 inches is about right.

We have also found that these multiple stem bundles will suffer less beaver damage than the single large diameter stems do.

Vole Control on Woody Plantings
By Loren St. John, PMC Team Leader

A successful woody planting is dependent upon proper design, site preparation, planting, and post-planting care. Many areas can experience large infestations of voles or meadow mice during ideal conditions for population expansion. Control measures should be taken during all phases of plant establishment to help reduce potential rodent problems.

Voles or meadow mice (*Microtus* spp.) generally eat grass and forbs but when preferred food sources are scarce, they will girdle trees by eating the bark and cambium layers. When vole populations are large, crowns and roots may also be damaged. Voles are very prolific; producing 4 to 6 litters each year with 4 to 6 offspring per litter. A moderate infestation of 500 voles per acre will damage up to 20,000 pounds of plant material annually. Factors that influence large infestations include availability of protective cover, favorable weather, abundance of food, and high reproductive potential.

During the design phase three questions need to be answered if runways and holes are present: 1) is the site appropriate for a woody planting; 2) can rodent control measures be successful; and 3) should species selection be altered to species that are less attractive to voles? Experience indicates that in general, less damage is caused to conifer species (Rocky Mountain juniper and Austrian pine) than to deciduous species (poplar and chokecherry).

Site preparation objectives should basically target clean, weed free conditions with minimal plant residues remaining at planting time that could be used for food, hiding, or nesting cover by voles.

Good site preparation, quality plant material, proper handling, and planting techniques will result in successful establishment. The use of weed barrier greatly enhances survival, growth, and also conserves soil moisture, but may also create habitat for voles. With proper site preparation, use of quality plant materials, and proper planting techniques, vole damage may be reduced to an acceptable threshold level.

Experience shows that woody plants are most susceptible to damage from voles during the first two years of establishment. The planting should be inspected frequently during the first two years for signs of damage. Look closely around the base of the plant for gnaw marks and for runways and holes. If vole activity is present, its time to begin serious control measures. Remove weeds and mulches such as hay or straw from around tree trunks. Rodenticides provide the quickest and most practical means for controlling large populations of voles. Products with the active ingredient zinc phosphide are fast acting and usually requiring only a single feeding. All zinc phosphide containing products are restricted use pesticides and may only be applied by certified pesticide applicators.

(Note: generally this applies to the transitional zone or upland zone at the upper end of riparian zone. Rodenticides should not be applied in the toe, bank or overbank zone. Any questions should be directed at the county extension agent or weed board. Also follow label instructions.)

Fairview Constructed Wetland System

We are currently working with Idaho State University on a new CWS research project in southern Idaho near American Falls Reservoir. This project will treat irrigation wastewater from a single farm before it returns to the Snake River. The project has replicated ponds and numerous possible combinations of treatment that will demonstrate the best combination of components necessary to treat loading rates generated from agricultural operations. Planting was completed on the Primary Filter and the Shallow Wetlands last summer. Construction of the control box and the Deep Water pond will be completed this spring. A couple of ISU graduate students have already started collecting data on the vegetation and water quality. They are also looking at the microbial populations in the different components.

Idaho Technical Note 32: *User's Guide to Description, Propagation and Establishment of Native Shrubs and Trees for Riparian Areas in the Intermountain West.*

Questions constantly arise about how to propagate a wide variety of woody riparian plants. There is no single source of this information that I am aware of. Tech Note 32 is an attempt to put this type of information in one place. Each woody plant is described and its habitat is explained. In addition, greenhouse asexual propagation techniques are laid out as well as field propagation techniques such as unrooted hardwood cuttings. Tech Note 32 also includes a set of tables that describes elevation ranges, root type, rooting ability from cuttings, which riparian zones it should be in, commercial availability, deposition tolerance, flooding tolerance, drought tolerance, salinity tolerance, wildlife values, and plant indicator status. I hope to add this publication to the web site in the future. Hard copies are available until then from the PMC.

Another tech note on the description, propagation, and establishment of sedges, rushes, and grasses for riparian areas of the Intermountain West is in draft stage and we hope to finish it this winter.

Additional Information

All of these publications are now available on the internet in Adobe Acrobat format. You can download each of the papers by going to **http://www.nhq.nrcs.usda.gov/BCS/links/wet-resources.html**. If you do not have access to the internet or would like to receive a hard copy, please contact us.

Bioengineering Information

The Practical Streambank Bioengineering Guide: A user's guide for natural streambank stabilization techniques in the arid and semi-arid Great Basin and Intermountain West. – Available on the internet at http://www.nhq.usda.gov/BCS/links/sbg.html**.** The internet version of the Bioengineering Guide is in 4 files written in Adobe Acrobat format.

Individual Wetland Plant Fact Sheets – description, ecology, collection, propagation, management, and uses of:

Nebraska Sedge *(Carex nebrascensis)*
Creeping Spikerush *(Eleocharis palustris)*
Baltic Rush *(Juncus balticus)*
Threesquare Bulrush *(Scirpus pungens)*
Alkali Bulrush *(Scirpus maritimus)*
Hardstem Bulrush *(Scirpus acutus)*

Riparian/Wetland Project Information Series

No. 2 - Selection and Acquisition of Woody Plant Species and Materials for Riparian Corridors and Shorelines.

No. 3 - Use of Willow and Cottonwood Cuttings for Vegetating Shorelines and Riparian Areas.

No. 6 - Seed and Live Transplant Collection Procedures for 7 Wetland Plant Species.

No. 7 - Use of Greenhouse Propagated Wetland Plants Versus Live Transplants to Vegetate Constructed or Created Wetlands.

No. 8 - Constructed Wetland System For Water Quality Improvement of Irrigation Wastewater.

No. 9 - Design Criteria for Revegetation in Riparian Zones of the Intermountain Area.

No. 11 - Getting "Bang for your Buck" on your next Wetland Project.

No. 12 - Guidelines for Planting, Establishment, Maintenance of Constructed Wetland Systems.

No. 13 – A Reference Guide for the Collection and Use of Ten Common Wetland Plants of the Great Basin and Intermountain West.

Idaho NRCS PM Technical Notes

No. 6 - The Stinger, a tool to plant unrooted hardwood cuttings of willow and cottonwood species for riparian or shoreline erosion control or rehabilitation.

No. 23 - How to Plant Willows and Cottonwoods for Riparian Rehabilitation.

No. 32 – User's Guide to Description, Propagation and Establishment of Native Shrubs and Trees for Riparian Areas of the Intermountain West.

For a copy, write or call:

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