

INTERAGENCY RIPARIAN/WETLAND PLANT DEVELOPMENT PROJECT

DECEMBER, 1995 TO JULY, 1996 SEMI-ANNUAL PROGRESS REPORT

Project Staff

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Introduction

This progress report covers from December, 1995 through July, 1996.

Annual Wetland Project Meeting and Tour in August, 1996

Everyone should have on their calendar the wetland project fall meeting and tour for 1996 on August 29. This date was proposed during the Spring business meeting. The first question is "Should we hold the meeting and tour?" Interest seems to be dropping off. We are proposing that we tour several riparian bioengineering sites this year around Boise. We are also open to alternative suggestions if anyone would like to look at something else. We can make it just one full day instead of two this year if that is everyone's desire. We need some input!!! This is a formal request for an **RSVP** before August 1.

Second Annual Newsletter

Our second issue of "View From A Wetland" was completed in February, 1996. We mailed copies to cooperators, NRCS offices, and those on our mailing list throughout our service area. We included a note at the end indicating that we were updating our mailing list and that anyone who wanted to remain on the mailing list needed to call or write us. We have had over 100 letters and phone calls already. Anyone who has comments on the articles in the newsletter, we would like to hear from you.

Gary Bentrup, Former Riparian and Wetland Consultant

Gary Bentrup, formally of Aquatic & Wetland Nurseries of Boulder, CO, presently a University of Idaho employee, is helping us this summer before he goes to graduate school at Utah State University this Fall. Gary is an accomplished landscape architect and has lots of experience with riparian bioengineering techniques and constructed wetland systems. His practical, real world experiences will benefit the Interagency Riparian/Wetland Plant Development Project in the short time he is here. We welcome him and hope to use his skills to produce several outstanding publications.

Release of Source Identified Wetland Plant Accessions

We are ready to release on the public market 22 ecotypes of 6 wetland plant species. The species include:

Nebraska Sedge, *Carex nebrascensis* (CANE2)
Creeping Spikerush, *Eleocharis palustris* (ELPA3)
Baltic Rush, *Juncus balticus* (JUBA)
Threesquare Bulrush, *Scirpus pungens* (SCPU3)

Alkali Bulrush, *Scirpus maritimus* (SCMA)
Hardstem Bulrush, *Scirpus acutus* (SCAC)

The release notices have been written and they will be submitted to the Foundation Seed Stocks Committee in December at their annual meeting. Actual release would occur after that.

We have elected to go with the Source Identified Alternative Release rather than cultivar to get the plants on the market faster. We decided on Source Identified rather than Selected or Tested because of the workload involved in maintaining breeders and foundation seed. We had quite a discussion at our Spring business meeting in March about whether to go with Source Identified or Selected. When it came right down to it, diminishing budgets, sponsors dropping out, cuts in our labor force, the requirements for growing fields of wetland plants, and travel time involved in collecting the breeders seed meant that there was really no other choice than Source Identified.

We are releasing 22 ecotypes based on Ecoregions within our Service Area. Our service area includes portions of 5 different states (southern Idaho, eastern Oregon, northeastern California, most of Nevada and most of Utah). In order to meet the demands for native plant materials, we decided to address the question of locally collected material by breaking our service area into 4 ecoregions; 1) Land Resource Region B east (LRR BE), 2) Land Resource Region B west (LRR BW), 3) Land Resource Region D north (LRR DN), and 4) Land Resource Region D south (LRR DS)(see attached map). These ecoregions were based on *Land Resource Regions and Major Land Resource Areas of the United States*, Agricultural Handbook 296. December, 1981. Extensive conversations with Jacy Gibbs and others about the soils, climate, topography, and vegetation within various MLRAs helped to draw the boundaries of the ecoregions. We are very comfortable with the delineations that we have drawn and we feel that the plant communities that we have observed fit ecologically and separately

Selection Criteria

Accessions from our five state service area were planted in the PMC ponds in 1992 (see previous progress reports for more detailed information regarding planting plans and scientific design). Data on survival, height, rhizome length, vigor, percentage of plants flowering, shoot density, and above ground biomass were collected on each accession two times each growing season through 1994. Each accession was then ranked for each criterion. These criteria rankings were then averaged for each accession so they could be compared with the mean ranking of other accessions within the same species.

The "first cut" was made by ranking the mean of the ranks for each accession for each of the LRR's. Once the mean rankings were calculated, the "top finishers" for each LRR were determined. The "second cut" was made by looking at other geographical and ecological data such as land ownership, and the size of the original collection site. USFWS lands, WMA's and other public lands were given preference over private lands due to greater ownership stability. Also, larger populations were favored over smaller ones.

The releases of *Scirpus maritimus*, Alkali Bulrush, were done a little differently. Our PMC pond data for this species was very poor due to a die off of the original plantings. For this species we made our selections for each of the LLR's based on land ownership, and the size and vigor of the of the stand.

By releasing plants in each of our LRR's, we can better meet the needs and desires of our customers by offering them a selection more ecotypical to their area. Also, by releasing plants from more areas we decrease the demands put on any one given population.

We believe the combination of these selection criteria offers a good balance of plant performance, population stability, and ecological sensitivity to our final selection process.

Presentations (posters, papers, talks)

Project personnel presented a number of talks, papers, poster sessions, and workshops this past reporting period. Below is a list of our presentations.

Hoag, J. Chris. 1996. Successful planting experiences with willows and cottonwoods in riparian areas and shoreline situations. Aspen and Cottonwood in the Blue Mountains, Le Grande, Oregon. April 2-4, 1996.

Riparian Zone Ecology, Restoration, and Management Workshops

A number of Riparian workshops were held in several states this year. The following is a breakdown of the sessions and participants.

Utah

Beaver, UT, April 9-10, 1996. 23 participants.
Coalville, UT, April 11-12, 1996. 33 participants.

Montana

Missoula, MT, April 15-16, 1996. 30 participants.
Bozeman, MT, April 17-18, 1996. 50 participants.
Miles City, MT, May 13-16, 1996. 50 participants.

Washington

Pullman, WA, April 24-26, 1996. 95 participants.

Idaho

Salmon, ID, May 7-9, 1996. 25 participants.

The Riparian Zone Ecology workshops were attended by NRCS employees, other federal agencies, SCD's, state agencies, and private organizations. The evaluations of the workshop by the participants were enthusiastic about the information offered. Several comments indicated that these workshops were one of the few places they could get practical hands-on bioengineering information that they could use in their professional jobs.

We are considering putting together a 1 or 2 day course on Wetland Ecology, Management, and Restoration. We could also conduct a field day and plant a wetland. We need some input as to whether a course like this is needed or not. Please call and let us know how many in your agency would like to participate in another riparian workshop and / or a wetland workshop.

Corvallis PMC Wetland Coordinated Study

The Aberdeen/Corvallis PMC coordinated Eleocharis study is winding down this year. The plugs which were planted in the summer have completely filled in and we can no longer obtain any

accessional data from them. The fall planted plugs are lagging behind the summer planted in terms of spread, but should fill in this growing season. We will evaluate the fall planted accessions once this summer and possibly once in the fall (provided the accessions are determinable). Both the summer and fall plantings have completely grown together at Corvallis so no more evaluations will be possible. Mike co-authored a paper with Dale Darris which was presented at the Regional Society of Wetland Scientists meeting in Olympia, WA last May. The Little Hole accession continues to perform very well in terms of rhizomatous spread.

Nature Conservancy Constructed Wetland System, Hagerman, ID

The Nature Conservancy Constructed Wetland System was built in early 1995 and planted in the spring and summer of 1995. The system covers approximately 15 acres. The design is a modification of the Maine system that better fits our needs in an arid and semi-arid climate that uses mostly irrigation water for crop production. The primary filter was split in half and one side planted with Garrison Creeping Foxtail (*Alopecurus arundinaceus*) and the other half with Baltic Rush (*Juncus balticus*, JUBA), Nebraska Sedge (*Carex nebrascensis*, CANE2), and Creeping Spikerush (*Eleocharis palustris*, ELPA3). The three wetland plant species have filled in their half of the primary filter beautifully. The Garrison far exceeded our wildest expectations in terms of growth, erosion control and nitrogen uptake. However, it is very aggressive and is invading into some parts of the other half of the primary filter, specifically in the Baltic Rush section that was planted on a very wide spacing. It has spread very little into the Carex and Eleocharis sections probably because of the close spacing and fast spreading of those sections. Mike Sellers will be evaluating the wetland community during the month of July. He will also try to document the rate of spread of the Garrison.

Last year, we were having trouble with the shallow wetland. We could not get bulrush or cattails established in it because it was too deep and did not drain properly into the deep water pond. The Nature Conservancy Stewards spent several weeks this spring planting transplants of bulrush and cattails into the shallow wetland. Mike and Chris O'Brian, and volunteers planted the shallow wetland from shore to shore with about 95% hardstem bulrush and 5% cattails. They have adjusted the watering schedule to enhance the rate of spread of the new plants. We fully expect the wetland, excluding any change in the watering regime, to be absolutely gorgeous by the end of the growing season.

Poulson CWS on American Falls Reservoir

If you remember, we worked on the Poulson CWS for over 1.5 years early on in the Project. We even constructed a portion of the overall design. However, the funding was insufficient to cover a government contracted construction project, so the project was dropped. The landowner was still enthusiastic about the idea and decided to see if he could resurrect it. He has renamed it the Fairview Wetland Project and is presently applying for grants to finish the construction and monitor the water quality of the irrigation wastewater. We have taken a backseat now and are providing some technical advice and probably will provide some of the plants for the various components. Isn't it amazing how a good idea never dies, it just goes dormant for a while.

C-6 Drain CWS, Minidoka, ID

After extensive investigations into appropriate sites, we found a site located on C-6 Drain just west of Minidoka. The C-6 Drain CWS located just west of Minidoka was designed and submitted to the USBR and A & B Irrigation District last year. Mike spent a lot of time developing the design according to the criteria that we put together during a meeting of conservation partners in Twin Falls. We had planned on constructing the CWS before March, 1996. However, BOR called and told us that the money was pulled by the Denver Office. This

means that the project is on hold at the present time. We have no idea if or when the project will be resurrected.

Cedar Draw Water Quality Research and Demonstration Site

The Cedar Draw Water Quality Research and Demonstration Project is located on the south shore of the Snake River near Twin Falls, ID. This project is designed to treat some of the water in Cedar Draw, and to test CWS design as well as individual species ability to uptake nutrients. The site consists of 6 abandoned fish raceways, each of which are divided into 2 bays. Each bay is 16 feet wide and 125 feet long. We planted a single species in each of 10 bays. Two bays were not planted. Water flows from each of the bays into a tail race which then feeds two separate CWS's. CWS I (the north wetland) consists of a primary filter, shallow water wetland, and a deep water pond. CWS II (the south wetland) consists of a primary filter, and a shallow water wetland only. Both CWS's then flow into the Snake River. The following is a summary of the plantings:

Bay	Common Name	Scientific Name	Date Planted
1	Baltic Rush	<i>Juncus balticus</i>	August 1995
2	Nebraska Sedge	<i>Carex nebrascensis</i>	August 1995
3	Hardstem Bulrush	<i>Scirpus acutus</i>	August 1995
4	Broadleaved Cattail	<i>Typha latifolia</i>	August 1995
5	Creeping Spikerush	<i>Eleocharis palustris</i>	August 1995
6	Threesquare Bulrush	<i>Scirpus pungens</i>	August 1995
7 ¹	Sago Pondweed	<i>Potamogeton pectinatus</i>	August 1995
8 ²	Little Duckweed	<i>Lemna spp.</i>	August 1995
9	Common Reed	<i>Phragmites australis</i>	September 1995
10	Coyote Willow	<i>Salix exigua</i>	October 1995
11	Not Planted		
12	Not Planted		

1: Planted using existing plant materials from other bays.

2: Planted using existing plant materials from other bays which were then held in a floating frame to reduce the chance of losing the duckweed over the spillway.

NORTH CWS

Component	Common Name	Scientific Name	Date Planted
Primary Filter ³	Tall Fescue	<i>Festuca arundinacea</i>	July 1995
Shallow Wetland ⁴	Hardstem Bulrush	<i>Scirpus acutus</i>	August 1995
	Broadleaved Cattail	<i>Typha latifolia</i>	August 1995
Deep Water Pond	Not Planted		

SOUTH CWS

Component	Common Name	Scientific Name	Date Planted
Primary Filter	Baltic Rush	<i>Juncus Balticus</i>	August 1995
	Creeping Spikerush	<i>Eleocharis palustris</i>	August 1995
	Nebraska Sedge	<i>Carex nebrascensis</i>	August 1995
	Hardstem Bulrush	<i>Scirpus acutus</i>	August 1995
	Three Square Bulrush	<i>Scirpus pungens</i>	August 1995

	Alkali Bulrush	<i>Scirpus maritimus</i>	August 1995
Shallow Wetland ⁴	Hardstem Bulrush	<i>Scirpus acutus</i>	August 1995
	Broadleaved Cattail	<i>Typha latifolia</i>	August 1995

3: Planted from seed.

4: The Shallow Wetlands in both CWS were planted with "clumps" of plant material using a back hoe.

On June 6, 1996 Gary Bentrup (U of I) and Mike Sellers evaluated the plantings in eight of the bays and both CWS designs. The upper ends of most of the bays had some weed problems (primarily Blue Vervain and Foxtail). Twin Falls Canal Co. staff are currently using the watering plan we submitted to them early this spring. Mike will be cutting the weeds back within the next few weeks, which, when combined with the watering schedule, should help to control the weeds.

Ten random points were selected in each bay. A 25"X25" frame was used at each point to measure basal cover. These data were then averaged for each bay.

Bay 1 - *Juncus balticus* (mean height = 87 cm)

<u>Species</u>	<u>% Basal Cover</u>
Baltic Rush	8.5
Foxtail	18.0
Blue Vervain	6.3
Water Cress	2.2
Curly Dock	0.6
<i>Ranunculus sp</i>	2.8
Lamb's Quarter	1.1
Hardstem Bulrush	0.1
Open	60.4

Bay 2 - *Carex nebrascensis* (mean height = 55 cm)

<u>Species</u>	<u>% Basal Cover</u>
Nebraska Sedge	8.8
Foxtail	3.7
Blue Vervain	16.6
Curly Dock	2.8
<i>Polygonum sp</i>	1.1
<i>Ranunculus sp</i>	16.0
Sago Pondweed	3.3
Open	47.7

Bay 3 - *Scirpus acutus* (mean height = 109 cm)

<u>Species</u>	<u>% Basal Cover</u>
Hardstem Bulrush	8.0
Baltic Rush	1.7
Unknown Grass	9.0

Foxtail	3.9
Blue Vervain	5.7
Curly Dock	1.3
<i>Polygonum sp</i>	3.2
<i>Ranunculus sp</i>	4.6
Sago Pondweed	1.1
Open	61.4

Bay 4 - *Typha latifolia* (mean height = 95 cm)

<u>Species</u>	<u>% Basal Cover</u>
Broadleaved Cattail	1.9
Hardstem Bulrush	0.9
Unknown Grass	1.9
Foxtail	11.0
Blue Vervain	5.0
Curly Dock	1.3
Smartweed <i>sp</i>	1.3
<i>Ranunculus sp</i>	2.2
Sago Pondweed	8.2
Open	66.3

Bay 5 - *Eleocharis palustris* (mean height = 45 cm)

<u>Species</u>	<u>% Basal Cover</u>
Creeping Spikerush	1.2
Threesquare Bulrush	0.3
Unknown Grass	5.0
Foxtail	1.1
Blue Vervain	29.8
<i>Ranunculus sp</i>	1.7
Sago Pondweed	3.7
Open	57.1

Bay 6 - *Scirpus pungens* (mean height = 57 cm)

<u>Species</u>	<u>% Basal Cover</u>
Threesquare Bulrush	3.3
Mustard	1.3
Unknown Grass	7.5
Foxtail	0.6
Blue Vervain	3.9
Sago Pondweed	58.2
Open	25.2

Bay 9 - *Phragmites australis*

<u>Species</u>	<u>% Basal Cover</u>
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Common Reed	0.3
Unknown Grass	1.1
Foxtail	4.4
Blue Vervain	5.0
<i>Ranunculus sp</i>	4.4
Sago Pondweed	12.3
Open	72.6

Bay 10 - *Salix exigua* (mean leader length = 49.9 cm)

<u>Species</u>	<u>% Basal Cover</u>
Coyote Willow	1.2
Foxtail	6.6
Blue Vervain	10.5
Sago Pondweed	42.9
Open	39.1

Bays 3 (Hardstem Bulrush), and **10** (Coyote Willow) looked the best in terms of growth. Bay 4 (Cattails) has not fared well. This is due primarily to the condition of the plant materials last August. Many of the rhizomes were black and hollow. We believe the few plants that did survive will fill in very well this summer. Bay 9 (Phragmites) didn't do very well either. This was probably due to two factors: 1) Plants were planted later than the other herbaceous materials, and 2) the bay was completely dry this winter, exposing the new plants to freezing conditions. We expect the surviving Phragmites to spread and start to fill bay 9 during this growing season.

CWS I (north wetland) is establishing vegetation very well. The Tall Fescue, which was planted from seed, has completely filled in the primary filter and is doing very well. There are approximately 12 "clumps" of Hardstem Bulrush in the upper end of the shallow water wetland. There are five "clumps" in the deeper portion of the wetland, but they are not spreading due to the depth of the water. Plants in this CWS should fill in nicely by the end of this growing season.

CWS II (south wetland) is also establishing well. We measured percent basal cover at ten random points within the Primary Filter. Nebraska Sedge was present in the Primary Filter but was not represented within any of the samples. The following is a summary of the cover data:

CWS II - Primary Filter

<u>Species</u>	<u>% Basal Cover</u>
Hardstem Bulrush	0.3
Alkali Bulrush	1.3
Threesquare Bulrush	2.6
Baltic Rush	2.5
Creeping Spikerush	0.6
Blue Vervain	1.1
Unknown Grass	3.5
<i>Ranunculus sp</i>	0.2
Open	87.9

There are 35 "clumps" of Hardstem Bulrush and seven clumps of Broadleaved Cattail growing in the shallow water wetland portion. The same plant stocks were used to plant the cattails in Bay 4 and the CWS. Again, we believe the poor condition of these materials lead to the poor establishment. Creeping Spikerush and Duck Potato are growing within the cattail "clumps". This CWS should fill in very nicely this year.

During August of 1995 we planted three separate accessions of Alkali Bulrush in the primary filter of CWS II. All three are doing well. The following is a summary of the accessional data:

Bear River NWR SCMA: 112 shoots/m²; 57 cm tall.

Bear Lake NWR SCMA: 40 shoots/m²; 38 cm tall.

Fernley Nevada SCMA: 124 shoots/m²

Overall, the bays and CWS's are establishing very well. Once the weed problem in the bays is under control we should see the wetland vegetation spread into the open areas and fill their individual bays. We are very excited about the progress being made on this project.

USBR H-Drain Project, Paul, ID

The H-Drain Constructed Wetland System is in cooperation with the Snake River Area - East, USBR, Burley, Idaho. We are continuing to collect information on establishment procedures, competition, community dynamics, water quality, and survival. Mike will be mapping the vegetation this summer.

Scarrow Dairy Animal Waste CWS

A dairy owner in Gooding is very interested in installing a CWS and had already installed two large lagoons and a solid waste bunker. Jim Scarrow is convinced that this technology can work and can benefit the Dairy business. We have agreed to help Jim plant the various components as soon as they are built to test our wetland plant materials under animal wastewater conditions. This project is still progressing and Jim is looking for grant money to help defray the construction costs. Planting will probably take place next spring.

Arimo Ranch (Marsh Creek)

The Arimo Ranch Research and Demonstration Site located on Marsh Creek south of Pocatello is proceeding on schedule. This demo site is designed to test a planned grazing system versus total exclusion, and planting (accelerated revegetation) versus no planting (natural revegetation). Starting in 1995, we have been planting woody riparian species using various bioengineering techniques, and developing new bioengineering methods in grazed and ungrazed (excluded) sections.

During the Fall, 1995, small tree and shrub revetments in addition to vertical bundles were installed on the grazed and excluded sections. We went back in this spring to beef up (no pun intended) the revetments with more Hawthorne and Chokecherry trees. We were trying to build up the revetment to cover more of the bank. The finished project looks good. It also has gone through several floods this spring and has collected a significant amount of sediment in the short time they have been in.

This last month, we also installed several new revetments on areas that had been planted with dormant cuttings or vertical bundles. We tried a couple of new methods for installing the revetments and they seemed to work very well. Tying down the revetments and protection from beavers have been our two biggest concerns.

On April 18, 1996 a meeting was held at the Arimo Ranch house to discuss the grazing plan, and to reaffirm the PMC's and ID F&G's commitment to the project. In attendance were: Lane Shoeman, Ranch Manager; Ron Davidson, NRCS-Pocatello; Gary Young, NRCS - Pocatello; Scott Engle, NRCS-Pocatello, Jim Cornwell, NRCS-Boise; Mike Sellers, PMC. A new grazing plan that Lane could adhere to more closely was discussed and Scott was going to work on the development of this plan.

Lane had some questions about whether or not he could graze the enclosure after a few years. Mike replied that he believed that went against the original agreement with the land owner. Dick Scully, ID F&G, latter wrote Lane a letter and included a copy of the agreement/grant stating that the excluded sections could not be grazed for at least ten years. Dick also discussed in his letter to Lane the purpose of the study so that Lane would be up to speed on the project. Over the last two years the Arimo Ranch has had three managers, so it has been difficult to keep the management informed/involved in the study. The land owner, Chris Robinson, is still 100% behind the project, and in fact, would like to be doing a lot more in terms of excluding sections of the stream from grazing.

Two other land owners up stream of the Arimo stretch have made arrangements with Dick Scully to exclude 2.75 miles of the riparian corridor from grazing this summer.

Blackfoot River WMA Bioengineering Project

The Idaho F&G purchased the Blackfoot River WMA two years ago. It has a history of intense cattle grazing. Cattle were removed from the area to increase the speed of the rehabilitation process. On June 24, we placed a 145 foot aspen revetment on an outside curve. The vertical bank is approximately 18 inches high. Behind the revetment we placed an additional layer of aspen, a 40 foot willow wattle and some soil. In addition, we planted seven willow poles behind the revetment, nine willows just upstream of the revetment, and 25 willows downstream of the revetment.

On Angus Creek, a tributary of the Blackfoot River, we planted 118 willows along a cut bank and around the edge of a pool. Our goal here is to provide additional stability for the streambank as well as to provide shade. Approximately 150 yards downstream of the pole plantings, we placed an 18 foot willow wattle at the toe of the slope on eroding outside curve.

The project gave us some very good PR. The Pocatello newspaper interviewed Mike on site. The article was published on June 27. Mike was also interviewed for a local outdoor sports magazine.

This planting site is part of a study to test the effectiveness and viability of mid-summer harvest and planting of woody material. This site will help us better address the questions and concerns of persons wishing to plant willow during the summer months. If this method is successful, it could open up countless opportunities for riparian rehabilitation work.

Mid-Summer Willow Planting Trial

Cuttings taken during the non-dormant season have a much lower establishment success than those taken during the dormant season. If the "planting window" could be increased to include

harvesting and planting of non-dormant woody materials, much more rehabilitation work could be done. We have recently initiated a mid-summer willow planting trial to address the problems/time constraints associated with the planting of dormant woody materials.

The use of rooting hormones is not usually recommended for dormant stock (except when the diameters of the cuttings are small or the cuttings have been stored for a long period of time), however, rooting hormones might be beneficial on non-dormant cuttings to increase the establishment success.

One study tested Peachleaf Willow. Cuttings were collected on the American Falls Reservoir, soaked for one week, and planted on June 19. Nineteen more Peachleaf cuttings were planted in sand in the PMC Wetland Greenhouse. The greenhouse Peachleaf Willows sprouted very well within six days after planting, but no roots were observed which is typical of the process.

We also planted both Geyer/Booth Willows at a site on Angus Creek (a tributary to the Blackfoot River) and on the Blackfoot River. These cuttings were harvested and planted on the same day, June 25. We will monitor their establishment success over the course of the summer and next year.

This trial will be expanded to include more species and different planting dates. We will also include paired trials on hormone treated vs. no hormone over time.

Camas Creek Stream Stabilization Project, Hamer, ID

We were asked to help with a stream stabilization project on an artificially intermittent (irrigation diversions) stream north of Idaho Falls near Hamer by Howard Johnson, DC Rigby, and Jerry Deutscher, USFWS Camas NWR. Camas Creek runs from the Spencer area down through Camas NWR to Mud Lake and has been straightened in the past. Larson Farms agreed to do some work to decrease the severe bank erosion in the straightened sections. This bank erosion results in heavy deposits of silts and sand on the Camas NWR which in turn causes problems with getting water to the Mud Lake Irrigation District. We have been working with Bob Lehman, NRCS Agricultural Engineer, to design some practices that will reduce the erosion and reestablish woody vegetation on the streambanks. Two main problems exist, 1) there is no water in the channel in the summer because it is diverted for irrigation, and 2) the banks are almost all pure sand. Sand is very difficult to stabilize especially when it gets wet without extraordinary methods. We are going to have to rely heavily on rock rip-rap with willows planted under it and through it. We are also using V-shaped rock weirs to slow the water down, drop sediment out, to back water up the channel, and to increase bank storage. Later, we will increase the riparian vegetation plantings to take advantage of the increase bank storage.

This project will be a real test of the various practices we have designed. Long term monitoring will increase our knowledge base significantly.

Seagull Bay BOR Woody Nursery

The tree nursery planted at Seagull Bay on the American Falls Reservoir last spring came out of the winter with many dead cuttings. As part of the American Falls Reservoir Erosion Control Study with the USBR, the dead cuttings have been replaced this spring. The BOR is adjusting the watering system to get better coverage this year.

Greenhouse Plantings

The greenhouse was planted this spring. One accession of each species was planted for each of our Ecoregions. We tried a new stratification technique this year for five of our six wetland species. We added sphagnum moss to the stratification cups to create a weak acid scarification. It seems to have helped with all most all of the species. *Scirpus pungens* continues to be a little stubborn and will take a bit more work to speed up its germination rate. *Scirpus maritimus* has responded incredibly well to this treatment; seeding to mature flowering plants in 30 days! We have had very good results with *Carex nebrascensis* as well. We have found that if you remove the perigynium, you can plant the seed without stratification and have excellent germination rates and 30 cm tall plants in 30 days.

Direct Seeding Trial at PMC Created Wetland Ponds

We will be investigating several seeding techniques in our ponds this summer and fall. One pond will be dedicated to testing "manual" seeding techniques (e.g. broadcast). We will be comparing planting the seed on the surface vs trampling the seed in. Another pond will be used to explore "mechanical" seeding techniques. In this pond we will simulate the use of heavy equipment used in planting. Two other ponds will be used to compare these same techniques in the late fall after the irrigation water is turned off. We will be exploring the use of these techniques with all six of our herbaceous wetland plant species.

Two other ponds (one summer and one fall) will be used to test wetland community seeding techniques. In these ponds we will compare different wetland species seed mixes in conjunction with seeding techniques to ascertain the "best" seed mix for planting a diverse wetland community.

Nebraska Sedge (*Carex nebrascensis*) Germination Study

This past winter we decided to look into ways of increasing the speed and percentage of germination of CANE2.

We looked at numerous factors including: length of stratification, perigynia removal, scarification, the addition of activated charcoal (to get rid of any germination inhibitors), and sphagnum moss. These factors were investigated by themselves and in various combinations. The combination of treatments that consistently performed the best included lightly scarified seeds stratified for 30 days in a mixture of distilled water and sphagnum moss. After this treatment, the seeds were all placed in petri dishes with 24 hours of light and heated to about 94°F. Without scarification or stratification the CANE2 seeds would begin to germinate in 14 days, and on average, never reached 50% germination within the 30 day trial. However, for the group which was scarified, and stratified with sphagnum moss, germination began in 5 or 6 days. It took 7 days for 50% of the viable seeds to germinate and 100% of the viable seeds germinated within 21 days. For the purpose of this paper, total viable seeds was determined by carrying on the experiment until seeds no longer germinated. This number was then considered to be total viable seeds. Actual germination was then adjusted accordingly.

It seems that we have pretty well mastered the germination of CANE2 in the greenhouse. We are now looking at increasing our success with SCPU3 later this season.

Seed preparation tips

We made our original scarification device from scraps we had around the shop. It consisted of a small topless box, about 4" X 6" and 1" deep, made from scrap lumber. We lined the bottom with 100 grit sand paper and cut a small piece of wood which fit in the box and wrapped it with the same type of sand paper. We put about 60 to 100 seeds in the bottom of the box. The block was

then drawn lightly back and forth over the seeds for about 10 to 15 seconds. We stopped as soon as we got the perigynia off. We then put the seeds in a cup with distilled water, and about 8 grams of sphagnum wrapped in cheese cloth in the bottom of the cup. The cups were then put in the cooler for a 30 day stratification period. This method will probably work for other wetland species as well. (For more information, see **Info Series No. 10** - Seed Germination Enhancement for *Carex nebrascensis* (Nebraska Sedge). **In Press**)

Ft. Hall Wetland Plant Nursery

We have contracted with the BOR to provide assistance the Shoshone-Bannock Indian Tribes at Ft. Hall, ID in developing a wetland plant project. We will train tribal members in how to collect wetland plant seeds, clean the seeds, and produce wetland plant plugs. The project will be in three phases, one each year. Mike will spend time over at the tribal headquarters organizing the project, examining market potential, locating suitable collect sites, training tribal employees on species ID and collection procedures, and generally preparing for the collection season. A good wetland plant nursery at the east end of the state would be valuable to many different agencies who are contemplating wetland projects in the future.

The Interagency Riparian/Wetland Plant Development Project is sponsored and funded by: USDA Natural Resources Conservation Service (Idaho & Utah), USDI Bureau of Land Management, USDI Bureau of Reclamation, US Fish and Wildlife Service, US Forest Service, Idaho Fish and Game, Idaho Transportation Dept., and Idaho Power Co.

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