BONNEVILLE POWER ADMINISTRATION

Sandy River Delta Habitat Restoration Project

Annual Report 2002 May 2006 DOE/BP-00005685-2

This Document should be cited as follows:

Kelly, Virginia, "Sandy River Delta Habitat Restoration Project", 2002 Annual Report, Project No. 199902500, 13 electronic pages, (BPA Report DOE/BP-00005685-2)

Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208

This report was funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. The views in this report are the author's and do not necessarily represent the views of BPA.

Sandy River Delta Riparian Forest, Wetlands, and Original Sandy River Channel Restoration

Project: 1999-025-00
BPA Contract # 5685, BPA Work order # 82604

2002 ANNUAL REPORT

The 2001 annual report summarized the work from 1997 through 2001 illustrating how the Forest Service, working with its partners, was using adaptive management to accomplish this restoration project. The Annual Report for 2002 will build upon the 2001 report; only briefly summarize past accomplishments but detailing the more recent work. This work was funded by the Bonneville Power Administration (BPA), the USDA Forest Service (FS), Ducks Unlimited (DU), Foundations, non-profit organizations, and many hours of volunteers.

Overview: Project Description and Objectives

Sandy River Delta was historically a wooded, riparian wetland with components of ponds, sloughs, bottomland woodland, oak woodland, prairie, and low and high elevation floodplain. It has been greatly altered by past agricultural practices and the Columbia River hydropower system. Restoration of historic landscape components is a primary goal for this land. The Forest Service is currently focusing on restoration of riparian forest and wetlands. Restoration of open upland areas (meadow/prairie) would follow substantial completion of the riparian and wetland restoration.

The Sandy River Delta is a former pasture infested with reed canary grass, blackberry and thistle. The limited over story is native riparian species such as cottonwood and ash. The herbaceous communities are almost entirely non-native, invasive species. A system of drainage ditches installed by past owners drains water from historic wetlands. The original channel of the Sandy River was diked in the 1930's, and the river diverted into the "Little Sandy River". The original Sandy River channel has subsequently filled in and largely become a slough.

The FS acquired the Sandy River Delta (SRD) in 1991 from Reynolds Aluminum (via the Trust for Public Lands). The Delta had been grazed for many years but shortly after FS acquisition grazing was terminated while a master plan and Environmental Impact Statement (EIS) were developed for the site. During the following three years, the vegetation changed dramatically as a result of cessation of grazing. The dramatic changes included the explosive increases of reed canary grass monocultures in wet areas and the expansion of Himalayan blackberries throughout the site.

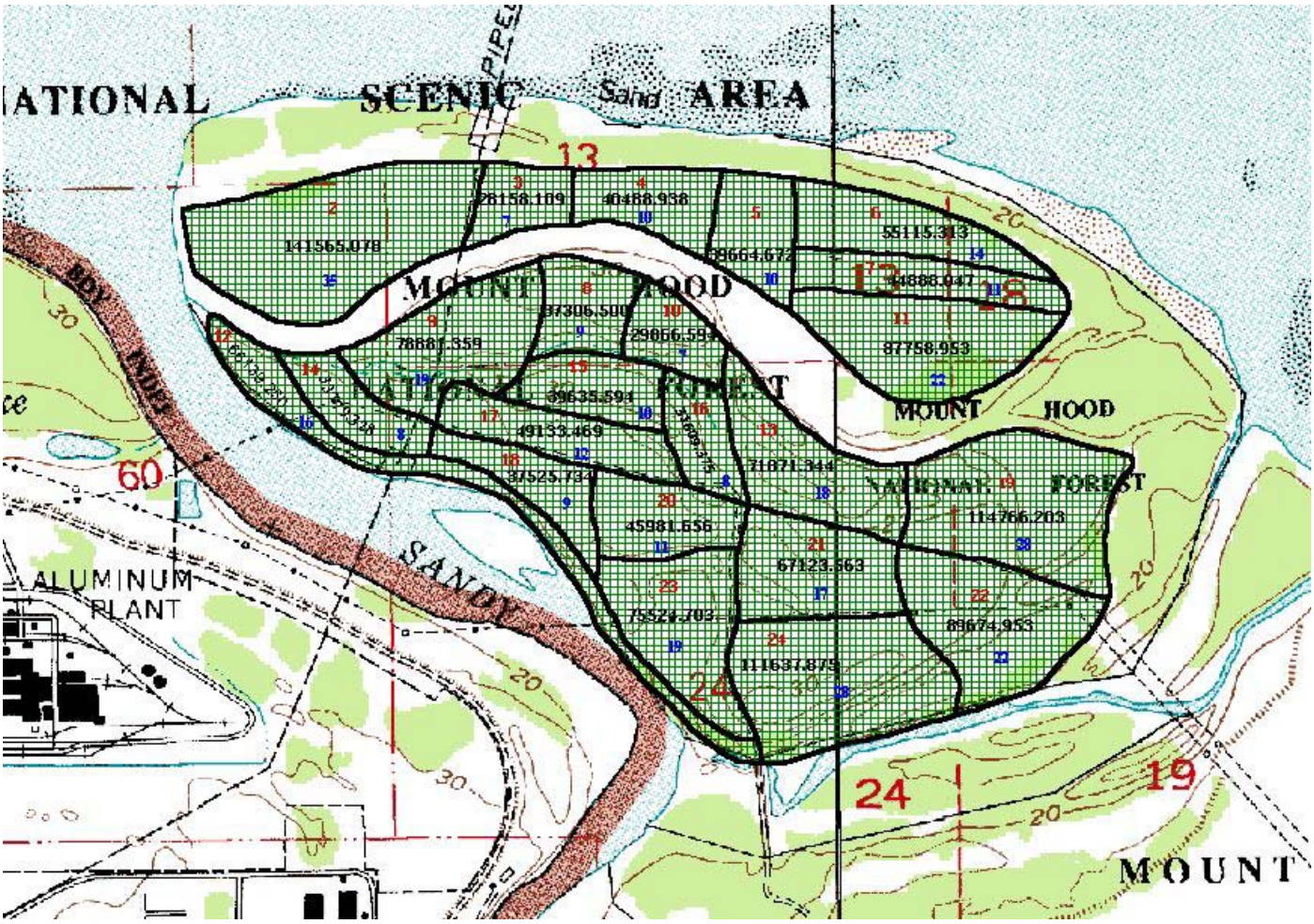
The completed comprehensive management plan (*Sandy River Delta Plan* and *EIS,* 1996) identified a landscape restoration plan, recreation facilities (trails and parking area), I-84 transportation improvements, and a 'gateway' to the Columbia River Gorge National Scenic

Area (CRGNSA). The master plan envisions wetland, riparian forest, shrub-scrub, upland forest, and upland meadow restoration. Riparian forest and wetland restoration were identified as first priorities. The long-term objectives are re-establishment of 600 acres of Columbia River bottomland riparian forest (dense stands of black cottonwood, willows and ash), and re-establishment of about 200 wetland acres and associated upland habitat. We also intend to monitor and evaluate restoration success.

Riparian Forest Restoration (Sundial Island)

The north island (Sundial island) was envisioned to become re-forested to the maximum extent possible. Clearly, it would not be possible to reforest under the transmission lines so this area was designated to be planted with shrubs. The old sloughs through the north island would be left intact as future flood channels. The species used for reforestation would those found in native gallery hardwood riparian forests: black cottonwood and Oregon ash with a diversity of other small trees and shrubs, such as willow spp., dogwood, ninebark, Indian plum, etc.

The Forest Service outlined the initial reforestation in a flexible five-year plan, which is illustrated in Fig.2 below.



The reforestation area was divided into blocks indicating when the areas were to be planted and when the associated activities were anticipated to occur. This type of out-year planning had to be very flexible to accommodate yearly changes, a result of adaptive management.

Summarized below is a brief chronology of the work accomplished prior to 2002 (for more details, please reference Annual Report 2001).

1997: - Seven acres were planted by volunteers in unit A1. High density at 900 trees/ac.
1998: - Severe deer browsing, vole girdling and weed competition occurred .
- Seven more acres were planted at high density using weed mats.
- Weeding the plantings was becoming prohibitively costly.
- Site prep work cleared 30 ac of blackberries.
1999: - Planted 22 ac. at same density.
- Used vexar tubes to help control deer predation. Trees above tubes continued to get severe browsing. Trees were not growing at expected rate.
- Voles were living under maps and continue to girdle trees.
2000: - A new approach had to be developed to over come the problems.
- For existing plantings, decided to fence individual trees to preclude browsing.
- In new plantings experimented with 6 ft tall trees to overcome deer problem.
- Decided to purchase tractor to facilitate vegetation control; this would result in row plantings at 20 foot rows.
- Site prep work cleared and sprayed an additional 60 ac of blackberries.
- A 200 ac fire occurred in planting area and presented opportunity to jump start a 15 ac trial of 20 ft row planting in the fall using tall planting stocks with no mats but did place tin foil to prevent girdling.
2001: - More cages were placed over the existing high-density plantings with dramatic results; some trees were showing 3 ft growth.
- Mowed vegetation between rows with tractor but there is still much concern with vegetation competition within row and around plants.
- New row plantings showing no browsing and good establishment. Planted an additional 10 ac.
- Exploring new approach of site prep by eliminating all vegetation, discing, and planting with trees in 12 ft rows.


Cages on trees

2002 Accomplishments

Maintenance of previous years plantings was completed. Monitoring data was collected showing dramatic growth in caged trees and good survival of plants in the mowed-tractor rows. Additional 10 acres were planted by volunteers organized through SOLVE .

Working with Ducks Unlimited, Ashcreek Management (a restoration consultant), and ODF (Oregon Dept. of Forestry) a Carbon Sequestration Grant was prepared to help fund future activities in the reforestation effort. The approach proposed was to eliminate all existing vegetation (reed canary grass, blackberries, exotic pasture grasses, etc), disc the area, and plant in 12 ft rows to facilitate tractor maintenance. Within the rows the vegetation would be controlled to reduce competition with the trees and shrub plantings; between the rows, native grasses would be seeded and established.

This approach was considered because it solves several of the problems that had been hindering past activities as noted below:

1). Trees were not showing the growth that was expected over the last 5 years. Several reasons were possible but the most likely was the competition between the trees and the grass sod. This new approach would eliminate this competition.

2). Voles were still a problem because, with grass sod up around the trees, this was providing excellent cover and promoting a healthy population. To over come this required eliminating the grass sod around the tree and shrub.

3). Deer predation was solved by using either fencing or tall plants; but tall plants are more costly and required many more years to get established before they begin to show good growth. Both of these problems could be solved by using smaller planting stocks and using deer repellent sprays.

4). The last problem lingering from the previous plantings was how to control, eliminate and replace the non-native, invasive herbaceous communities (reed canary grass and blackberries). Our previous approach was to address this problem at a later time after the trees had become established. This new approach would essentially solve this dilemma up front by eliminating all non-native vegetation prior to planting.

Prior to this year, our approach was to be 'lighter' on the land, maintaining most of the vegetation as possible. However, it became clear that considering that almost all the existing vegetation was non-desirable, the new approach, although it would be 'heavier' on the land up-front, would actually solve most of the problems and achieve our goals. In addition, the new approach appeared to be less costly in the long run and would likely establish our riparian hardwood gallery forest community in a far shorter time frame. This is important not only to meet the objectives but also to cut down on maintenance costs.

As a result, we decided to try this new approach on a 50 acres demonstration pilot study. The area was adjacent to our previous plantings, which would allow for comparisons. The various activities were completed in the fall and winter of 2002. Most of the area was planted mechanically. Following is a brief summary of the operations used in this pilot study:

- The blackberries and grasses were cut and mowed and then sprayed with glyphosate and Garlon.
- The area was disced several times to create a good planting bed.
- The area was then re-sprayed.
- Mechanical planting of trees (various sizes) and shrubs in late December on 65 acres. Planted 35,796 plants.
- Grass seeding will occur in 2003 after an additional spraying to eliminate any left over grasses.

Pilot area cut ready to be disced.

Pilot area disced.

The success of this new approach will hopefully become clear after monitoring during the 2003 summer.

Summary: Riparian Forest Restoration, Acres per Year by Activity

Activity	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Site Prep	21	43	30	150	130	155
Planting	7	14	34	25	20	65
Maintenance	--	7	14	35	40	60

Mechanical planting.

Wetland Restoration and Evaluation

As shown in Fig. 1, the wetland enhancement work was identified to occur in the southern portion of the Delta for several reasons. The most important being that there were more positive hydrologic conditions present. These wetland areas were severely infested with monocultures of reed canary grass that had displaced essentially all of the native wetland flora. The FS developed a partnership with DU and obtained funding from BPA and foundations to initiate the enhancement work.

The objective of this wetland work was to create more functional wetlands by increasing the amount of open water/emergent wetlands and thereby decreasing the amount of red canary grass dominated wetlands. This would in turn create more favorable habitat for waterfowl and water dependent birds, herptiles, and other wildlife and native plants.

The work began in 1997 and is briefly summarized below (see Annual Report for 2001 for more details). The management approach was similar to the re-forestation effort in that we attempted to be as flexible as possible to respond to lessons learned from previous years using the adaptive management concept.

1997: - Water control structures were built to retain all surface water in the four ponds identified for this project.

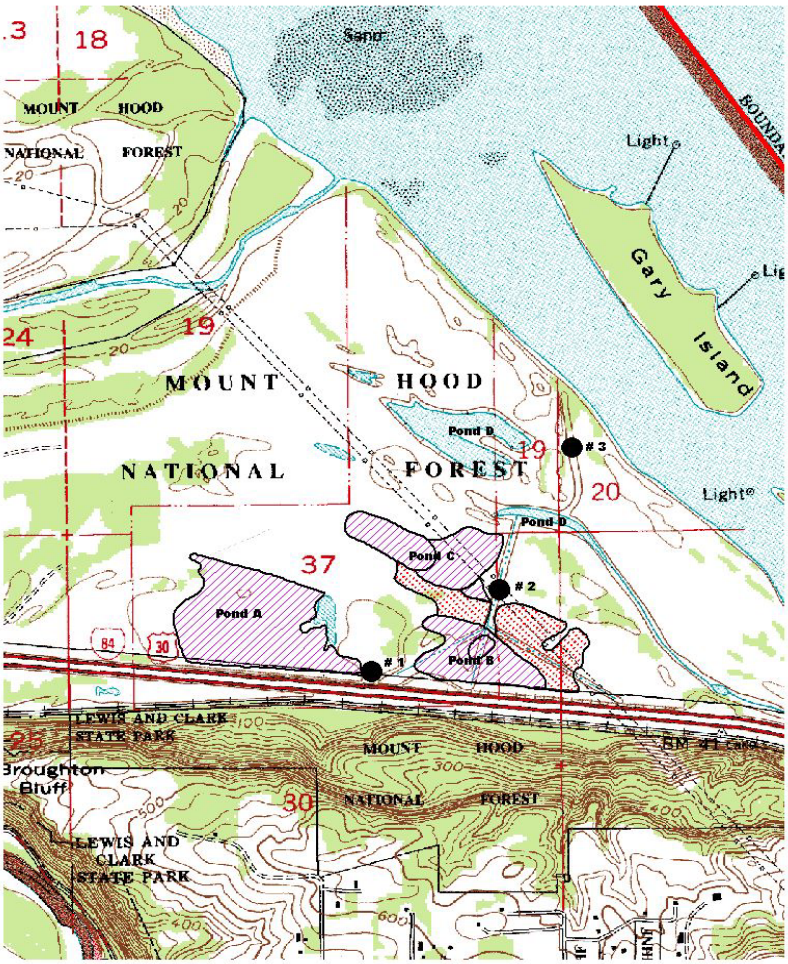


Fig. 3: Three water control structures (#1, 2, and 3) and wetland areas that were excavated at the Delta (pond A, B, C, and D). Red shaded areas adjacent to pond B and C were disced and not excavated. The source of the water for the wetlands is Broughton Bluff located south of the ponds.

1998: - Pond B, C, and D were disced in attempts to control reed canary grass as detailed by the USFWS. This operation was not successful although wetland flora did germinate from the soil seed bank.

1999: - The ponds did fill up during the winter ('98 – '99) but did not retain water beyond July. To obtain good control of reed canary grass, longer water retention will be required. Monies that were to be used for discing were instead used to deepen pond B in hopes of retaining more water for longer time.

2000: - The ponds were well flooded during the winter ('99-2000). Again the water receded rapidly in July 2000. We recognized that quantity of water was a problem. Ponds disced in '98 had become completely infested with reed canary grass once again –

illustrating that discing in conjunction with the water quantities available at the delta will not give any control of this invasive species.

2001: - The winter of 2000-2001 was very dry and the ponds did not fill. In 2001 pond A and B were further deepened. We began to explore the possibilities of establishing a well capable of supplementing the water for the wetlands during a couple of months of the summer, long enough to get control of the reed canary grass.

2002 Accomplishments

The deepening of the ponds was now complete and the problem of water and restoration was at hand. During the winter of 2001-2002 the ponds did fill but not to overflow capacity.

Pond A in 2002

Pond D never even began to fill. However, a very good wetland vegetation (predominantly spike rush spp) did germinate from the soil seed bank in pond A and B (which had been deepened during the summer of 2001). Monitoring transects completed by PSU wetland students and Americorps were established in pond A. Pond C did fill but has become re-infested with reed canary grass.

During the summer of 2002 we explored the possibilities of getting a well dug near pond A. A water right was obtained and the necessary NEPA and consistency documents were completed. Final approval and financing of the well will be decided in 2003.

The concept of restoration of the ponds was to finish the land movement aspects, then eliminate the reed canary grass from a 50 ft buffer surrounding the wetlands. This buffer zone would then

be planted to native grasses, wetland plants and shrubs. From this beginning, the circle would be enlarged at later times to restore more upland meadows adjacent to the wetlands.

Spraying of ponds A , B, C, and the disposal area for soil from pond A and B were to have been sprayed in May 2002. Due to complications with weather and contracting this did not occur. However, in the fall of 2002, it was determined that we needed to put all emphasis on the ponds that were deepened in 2001 and let pond C remain infested until later. As a result, a 60 ft area all around ponds A and B were sprayed with glyphosate and Garlon in Oct 2002. This spraying eliminated reed canary grass and blackberries. Portions of the area that were still dry enough were disced in December. Isolated infestations of reed canary grass within the wetlands were spot sprayed in October before the rains had come.

The wet areas that could not be disced will be treated in the summer of 2003. All the areas around the wetlands will be keep weed free and re-sprayed before any planting occurs.

Summary: Wetland Restoration, Acres per Year by Activity

Activity	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Structures	3	--	--	--	--	--
Discing	--	200	75	--	--	30
Deepening	--	--	8	40	30	--
Spraying	--	--	--	--	--	60

Removal of Dike across the Original Channel of the Sandy River

No new work on the dike removal was initiated in 2002 other than the project was submitted to BPA for potential funding. In addition, the Forest Service took the USFWS and NMFS out to the dike to familiarize them with this potential new project.

Conclusion

The work completed at the Sandy River Delta in 2002 was very productive. The new pilot planting project was a huge success in its initial stage and the outlook for future years is very encouraging. Should this pilot study do well, it will greatly influence our future approach in the future.

The wetland work is now poised to move forward rapidly. The only remaining problem is the water supply. Should a well not be completed, the control of invasive reed canary grass will need to be re-examined and likely mean that some other form of control, such as spraying, will be necessary. It will also require more extensive work on identifying competitive native wetland flora that might ultimately keep this invasive species in check.