Natural Resource Damage Assessment Settlement

ANNUAL MONITORING REPORT

Fort Wayne Reduction Site Allen County, Indiana

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2004 Annual Monitoring Report

The following report summarizes the monitoring work that was completed on the Fort Wayne Reduction Site Reforestation project located in Allen County, IN. (See Location Map A). This report is submitted as part of the requirement of the Trustee approved Restoration Plan dated December 23, 1999.

Planting of the seedlings was completed on May 6-7th, 2000. 25,400 seedlings were machine planted on approximately 47 acres and annual herbicide was applied at the time of planting. The trees were planted on as close to a 9'x 9' spacing as possible. It should be noted that small changes in soil type, moisture, and terrain may result in trees being planted either somewhat closer or farther apart than that. The following seedlings based upon nursery availability, were planted on the site:

Bur Oak	3,000
Pin Oak	2,500
Swamp White Oak	1,500
Swamp Chestnut Oak	1,500
Overcup Oak	1,000
Green Ash	3,500
Sycamore	3,500
River Birch	3,000
Shellbark Hickory	1,000
Buttonbush	1,600
Silky Dogwood	1,700
Red Osier Dogwood	<u>1,600</u>
-	25 400

Monitoring

Three, one acre test plots approximately (208' x 208'), were established on September $14-15^{th}$, 2001. Metal "T" fence posts were installed at the corners of all three plots to mark the boundaries. The test plots were located to sample tree survival rates in areas that have different soil types, as well as differences in elevation (depressional areas and high ground). Three photographic stations were also set up in the monitoring areas to

provide visual documentation of development of the areas. Observations of wildlife were noted during all site visits to the reforestation property to document usage of the property.

Monitoring Area #1

Monitoring area # 1 is located in the far west field north of Parrott Road and east of the abandoned Nail Road. The terrain in this field is fairly level with the one exception being a low depression in the far southeast corner of the field next to the drainage ditch. This field was the last area to be planted. In order to plant the trees that we had remaining, the field was planted on an approximately $8' \times 8'$ spacing (680 trees/acre).

Results:

(See attached Monitoring Area #1 Table for complete results)

Total Stems Surviving for Monitoring Area #1 was 557/Acre. Green Ash and Silky Dogwood were the most abundant species followed by Sycamore and Red Osier Dogwood. Total Percent Stem Survival for Area #1 was 81.9% and 11 different species were identified. Deer browse damage was not a problem in the 2004growing season. Most of the dogwood shrubs are now reaching heights of 6-10' tall and are beginning to spread out into much larger shrubs.

Monitoring Area #2

Monitoring Area #2 is located in the far southeast corner of the property on the north side of Parrott Road. This area was selected as a monitoring area to sample seedling survival in an area that has frequently saturated soil conditions. The test plot is located in a depression area on the landscape and is frequently saturated by runoff from surrounding areas.

Results:

(See attached Monitoring Area #2 Table for complete results)

Total Stems Surviving for Monitoring Area #2 was 439/Acre. Green Ash and Swamp White Oak were the most abundant species followed by River Birch and Silky Dogwood. Total Percent Stem Survival for Area #2 was 81.3% and 8 different species were identified. Rabbit damage was once again not as noticeable in 2004 as in previous years. Most of the trees are now reaching heights of 6-10' on average while Green Ash and Sycamore trees are reaching heights of 10-20' tall after 5 growing seasons. Area #2 was inundated with as much as 3' of standing water during 2004 as a result of backwater flooding from the Maumee River. Sediment stains and floating debris (paper cups, plastic bottles, and miscellaneous trash) was noticeable in the understory vegetation.

Monitoring Area #3

Monitoring Area #3 is located along the north side of Parrott Road in the southwest corner of the field. The test plot area is mostly level and provides a good sampling area that is fairly representative of the high areas in the rest of the field.

Results:

(See attached Monitoring Area #3 Table for complete results)

Total Stems Surviving for Monitoring Area #3 was 491/acre. Pin Oak and Swamp White Oak were the most abundant species followed by Bur Oak and River Birch. Total Percent Stem Survival for Area #3 was 90.9% and 9 different species were identified. Rabbit damage to the River Birch was still noticeable in 2004 especially towards the western portion of the sampling area nearest the county ditch.

General Discussion

Growing conditions in 2004 were favorable for establishing trees along the Maumee River. Above average precipitation was again experienced in 2004. Portions of the reforestation project area were flooded for short durations during the growing season in early June, July, and once again in late December. In addition to the planted seedlings, volunteer seedlings are also starting to provide additional habitat. Volunteer species identified include; Silver Maple, Red Maple, Slippery Elm, Box Elder, White Ash, Green Ash, Sycamore, and Cottonwood. Volunteer Elm, Ash, and Cottonwood seedlings are reaching heights of 10-20' tall after five growing seasons.

Water quality benefits to the Maumee River are also noticeable on the project area. Sediment deposition in the reforested areas is easily recognized with as much as ¼" sediment on plant debris in the lowest lying areas on the property. Flood debris as high as 3' above the ground in the understory vegetation also left sediment stains where water had stood for some time during the growing season.

Wildlife habitat has continued to improve since the reforestation was completed. Increased plant diversity and continuing development of the reforestation project provide improved wildlife habitat. Several new nesting cavities were noticed in Sycamore trees along the south bank of the Maumee River. Cavity nesting birds like the Wood duck and Hooded merganser are undoubtedly nesting in the nearby area, as they have been seen on almost every site visit. Wildlife observed on July 5, 2004 and on October 29, 2004 includes the following:

Wood duck Mallard Hooded Merganser Red wing Blackbird Crow Brown headed Cowbird Gold Finch Cardinal Red Tail Hawk Deer Rabbit Fox Squirrel Northern Leopard Frog Unidentified Toad species Snapping Turtle

Conclusions

The reforestation project is exceeding the goals of the Restoration Plan after five growing seasons. The original goals of the Restoration plan required a 50% Total Stem Survival with a minimum of five species present. The three monitoring areas averaged 84.7% Total Stem Survival and had an average of 9 different species present since the initial planting in May 2000. Volunteer tree species and planted seedlings are beginning to provide additional cover for wildlife and water quality benefits are already being provided in the form of sediment deposition and nutrient removal from the water column.

Long- term ownership of the property has been discussed with the Trustee Agencies. Waste Management, Inc. and the Participating Generators appreciate the efforts taken by the Trustee Agencies to coordinate the possible transfer of ownership. Waste Management, Inc. and the Participating Generators wish to continue coordination efforts and looks forward to completing this restoration project.

2005 will be the final year of required monitoring under the Restoration Plan. Assuming the reforestation project continues to exceed the goals of the Restoration Plan, Waste Management, Inc. and the Participating Generators will submit the last Annual Monitoring report to the Trustee Agencies by December 31, 2005. Waste Management, Inc. and the Participating Generators will also ask for a Certificate of Completion and a termination of the Consent Decree.

Species List	Total Stems Surviving by Species	% Stem Survival by Species
Bur Oak	4	<1%
Pin Oak	14	2.5%
Swamp White Oak	27	4.8%
Swamp Chestnut Oak	4	<1%
Green Ash	233	41.8%
Sycamore	70	12.6%
River Birch	15	2.7%
Shellbark Hickory	0	0.0%
Overcup Oak	2	<1%
Silky dogwood	124	22.3%
Red Osier Dogwood	44	7.9%
Buttonbush	20	3.6%

Monitoring Area #1 Approximately 1 Acre (208' x 208')

Total Stems Surviving for Monitoring Area #1 557/Acre

Total Percent Stem Survival* 81.9% (557/680)

Species Richness = 11

* Total Percent Stem Survival = Total Surviving Stems / 680 trees per acre planted on 8' x 8' spacing.

NOTE: Area #1 was the last area to be planted. In order to plant the approximate 3 acre field. remaining trees were planted on an approximately 8' x 8' spacing (680 Trees/Acre.)

Monitoring Area #2 Approximately 1 Acre (208' x 208')

Species List	Total Stems Surviving by Species	% Stem Survival by Species
Bur Oak	54	12.3%
Pin Oak	46	10.5%
Swamp White Oak	70	15.9%
Swamp Chestnut Oak	20	4.6%
Green Ash	78	17.8%
Sycamore	54	12.3%
River Birch	62	14.1%
Shellbark Hickory	0	0.0%
Overcup Oak	0	0.0%
Silky dogwood	55	12.5%
Red Osier Dogwood	0	0.0%
Buttonbush	0	0.0%

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Total Stems Surviving for Monitoring Area #2 439/Acre

Total Percent Stem Survival* 81.3% (439/540)

Species Richness = 8

* Total Percent Stem Survival = Total Surviving Stems / 540 trees per acre planted on 9' x 9' spacing.

Monitoring Area #3 Approximately 1 Acre (208' x 208')

Species List	Total Stems Surviving by Species	% Stem Survival by Species
Bur Oak	65	13.2%
Pin Oak	136	27.7%
Swamp White Oak	92	18.7%
Swamp Chestnut Oak	17	3.5%
Green Ash	51	10.4%
Sycamore	32	6.5%
River Birch	60	12.2%
Shellbark Hickory	0	0.0%
Overcup Oak	1	<1%
Silky dogwood	37	7.5%
Red Osier Dogwood	0	0.0%
Buttonbush	0	0.0%

Total Stems Surviving for Monitoring Area #3 491/Acre

Total Percent Stem Survival* 90.9% (491/540)

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Species Richness = 9

* Total Percent Stem Survival = Total Surviving Stems / 540 trees per acre planted on 9' x 9' spacing.



Location Map A Reforestation Areas and Monitoring Areas Fort Wayne Reduction Site NRDA Allen County, IN

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PS Area Area #2

Tree

Planting

Parrott Road + PS = Photo Station

Scale: 1 = 400'



