DUNE RESTORATION MONITORING REPORT 2

FOR

AMERICAN AIRLINES 331 ACCIDENT SITE

Submitted to:

AMERICAN AIRLINES

Prepared by:

CL ENVIRONMENTAL

Taking Care of You and Your Environment.

DECEMBER 2010

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1.0 INTRODUCTION

This report outlines the second monitoring report on the dune restoration for American Airlines 331 accident site. This monitoring exercise was conducted on December 17th, 2010, four months after the planting exercise which occurred on August 9-10, 2010.

Plate 1 shows the Dune Restoration site after four months.

Plate 1 American Airlines Dune Restoration Site-December (Month 4)

2.0 METHODOLOGY

Two belt transects which were two meters wide by thirty-two meters long, previously established at the restoration site, were used to determine both growth and survivorship. The transect began at the southern end (seaward) of the area at the edges of the replanted site and ran diagonally across the area ending at the western edges of man-holes close to the roadway (Figure 1) (Plates 2-3).

Data was then collected along the transect using 2m x 2m quadrats. Plant growth was measured in terms of three parameters: percentage cover (grasses), shoot length and shoot numbers (runners). Species position, type and general health were also noted.

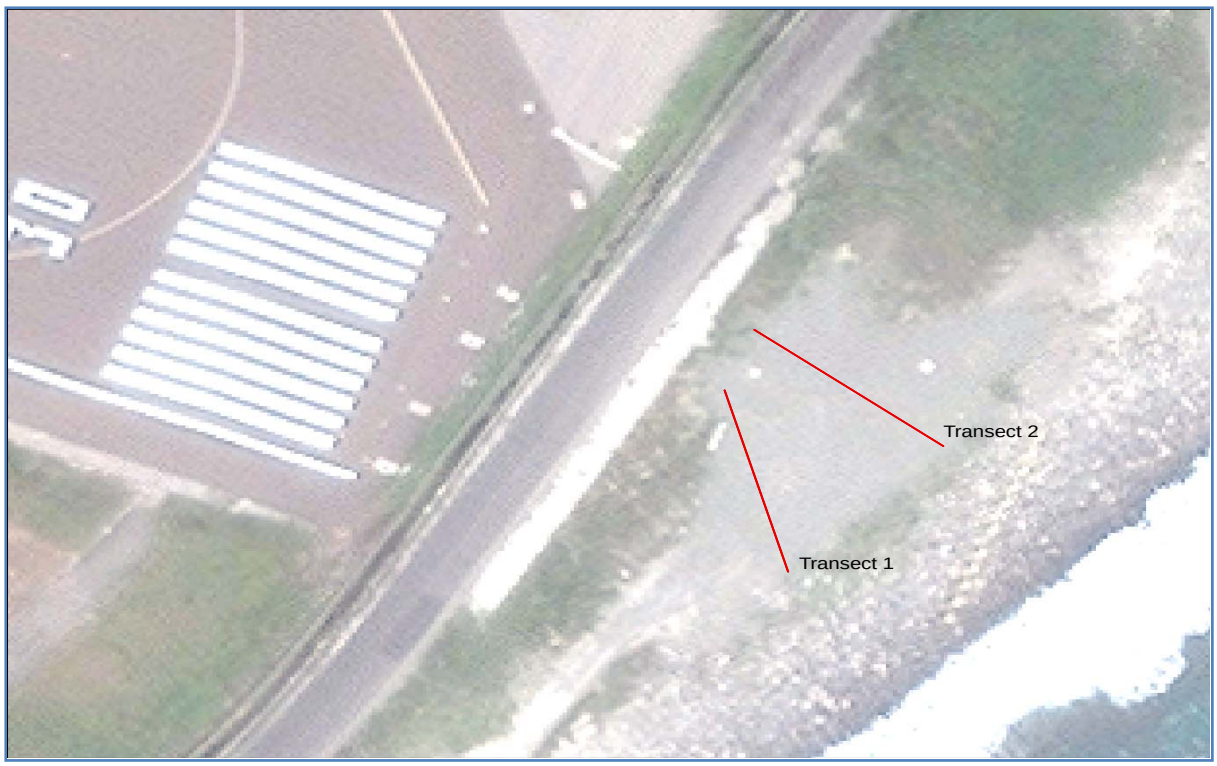

Figure 1 Map showing locations of belt transects at dune restoration site

Plate 2 Photo showing positioning of Transect 1-North View: Month 4

Plate 3 Photo showing positioning of Transect 2-North View: Month 4

3.0 RESULTS AND DISCUSSION

3.1 Survival

There was 100% survival of the grass (*Sporobolus*) in both transects. Survival for the runners (*Ipomea* and *Sessuvium*) in both transects was not as impressive, with an average survival of 70.39% (Table 1, Figure 2).

Table 1 Plant Survival of runners and grasses in each transect

Plant Survival		
	Transect 1	Transect 2
% Survival of runners- month 4	77.14	63.64
% Survival of grasses-month 4	100	100

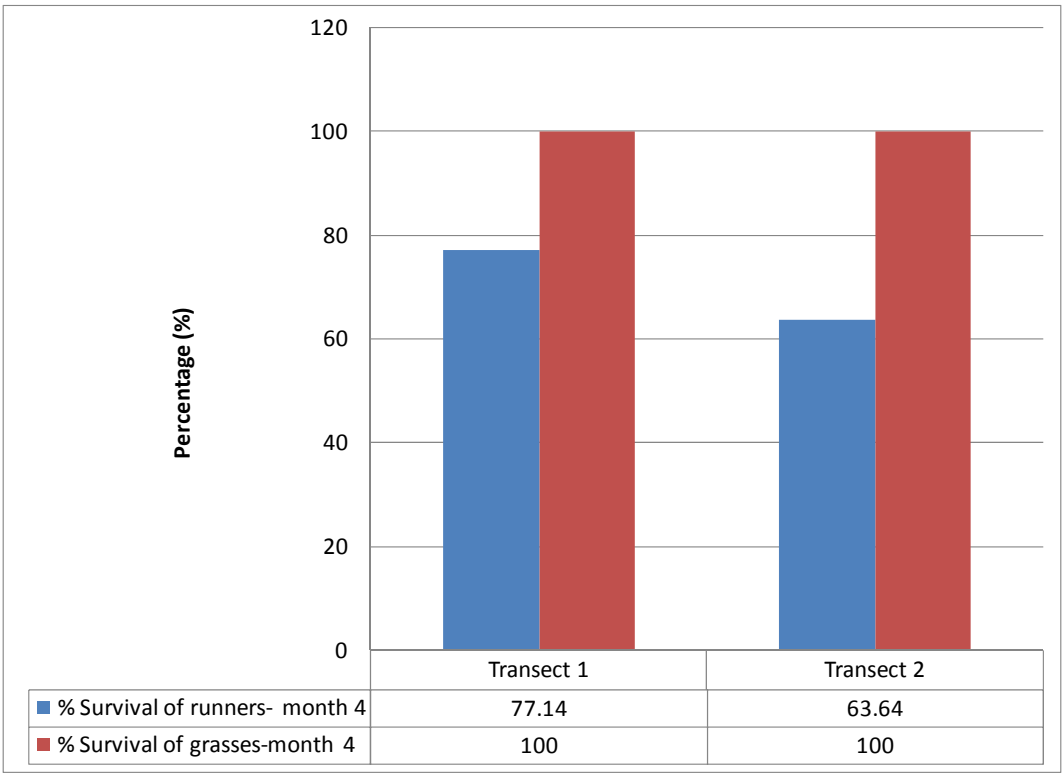

Figure 2 Percentage survival of runners and grasses in each transect

In the previous report a noticeable mortality in the northern end of transect 1 was discussed. This area was theorized to be affected directly by the heat exhaust from departing airplanes from the NMIA runway. However, observations this period show survival of plants closer to the jet-blast. The area referred to seems to be more affected by the drainage of the sand dune. Drainage grooves were noticed in this area, which indicate that the plants are being affected by a surplus of water during heavy rains (Plate 4).

Plate 4 Drainage grooves in area of plant mortality in Transect 1

3.2 Growth

The majority of *Sporobolus* individuals exhibited an increase in percentage cover over the four (4) month period. These grasses are showing positive growth, despite a small increase in leaf cover. A few individuals are showing impressive root extension from which new shoots are emerging (Plate 5).

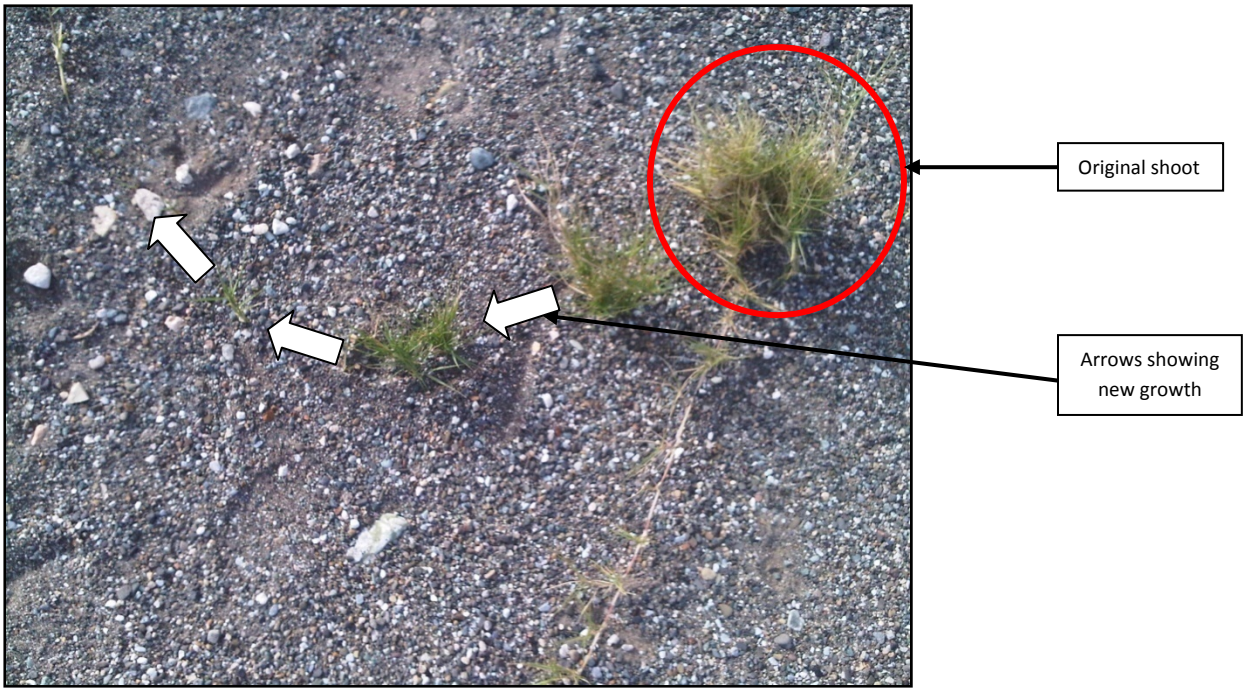

Plate 5 ***Sporobolus*** **showing positive growth of root and shoot**

3.3 Shoot Number

Plant growth within the restoration area is showing a positive increase in comparison to recovery period in September 2010 (Table 2, Figure 3). Despite the majority of runners having no net increase in shoot numbers, the average shoot number increased by 0.66 shoots per plant in transect 1 and 0.86 per plant in transect 2. This new growth is important to the runners colonizing the area.

Table 2 Average Shoot numbers for runners in Restoration Site

Mean Shoot Numbers		August	September	December
TRANSECT 1	Mean Shoot number	1.6	1.62	2.62
TRANSECT 2	Mean Shoot number	2	2.04	2.86

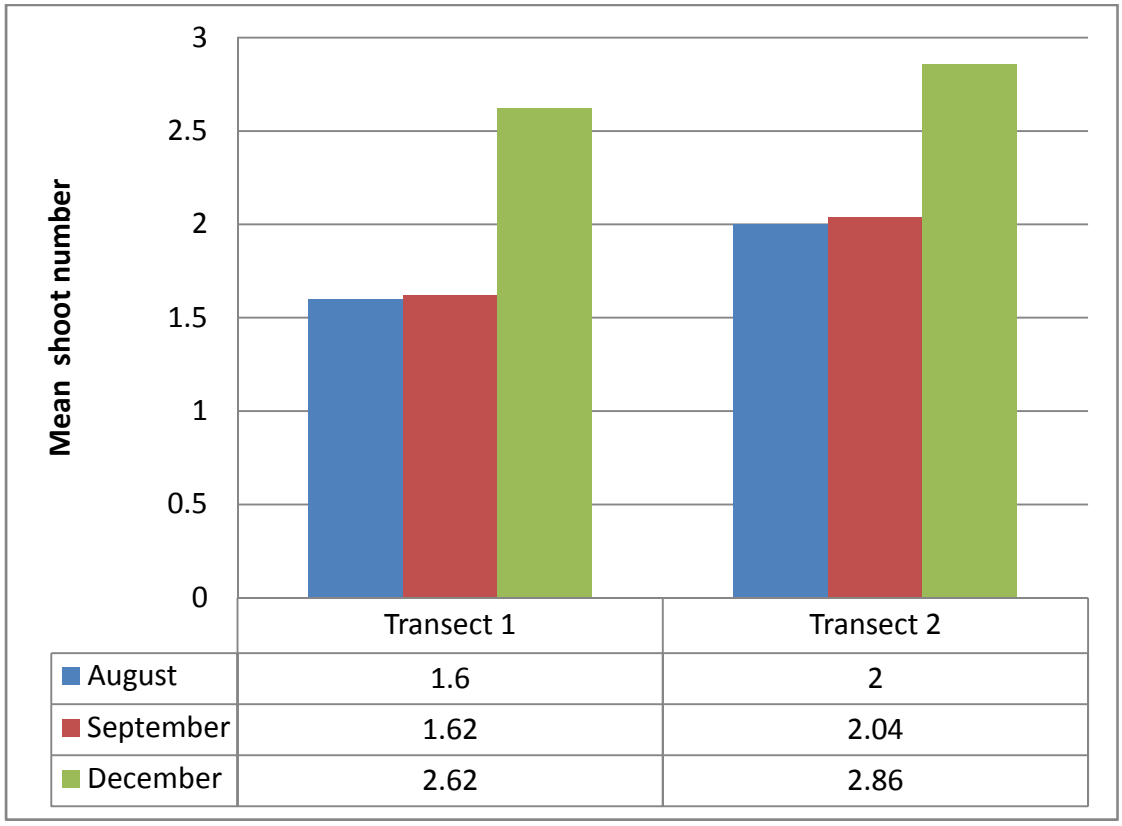

Figure 3 Mean shoot number for both transects

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3.4 Shoot Length

The increase in growth of shoots for the restoration site was impressive. Both transects had approximately 200% increase in average shoot length for shoots measured (Plate 6). This is indicative of a growth spurt following the plant's post-transplant recovery (Table 3, Figure 4).

Table 3 Mean shoot length for runners for both transects

Timeline		August	September	December
TRANSECT 1	**Average Shoot length(cm)**	35	26	45.89
TRANSECT 2	**Average Shoot length(cm)**	33	23	92

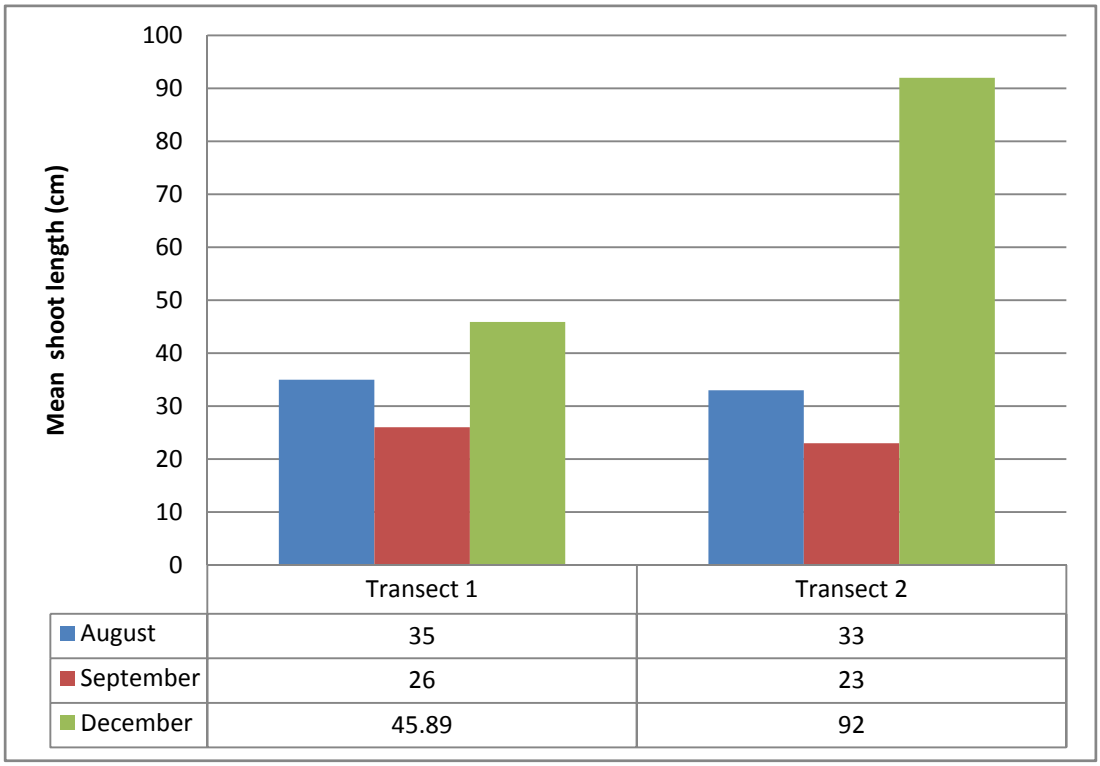

Figure 4 Mean shoot length for both transects

Plate 6 ***Sesuvium*** **plant showing over 200% increase in shoot length**

3.5 Ecological Data

No animals or evidence of animals were observed to inhabit the soil or general plant area.

4.0 CONCLUSIONS

- The plants within the restoration site have recovered from the initial shock of transplanting.
- Average plant survival is 70.3%
- There was a positive increase in shoot extension, shoot number and percentage cover for runners and grasses.

5.0 PROFESSIONAL STATEMENT

The Restoration of American Airlines crash site to date has been a success, showing a satisfactory level of plant survival and the majority of surviving runners showing greater than expected growth rates. The plants have recovered well from the initial, stressful transplant period and are expected to show a positive but more conservative growth rate in the next few months.