Mesa Verde National Park, Colorado

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Plant Salvage Report

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GREAT BEAR TEAM

Native Resources INTERNATIONAL

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Mesa Verde National Park Plant Salvage Analysis

The purpose of the salvage at this project was to protect and preserve native plant material to the area; in this case the specific plant to be salvaged was the Squaw Apple plant from the East side of entry to West side entry (nursery location). This salvage is classified as a quick dig since the plants were side boxed, bottomed and relocated to the nursery within two days. The following information pertains to the specific tasks during the plant salvage period.

Upon arrival on April 27, 2009, the Project Coordinator walked the designated salvage area to analyze any site condition issues. In this case, with the exception of the designated salvageable plant material, the site was to remain undisturbed to preserve the natural condition of the site. During this time the nursery site was reviewed as well as site access, water source and possible underground utilities.


Once the site limits are located a plant inventory is conducted by using a Global Positioning System (GPS) to plot the location of plants. This is the stage where the salvageability of the plant is determined based on health, physical structure and survivability. The plants are tagged and numbered on the north side of the plant to allow the salvage team to preserve the original orientation of the tree.

The salvage team then locates each plant to be salvaged. A pruning team begins the salvage process by pruning 10% to 15% of the foliage as well as dead branches.

The process of side boxing begins with a team which hand digs the outline of the trench to be dug around the base of the plant about 24 inches wide past the root zone.

The foliage was tied up to prevent any damage when digging near the base of the plant. Then the backhoe is used to dig further down around the tree and leave enough space to work and attach the sides of the boxes. During this time the roots are pruned back carefully with a pruning saw to prevent damage of the root system and fit to the shape of the box. Some plants were hand dug completely or partially due to the salvage location and proximity to other protected vegetation.

Following the side boxing the plants are watered and left for the next day to bottom.

The bottoming of the plants requires for the plant to be tipped to one side in order to nail the bottoms of the boxes on. One half inch steel banding was placed vertically and horizontally around the box to keep the sides and bottom of boxes intact. The salvaged plant boxes were carefully uprighted. The backhoe was then used to lift the boxed tree out of the ground and then transported to the nursery site.

Transportation of plants from salvage site to nursery required the team to utilize a flag man to signal men working. Trees were transported across and down the roadway. Careful attention was paid to the safety of the crew as well as local traffic.


Preparation of the nursery site required cleanup of debris to create enough space for 40- 24" box plants. 12" trenches were dug and the plants were placed in the trenches in rows with the original orientation of the shrubs facing north. A silt fence liner was placed between the soil and the box to prevent the soil from rotting the wood prematurely. The trenches were then backfilled back to the natural soil surface level. 12 inches of peat was added to the top of the soil surface completely encompassing the tree box. (see pictures next page) This was done in an effort to protect the plants from inclement winter weather. Plants were then hand watered to remove any air pockets and to further settle the soil. Miracle Grow with Fertilizer (12-8-8) was applied to the trees on the soil surface, and then watered in. In addition a plaque was located on the North side of the box indicating plant type, box size, side- box date, bottom box date and the date plant was placed in the nursery.






Temporary irrigation was then installed to the plants. Materials used for irrigation system are as follows:

- ¾" poly tubing
- ¼" spaghetti tubing
- 2- gallon emitters- 3- 2 gallon emitters per tree
- A battery operated clock was installed and scheduled for 2 waterings per week for 90 minutes each cycle. Watering will occur from 8:00 a.m. to 9 a.m.

Irrigation valve box

Nurseried, salvaged plants were located via a Trimble GPS unit. A six foot chain link fence was installed around plant nursery. 8' support posts were driven into the ground 2' and the chain link fence was attached to the support poles with wire. A rudimentary gate fashioned along the eastside of the nursery. Gate is secured via heavy gauge wire. Lastly, as a safety measure, shrub salvage holes were backfilled.

Fence installation after nursery was complete.

Observations of the Squaw Apple plants during this time are as follows:

- Soil type: Clay, held up very well during salvage

- All plants to be salvaged showed signs of buds ready to sprout leaves.
- Recent rains allowed for the plants to be hydrated prior to NRI arriving on site. Soil profile was moist through the root zone which is helpful in reducing the amount of stress the plants will go through during the salvage process. Soft fibrous roots occurred from the soil surface to approximately 6 inches subsurface.
- Lateral support roots occurred down to 20 inches below the soil surface.
- Many of the Squaw Apple shrubs were multi-trunked. It has been our experience when digging multi-trunked shrubs to upsize the tree box to encapsulate more of the shrub roots in order to reduce plant stress. If larger boxes can not be utilized then the recommendation would be to salvage plants with smaller overall trunk diameter.
- Superthrive (fish based root stimulator) was applied during the side boxing stage after the initial watering to promote root growth.
- 1- Rocky Mountain Juniper and 1-Utah Juniper were quick dug and planted in their permanent location 4/28/2009. This was approximately a 2 hour process from salvage to replant. These trees were watered only after planting and will continue to be watered 2X/week by park employees.

Project Notes:

While NRI does not have prior experience salvaging the Squaw Apple species, we believe this salvage operation should yield a 95% survival rate. If salvage is going to occur in the future, survival rates can be increased by pre-watering plants 2 weeks prior to commencing salvage if no rain has occurred. A soil moisture probe should be used to monitor the amount of moisture remaining in the soil in between watering to confirm that the plants are not retaining too much moisture. If the plants retain too much moisture there is a risk of root rot and chlorosis.