RESTORATION

Plant and Topsoil Salvage for Revegetation in Lake Mead National Recreation Area

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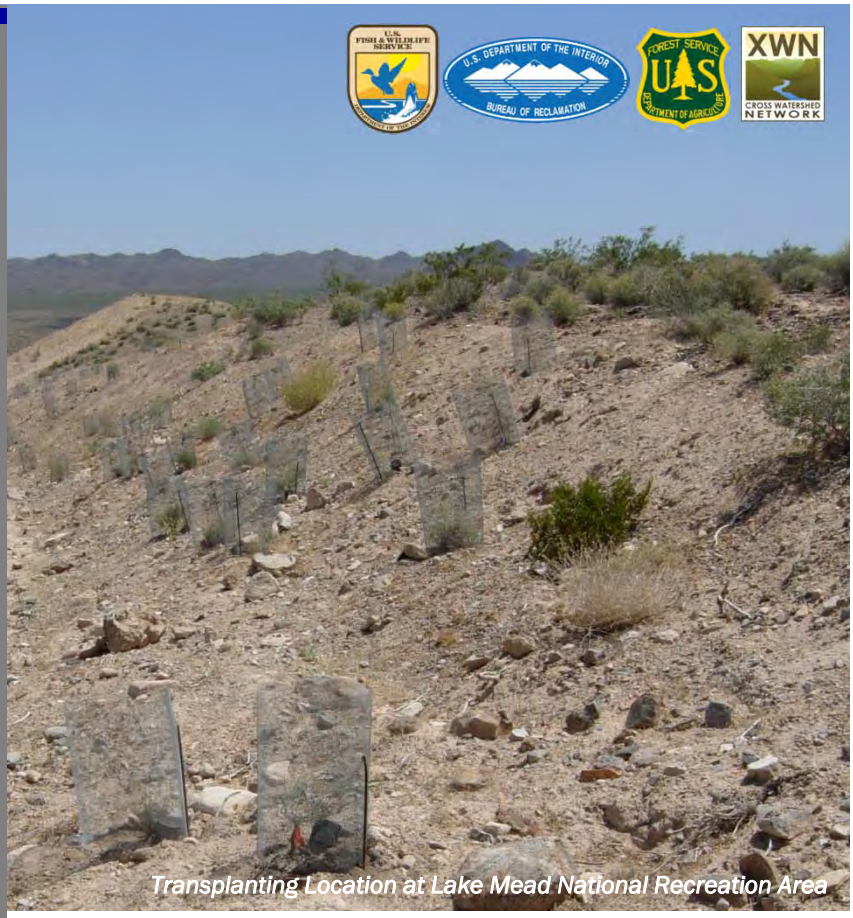
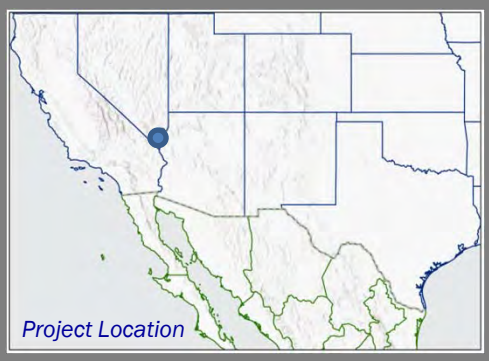


Transplanting Location at Lake Mead National Recreation Area

Lake Mead is a 563,513-hectare (1,392,471-acre) National Recreation Area managed by the National Park Service (NPS) in southeastern Nevada and northwestern Arizona. Lake Mead has the largest water capacity of any reservoir in the United States. Water flows into Lake Mead from the Colorado River, ephemeral washes, and storm drains and a wastewater treatment plant in Las Vegas, Nevada. Lake Mead lies within the Mojave Desert, which contains perennial shrubs such as creosote bush, white bursage, and desert holly. These plants provide habitat for numerous species including the desert tortoise, desert plantain, other native annual plants, and pollinators.



Project Location

KEY ISSUES ADDRESSED

Maintaining the aesthetic of National Park lands is important for recreation. Disturbances, such as road maintenance, remove mature perennial shrubs and native vegetation that provide important ecosystem services. In 2008-2009, a maintenance project was implemented in the upper reach of Lake Mead National Recreation Area to widen and straighten Northshore Road. Collaborators are attempting to restore areas affected by maintenance activities in order to re-establish habitat that might not recover otherwise and to test methods that mitigate disturbance-related impacts.

PROJECT GOALS

- Balance biodiversity conservation and aesthetic restoration in a nationally protected area
- Determine best methods for successfully revegetating sites after disturbance
- Identify plant species and lifeforms that survive salvage and outplanting activities

SOIL SALVAGE

Salvaged topsoil retains microbial communities, often formed in special association with plant species, which are critical for improving survival of certain plants in harsh environments.

Installing DRiWATER with Desert Globemallow

PROJECT HIGHLIGHTS

Resource Salvage: Twenty-three species of cacti, grasses, forbs and shrubs were salvaged from the construction site. Plant roots were treated with root stimulating hormone (IBA), slurry of watersorb water crystals, IBA and slurry, or dipped or left soaking overnight in water. Topsoil was scraped from the top 5-20 cm of the soil surface and stored on site for later re-distribution.

Phased Experiment: To determine ideal root treatments, salvaged plant survival was determined after one year storage in a nursery. Surviving plants were then transplanted in road removal areas with or without salvaged topsoil and with one of the following treatments: DRiWATER, hand watering, or no further watering.

Tracking Field Survival: Vegetation surveys were conducted 3, 15, and 27-months after transplanting. During the final assessment, the number of natural recruits in both topsoil amended and non-amended areas were also counted.

Collaborators

- Lake Mead National Recreation Area
- National Park Service
- Natural Resource Conservation, LLC
- See online for full list of collaborators

Funding Partners

- Federal Highway Administration

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Photos courtesy of Scott R. Abella/University of Nevada Las Vegas

LESSONS LEARNED

Almost half of 2,105 plants survived salvage and nursery storage. Shrub survival decreased when roots were soaked in water overnight. There were no significant differences in plant survival for other treatments.

After 27 months, 50% of the transplants survived outplanting. Most species within cactus, forb, grass and shrub lifeforms survived salvage and transplanting.

Adding salvaged topsoil increased survival-survival rates of transplants only receiving topsoil addition was similar to the survival of plants that received irrigation. Survival was 65% higher for transplants receiving hand watering or DRIWATER treatments versus those that received no irrigation.

While the transplanting success rate of 27% seems low, the project was successful as an experiment to determine best methods for plant salvage and revegetation of disturbed sites at the park.

NEXT STEPS

- Optimize salvage costs and benefits by adjusting methods to only salvage the topsoil beneath perennial shrubs
- Restore disturbed areas with the best performing species and treatments
- Test the placement of DRiWATER at different depths and angles to optimize utilization by plants

PROJECT RESOURCES

For more information on this project, contact Scott Abella: scott.abella@unlv.edu

For additional project resources and case studies, visit the Collaborative Conservation and Adaptation Strategy Toolbox: WWW.DESERTLCC.ORG/RESOURCE/CCAST

Transplanted Forbs in Protective Wire Baskets