

National Park Service



Road restoration in Joshua Tree National Park



Michelle Cox
March 3, 2004
Photo by N. Pietrasiak

History of Federal Highway Projects

1999: Planning for “JOTR 173”

2000: Salvaging began

2001: Outplanting, watering

2002: JOTR 291 plans begin, watering

2003: salvaging begins for 291, watering
173 & 291, planning for 292



The Process

- Review designs with Federal Hwy
- 70% start surveying plants
- Final approval & compliance
- Announce & award contract
- Salvage plants, vertical mulch, soil crust
- Move wildlife logs outside the CL
- Road construction
- Restoration



Surveying



Data collection

Microsoft Access

File Edit View Insert Format Records Tools Window Help

Type a question for help

qData Summary

Federal Lands Highway Program JOTR 291 Road Rehabilitation

Vegetation Salvage and Restoration Data

REMEMBER: Note ANY changes in the appropriate comments section!

Plant Survey Data

Plant #

Species Code

Crown Diameter (cm)

Height (cm)

Diameter (cm)

Gpsed? Side of Road

Tagged?
 1=Sorry
 2=Contract
 3=In-House
 4=On Line
 5=Avoid
 6=Died post-tag

Map Sheet

Salvage Type

Survey Comment

Salvage Data

DATE salvaged: Caliche present?

Data Recorder Ground moisture?

Salvage Method Lateral roots cut?

Pot Size Branches cut?

Weather

Salvage Comments

Transplant Data

Date Transplanted

Transplant Comments

Location of transplant

Record: of 1021

Form View

start Removable Disk (E:) Microsoft PowerPoint ... ACTIVE291salvage : ... qData Summary 9:37 PM

Salvaging

- Determining salvage method
 - Direct transplant
 - Boxing
 - Potting
 - Vertical mulch
 - Soil crust
 - Topsoil
- 

Direct Transplants

- Requires large machinery
- Plants > 3.5 Ft. = \$425



Yucca schidigera (Mojave Yucca)



Boxing



- Success
- Most expensive method
- Cost depends on height

Yucca brevifolia in 60" box



Satellite nursery



Potting

- < 2.5 ft.
- Grasses, small cacti
- Stored in nursery
- Low cost
- High success rate



Potting a small cactus for later transplanting.



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Map Sheet

Salvage Type

Survey Comment

Salvage Data

DATE salvaged:

Data Recorder

Salvage Method

Pot Size

Weather

Salvage Comments

Caliche present?

Ground moisture?

Lateral roots cut?

Branches cut?

1 gal
2 gal
5 gal
7 gal
15 gal
N/A

Transplant Data

Date Transplanted

Transplant Comments

Location of transplant

Record: of 1021

Form View

start Removable Disk (E:) Microsoft PowerPoint ... ACTIVE291salvage : ... qData Summary 9:37 PM

Maintenance

- Plants are watered for 2 yrs (May-Sept)
- Berms
- Cages: Herbivory damages 75% of the plants <2ft



Watering



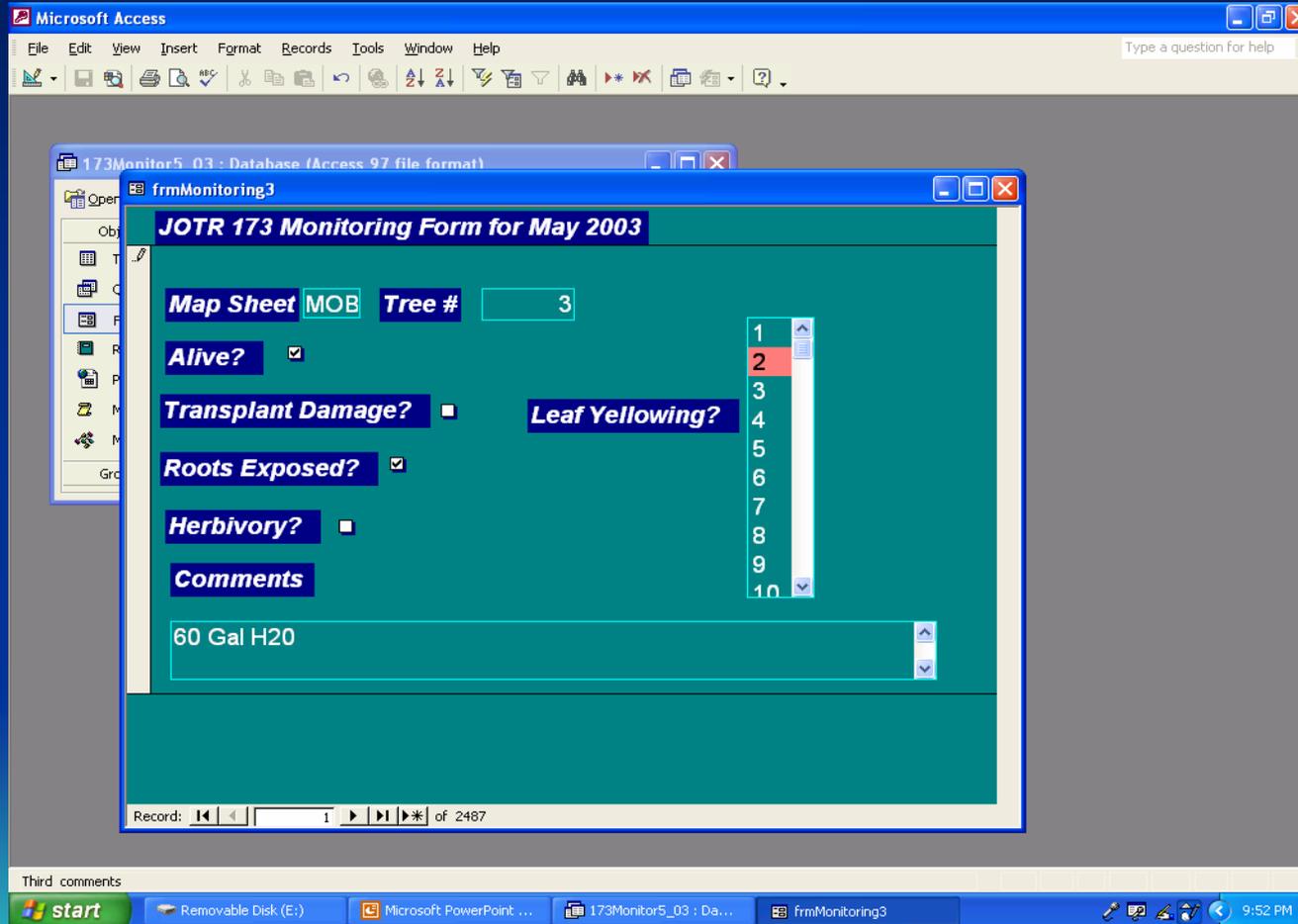
- (3) 500 gal water trailers
- 24,000 gal (May-Sept)
- \$15,000 contract

Monitoring



- Every plant has a tag and is tracked in a health monitoring database.

Health Monitoring Database



Post-Construction

- Road berm removal
- Ripping
- Topsoil placement
- Outplanting (salvage & nursery)
- Vertical mulch



The Vertical Mulch Technique



Pull It



Dig a Hole



Plant It



Anchor It

Barker Dam parking lot prior to restoration



Barker Dam parking lot 1 yr post restoration



Before....



After!!!



Lessons Learned

- Joshua trees <4ft tall have a lower survival rate (30%) than those >4ft (80%)
- Keep cages around plants vulnerable to herbivory (even cactus)
- Berms as wide as dripline
- Cut back on water for nursery plants several months before outplanting
- Roadside plants for first outplanting
- Move wildlife logs outside CL



Lessons Learned

- Remove shrubs within the CL
- Replace rock cover
- Juniper transplant success
- Data Management
 - Databases
 - Metadata
 - Protocol Handbooks



Protocol Handbooks

The OutPlanting Handbook

A detailed protocol for outplanting salvage plants



By

Amy Miller

Biological Science Technician

Joshua Tree National Park

Next Step....

- Vegetation monitoring plots
- Erosion control
- Interpretive signs
- Interpretive programs





Photo by N. Pietrasiak