

# **Road Monitoring on BLM Lands**

## **2005-BLM-503**

Las Vegas Field Office  
2011



BLM

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# Why Monitor Roads?

Roads provide access to large tracts of public land for recreational use. Many miles of roads are located within the habitats of the MSHCP covered species.





# Why Monitor Roads?

Proliferation of roads and unauthorized off-road vehicle use has left persistent scars in the desert.

(Rowlands 1980)





# Why Monitor Roads?

Off-highway vehicles remain a major source of habitat degradation for covered species:

- Disrupt water balance, thermoregulation and energy requirements of desert tortoises. (USFWS 1994)
- Reduce availability of food. (USFWS 1994)
- Increase erosion and changes drainage patterns. (Brooks and Lair 2005)



# Why Monitor Roads?

Habitat recovery is slow in the desert. Studies show that it takes:

- 76 years for full reestablishment of total perennial plant cover
- an estimated 215 years for the recovery of species composition typical of undisturbed areas (Abella 2010)





# Why Monitor Roads?



Increased visitation does not mean increased habitat damage when recreationists stay on designated roads and operate under the speed limit.





# Why Monitor Roads?



Disregard for OHV closures and road designations sets the stage for others to follow the tracks, creating new roads and further fragmenting habitat.



# Why Monitor Roads?



Illegal OHV trail created by an ATV traveling cross-country



8 days later the illegal trail has become a 2-track road used by multiple visitors





# Why Monitor Roads?



Vehicle-caused mortalities on highways and unpaved roads are a continuing concern.





# Step I: Route Inventory

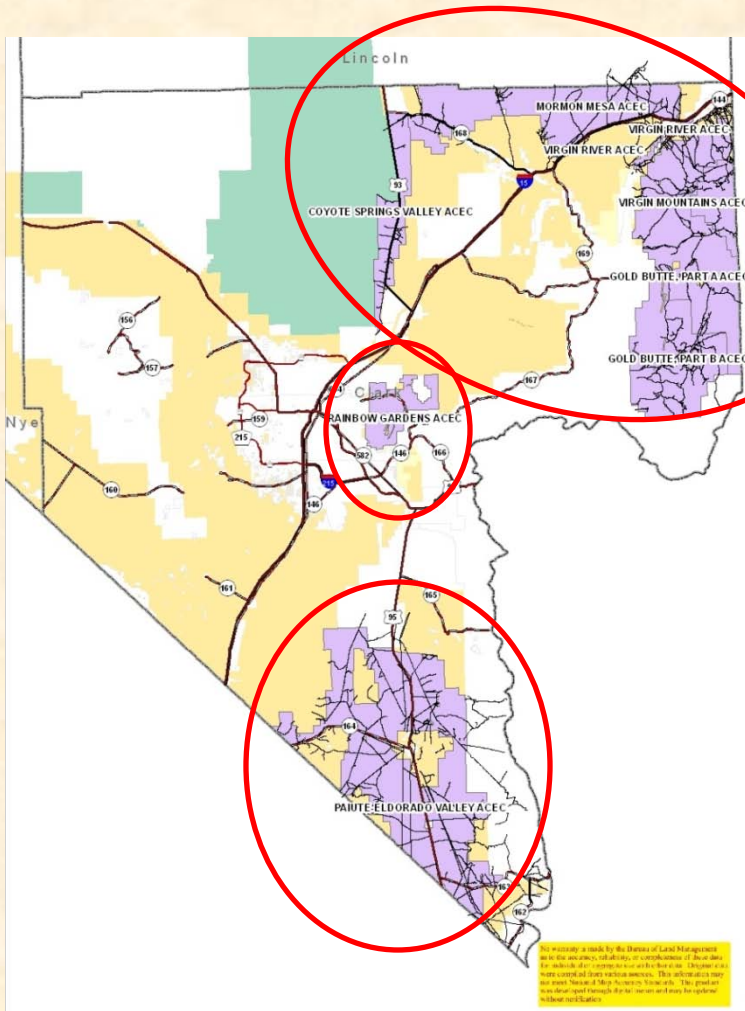


1994 –BLM started inventory and designation of roads within ACECs in Clark County.

2003-2005 Biennium – ACEC inventory completed in NE Clark County – 981 miles of routes inventoried



# Step 2: Route Designations



- 1994-1996 - Piute-Eldorado ACEC
- In 2001 - Rainbow Gardens ACEC
- In 2008 - 10 additional ACECs including Coyote Springs, Gold Butte, Mormon Mesa and Virgin River



# Step 2: Route Designations



Routes were designated to protect resources and provide public access...





# Step 2: Route Designations



...and signed to notify the public of appropriate uses.



# Step 3: Route Monitoring



- The project goals are:
  - Gather information on use of roads on public land in order to improve management of those public lands in Clark County;
  - Manage roads through signage to aid in proper use by public;
  - Increase public awareness regarding approved roads and proper use; and
  - Determine the effectiveness of road monitoring conducted by volunteers.



# To achieve these goals, BLM :

- Monitors:
  - use (type and amount of use)
  - conditions (illegal incursions, sign conditions, etc.)
- Documents:
  - road conditions
  - reports of illegal use
  - signs, markers and kiosks along roads
  - BLM's response





# To achieve these goals, BLM :

- Repairs and replaces signs, markers and kiosk components when needed
- Validates work conducted by other agencies or volunteers to determine accuracy of volunteer monitoring and suggest improvements
- Collects, documents, and transmits data to the Clark County Desert Conservation Program (DCP)



# To achieve these goals, BLM :

- Educates:
  - kiosks and panel signs
  - area maps
  - web page
  - participate in community outreach events

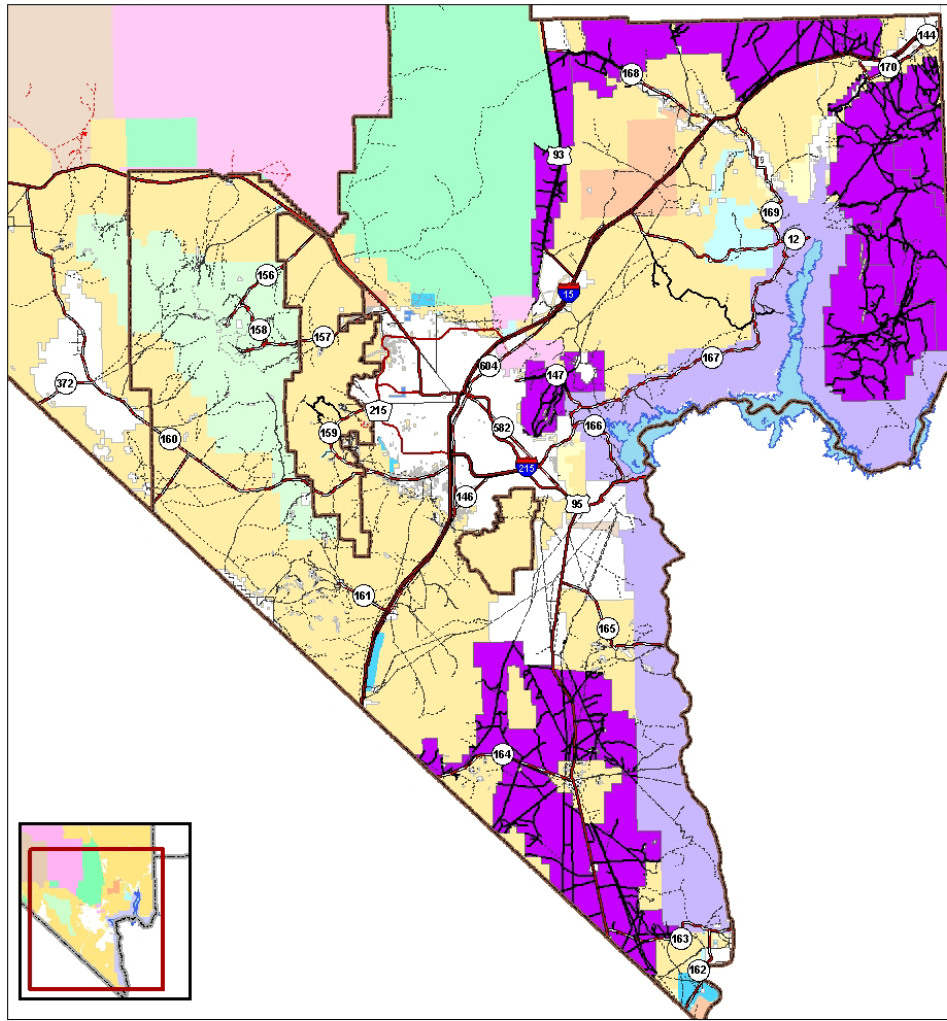




# BLM Monitoring Areas:

- In this project, BLM is monitoring approximately 900,000 acres of habitat for covered species and approximately 1,900 miles of roads
  - Coyote Springs ACEC
  - Gold Butte ACECs
  - Mormon Mesa ACEC
  - Piute/Eldorado ACEC
  - Rainbow Gardens ACEC





## Area Monitored

**Legend**

- Southern Nevada District Office
- Route Designation
- Open route
- Project Area
- Lake Mead
- Land Status
- Bureau of Indian Affairs
- Bureau of Land Management
- Bureau of Reclamation
- City of Las Vegas
- Clark County, Nevada
- Department of Defense
- Department of Energy
- Fish and Wildlife Service
- Forest Service
- National Parks Service
- Nevada State
- Private



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# Tasks Completed – 47 of 60

- Kick-off meeting
- Work Plan with Area Maps
- Data Management Plan
- Trail Data Collection and Data Transfer
- GIS Deliveries of Baseline Conditions
- Sign Plan
- 2010 Annual Progress Review Presentation
- ACEC Open Roads Maps





# Tasks Completed

- Updates to the BLM Web Page
- 6 Outreach Events
- 2 NEPA documents for Interpretive Signing
- Design and Installation of 10 Informational Signs
- Design and Installation of 10 Kiosks with Informational Signs and Maps
- Design of 3 Brochures – Coyote Springs ACEC, Gold Butte ACECs, and Mormon Mesa ACEC.



# Tasks Completed

- Annual Project GIS Data Delivery
- Biennium Progress Summary Report
- 6 Quarterly Reports
- 5 Monitoring Summary Reports

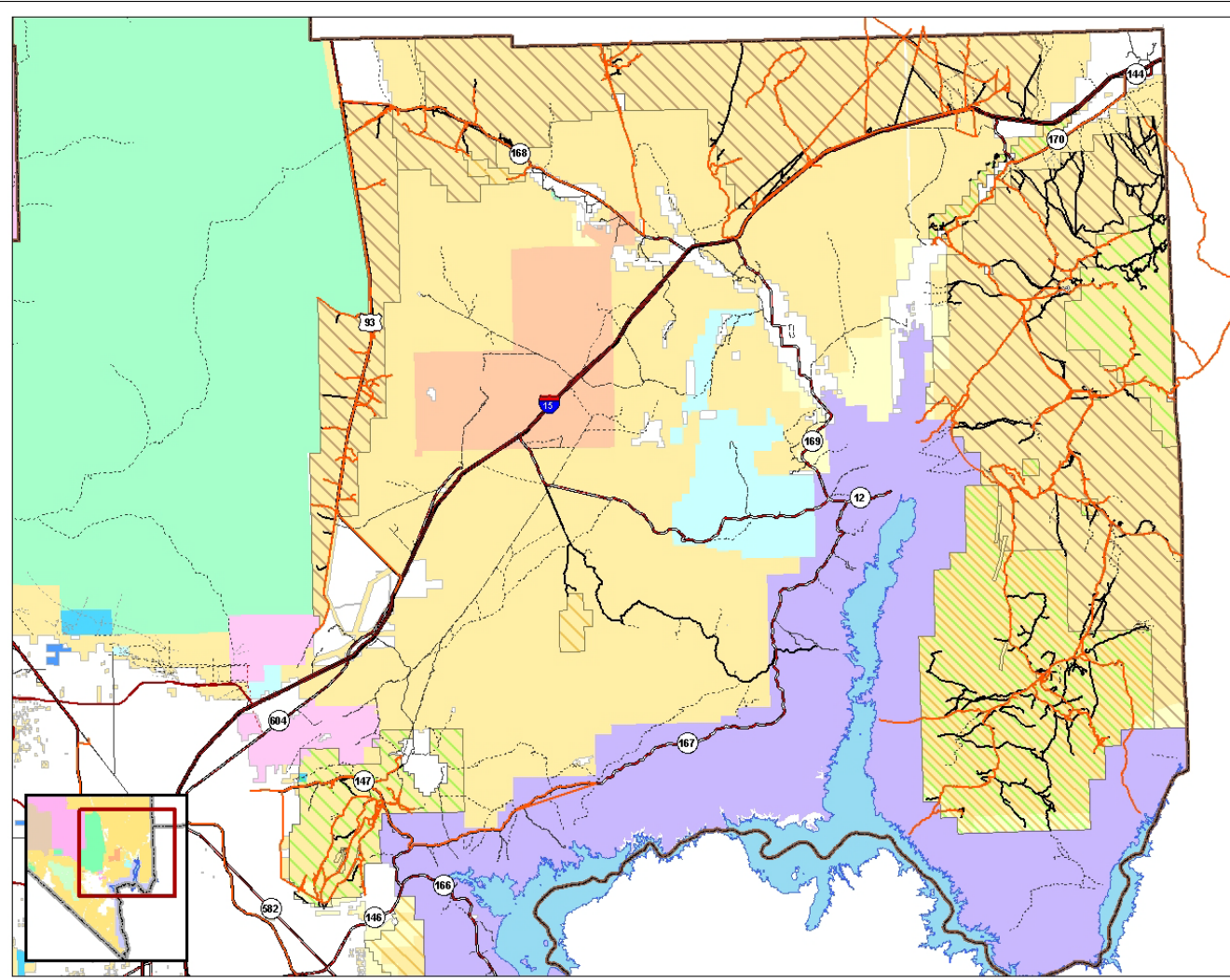


# Monitoring Results

- Total number of miles driven by BLM from April 2010 through July 2011:
  - 4800 miles
- Volunteer monitoring miles (includes driving to monitoring locations)
  - 44,425 miles







## Roads Monitored

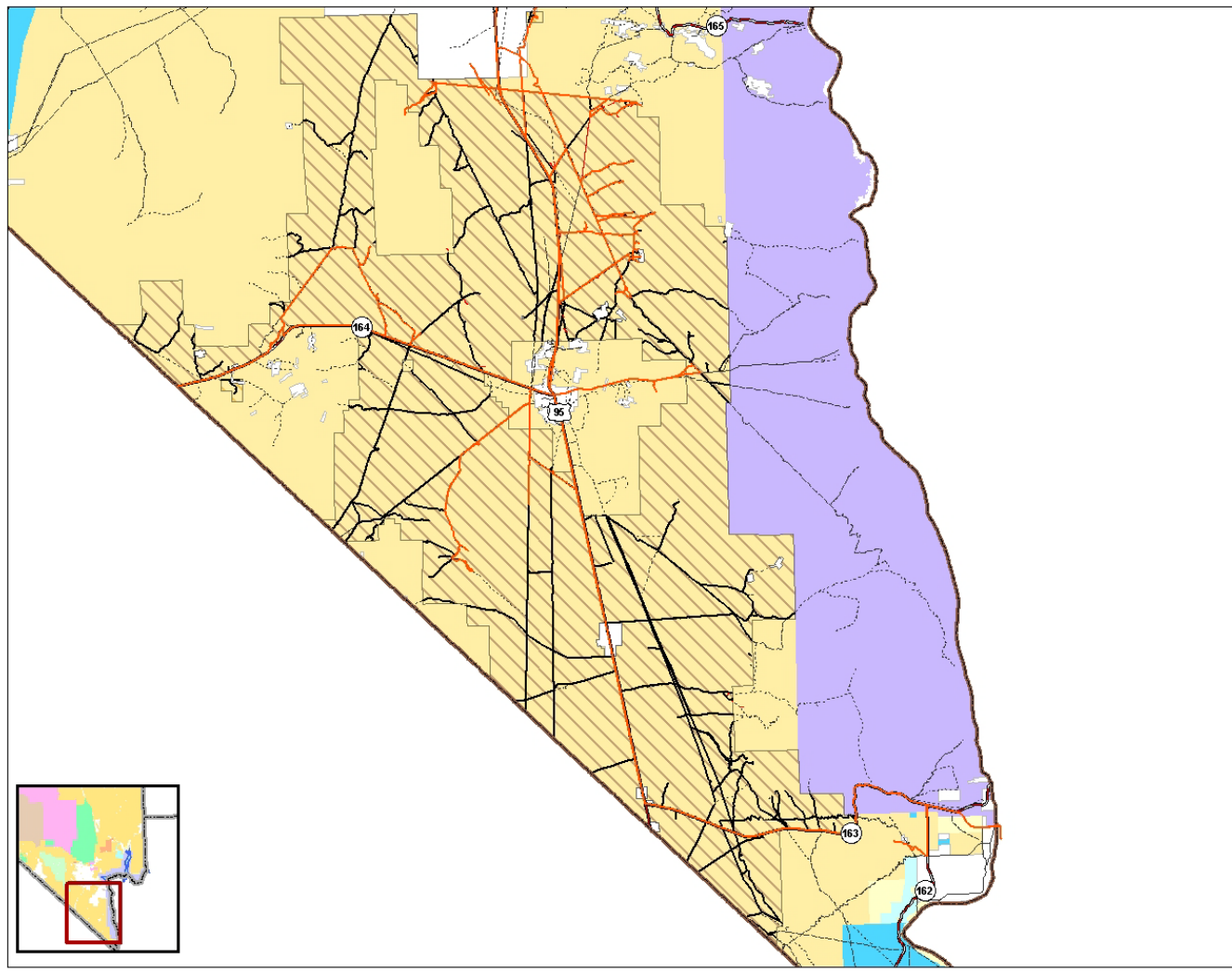
**Legend**

- Roads Monitored
- Southern Nevada District Office
- Route Designation**
- Open route
- Lake Mead
- Land Status**
- Bureau of Indian Affairs
- Bureau of Land Management
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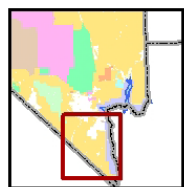
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## Roads Monitored

- Legend**
- Roads Monitored
  - Incident - linear disturbance
  - Incident - area disturbance
  - Southern Nevada District Office
  - Route Designation
  - Open route
  - Lake Mead
  - ACEC
    - Biological
    - Cultural
    - Cultural/Biological
    - Desert Tortoise
  - Land Status
    - Bureau of Indian Affairs
    - Bureau of Land Management
    - Bureau of Redamation
    - City of Las Vegas
    - Clark County Nevada
    - Department of Defense
    - Department of Energy
    - Fish and Wildlife Service
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# Monitoring Results

- 131 Site Visits:
  - Coyote Springs – 33
  - Gold Butte - 35
  - Mormon Mesa – 23
  - Piute/Eldorado – 16
  - Rainbow Gardens - 24





# Monitoring Results

## Point Incidents - BLM

89 – Signs Damage

29 – Dumpsites

10 – Shooting areas

9 – OHV Incursions

6 – Graffiti or Burn Area

5 – Camping and Staging Areas

4 – Road Hazards

1 – Weed Infestation



# Monitoring Results

## Linear Incidents - **BLM** (Total: 61.45 miles)

60 miles – 2–Track

0.36 mile – Hill Climbs

1.07 miles – Single–Track



# Monitoring Results

## Area Incidents- BLM (18.9 acres)

9.26 acres - OHV Play Areas

3.72 acres - Shooting Areas with Trash

2.77 acres - Scenic Overlook

1.58 acres – Dumpsite with Tires

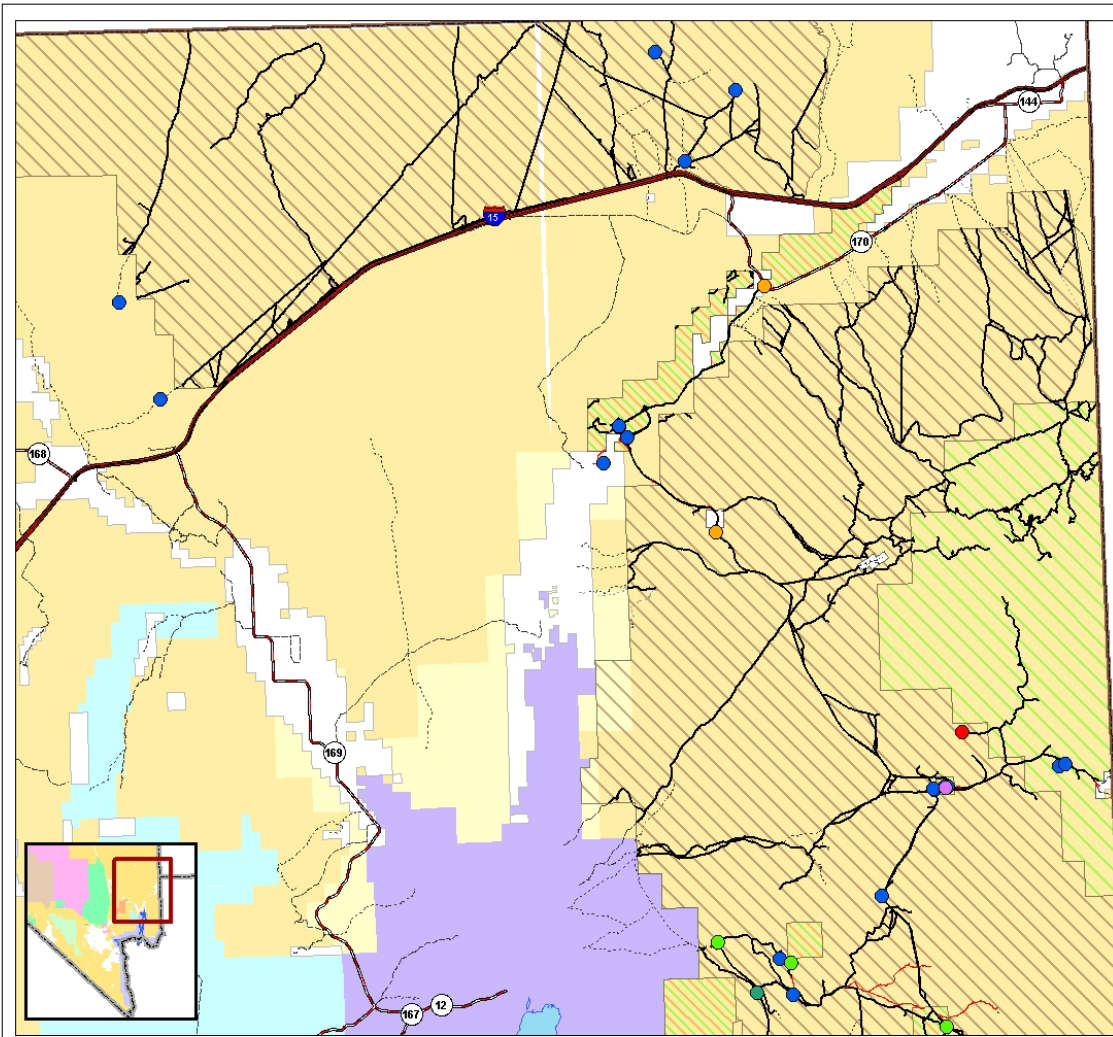
1.13 acres – Hill Climb

0.33 acres - Staging and Parking Areas

0.12 acres - campsites







## Incident Locations

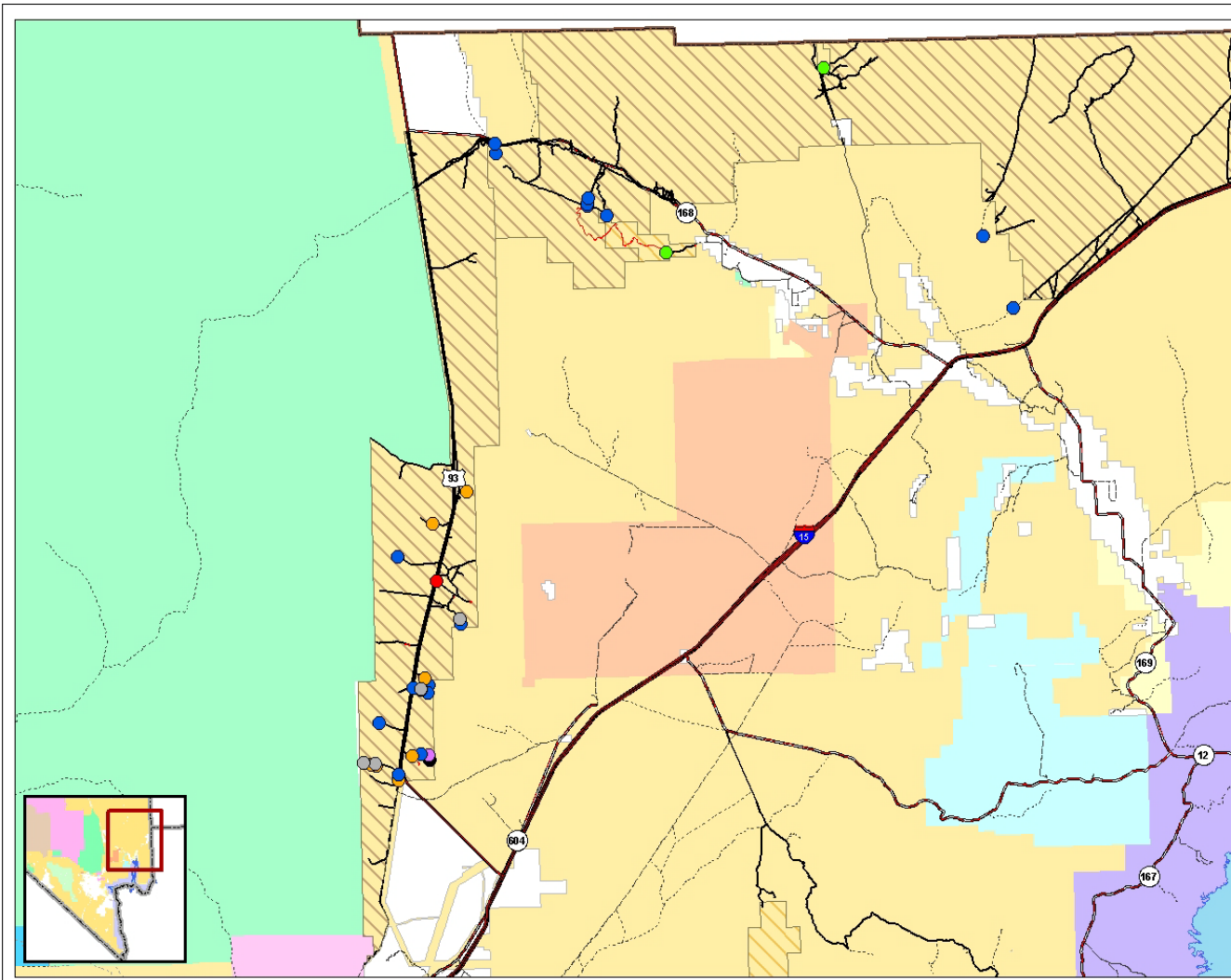
- Legend**
- Incidents - point locations**
- Disturbance cause
- UNAUTH TRAIL 2-TRACK
  - UNAUTH TRAIL MOTORCYCLE
  - BURN AREA
  - DUMPING
  - FENCE DAMAGE
  - GRAFFITI
  - HILL CLIMB
  - SHOOTING AREA
  - SIGN DAMAGE
  - OTHER
- Incidents - linear disturbance
- Incident - area disturbance
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0051 2 Miles



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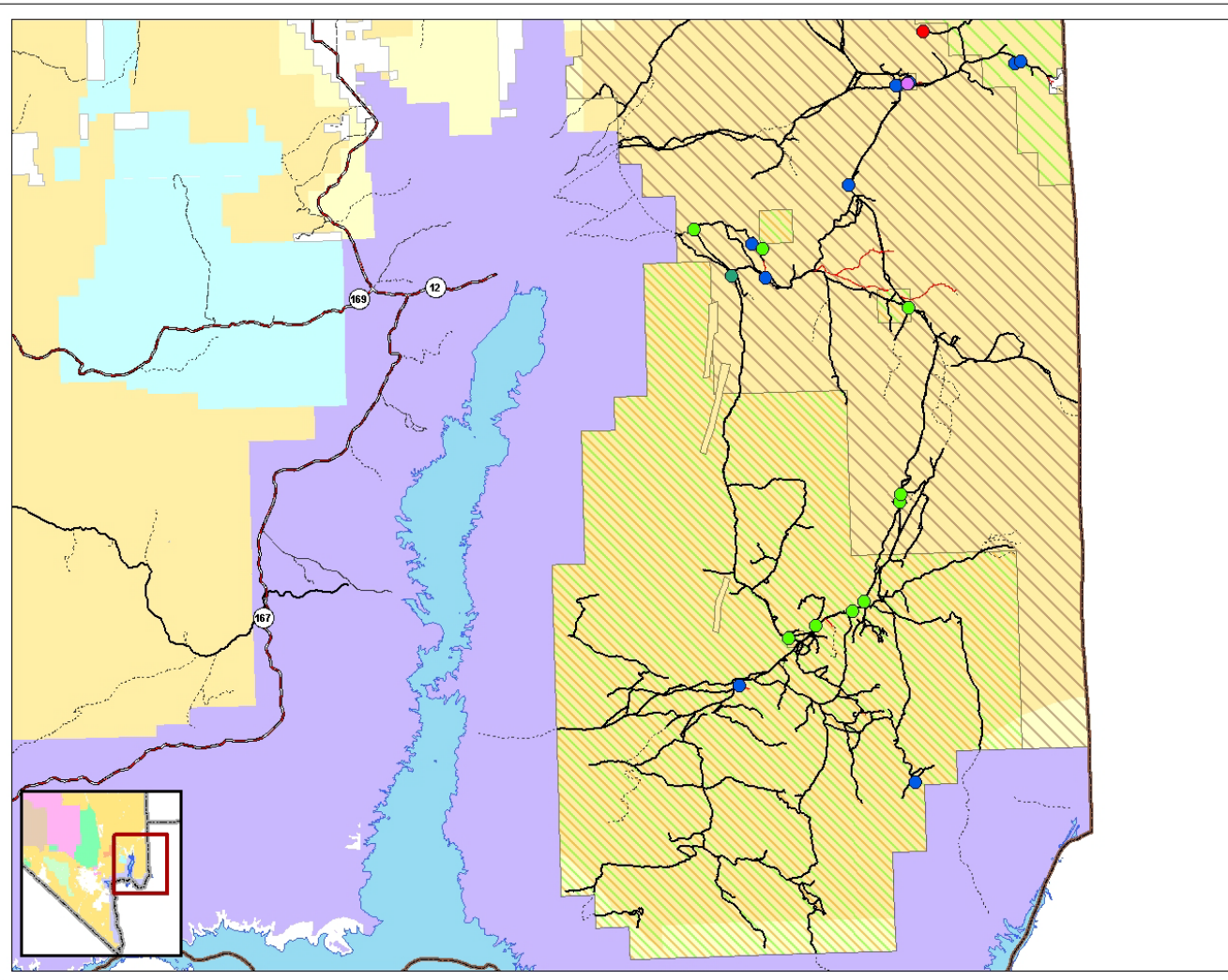
## Incident Locations

- Legend**
- Incidents - point locations**
- UNAUTH TRAIL 2-TRACK
  - UNAUTH TRAIL/MOTORCYCLE
  - BURN AREA
  - DUMPING
  - DUMPING
  - FENCE DAMAGE
  - GRAFFITI
  - HILL CLIMB
  - SHOOTING AREA
  - SIGN DAMAGE
  - OTHER
- Incidents - linear disturbance**
- Incident - linear disturbance
  - Incident - area disturbance
- Incident - area disturbance**
- Southern Nevada District Office
- Route Designation**
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# Incident Locations

- Legend**
- Incidents - point locations**
- UNAUTH TRAIL 2-TRACK
  - UNAUTH TRAIL MOTORCYCLE
  - BURN AREA
  - DUMPING
  - DUMPING
  - FENCE DAMAGE
  - GRAFFITI
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0.051 2 Miles



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# Monitoring Results

A total of 329 signs were installed of which:

- 62 signs were replacements due to vandalism, weathering, or that were otherwise missing.
- 267 new signs were installed



# Monitoring Results





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**MOTORIZED  
USE  
LIMITED TO  
DESIGNATED  
ROUTES  
ONLY**

8000478 26-167



# LIMITED USE AREA

**IN AREA BEYOND SIGN  
VEHICLES MUST REMAIN  
ON DESIGNATED ROUTES  
NO CROSSCOUNTRY TRAVEL  
OBEY POSTED SIGNS**

**VIOLATIONS PUNISHABLE—UP TO \$100,000 FINE**

© 1993 CARBONITE

BLM-8476



**RESTORATION IN  
PROGRESS**

**PLEASE DO NOT  
DISTURB**



© 1996 CARBONITE

FS-8111





# Monitoring Results

- BLM observations of people/groups recreating within the monitoring areas: 127 observations (~218 users)
  - 4WD 30
  - ATV/UTV 24
  - 2WD 24
  - RV 20
  - Pedestrian/Hiking 10
  - Shooting 6
  - Camping 5
  - Motorcycle 4
  - Bicycle 4



# Monitoring Results

- BLM visited 134 incidents documented by volunteers:
  - *Coyote Springs*: 13 disturbance sites
  - *Mormon Mesa*: 61 disturbance sites
  - *North Gold Butte*: 23 disturbance sites
  - *South Gold Butte*: 24 disturbance sites
  - *Piute/Eldorado*: 13 disturbance sites

These consisted of the highest priority incidents – those documenting resource damage and health and safety concerns like 2-track roads, dump sites and road hazards.



# Monitoring Results

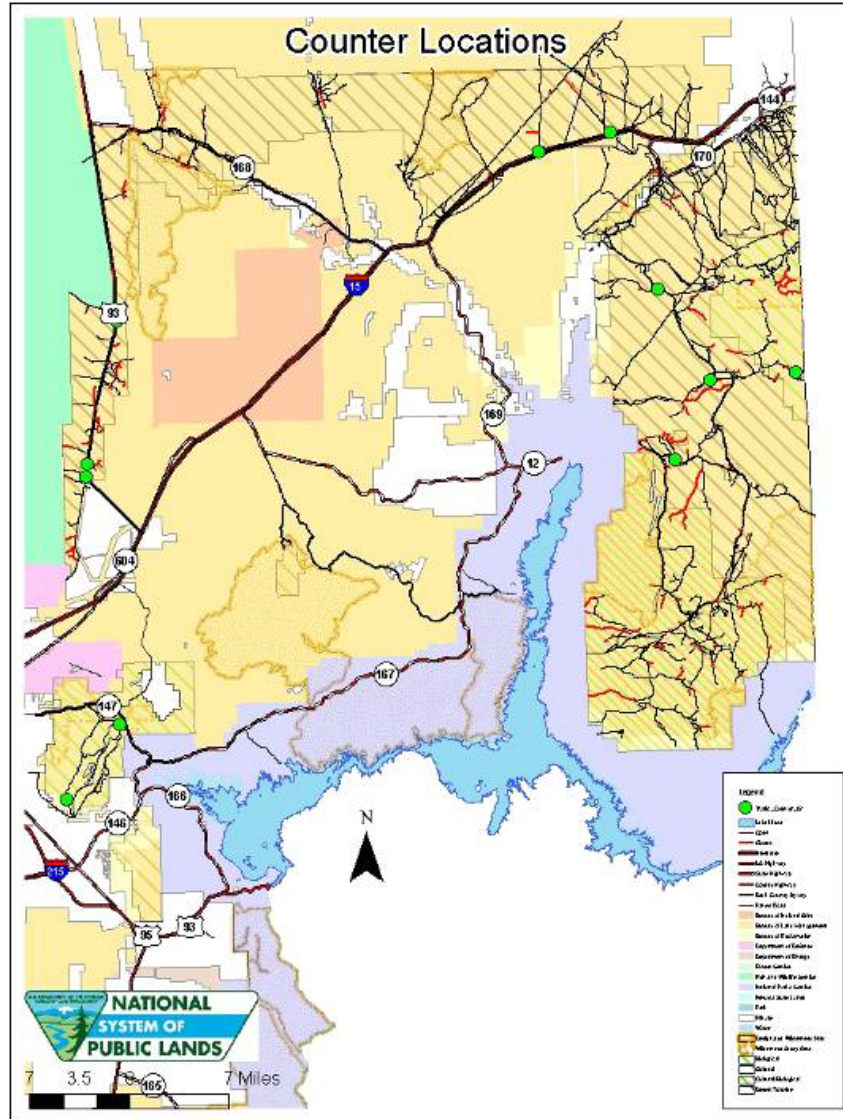
## Volunteer Data Collected (PIC):

- Total project waypoints 545
- Total project incident points 2,043
- Total project linear GPS data 2,264 km or 3,654 mi
- Total project Daily Field Notes 1,067
- Total project field work hours 3,757 (~235 days - min. 2 people per day)
- Total project field work miles 44,425 (average of 189 miles per trip)





# Monitoring Results



# Monitoring Results

Gold Butte Byway traffic counter January 19, 2011 - June, 28, 2011:

- 5,684 hits logged. (This figure is half the actual total to account for vehicles leaving in the same direction they entered.)
- At an average of 2.2 persons per vehicle, approximately 12,504.8 visitors have recreated in the Gold Butte area.



# Monitoring Results

- Data gathered from other counters in the area show that at an average of 31 vehicles per day on the Byway approximately 1/3 continue to travel west to the Black Butte area and another 1/3 travels east into Arizona. This extrapolation will need further examination and will need to be confirmed with visual counts.





# Monitoring Results

Two counters were placed along two major routes that run through the interior of the Mormon Mesa ACEC, one on the Carp/Elgin Rd and the other along Halfway Wash Rd. Both are north-south trending routes that connect Clark and Lincoln counties. The following data was recorded from April 11, 2011 - June 21, 2011:



# Monitoring Results

- Carp/Elgin counter logged 7,899 hits. The month of April 2011 showed a disproportionately large number of vehicles. This was a result of a pipeline project that was in progress during that month along that route.
- Excluding the month of April, approximately 1,911 visitors recreated or passed through the Mormon Mesa ACEC on Carp Elgin Road.



# Monitoring Results

- Halfway Wash counter received 1,132 hits.
  - Approximately 2,490 visitors recreated or passed through the Mormon Mesa ACEC on Halfway Wash Road.





# Monitoring Results

Two counters were placed adjacent to US 93 on two roads that dead end and receive heavy use by shooters. One was placed at mile marker 57 west of the highway. Another counter was installed at mile marker 58 on the east side of the highway. The following data was recorded from January 31, 2011 - June 9, 2011:



# Monitoring Results

- The west side counter logged 1,611 hits (this figure is half the actual total to account for vehicles leaving in the same direction they entered)
  - Approximately 3,544 visitors recreated on the west side.



# Monitoring Results

- The east side counter received 1,901 hits (this figure is half the actual total to account for vehicles leaving in the same direction they entered). This counter was expected to receive the most hits as it is at the site with the most resource damage.
  - Approximately 4,182 visitors recreated on the east side.





# Monitoring Results

- Law Enforcement has taken special interest in the times of visitations for this area. Weekends experience significantly higher visitation rates. Mid-day encounters the most use but, interestingly, late night and early morning hits have been recorded. This is when a large percentage of crimes are suspected to occur (e.g. graffiti, burning, dumping, etc.).



# Monitoring Results

Two counters were installed in the Rainbow Gardens ACEC, one at the north end, adjacent to Lake Mead Blvd. and the other at the south end of Kodachrome Rd., which was recently reengineered.



# Monitoring Results

- The Lake Mead counter logged 5,058 hits between April 13, 2011-June 5, 2011.
  - Approximately 11,127 visitors recreated or passed through this area.
  - This area experiences heavy use due to its proximity to Las Vegas.



# Monitoring Results

- The Kodachrome counter logged 2,160 hits between February 16, 2011-June 5, 2011.
  - Approximately 4,752 visitors recreated or passed through this area.





# Adaptive Improvements to Methods

- Interdepartmental cooperation and communication has been strengthened, primarily with Law Enforcement and the Restoration Team, helping to ensure that all goals were met.
- BLM, with PIC input, improved the Data Dictionary and field forms
- BLM is collecting monitored routes with second GPS to show where we traveled in addition to incidents recorded.



# Adaptive Improvements to Methods

- PIC and BLM provided additional training for volunteers
- PIC created a “cheat sheet” to remind volunteers of collection and observation methods.
- PIC improved materials and supplies provided to volunteers (maps, safety equipment, etc.)



# Adaptive Improvements to Methods

- PIC reviewed quality of work provided by each volunteer to retrain as needed and to determine suitability to work on this project.
- All monitors will be reminded to be more diligent about recording recreational use.



# Adaptive Improvements to Methods

- BLM identified that volunteers are collecting point features in situations where BLM records incidents as lines and areas. Additional training was provided. It appears that volunteers generally do not hike long incursions to record vehicle tracks. This is very time intensive and weather is often unpleasant.
- BLM implemented traffic counters to help determine when use is occurring.





# Management Response: Restoration of habitat



Before



After

When damage occurs, restoration is scheduled.





# Management Response: Restoration of habitat



Before



After

One day there is a road and the next it is gone.





# Management Response: Trash Removal



# Management Response: Law Enforcement





# Incident Delegation

- 60% of BLM recorded incidents received a management response by BLM at the time the incident was recorded.
- 18% additional incidents were delegated to Law Enforcement or Restoration.
- 20% require further evaluation to determine management response.
- 2% do not require a management response. (i.e., superfluous sign, tracks from legal parking)



# References

- Abella, S. Review: Disturbance and Plant Succession in the Mojave and Sonoran Deserts of the American Southwest *Int. J. Environ. Res. Public Health* 2010, 7(4), 1248-1284; doi:10.3390/ijerph7041248.
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- Rowlands, P.G. *The Effects of Disturbance on Desert Soils, Vegetation and Community Processes with Emphasis on off Road Vehicles: A Critical Review; Special publication, U.S. Bureau of Land Management: Jackson, MI, USA, 1980.*
- Vogel, J.; Hughson, D.L. Historical patterns of road networks in Mojave National Preserve. In *The Mojave Desert: Ecosystem Processes and Sustainability*; Webb, R.H., Fenstermaker, L.F., Heaton, J.S., Hughson, D.L., McDonald, E.V., Miller, D.M., Eds.; University of Nevada Press: Reno, NV, USA, 2009; pp. 196-210.
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