



APPENDIX E
TRAVEL MANAGEMENT PLAN



**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**

SONORAN DESERT NATIONAL MONUMENT TRAVEL MANAGEMENT PLAN

Supplement to the
**Sonoran Desert National Monument
Record of Decision and
Approved Resource Management Plan**

September 14, 2012



*Lower Sonoran Field Office
Sonoran Desert National Monument
21605 N. 7th Ave.
Phoenix, Arizona 85027*



SONORAN DESERT NATIONAL MONUMENT TRAVEL MANAGEMENT PLAN

SIGNATURE PAGE

Prepared by: Thomas Bickauskas 9/14/12
Thomas Bickauskas
Travel Management Coordinator Date

Reviewed and Edited by: Penny Foreman 9/14/12
Penny Foreman
SDNM RMP Planning Coordinator Date

Recommended by: Richard B. Hanson 9/14/12
Richard Hanson
Manager, Sonoran Desert National Monument Date

Approved by: Emily Garber 9/14/12
Emily Garber
Manager, Lower Sonoran Field Office Date

TABLE OF CONTENTS

| | |
|---|----|
| Introduction | 1 |
| Background..... | 1 |
| Project Legal Descriptions..... | 2 |
| Environmental Review | 3 |
| Goals..... | 3 |
| TMP Components | 3 |
| Travel Management Decisions Made In the RMP | 3 |
| Facilities..... | 9 |
| Travel Management Sign Implementation..... | 9 |
| Education and Information..... | 10 |
| Route Rehabilitation Plan..... | 12 |
| Monitoring..... | 15 |
| Adaptive Management..... | 17 |
| Enforcement..... | 17 |
| Legal Public Access/Landowner Access..... | 18 |
| Maintenance and Engineering..... | 23 |
| Best Management Practices: | 29 |
| Standard Operating Procedures..... | 30 |
| Implementation of Travel Management Plan..... | 33 |
| Funding Strategy | 33 |
| Adaptive Management..... | 34 |
| Foreseeable Projects..... | 35 |
| References..... | 35 |
| Attachment 1 – Temporary OHV Closure Area..... | 36 |
| Attachment 2 – SDNM Sign Plan | 38 |
| Introduction | 38 |
| Sign Types..... | 38 |
| Public Access and Information Locations..... | 40 |
| Future Signing | 48 |

Special Management Area Access and Public Information..... 50

References..... 51

Attachment 3 – Sample Route Management Objective Form..... 52

Attachment 4 – Environmental Analysis..... 53

Finding of No Significant Impact and Decision Record 53

Environmental Assessment..... 60

Purpose and Need..... 61

 Introduction 61

 Purpose and Need for Action 61

 Decisions to be Made 62

 Applicable Laws, Regulations and Orders 62

 Land Use Plan Conformance..... 62

 Background..... 62

 Scoping & Public Participation..... 63

Description of Alternatives 66

 Introduction 66

 Description of Signing Action– Common to Both Action Alternatives 66

 Rehabilitation Actions – Common to Both Action Alternatives 66

 Alternative 1 - Passive Rehabilitation Methods..... 68

 Alternative 2 – Very Active Approach to Rehabilitation Methods..... 71

 No Action Alternative 74

Affected Environment & Environmental Consequences..... 74

 Definition of Terms 74

 Resources Not Affected by Proposed Action..... 75

 Affected Resources..... 76

Cumulative Actions..... 94

Tribes, Individuals, Organizations or Agencies Consulted..... 96

List of Preparers..... 97

References..... 97

INTRODUCTION

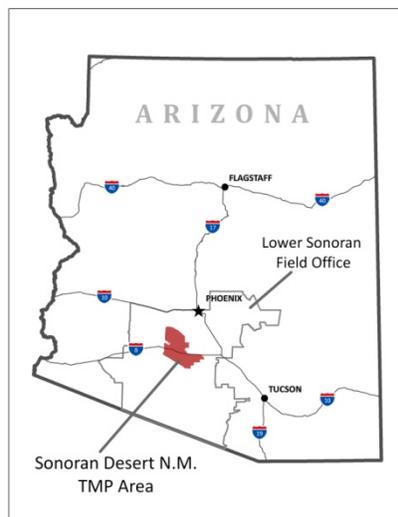
This Travel Management Plan (TMP) supplements travel management land use allocations and planning decisions made in the Sonoran Desert National Monument (SDNM) Record of Decision and Approved Resource Management Plan (RMP). Decisions and implementation actions not made in the RMP will be addressed in this TMP. This document will set forth a plan to manage SDNM's designated system of roads, primitive roads and trails, access and uses while ensuring Monument objects, for which the Monument was created, are protected.

BACKGROUND

Monument Creation

On January 17, 2001, Presidential Proclamation 7397 created the Sonoran Desert National Monument to ensure protection of a spectacular diversity of biological resources, and archaeological and historic sites. These Monument objects include abundant saguaro cactus

Map I. SDNM Project Area



forests, a rich diversity, density and distribution of plants in the Sand Tank Mountains area, rare patches of desert grasslands, a wide variety of desert wildlife such as the desert bighorn sheep and Sonoran desert tortoise, and significant archaeological resources such as large village sites, rock art sites, and lithic quarries. The SDNM is located in Maricopa and Pinal Counties, Arizona, and contains 486,400 acres of BLM-administered lands (see **Map I**, SDNM Project Area).

North Maricopa Mountains-Anza National Historic Trail Vehicle Closure

In May of 2008 a temporary off-highway vehicle (OHV) area closure was put into effect and has not been lifted on 54,817 acres near the North Maricopa Mountains in the northern portion of the SDNM. The intent of the closure was to

better manage motor vehicle related impacts around the Butterfield Trail, which also shares its alignment with the Juan Bautista de Anza National Historic Trail (Anza NHT). The persistent and visible damage to soils and plants from increasing OHV use had adverse effects on the Anza NHT and caused a degradation of scenic values. BLM will continue to follow the regulations at 43 CFR 8341.2, which allows the BLM to keep the lands closed to OHV traffic until the authorized officer determines that the adverse effects have been eliminated and measures implemented to prevent recurrence. See **Attachment I**, Temporary OHV Closure Area, for additional information.

Route Designations

On September 14, 2012, the SDNM RMP established the OHV area designations and designated route system; however, the RMP did not create the travel management plan components that support this designated route network. The designated route network contains nearly 411 miles of open roads, primitive roads and trails. Many projects will need to be completed, along with additional NEPA in some cases, before the route system will be fully implemented and well managed. For example, keeping routes open and clarifying which ones to use require signage and production of a current travel management map. Closure and rehabilitation, also known as decommissioning, of these linear disturbances is a balance between preventing future use and minimizing the effects to the very resource that closure is intended to protect. A plan to implement these actions and monitoring conditions is paramount to achieving the desired resource conditions and visitor experiences.

Access

Access to the SDNM exists today although not all access points are in a safe or legal condition. Use of fence gates along Interstate 8 (I-8) to access BLM land needs resolution to improve safety conditions and meet driver expectations. Access to roads on BLM land have been available since the interstate was built, yet only three exit ramps exist to safely allow access to BLM land. Some access points to SDNM are across private land or go under railroad trestles. While these are traditional access points, BLM needs to work towards satisfying the necessary conditions to legalize public and administrative access.

PROJECT LEGAL DESCRIPTIONS

Table I shows the legal descriptions for the entire SDNM project area.

Table I. SDNM Project Area Legal Descriptions

| Township/Range | Sections | Township/Range | Sections | Township/Range | Sections |
|----------------|-----------------------------------|----------------|-----------------------------|----------------|--------------------|
| T2S, R4W | 36 | T5S, R1W | 1-36 | T7S, R1W | 1-36 |
| T2S, R3W | 31, 32, 33, 34, 35, 36 | T5S, R3W | 1-6, 9-14, 16, 23-27, 29-36 | T7S, R4W | 1-3, 10-14 |
| T2S, R2W | 31 | T5S, R4W | 23-26, 35, 36 | T7S, R4E | 30-31 |
| T3S, R4W | 1, 12, 13, 23, 24, 25, 26, 35, 36 | T6S, R1W | 1-36 | T8S, R3W | 1 |
| T3S, R3W | 1-36 | T6S, R2W | 1-36 | T8S, R2W | 1-16, 23-25 |
| T3S, R2W | 5, 6, 7, 8, 9, 10, 11, 13-36 | T6S, R1E | 3-7, 18-19, 29-32 | T8S, R1W | 1-30, 32-36 |
| T3S, R1W | 19, 29, 30, 31, 32, 33, 34 | T6S, R3W | 1-36 | T8S, R1E | 1-36 |
| T4S, R3W | 1-36 | T6S, R4W | 1-2, 11-14, 23-26, 35, 36 | T8S, R2E | 1-13, 19-21, 28-33 |
| T4S, R2W | 1-36 | T7S, R3W | 1-29, 34-36 | T8S, R3E | 4-9, 16-18 |
| T4S, R1E | 2-36 | T7S, R2W | 1-36 | T9S, R1E | 1-18 |
| T4S, R4W | 2, 11, 14, 23, 26, 35 | T7S, R2E | 7-36 | T9S, R1W | 1-3, 12 |
| T5S, R1E | 15-22, 27-34 | T7S, R1E | 3-36 | | |
| T5S, R2W | 1-36 | T7S, R3E | 7-11, 14-36 | | |

ENVIRONMENTAL REVIEW

A review of the plan proposed TMP components has been completed. Components that were found to require further evaluation of environmental effects, as required under the National Environmental Policy Act (1969), were addressed in the Environmental Assessment found in Attachment 4. The actions deemed to have potential for environmental effects were route rehabilitation and signing.

GOALS

The route designations completed in the RMP and associated actions presented in this TMP are done with the following RMP goal in mind: TM-4: *Provide a comprehensive travel management system that supports protection of Monument objects, facilitates resource protection, and provides sustainable public use and enjoyment.*

TMP COMPONENTS

TRAVEL MANAGEMENT DECISIONS MADE IN THE RMP

As addressed previously under Route Designations section above, the RMP made many planning and implementation-level decisions (see Section 2.216 of the RMP for specific decisions relating to travel management). These decisions included the allocation of areas as open, closed or limited to motorized OHV use; identifying the specific roads, primitive roads and trails to keep open, close or limit use as part of a planned transportation network (route designations); and identifying transportation asset types as roads, primitive roads or trails in accordance with the BLM 1626 Travel and Transportation Manual issued in 2011.

Transportation assets are defined in the manual as follows:

Assets: An engineering term utilized to describe roads, primitive roads, and trails that are included in Facility Asset Management System (FAMS). Assets are maintained through the maintenance program.

Asset Types:

Road: A linear route declared a road by the owner, managed for use by low-clearance vehicles having four or more wheels, and maintained for regular and continuous use.

Primitive Road: A linear route managed for use by four-wheel drive or high-clearance vehicles. These routes do not normally meet any BLM road design standards.

Trail: A linear route managed for human-powered, stock or off-highway vehicle forms of transportation or for historical or heritage values. Trails are not generally managed for use by four-wheel drive or high-clearance vehicles.

Table 2, Route Designations, summarizes the approved route designations and asset type decisions made in the RMP. **Maps 2 and 3**, Asset Type and Route Designations North and South of I-8, show the approved designated route network identified in the RMP. **Maps 4 and 5**, Final BLM Sign numbers North and South of I-8, depict the numbers to be used when signing the open route network.

Table 2. Route Designations (Miles)

| | |
|--|-------|
| Total Route Inventory | 631.7 |
| Total Proposed Route System Available for Public Use ¹ | 410.9 |
| Roads Closed to General Public Use ² | 220.4 |
| Road Closure Percentage ³ | 35% |
| Designated Asset Type | |
| Road - Maintained | 32.6 |
| Open | 24.2 |
| Limited to Admin Use Only | 0.4 |
| Closed | 0 |
| New | 8.0 |
| Primitive Road - Unmaintained | 570.2 |
| Open | 323.8 |
| Seasonally Limited (Closed April 15 to Aug. 31) | 26.0 |
| Limited to Non-motorized Use ⁴ | 8.3 |
| Limited to Admin Use Only | 7.8 |
| Closed | 204.3 |
| Trail | 28.9 |
| Open to non-motorized/ mechanized travel (e.g., bicycles, handcarts, etc.) | 3.3 |
| Open to non-motorized/non-mechanized travel (wilderness trails) | 25.6 |

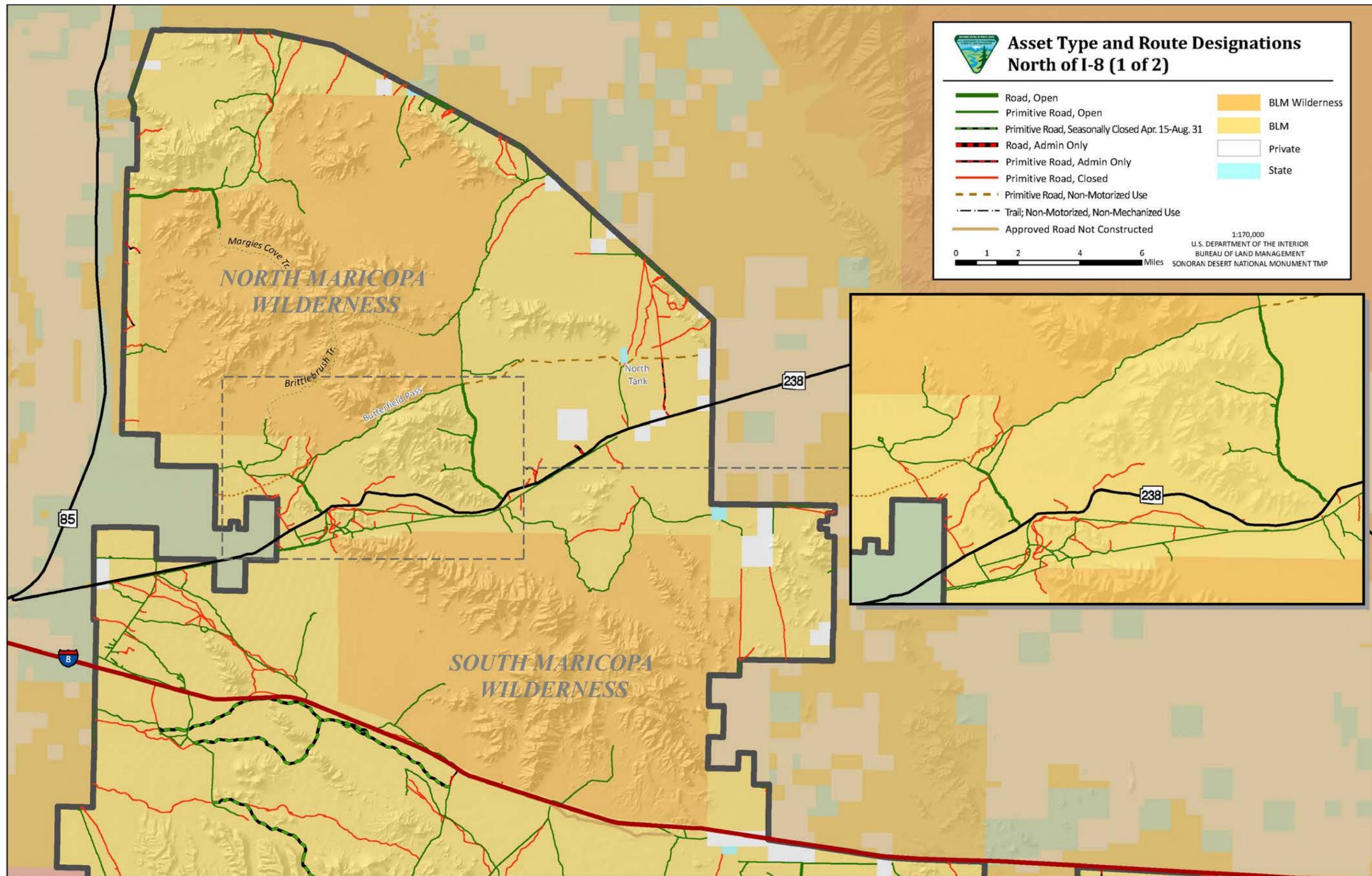
¹Total Proposed Route System (Miles) equals the sum of open roads, primitive roads, trails (including those limited by season, width, and non-motorized use), and new roads. The total excludes roads and primitive roads limited to administrative use.

² Road Closures (Miles) equals the sum of closed roads and primitive roads, roads and primitive roads limited to administrative use, and primitive roads limited to non-motorized use.

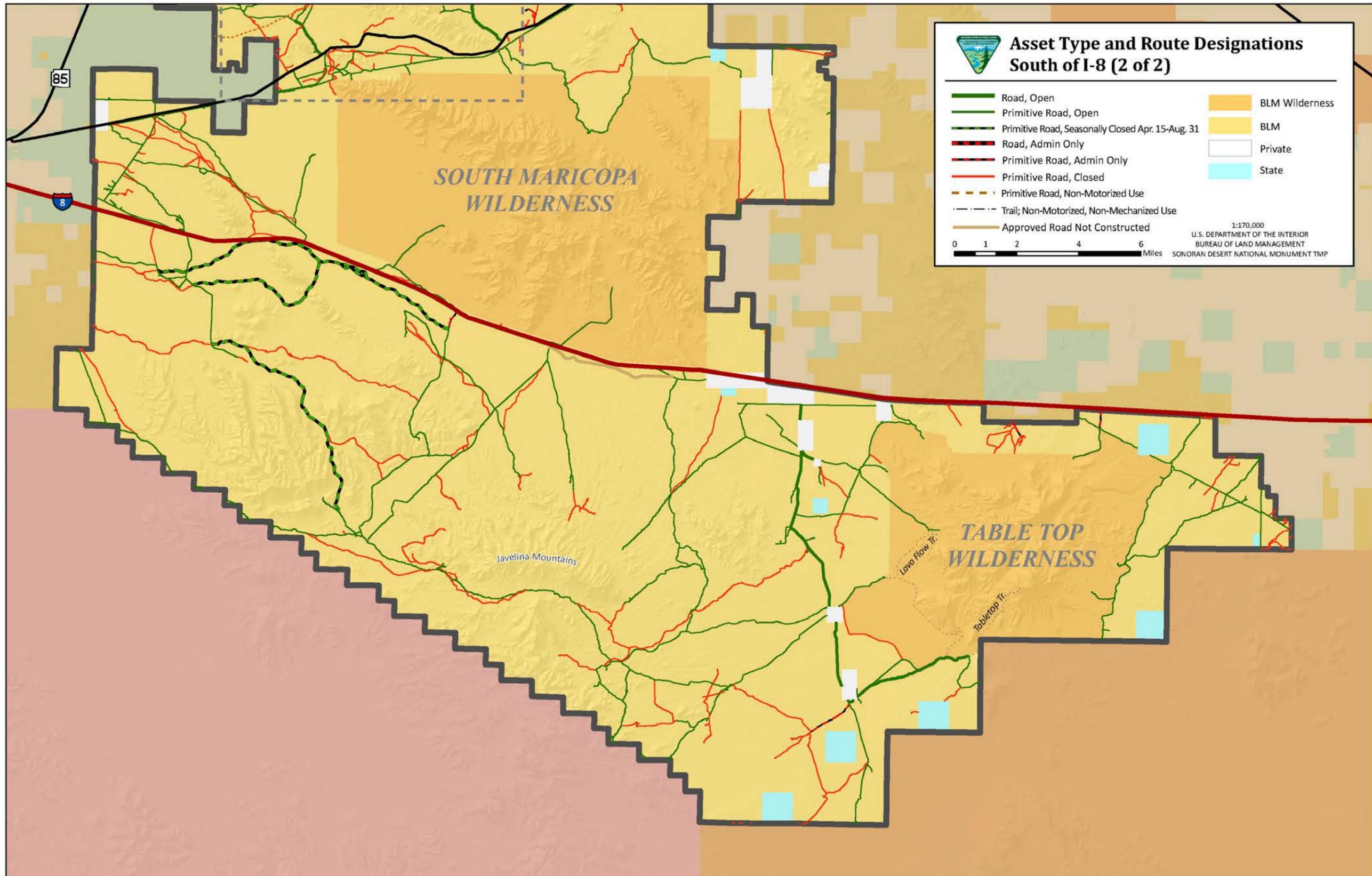
³ Road Closure Percentage equals the miles of road closure divided by the total route inventory (631.7 miles). Note: Primitive roads limited to non-motorized use are included here because no vehicular use will be permitted.

⁴ Applies to the Anza NHT, where bicycles and handcarts will be allowed, but not motor vehicles.

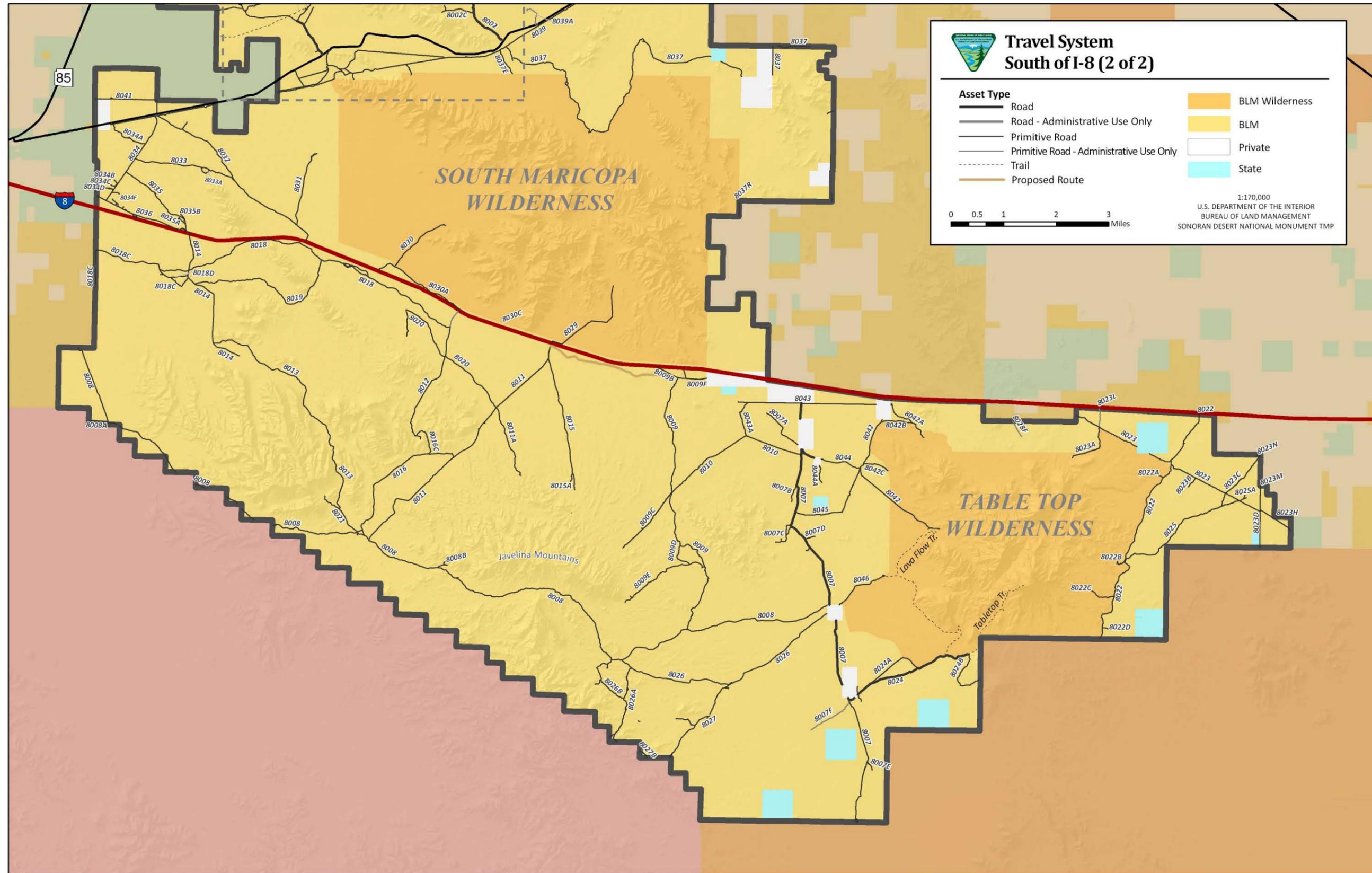
Map 2. Asset Type and Route Designations North of I-8



Map 3. Asset Type and Route Designations South of I-8



Map 5. Official BLM Sign Numbers South of I-8



FACILITIES

This plan will not be identifying specific facilities that will be needed or developed. These will be identified in subsequent area-specific comprehensive recreation activity plans which will include travel-related decisions. One is currently being developed for the current North Maricopa Mountains-Anza NHT OHV closure area north of SR-238 discussed above to restore and enhance the area. This plan will be very detailed regarding the types of facilities needed to ensure successful management and resource protection for that area. The area south of Interstate 8 (I-8) is expected to have limited facilities other than the existing ones located at the wilderness trailheads. No parking or camping areas are planned at this time except for those being planned for the restoration area.

Unless stated otherwise in subsequent planning, the statewide policy for motorized use in National Monuments will remain in effect (IM No. AZ-2005-007, State Director Guidelines for Arizona Land Use Planning Efforts). The policy is reflected in management decision TM-6.1.1 contained in the RMP which reads as follows:

The use of motorized or mechanized vehicles off designated roads or primitive roads will be prohibited with the following management restriction: motorized and mechanized use will be limited to areas within the designated route with reasonable use of the shoulder and immediate roadside allowing for vehicle passage, emergency stopping, or parking unless otherwise posted. Non-motorized, hand-powered wheeled game carriers will be permitted to travel cross-country (except in wilderness areas) for the purpose of retrieving downed game on public lands.

TRAVEL MANAGEMENT SIGN IMPLEMENTATION

Presently, most of the existing roads, primitive roads and trails have fiberglass sign posts for route identification installed. The total to date is approximately 1,000 to 1,500 signs. Signs of varying size, age and different messages are found at boundaries, gates and for special purposes.

To implement the route designations and convey information to visitors, various types of signs and markers will be installed according to current BLM policy and guidance per the BLM Sign Guidebook (2004) for recreation and travel management signing. Signing will provide the public with clear and correct information for visitor enjoyment, enforcement and to prevent conflict between uses.

Signs types could include:

- Regulatory or traffic control type signs
- Area and public land boundary identification
- Entry kiosks and informational kiosks
- Route numbers and the designation status of a route.
- Traffic control such as road intersections;
- Boundary markings such as wilderness boundaries,

- Informational signs for trails, and vehicle routes;
- Signs indicating unique features or requirements of certain areas, such as areas closed to access by motor vehicles;
- Temporary signs such as temporary land use restrictions relating to seasonal fire prevention orders.

Signing will be installed as necessary for visitor management, assistance and for resource protection, regulatory and informational purposes. Specifics for sign design, use and location are controlled by the BLM manuals for Roads (9113), Trails (9114) and Primitive Roads (9115), the Sign Manual (9130) and the Travel Management Handbook (8342).

Maintenance procedures and schedules will be developed for signs and markers. This will include anticipated replacement needs. A sign inventory and database will be created to facilitate tracking of sign location and maintenance. Signage will be replaced as necessary and messages changed when warranted. For more specifics see the Sign Plan in **Attachment 2**.

EDUCATION AND INFORMATION

Currently the SDNM lacks a formalized educational program, though safety information and area maps can be obtained from the SDNM office and the Lower Sonoran Field Office and online from the BLM website. Formal signage placed in the Monument is occasionally destroyed or vandalized. The BLM promotes education through a park ranger, volunteer groups and community events.

Because the SDNM will be primarily managed for protection of Monument objects, and recreation secondarily, messaging about accepted uses and rules of use is very important. In particular, information about routes, camping and target shooting opportunities, along with closures, is imperative to communicate to visitors. Interpretive programs will be developed as a tool to help in this public education effort. These programs may include the natural and cultural history of the area, such as desert biology, past activities such as prehistoric Native American use, Spanish influence and historic stage coach routes, etc. These messages will be conveyed along with concepts of ethics, safety, and courtesy. Outdoor ethics such as *Tread Lightly* and *Leave No Trace* will be communicated.

Minimization of conflict between motor vehicle use and other recreation on BLM land is required by 43 CFR 8342.1. Most motorized and non-motorized use in high use areas will be separated to minimize the number of contacts between these recreational uses. Use levels are expected to be moderate to high in developed areas and research supports the separation of uses (Jacob, 1980). Messaging on kiosks and literature will promote acceptable uses, tolerance and mutual respect.

Interpretive and or interactive programs will be developed to foster appreciation of the natural, historic, and cultural elements of the area and to attract urban youth to the outdoors. The SDNM educational outreach program will be developed in collaboration with federal, state, and county entities, and may be established with emerging organizations and friends groups. Development of interactive programs may include public involvement.

Key Messages to Communicate

- SDNM is a special place for Sonoran desert appreciation and is intended to be shared responsibly by all.
- All motor vehicle and bicycle travel is required to stay on designated and signed open routes.
- Parking and camping is limited to pulling off to the shoulder of the route.
- Don't crush vegetation – it takes a long time for desert plants to regrow.
- Pack it in – Pack it out!
- Read and obey area signs. SDNM has many shared use roads. Some roads or trails are limited to non-motorized uses.
- Get a map – improve your experience and your stewardship by staying on Open routes.
- Land ethics such as Leave No Trace and Tread Lightly! are important and are explained in literature and area signs.
- The historic trail corridor includes the National Historic Trail – the Juan Bautista De Anza Trail and the Butterfield Stage Overland Trail is a primarily non-motorized trail where motor vehicle use is allowed as shown on maps and by signs.
- The route designations presented by the land use plan are intended to make motorized recreation opportunities on SDNM sustainable for generations.
- Volunteerism is encouraged. Opportunities for partnerships exist. You can help maintain your public lands.

Targeted Methods of Communication

- POD-casts including downloadable items such as: maps, land use ethics, rules, historic and cultural settings, maps, rules, air quality alerts, fire prevention restrictions, emergency announcements, etc.
- Electronic kiosks: Including downloadable items such trail track logs, audio story telling for cultural, historic, natural interpretative information
- Web video and focus surveys: produce interactive sites for user info and feedback to BLM
- School presentations: promoting the BLM messages and outdoor multiple land uses, land ethics, leading to invitations for field tours.
- Website: updated regularly and designed to give viewers something new each time they view the page.

- Organized Tours: regular/routine schedules for schools, local organizations, elected leaders, and parent and teacher groups. *Use inner city partners and events that already include minorities and new residents, gateway cities*
- Onsite Workshops: emphasizing urban youth activities in greater outdoors
- Public service announcements
- Media field trips
- Cable access (TV) shows: including Spanish speaking channels
- Morning TV talk shows
- Exhibits in gateway communities and public events
- Traditional signs, brochures and guides
- Organized education: Use new and alternate university sources (marketing, journalism, recreation), formalized law enforcement activities and informal law enforcement peer to peer education, youth and outdoor organizations, etc.

Partnerships

In order to achieve the aforementioned outreach and education objectives, it is imperative to create sustainable partnerships with non-governmental and governmental organizations with compatible missions, such as:

- National Monument advocacy and friends groups
- Special interest groups for recreation, target shooting, vehicle use, hunting, wildlife and wilderness.
- Media organizations
- Divisions of state government such as, but not limited to, AZ Game & Fish Department, Maricopa County Parks, Maricopa and Pinal County Sheriff departments,
- American Indian tribes
- Utilities and private businesses that hold permits within or adjacent to SDNM.

Financial resources for many outreach programs need to be identified. Moreover, it will be increasingly important to create an annual calendar of events and prioritize activities with the responsible personnel/organizations and the funding sources in order to ensure sustainability.

ROUTE REHABILITATION PLAN

Route rehabilitation is conducted to achieve a restored function to the vegetative community and restore the natural appearance of the landscape. A full range of rehabilitation techniques will be employed. Application of active rehabilitation techniques to closed routes will be used where necessary to speed the recovery process. Two alternatives for possible route rehabilitation, identified on a route-by-route basis, and associated environmental analysis can be found in the attached EA located in **Attachment 4**.

Rehabilitation Strategy

A general strategy for conducting rehabilitation of closed routes will be followed by zoning the SDNM into three areas: north of State Route 238 (SR-238), south of SR-238 and north of I-8 (South Maricopa Wilderness corridor), and south of I-8. Possible strategies for these areas are as follows:

- 1) Use active restoration techniques aggressively for the area surrounding the Anza/Butterfield trail corridor north of SR-238 (highest use area) - Rehabilitation work would generally include barriers and active restoration methods due to the flatter terrain making cross-country driving easier.
- 2) Use active restoration techniques selectively for the area surrounding the South Maricopa Mountains wilderness (moderate use area) – Rehabilitation work would be less intensive and use barriers selectively.
- 3) Use active restoration techniques occasionally south of I-8 (lowest use area). Use natural techniques and the least number of barriers in this area. Exceptions to the rule would be Vekol Valley Road and Smith Road where higher use may require physical barriers to be effective.

On border-related resource impacts and new trespass roads use restoration techniques will be used aggressively to remediate them in the shortest time possible and prevent motorized use from reoccurring as deemed necessary by the authorized officer. This aggressive philosophy is intended to support law enforcement efforts to stop vehicle based smuggling activities and could be done anywhere there is a hot spot for illegal activity.

Rehabilitation Techniques and Rationale for Selection

Rehabilitation actions will be undertaken according to the methods described below. Options are presented in order of their level of ground disturbance categorized between manual and mechanical techniques: identified below:

Manual:

- Passive: Allow the route to naturally reclaim without any signing or replanting of vegetation. This method is proposed in lightly used areas and on routes where the condition is already reclaiming. The goal is to avoid attracting attention by signing or fencing, and the consequent vehicle use of, these lightly used routes. This is the least obvious method of closure, the least cost to BLM and provides a high degree of naturalness when successfully done.
- Fence and sign/fence only: This method applies to both upland and wash routes. This type of closure has little ground disturbance and is used in areas where fence cutting would be expected to be minimal. Generally, the fence type would be T-post and four strand smooth wire with reflectors; however, the fence type could be increased to pipe rail/steel rail as needed while still maintaining a small footprint at the beginning or end of the route. Fencing and signs can be removed to complete the rehabilitation process.

- Sign only: This method applies mainly to upland routes in lightly used areas and is proposed on routes in lightly used areas and/or in areas where compliance with signage is expected to be good. The signage can be removed to complete the rehabilitation process.
- Rake out tracks only: This applies mainly to sand washes where erasing the evidence of use in lightly used areas may be enough to prevent attracting future use. This is very light on the land and provides a high degree of naturalness when done. The goal is to avoid attracting attention, and thus use, to these lightly used routes by fencing or signing them. Monitoring and raking is required to ensure effectiveness and may be required for up to one year.
- Rake out tracks and sign: This method applies mainly to sand washes in lightly used areas. A sign reinforces the closure by placing physical notice for visitors and to assist law enforcement. This method is low cost to BLM and provides a moderate degree of naturalness when done. A downside to this method is the potentially high number of closed signs that can accumulate in a given area and the perception that many routes are being closed, leading to vandalism. Monitoring is required to ensure effectiveness. Signage can be removed to complete the rehabilitation.
- Vertical mulch with berm/fence and sign: This method works in upland areas where occasional use of the route in lightly used areas prevents natural restoration. A sign provides physical notice and assistance to law enforcement. A t-post and 4 strand smooth wire fence works best when the fence is placed in an area where bypassing it is difficult. Combined with a sign and/or fencing, actively placing cuttings of cactus and transplanted bushes in the wheel tracks may be enough to prevent use. Placement of plants in the closed route to the visible horizon minimizes cost and ground disturbance. Native seed mixtures could also be applied where it would be beneficial.
- Barriers (fences): Physical blockades constructed to prevent the passage of vehicles. The only manual type would be wire fencing.

Mechanical:

- Berm with signs: This method would be applied in upland areas where a berm cannot be bypassed. This type of closure has minimal ground disturbance due to only digging dirt to create a berm at the beginning or end of the closed route. Signage provides physical notice to visitors and assistance to law enforcement. The berm stands as an indicator of closure if the sign is removed, providing additional notice to visitors. After the route has restored, berms can be removed or flattened to complete the rehabilitation process.
- Rip/harrow: A more expensive, but effective way to achieve stoppage of use and expedited regrowth. These techniques are necessary in high use areas where use is likely to continue on a route if not made completely obvious that the route is being restored. 100% of the surface is disturbed by this method. A tractor towed disc harrow or a finger-type ripper mounted on a tractor or bulldozer would be the typical

equipment used. Benefits include reducing compaction and allowing seeds to take root more quickly including larger trees. Drawbacks to these methods are: (1) significant growth (20% cover) may take up to five years; (2) no regrowth may occur if barriers are bypassed and use continues on the ripped road bed; (3) the complete removal of existing vegetation causing a larger disturbed area temporarily; (5) increased likelihood of invasive weed infestation, and (5) possible disturbance to undiscovered buried cultural objects.

- **Barriers:** Physical blockades constructed to prevent the passage of vehicles. Types can be earthen mounds, wire fence, pipe rail fence, post and cable fence, concrete wall sections (also referred to as Jersey or K-rail barriers), or free standing steel structures commonly referred to as Normandy barriers.

MONITORING

Systematic monitoring of the travel system, and the components within the system, is needed to maintain or improve resource conditions. Specific actions, including timeframes, methods and anticipated resource needs, will be identified for environmental monitoring. Possible monitoring and recording techniques are listed below.

- 1) Route Management Objectives (RMO) will be created for each numbered route. Basic information about the route will be collected. A sample RMO Inventory Form can be found in **Attachment 3**. Information to be collected includes:
 - a. Route number and name;
 - b. Route type (road, primitive road or trail);
 - c. Allowable types of use and any other restrictions;
 - d. Target use level, maintenance intensity and type of maintenance (e.g. mechanized, handwork, interval, or as needed);
 - e. Road or trail specifications (width, grade, brush clearance, allowable surface obstacle size, drainage structures);
 - f. Type and expected frequency of patrol (Law enforcement, visitor service, maintenance, monitoring);
 - g. Listing of facilities along route;
 - h. Monitoring frequency and notes field/signature block for completion of task; and
 - i. Crossover identifier for use in Facilities Asset Management System (FAMS).
- 2) Traffic counters will be employed to document overall motorized and non-motorized travel. Counters are currently in use and their use will continue for the reasons listed. Counters will be placed for the following reasons:
 - a. Document the total number of visitors for input into the Recreation Management Information System (RMIS).
 - b. Document visitation during a particular event such as a permitted event

- c. Study and understand public use patterns for better service
 - d. Law enforcement activities
- 3) Photo or video monitoring points will be established in key locations to monitor implementation actions and their effectiveness. Photo points will be logged with the associated route's RMO form for efficient data transferal to future monitors and periodic review. Each route will be reviewed at least once every five years with a standard of 20 percent reviewed per year. Video recording using digital recorders may be employed or substituted in place of photo recordation of the routes.

Examples of where photo points will be established are:

- a. Closed routes and rehabilitation projects;
 - b. Potential erosion points where immediate action is not necessary;
 - c. Areas of good road quality for future reference;
 - d. Single use cross country travel areas to document natural rehabilitation time;
 - e. General area monitoring for visual signs of overuse including camping along routes; and
 - f. Establishing a sign inventory for maintenance.
- 4) Non-law enforcement park ranger logs will be organized, possibly using a database system, to assist in monitoring, compliance and reporting. Consideration will be given to creating a district wide monitoring database that includes ranger patrols and the RMO information above. Paper logs will be used if a database is not used.
- 5) Monitoring data collected would be used to assess the effectiveness of the plan on a yearly basis. Closed routes will be monitored for signs of use and photo points will be taken yearly until completely rehabilitated. Rehabilitating routes will be monitored to determine effectiveness of seeding, soil and plant recovery and water flow.
- 6) Standardized forms may be created to assist in the collection of data not normally collected such as tread wear measurements and rapid site assessments. Such forms would support RMO forms created for each numbered route. Data collection and analysis may be outsourced to manage workloads, reduce cost, improve efficiency and manage quality.
- 7) Camping will be monitored and the data integrated into the road monitoring. Management decisions in the SDNM Approved RMP Record of Decision limits camping to existing campsites accessed by designated routes. An existing inventory of campsites will serve as the baseline for determining if new campsites are being created.
- 8) Use new technology to improve the quality, quantity and/or accuracy of monitoring through the use of emerging technology such as remote sensing, video recording or other methods as developed.

- 9) Changes to the route system and the TMP will be considered in unison with the SDNM RMP five-year evaluation process. The guidance for the five-year RMP evaluation cycle and how such an evaluation is conducted is provided in the Land Use Planning Handbook, H-1601-1, section V.B, on pages 33-36. Consequently, a five-year evaluation cycle is also suitable for the TMP. The evaluation will determine if the RMP, and successively the TMP, are being properly implemented, analyze the plan's effectiveness, and determine if changes to the subject plans are needed. Linking the evaluation cycle of the TMP to the RMP evaluation cycle will be very informative in determining success for key aspects of plan implementation and desired monument management outcomes. Moreover, the evaluation process will afford citizens, organizations and agencies opportunities to propose changes to the TMP and travel management system. BLM-driven route changes or projects required for public health and safety, to maintain or acquire public access as prescribed by the TMP, or to address new issues, rules, regulations or laws will be conducted on an "as needed" basis.

ADAPTIVE MANAGEMENT

After the initial five year review, modifications to this plan, or another appropriate plan, would be considered if monitoring indicates that goals are not being met. Adaptive management thresholds requiring a change in management, travel system, or plan implementation modification, will be developed within 2 years of this plan. The paramount purpose of the monument will be met by ensuring the conservation, protection and restoration the monument objects. Factors to consider for warranting further review of the travel system and/or TMP could include the following:

- Changes in route width;
- Dramatic changes in route use levels;
- Increase in route proliferation;
- Increase in vegetation damage, and
- Serious non-compliance with route designations and established regulations and supplementary rules.

ENFORCEMENT

To adequately satisfy the need for law enforcement in support of this plan, methods to assist management to maintain reasonable compliance are identified below.

- 1) Law enforcement efforts will be commensurate with the following philosophy:
 - Upon signing, completing closed route rehabilitation and public availability of a route designation map, law enforcement officers (LEOs) will make extra effort to educate visitors with regards to new route designations and changes to parking and camping activities.

- Upon full plan implementation, educational efforts will be the primary responsibility of interpretive park rangers and field staff. Law enforcement officers will exclusively be responsible for the enforcement of the applicable Federal regulations, state law as applicable and supplementary rules.
- 2) The SDNM, as an NLCS unit, is deemed a priority enforcement area to ensure the protection of Monument objects. Increased patrol, or specific operations, will be implemented in areas where monitoring detects non-compliance with route designations or other travel related rules. Patrols may also be increased in high priority areas such as wilderness areas and during high use times for preventive measures.
 - 3) A supplementary rule will be issued to enforce vehicle and driver licensing requirements whereby all motor vehicles used in SDNM must be licensed and registered for highway use and operated by licensed drivers.
 - 4) Supplementary rules may also be issued to enforce other travel related rules such as imposed speed limits in high recreation use areas for safety or where needed for dust control.

LEGAL PUBLIC ACCESS/LANDOWNER ACCESS

Roads or primitive roads across private lands may be currently available. Unless BLM has acquired legal access rights, access to SDNM from highways and perimeter roads is not ensured for the long term. Currently BLM has secured the necessary legal public access at four locations in the SDNM: two locations off of SR-85 and two off of Vekol Valley Road across private land. The majority of locations where the public, BLM and other governmental entities access the SDNM across private land or via roadways are not legal access points and public safety is a concern at many of these sites. BLM remains committed to resolve these safety issues through improvement of signage, implementation of turn lanes or other suitable methods. BLM will seek resolution with highway managing entities such as AZ Department of Transportation (ADOT) or Maricopa County Department of Transportation (MCDOT).

Private lands are contained within the SDNM boundary. Identifying existing rights-of-way (ROW) to private lands and establishing the location for future ROW issuance is one way to minimize the effects of recreation and recreational travel on land owners. **Maps 6 and 7**, Access Improvement Plan North and South of I-8, shows the approved routes to private property that exist today or those that will be granted for future rights-of-way. Not all of the private property within the planning area has legal access. For access to private land where no ROW has been issued by BLM, the roads identified on the Access Improvement Plan maps would be used by the BLM to issue the necessary access. These maps also show (1) access points and routes where legal public access will be pursued; (2) locations for highway access safety to be addressed; and, (3) BLM's preferred access routes for landowners when applying for rights-of-ways for legal access to property.

To ensure long term access across necessary Arizona state trust lands, access permits and/or rights would be pursued. BLM can directly secure access through easement or seek temporary access through a special land use permit, which conveys no rights, but would remove a requirement for the public to possess a state trust land recreation permit to use the connecting primitive roads on trust land. Access could be acquired by BLM or a partner of BLM.

Table 3, SDNM Access Improvement List, shows the existing condition and the desired condition for access along primary access points to SDNM. BLM will work with the appropriate entities to manage access for safety, conflict avoidance and ease of access for visitors.

Table 3. SDNM Access Improvement List

| No. | Existing Condition | Desired Condition | Mile Post |
|-----|--|--|-----------|
| 1 | I-8 highway fence gate (south side), no deceleration/acceleration lane | I-8 acceleration/deceleration lane with cattle guard and sign (S) | 124 |
| 2 | I-8 highway fence gate (north side), no deceleration/acceleration lane | I-8 acceleration/deceleration lane with cattle guard and sign (N) | 124 |
| 3 | I-8 highway fence gate (north side), no deceleration/acceleration lane | I-8 acceleration/deceleration lane with cattle guard and sign (N) | 128 |
| 4 | I-8 highway fence gate (north side), no deceleration/acceleration lane | I-8 acceleration/deceleration lane with cattle guard and sign (N) | 133 |
| 5 | I-8 Hwy Fence gate (north side), no deceleration/acceleration lane | I-8 acceleration/deceleration lane with cattle guard and sign (N) | 136.5 |
| 6 | I-8 unmanaged underpass | Permit for Smith Road under I-8 overpass (N-S) | 158 |
| 7 | SR-238 intersection, RR trestle (wood) underpass (south side) | Permit for SR-238 & railroad trestle (wood) underpass (S) | 3.5 |
| 8 | SR-238 intersection, RR trestle (wood) underpass (south side) | Permit for SR-238 & railroad trestle (wood) underpass (S) | 5 |
| 9 | Concrete culvert under railroad | Permit for box culvert under railroad tracks (N-S) | 10.5 |
| 10 | SR-238 intersection, no deceleration/acceleration lane | SR-238 acceleration/deceleration lane with cattle guard and sign (N) | 17.5 |
| 11 | SR-238 intersection, no deceleration/acceleration lane | SR-238 acceleration/deceleration lane with cattle guard and sign (N) | 10.5 |
| 12 | SR-238 intersection, no deceleration/acceleration lane | SR-238 acceleration/deceleration lane with cattle guard and sign (N) | 26 |
| 13 | Existing legal access at interchange (AZA-17274) | Existing legal access at interchange (AZA-17274) | 127.5 |
| 14 | Existing legal access at fence gate (AZA-17273) | Existing legal access at fence gate (AZA-17273) | 132 |

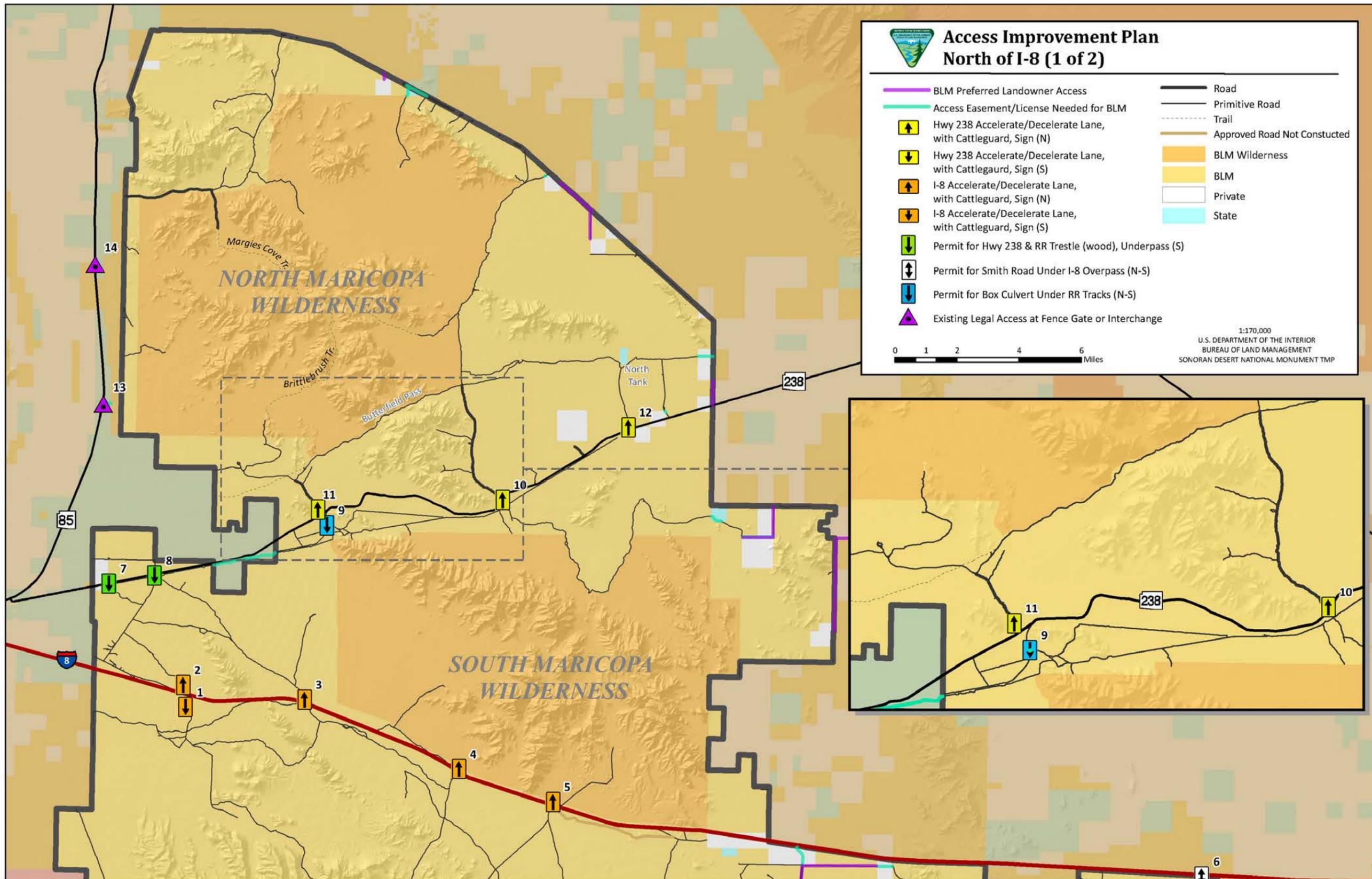
BLM will seek to acquire long term ROW or short term access licenses from willing sellers. Rights-of-way or easements may be acquired through donation following the procedures set forth in *BLM Manual 2100-Acquisition*. Access licenses or rights may also be acquired by Arizona Game and Fish Department or another legal entity authorized to acquire and hold such licenses or rights.

As shown in **Table 4**, there are many places where access will be sought to allow visitors to have legal access to SDNM. Numbers in the table correspond to points on **Maps 6 and 7**, Access Improvement Plan North and South of I-8.

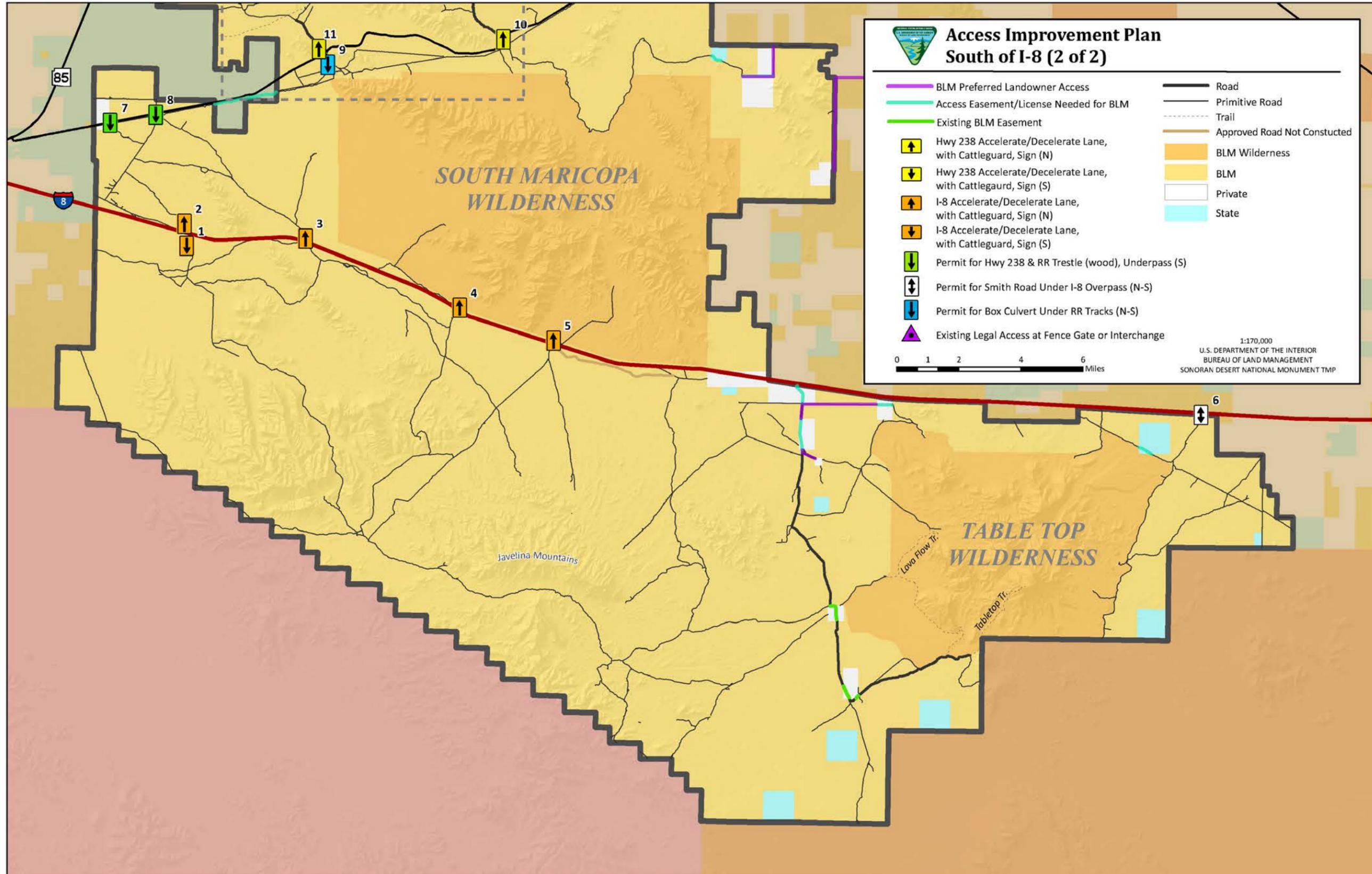
Table 4. BLM Access Easement or License Acquisition List

| Number | Name | Township | Range | Section(s) |
|--------|--------------------------------------|----------|-------|-------------|
| 1 | Bosque Well Fence line - State Land | 5S | 3W | 21,22,28,29 |
| 2 | Twin Tanks - State Land | 5S | 1E | 18 |
| 2 | Twin Tanks - State Land | 5S | 1W | 13 |
| 3 | Plug Tank - State Land | 3S | 2W | 04 |
| 4 | Pipeline access - Private Land | 3S | 1W | 19 |
| 5 | Butterfield Trail - Private Land | 4S | 1W | 24 |
| 6 | Mobile Valley - Private Land | 5S | 1E | 16,17,20 |
| 7 | Mobile Road North - Private Land | 4S | 1W | 35 |
| 8 | Komatke Pipeline Road - State Land | 3S | 2W | 4,5,9 |
| 9 | Vekol Valley Road (1) - Private Land | 7S | 1E | 4,9,10 |
| 10 | Vekol Valley Road (2) - Private Land | 7S | 1E | 15 |
| 11 | Antelope Peak Access - Private Land | 7S | 1E | 12 |
| 12 | Power line Road - State Land | 7S | 3E | 16,21 |
| 13 | Railroad Underpass (1) - BLM Land | 5S | 3W | 25 |
| 14 | Railroad Underpass (2) - BLM Land | 5S | 3W | 13 |
| 15 | Mobile Valley - Private Land | 5S | 1E | 4,9 |
| 16 | Mobile Valley - Private Land | 4S | 1E | 26,27 |
| 17 | Vekol Valley Road (3) - Private Land | 8S | 1E | 11,14,15 |
| 18 | Vekol Valley Road (4) - Private Land | 8S | 1E | 26,35 |

Map 6. Access Improvement Plan North of I-8



Map 7. Access Improvement Plan South of I-8



MAINTENANCE AND ENGINEERING

Maintenance Intensity

The routes designated in the RMP need to be maintained periodically to ensure protection of Monument objects, compliance with land health standards and provide safe and efficient travel. In the past there had been little guidance regarding route maintenance and procedures resulting in inconsistencies between recreation and engineering staffs bureau-wide in regards to how to identify, implement, manage and report maintenance needs for routes. This was identified as an issue and originally addressed in the BLM Roads and Trails Terminology Report (2006). The report shifted the common term of “maintenance levels” to “maintenance intensity” and established standards for consistency for all linear features (roads, primitive roads and trails). This new approach has now been incorporated into the new BLM Manual for Primitive Roads (9115).

As stated in the report, “Maintenance intensities provide consistent objectives and standards for the care and maintenance of BLM routes based on identified management objectives. Maintenance intensities provide operational guidance to field personnel on the appropriate intensity, frequency, and type of maintenance activities that should be undertaken to keep the route in acceptable condition and provide guidance for the minimum standards of care for the annual maintenance of a route.”

Maintenance intensities provide a range of objectives and standards, from “identification for removal” through frequent and intensive maintenance and these are explained below.

Level 0

Maintenance Description

Existing routes that will no longer be maintained and no longer declared a route. Routes identified as Level 0 are identified for removal from the Transportation System entirely.

Maintenance Objectives

- No planned annual maintenance.
- Meeting identified environmental needs.
- No preventive maintenance or planned annual maintenance activities.

Level I

Maintenance Description

Routes where minimum (low intensity) maintenance is required to protect adjacent lands and resource values. These roads may be impassable for extended periods of time.

Maintenance Objectives

- Low (minimal) maintenance intensity

- Emphasis is given to maintaining drainage and runoff patterns as needed to protect adjacent lands. Grading, brushing or slide removal is not performed unless route bed drainage is being adversely affected, causing erosion.
- Meet identified resource management objectives.
- Perform maintenance as necessary to protect adjacent lands and resource values.
- No preventive maintenance.
- Planned maintenance activities limited to environmental and resource protection.
- Route surface and other physical features are not maintained for regular traffic.

Level 3

Maintenance Description

Routes requiring moderate maintenance due to low volume use (e.g. seasonally or year-round for commercial, recreation, or administrative access). Maintenance intensities may not provide year-round access but are intended to generally provide resources appropriate to keep the route in use for the majority of the year.

Many primitive road assets will only be maintained as needed, at a frequency that could exceed twenty years or more due to low use and stable soils.

Maintenance Objectives

- Medium (Moderate) maintenance intensity.
- Drainage structures will be maintained as needed. Surface maintenance will be conducted to provide a reasonable level of riding comfort at prudent speeds for the route conditions and intended use. Brushing is conducted as needed to improve sight distance when appropriate for management uses. Landslides adversely affecting drainage
- Meet identified environmental needs.
- Generally maintained for year-round traffic.
- Perform annual maintenance necessary to protect adjacent lands and resource values.
- Perform preventive maintenance as required to generally keep the route in acceptable condition.

Level 5

Maintenance Description

Route for high (maximum) maintenance due to year-round needs, high volume of traffic, or significant use. Also may include route identified through management objectives as requiring high intensities of maintenance or to be maintained open on a year-round basis.

Maintenance Objectives

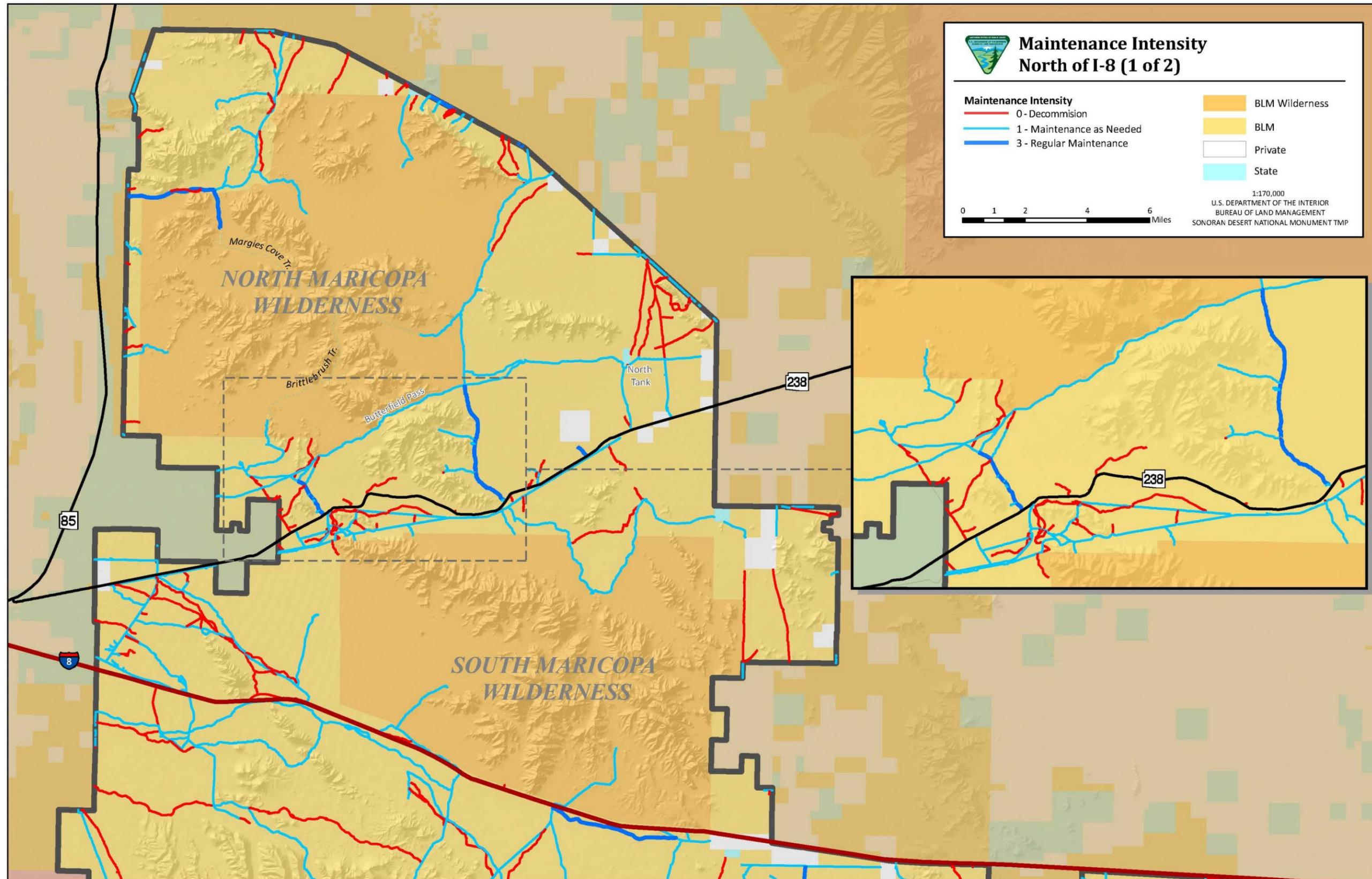
- High (maximum) maintenance intensity.
- The entire route will be maintained at least annually. Problems will be repaired as discovered. These routes may be closed or have limited access due to weather conditions but are generally intended for year-round use.
- Meet identified environmental needs.
- Generally maintained for year-round traffic
- Perform annual maintenance necessary to protect adjacent lands and resource
- Perform preventative maintenance as required to generally keep the route in acceptable condition.
- Planned maintenance activities should include environmental and resource protection efforts, annual route surface.
- Route surface and other physical features are maintained for regular traffic.

Currently, no roads are assigned as level 5 in SDNM.

Assignment of Asset Types and Maintenance Intensity

Asset types and maintenance intensity levels were assigned as part of the route designation process approved by the RMP and are provided in **Table 5**, Maintenance Intensity and Asset Types (Miles), and depicted on **Maps 8 and 9**, Maintenance Intensity North and South of I-8.

Map 8. Maintenance Intensity North of I-8



Map 9. Maintenance Intensity South of I-8

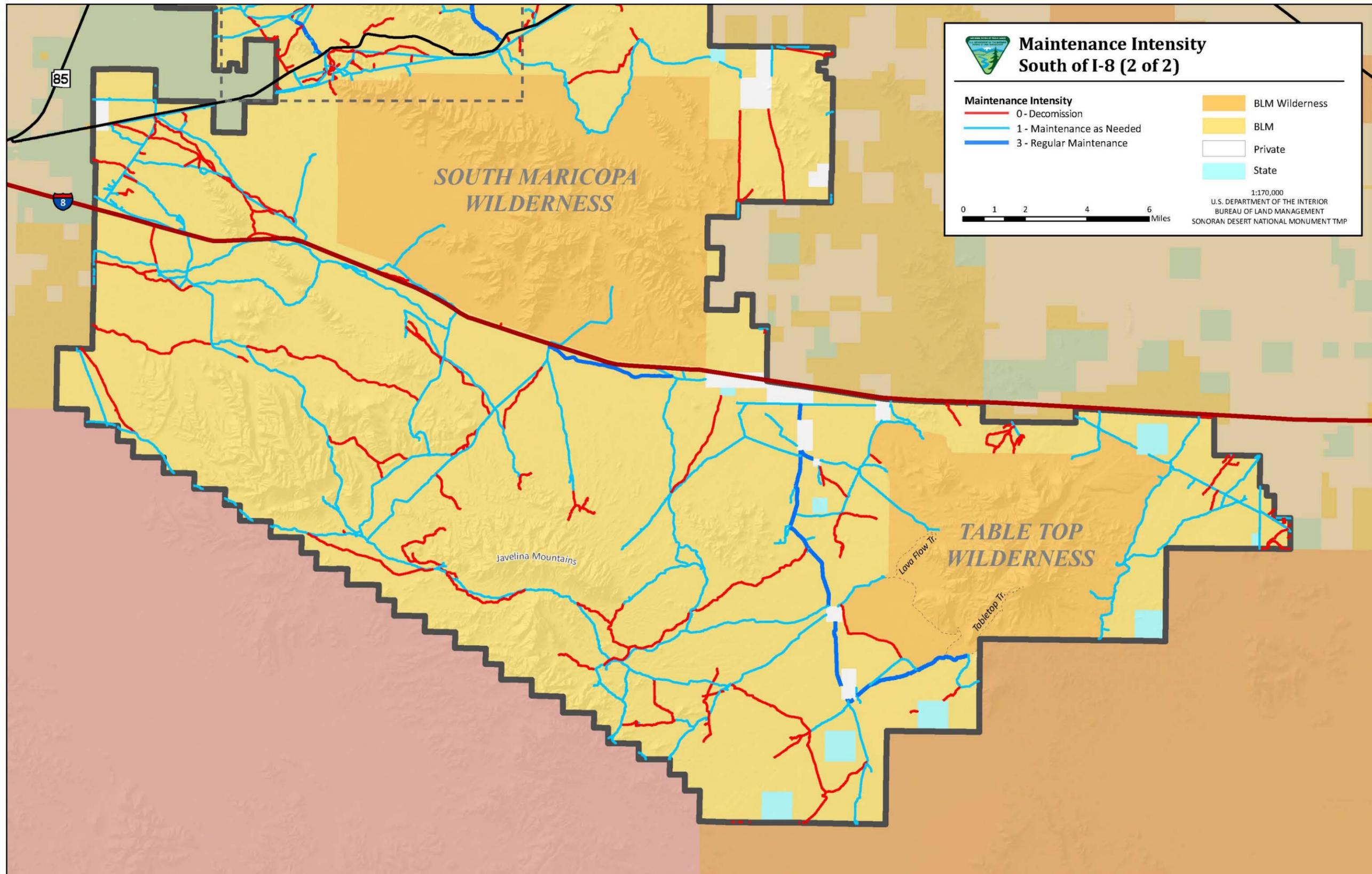


Table 5. Maintenance Intensity and Asset Types (Miles)

| Maintenance Intensity Level* | Asset Type | Miles |
|------------------------------|----------------|-------|
| 0 (decommission) | Road | 0 |
| | Primitive Road | 204.3 |
| | Trail | 0 |
| 1 (maintain as needed) | Road | 0 |
| | Primitive Road | 365.9 |
| | Trail | 28.9 |
| 3 (regular maintenance) | Road | 24.6 |
| | Road (new) | 8 |
| | Primitive Road | 0 |
| | Trail | 0 |
| | Total | 631.7 |

*No roads are assigned as Level 5.

Maintenance and Engineering Guidelines

The following actions will be accomplished as a part of managing the route system.

- 1) Route asset type, maintenance intensity and on-the-ground numbers will be recorded in a Ground Transportation Linear Feature Database for use on maps and also in BLM's Facility and Asset Management System (FAMS).
- 2) Route Management Objectives (RMOs) forms will be established for each route which contains this information and other information necessary for upkeep and monitoring.
- 3) Maintenance of open roads, primitive roads and trails will be done to minimize soil erosion and other resource degradation. For primitive roads, maintenance will be done on a case-by-case basis unless scheduling it is beneficial. One reason for scheduling maintenance would be the limited availability of equipment or operator or known recurring problems. Roads will be put on a maintenance schedule.
- 4) Completion of road or trail maintenance will be accomplished by BLM or others such as Maricopa or Pinal County via road maintenance agreements, permittees as authorized by a valid permit or by contract. Any maintenance conducted by permittees will be supervised by BLM.
- 5) Significant changes to roads or trails, such as widening or rerouting, will require prior environmental review including biological and/or archaeological clearance. Each route will be reviewed on the ground by the appropriate monument staff prior to conducting maintenance activities.
- 6) Maintenance procedures and/or schedules will be developed for signs and markers. This will include anticipated replacement needs. A sign location and photo log/database will be created to facilitate timely replacement of missing or damaged

- signs. This may be combined with the overall monitoring procedure including logs/database. The sign plan is the initial plan for installing signage.
- 7) Installation plans and maintenance procedures for physical barriers will be developed as needed. The rehabilitation plan is the initial plan and identifies the type and location of proposed barriers. Replacement or modification of barriers is expected as use levels and types change. Barriers will be used sparingly and only for the duration necessary to minimize effects to visitor experiences and visual resources. An appropriate level of environmental review will be completed prior to beginning ground-disturbing activities. Barriers will be removed when no longer needed.
- 8) BLM coordination with the following entities would continue or be established for maintenance, monitoring, restoration and law enforcement:
- Tohono O'odham Indian Nation
 - Arizona Game and Fish Department
 - Arizona Department of Transportation
 - Arizona State Land Department
 - Pinal County Public Works
 - Pinal County Sheriff's Office
 - Pinal County government

BEST MANAGEMENT PRACTICES:

In addition to the Best Management Practices and Standard Operating Procedures identified in the Sonoran Desert RMP in Appendix D, the following will be used during all phases of this implementation plan.

Dust Abatement Practices

- Apply dust suppressants or other means to harden main access roads and common areas to reduce emissions produced through windblown events and mechanical means. Considering the diverse uses of many high use areas and length of stay at these congregation areas, this provides the most benefit to the most people and will be emphasized as a primary method to reduce dust emissions.
- Post speed limits to reduce vehicle speeds on main entry roads and within staging/camping areas. Limits will usually be set between 5 mph and 15 mph.
- Create silt traps on roads and trails to allow silt to accumulate in catch basins adjacent to the route. These silt traps are commonly referred to as drain dips or rolling dips and are part of road and trail maintenance. Conducting the necessary environmental study is necessary prior to conducting maintenance.
- Conduct road and trail maintenance when significant soil moisture is present. When significant moisture level in soils is not present, apply water prior to and during maintenance activities to reduce dust emissions. Emissions from maintenance activities are to be minimized. It is recognized that the short term production of low

levels of emissions are necessary to provide the longer term benefit of reduced airborne emissions resulting from well-maintained roads and trails.

- Stabilize and replant vegetation on denuded areas over 0.1 acres to reduce the potential for windblown events and mechanical dust generation. Areas include unplanned parking areas, campsites and other previously disturbed areas. Restoration may require the use of heavy equipment resulting in ground disturbance, thus requiring environmental study prior to breaking ground.
- Emphasize application of dust suppressants and/or silt traps on roads. Single track trails generally do not require such applications.
- Prohibit the use of OHVs on High Pollution Advisory Days (PM-10 only), as indicated by Maricopa County.

Rehabilitation of Routes

- Soil ripping activities using tracked vehicles and vehicles other than all-terrain vehicles and utility terrain vehicles (ATVs/UTVs) will be conducted when tortoise are inactive. This is generally October 15 – March 31.
- When activities are conducted in the tortoise active season using ATV/UTVs pulling a harrow, a tortoise monitor will be on site to prevent injury to tortoises.
- Work crews will be briefed for encounters with desert tortoise.

STANDARD OPERATING PROCEDURES

General

- Any significant future modifications of this plan could only occur through NEPA compliance, public involvement, interagency coordination, and the preparation of a decision document for the amendment. In the case that environmental effects are adequately described by this plan, only a Determination of NEPA Adequacy (DNA) form would be completed along with the necessary surveys as determined by the Monument manager.
- A visitor access guide will be published and made available as full size hard copy maps for sale. Smaller maps will be available for free and also posted virtually on the internet. The visitor access guide may be provided for free or at a low cost based on quality of the product. All other products will be free.
- Appropriate NEPA analysis will be obtained prior to any ground disturbance not discussed in this plan, and impacts to cultural resources, or other resource values, that may be discovered will be mitigated or avoided.

Routes

- Standards and guidelines will be followed per BLM Manuals 9113, 9114 and 9115 for BLM road, trail and primitive road maintenance, new construction or reconstruction. The standards and guidelines for primitive roads will be based on the

functional requirements of the various types of recreational motorized users. BLM will not develop, endorse or publish road or trail ratings. BLM will describe the physical aspects of a road, primitive road or trail and / or recreation site as necessary to avoid visitor inconvenience and align visitor expectations with existing conditions. Maintenance standards for each designated route will be documented and route modifications will be identified and recommended if necessary using Route Management Objective forms. Maintenance will be completed only to the identified maintenance intensity level in support of resource protection, delivery of services to the public and public safety.

- Maintenance activities using tracked vehicles and vehicles other than ATVs/UTVs will be conducted when tortoise are inactive. This is generally October 15 – March 31.
- Maintenance procedures for physical barriers will be developed and tracked manually or systematically by a system such as FAMS.
- BLM may open an administrative route where valid rights of way or easements of record were not accurately identified in the route designation process.
- Any person, organization or governmental body may propose that any current route designations be changed to another designation. This means from “open”, “closed” or “limited” to another designation of “open,” “closed” or “limited.” Until such time that specific application materials are developed, requests to change route designations must be submitted in writing to the field manager as described in the New Routes section of this plan.
- Upon receipt of a route change proposal, it will be reviewed by the authorized officer. Since the designation of routes is a discretionary action the authorized officer may determine whether or not the proposal has merit and whether or not the proposal constitutes a significant or minor modification. If the application is rejected, a letter will be sent to the applicant indicating the reasons for rejection. If accepted, the application will be forwarded to the appropriate BLM staff. The application will be reviewed and a recommendation shall be made to the authorized officer as to appropriateness of the proposal and magnitude of NEPA requirements. Further, a recommendation shall be forwarded as to whether or not the proposed action is significant or minor. If the authorized officer determines that staffing/funding is lacking, the authorized officer may reject one or all proposals.
- The proposed BLM Roads consist of roads or primitive roads that provide the principal access from the public highway system to public lands in the planning area. These routes are the main connectors of the planning area’s existing travel route network under current and foreseeable traffic patterns. These routes function as BLM local roads although road standards may vary depending on type of use or to meet specific management objectives. These routes will generally be the priorities for pursuing legal access acquisition (or adjudicating existing access rights) across non-federal land, and for completing maintenance to ensure long term, legal public

access to the public lands in the planning area. Road segments from the public highways to the public land may be posted with 'Public Land Access Route' signs or another suitable message.

- When accepting a proposal, the authorized officer should consider cost recovery.
- Hand raking and disguise of prominent officially closed routes, including planting commonly found plants on closed routes will be employed to help discourage use.
- Proactive route rehabilitation work would be utilized where the first passive phase has not proven to be successful or where route conditions were clearly beyond the capability of the first phase to address.
- Focus on signing of the open route network so that it stands out well, thus discouraging interest in closed routes. The signing of closed routes will be done infrequently, since they have been found to be more of an attractant than a deterrent to unauthorized use.

New Routes

All proposed route additions received from the public will be processed as follows:

- 1) Route locations will, as a minimum, be mapped or located under instructions from the BLM using accepted global positioning system devices and presented to BLM for consideration. Locations of route proposals off of designated motorized routes must be located and mapped using non-motorized methods.
- 2) Route proposals submitted to BLM will include a description of the route (including its proposed width), its proposed use(s) (including expected traffic and design vehicle) and rationale for its need.
- 3) The proposed location will be staked and flagged for on-the-ground review by resource specialists.
- 4) The route location will be analyzed for potential conflicts such as (but not limited to): wildlife habitat and movement, cultural resources, visual resources, other recreation uses, mining claims or leases, grazing facilities, ROWs, and proximity to other jurisdictions (such as private land). A structured process will be used to evaluate and document the potential route conditions.
- 5) The conflict assessment may lead to development of mitigation actions or alternative locations or design.
- 6) An environmental analysis would be conducted to determine the environmental effects of the proposed route and any alternatives and recommended mitigation.
- 7) A decision will be issued by the authorized officer based on LUP conformance, resource objectives, and environmental impacts.
- 8) If the decision is to approve the addition of the route, the Travel Management Plan will be updated, accordingly.

- 9) BLM may require that a licensed surveyor provide cadastral survey (to be reviewed by a BLM cadastral surveyor) of a right-of-way route prior to issuance of the authorization to an outside entity.

Dust Management

Efforts will be made to manage air quality throughout the Monument and specifically inside the PM-10 non-attainment boundary in the northern part of the Monument. Best Management Practices regarding dust management are described above. Specific treatments to manage dust would be recorded on the Trail Management Objectives form on an individual basis to inform the BLM reviewer of the desired treatment and application frequency and/or rate.

IMPLEMENTATION OF TRAVEL MANAGEMENT PLAN

Implementation of the actions specified in this plan, in a consistent and timely manner, is necessary to protect monument objects and serve visitors better. The order of implementation is based on the ability to make noticeable change in Monument conditions and affect visitor behavior to achieve desired conditions. Actions described below may be done concurrently, combined or conducted in the order in which they are funded. BLM will attempt to complete implementation in the order shown.

The order in this list refers to the priority of the task:

- 1) Complete installation of route marking signs for open and closed routes.
- 2) Begin rehabilitation of closed routes.
- 3) Install new information kiosks and billboards. Upgrade existing kiosk boards as necessary. New portal Entry signs will be installed at locations as identified in the Sign Plan. Replace existing signs as necessary.
- 4) Complete a plan/environmental assessment to reopen the temporary OHV closure area.
- 5) Create, print and begin distributing new public access map brochures.
- 6) Develop the monitoring program including the creation of Route Management Objectives (RMOs) for all numbered routes.
- 7) Develop a road and trail maintenance schedule or on-demand triggers to meet the Route Management Objectives desired route conditions.
- 8) Conduct surveys, engineer and apply for funding to construct new road south of I-8.
- 9) Conduct deferred maintenance on roads, primitive roads and trails through site specific projects.
- 10) Construct the new road south of I-8.

FUNDING STRATEGY

Funding will be needed for labor costs to provide law enforcement, recreation visitor services, and to cover maintenance and operational costs such as supplies, materials, tools, equipment, vehicles and communications. For instance, implementation of the Rehabilitation Plan involving

the restoration and decommissioning of nearly 204 miles of closed routes is expected to range from \$200,000 for the more passive alternative to \$500,000 for the very active alternative. Operations funding for cultural surveys, land health assessments, wildlife surveys, transportation maintenance and related costs will be determined on an ongoing project basis, and planned annually. A preliminary engineering summary has not been completed. BLM will strive to lower the costs through partnerships, in-house labor and careful engineering.

Funds for labor, supplies and equipment will be pursued through the BLM budget process, and will be subject to appropriation of funds. Additional funding sources may include the BLM's Repair of Damaged Lands remediation fund, the Arizona OHV Fund, and contributed funds available from non-profit groups. Funding for partnerships will be pursued through Challenge Cost Share, a funding program that matches non-federal funding sources for cooperative agreements. Grants from any appropriate sources will be pursued, including state, federal, and private sources. Appropriate agreements will need to be created to enable acquiring such funding.

ADAPTIVE MANAGEMENT

Modifications to this plan, or another appropriate plan, would be considered if monitoring indicates that goals and objectives are not being met. Adaptive Management Thresholds triggering a review of this plan, or another appropriate plan, will be as follows:

- Monument values or objects are being harmed, or are likely to be harmed if the current trend of damage continues. Trends would be established through monitoring and include recording of impacts and tracked to establish if a trend exists.
- Determination that less than 98% of visitors are staying on route after full implementation of the plan. This could be calculated by dividing the number of reports of travel off of designated routes by the yearly count for vehicle counters in a given area. Other methods to assess compliance could be developed with the intent of increasing the accuracy of assessing 98%.
- Staff and/or partners are unable to keep up with rehabilitation of off-route travel and impacts from parking and/or camping. This would be assessed through park ranger logs, rapid site assessment reporting or management review.
- Where use levels increase in SDNM, increases in route maintenance may be necessary to maintain the desired level of access. When primitive road maintenance no longer achieves the desired condition, upgrading of primitive roads to roads may be necessary to protect resources and Monument objects. Such upgrading would be accomplished by completing a plan/environmental assessment related to the construction activities. RMP compliance would be determined through this process. The primitive road asset type would be changed to road at that time.

- Signage may need to be adjusted based on changes in use of the routes. Areas receiving little use today may become popular in the future. Signage would be adjusted based on staff observations, monitoring data and park ranger logs. Additional signs and special message signs would be installed as necessary to address the changing conditions and to protect resources and Monument objects.

FORESEEABLE PROJECTS

The topics below identify route system actions that may be taken at a later date which will require further analysis and documentation. This is not an exhaustive list, but represents actions that are likely to occur in the next one to three years.

- 1) Activity level recreation planning and construction of camping areas to satisfy the requirements of 43 CFR 8341.2 to reopen the temporary OHV closure area and implement the recreation decisions of the RMP.
- 2) Site specific planning to address target shooting and related access to suitable areas while using designated routes.
- 3) Road, primitive road or trail maintenance will likely be needed and will be completed after the necessary surveys and environmental review have been completed.
- 4) New routes may be added to the designated route network to address changed conditions or demands. The process of adding new routes to the designated route network, motorized or non-motorized, will include a structured analysis approach as outlined in the SOPs section.

REFERENCES

Jacob, Gerald R. and Richard Shreyer, *Conflict in Outdoor Recreation: a Theoretical Perspective*, Journal of Leisure Research, Fourth Quarter 1980, pp 368-381

ATTACHMENT I – TEMPORARY OHV CLOSURE AREA

A temporary closure area described in Federal Register Notice 73 FR 27844 was issued on May 14, 2008. This closure closed 88 miles of primitive roads in SDNM south and east of North Maricopa Mountains wilderness area. **Map 10**, Vehicle Route Closure, shows the closure area currently in effect.

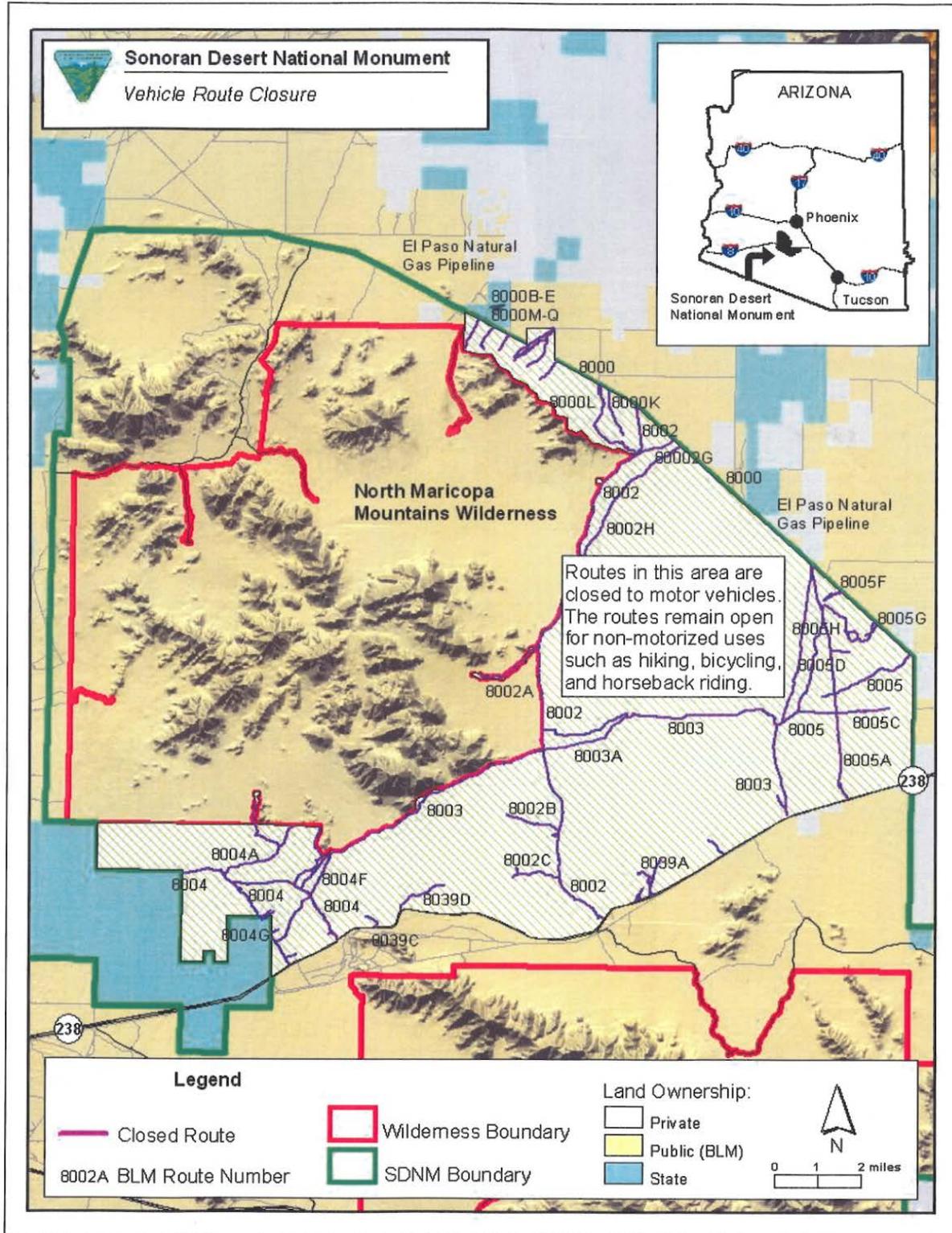
Conditions to reopen this closed area are described in 43 CFR 8341.2. The CFR states:

Such closures will not prevent designation in accordance with procedures in subpart 8342 of this part, but these lands shall not be opened to the type(s) of off-road vehicle to which it was closed unless the authorized officer determines that the adverse effects have been eliminated and measures implemented to prevent recurrence.

The route designations made in the SDNM RMP/ROD do not resolve the causal agent of the OHV closure which is the issue of unlawful cross-country driving. RMP decisions to limit the access to licensed vehicle drivers using street legal registered vehicles are intended to address, on a landscape level within SDNM, reducing or ending cross-country driving. There are currently no engineering solutions proposed in the RMP to prevent recurrence. Therefore, the conditions to reopen the temporary OHV closure area were not satisfied in the RMP.

Due to the extensive engineering, time and cost associated with reopening this area, a subsequent plan will be forthcoming to address this issue specifically and satisfy the requirement to prevent recurrence. Such a plan was circulated for public comment in 2008, however, it was not released as a result of a court settlement which mandated BLM to keep the closure in effect until the RMP was completed. A detailed plan and environmental assessment will be completed to satisfy the need to prevent damage from reoccurring.

Map 10. Vehicle Route Closure



ATTACHMENT 2 – SDNM SIGN PLAN

INTRODUCTION

The Sonoran Desert National Monument (SDNM) poses numerous challenges in providing proper public information in the field, including directional, regulatory, and interpretive signs. The SDNM is vast (486,400 acres) and remains undeveloped, remote, and difficult to access. Although the area has an extensive network of unimproved “two-track” vehicle routes that provide access at numerous points along the boundary of the SDNM, there currently is no improved access to the SDNM. Additionally, the monument is bisected by Interstate 8 and State Route 238 (SR-238), and State Route 85 parallels the western boundary of the monument. Thus, large numbers of potential visitors pass by the monument each day, but the access and travel conditions on the monument itself are entirely primitive. Within the boundary of the SDNM are other federal land use designations of interest and importance to the visiting public, including three designated wildernesses and the Juan Bautista de Anza National Historic Trail. Also, the SDNM is bordered by the Barry M. Goldwater Air Force Range and the Tohono O’odham Nation, and a portion of the monument consists of lands re-conveyed to the public domain from the Department of Defense.

This document attempts to address these challenges and put into place a cohesive approach to providing public information signing for the SDNM. The objectives of this plan are to:

1. Provide an orientation to the many types of signs and their uses on the SDNM;
2. Inventory public access and information locations; and,
3. Provide suggestions for future signing.

SIGN TYPES

The BLM “Sign Guidebook” (December, 2004) lists the following categories and subcategories of signs:

- Identification Signs
 - Administrative Signs
 - Feature Signs
 - Area Signs
- Guide Signs
- Informational Signs
 - Bulletin Board
 - Instructional
 - Information/Interpretive
 - Accessibility
- Traffic Control Devices
- Regulatory Warning Signs
- Administrative Signs
- Stewardship Messages
- Miscellaneous Signs
 - Temporary
 - Concessionaire
 - Snowmobile Use
 - Special Event
 - National/Programmatic Initiatives

Many of these types of signs are already in use on the SDNM, and with increasing public awareness and visitation to the monument, additional signing will be required to provide safe, educational experiences for the visiting public. **Figures 1 through 5** below provide illustrations of some of the signs currently in use on the SDNM.



Figure 1 shows a standard BLM “portal” sign posted at the boundary of the SDNM. This sign is an example of an “administrative identification” sign.

Figure 1. Example of an “administrative identification” sign.



Figure 2. The sign display at the Margie’s Cove West Trailhead provides information on wilderness, the Margie’s Cove Trail, common wildlife of the area, and a map of the trail and adjacent terrain. Such sign displays are categorized as “informational / interpretive.”

Figure 2. Example of an "informational/ Interpretive" sign.

Figure 3. A standard BLM route marker is an example of a “guide” sign.



Figure 3. Example of a “guide” sign.



Figure 4. This sign warning of potential smuggling and illegal immigration activity south of Interstate 8 is an example of a “temporary informational / warning” sign.

Figure 4. Example of a “temporary informational / warning” sign.

Figure 5. This abandoned mine hazard warning is an example of a “regulatory warning” sign.



Figure 5. Example of a “regulatory warning” sign.

Public information needs on the on the SDNM include signs to convey information at specific locations, such as boundary entrance points, recreation sites, and road intersections; marking continuous linear features such as wilderness boundaries, trails, and vehicle routes; unique features or requirements of certain areas, such as areas closed to access by motor vehicles; and conditions or situations of a temporary nature, such as temporary land use restrictions relating to seasonal fire prevention orders.

PUBLIC ACCESS AND INFORMATION LOCATIONS

Access and public information points are locations where the public enters the SDNM and has an expectation of receiving area information that relates directions, educational material, and regulations. An inventory of specific locations on the SDNM that currently have, or are anticipated to require, public information signing is depicted in **Maps 11 and 12**, SDNM Access Points and Visitor Information Locations North and South of I-8. These locations were

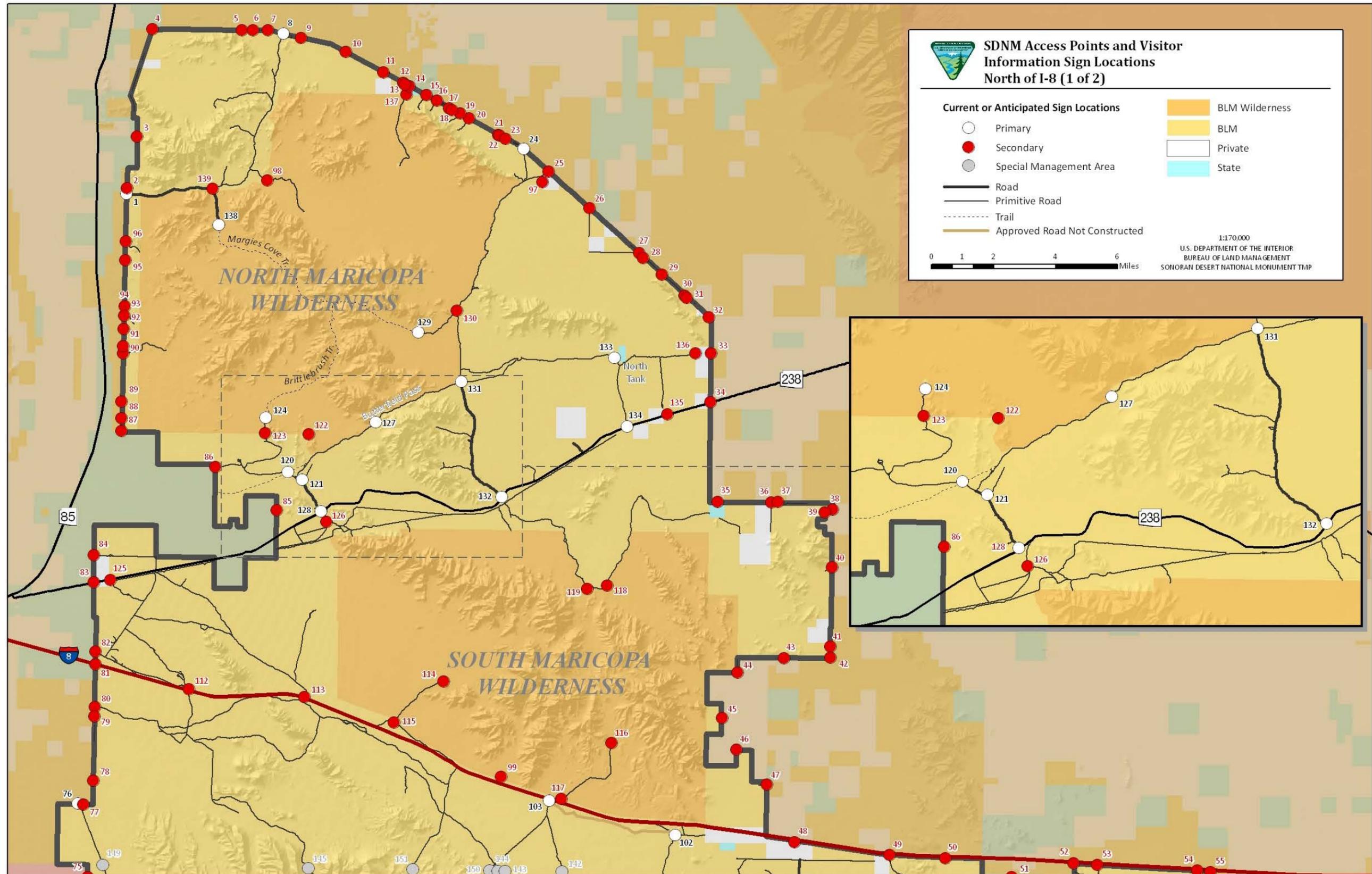
subdivided into two categories – primary and secondary – depending on the amount of anticipated visitation and public information needs. A primary access and information point is a location where visitors access the SDNM in relatively high numbers. These locations are anticipated to have a higher demand for on-site public information materials, and thus a need for more substantial infrastructure such as sign “kiosks” and interpretive sign displays, directional signing, and traffic control. Secondary access and information points are expected to have less visitation and a correspondingly lesser need for public information infrastructure. The SDNM does not have quantitative visitor data available, so these judgments are subjective.

In addition, separate access and public information requirements exist for special management areas within the SDNM. These special management areas include a portion of the Sand Tank Mountains of the SDNM formerly known as “Area A” and re-conveyed to the public domain after service as a portion of the Barry M. Goldwater Air Force Range. Area A has special access requirements mandated by statute, including access only by permit. Other special management areas with special access requirements include three wilderness areas and the Juan Bautista de Anza National Historic Trail. **Table 6**, Number of Access Points and Public Information Locations on SDNM, provides an enumeration for each category of public access and information location.

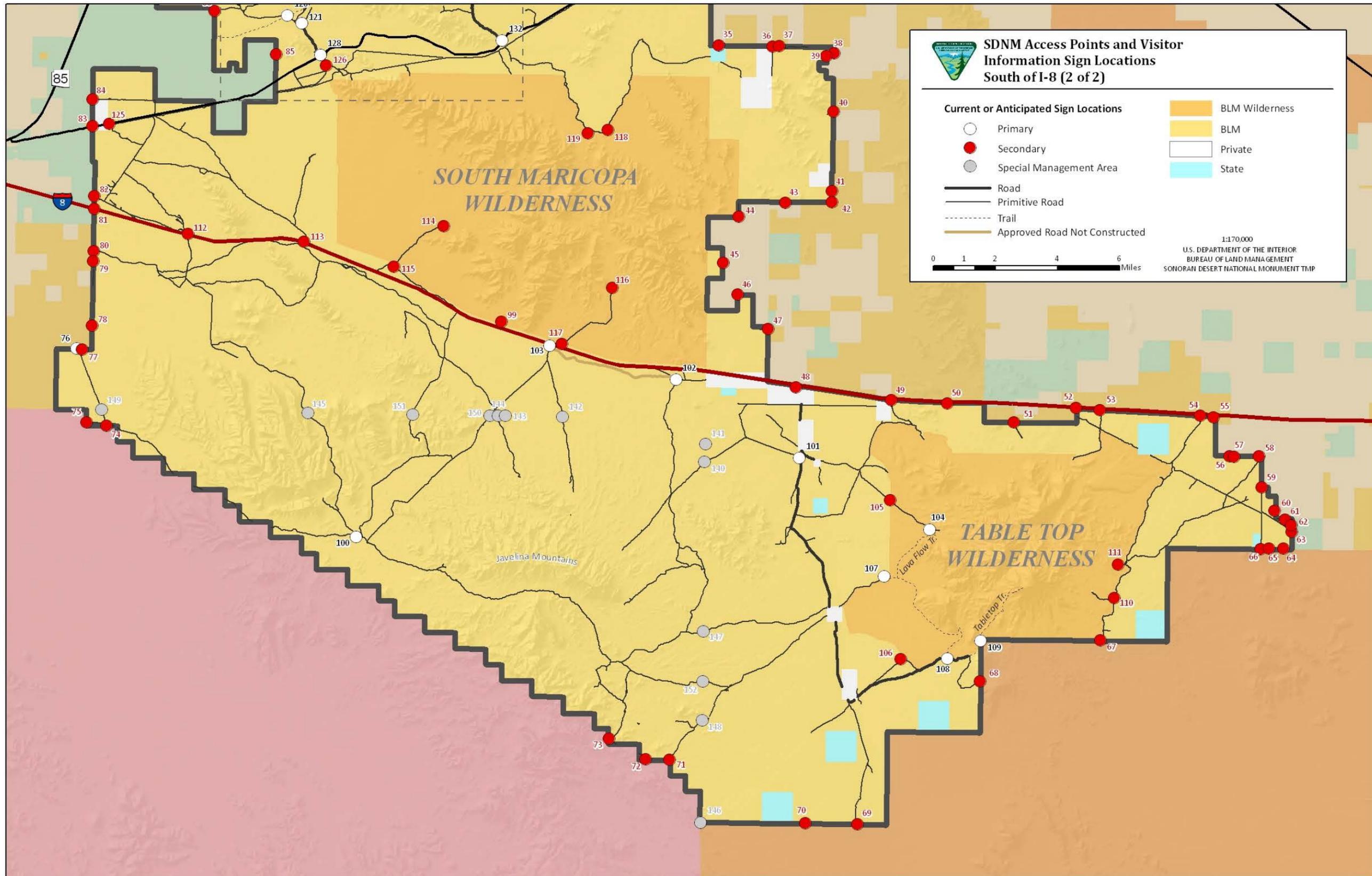
Table 6. Number of Access Points and Public Information Locations on SDNM

| Primary | Secondary | Sand Tank Mountains (formerly Area A) | Total |
|---------|-----------|--|-------|
| 23 | 116 | 13 | 152 |

Map 11. SDNM Access Points & Visitor Information Sign Locations North of I-8



Map 12. SDNM Access Points and Visitor Information Sign Locations South of I-8



Primary Access and Public Information Points

There currently is no improved access to the SDNM; therefore, all primary access points to the SDNM are locations where primitive dirt roads leave the pavement of the major highways that bisect the monument, or are locations where BLM has placed small recreation facilities such as trailheads. **Figure 6** depicts the public information display at the monument entrance from SR-238 to the “Gap Well,” or “Butterfield” area (point 121 on **Map 11**).



Figure 6. Entrance to the SDNM from SR-238 at “Gap Well”.

Table 7 below provides a listing of the primary access and public information points to the SDNM and the signing currently existing at those locations.

Table 7. Primary Boundary Entrance and Interior Access and Public Information Locations on the SDNM

| Map Number | Name / Location | Comments |
|------------|--------------------------|---|
| 1 | BLM Route 8001, West | SDNM boundary; existing portal sign. |
| 8 | BLM Route 8001, North | SDNM boundary; existing portal sign. |
| 24 | BLM Route 8002, North | SDNM boundary; existing portal sign. |
| 76 | Sand Tank Wash, West | SDNM boundary; existing portal sign; Area A gate. |
| 100 | Papago Indian Chief Mine | No visitor information on-site. |
| 101 | Vekol Valley | Existing portal sign, temporary “smuggling warning” sign. |
| 102 | Freeman Road | Existing temporary “smuggling warning” sign. |
| 103 | Bighorn Station | Existing portal sign, temporary “smuggling warning” sign. |

| | | |
|-----|----------------------------------|---|
| 104 | Lava Flow Trail, North Trailhead | Existing sign display, visitor register, parking for three vehicles. |
| 107 | Lava Flow Trail, West Trailhead | Existing sign display, visitor register, one campsite, parking for five vehicles, wire gate. |
| 108 | Lava Flow Trail, South Trailhead | Existing sign display, visitor register, parking for three vehicles. |
| 109 | Table Top Trailhead | Existing three-site campground, single-vault toilet, one picnic site, sign display. |
| 120 | Anza NHT, West | Existing interpretive sign. |
| 121 | Gap Well | Existing double-vault toilet. |
| 124 | Brittlebush Trailhead | Existing sign display, pipe-rail vehicle barrier, visitor register, parking for five vehicles. |
| 127 | Happy Camp | Existing interpretive sign. |
| 128 | BLM Route 8004, Gap Well | Existing portal sign, sign “kiosk”/bulletin board, wire gate, visitor register. |
| 129 | Margie’s Cove East Trailhead | Existing single-vault toilet, parking for five vehicles, one picnic table, pipe-rail vehicle barrier, visitor register, sign display. |
| 131 | Anza NHT, East | Existing interpretive sign. |
| 132 | BLM Route 8002, Estrella | Existing portal sign, sign “kiosk”/bulletin board, wire gate, visitor register. |
| 133 | Christmas Camp | Existing sign “kiosk”/bulletin board. |
| 134 | BLM Route 8003, North Tank | Existing sign “kiosk”/bulletin board. |
| 138 | Margie’s Cove West Trailhead | Existing three-site campground, single-vault toilet, parking for ten vehicles, pipe-rail vehicle barrier, visitor register, sign display. |

Secondary Access and Public Information Points

All boundary access to the SDNM, with the exception of the four locations indicated in **Table 7** above, is judged to be “secondary” in nature. These are locations where primitive dirt roads intersect the boundary of the SDNM and where visitation is very light and dispersed and does not tend to converge at a specific destination. Secondary access and public information points also consist of notable road intersections or destinations such as wilderness barriers that require directional or informational signs to better inform the public of the nature and intent of such facilities. As a result of the SDNM travel management plan, several of the secondary boundary entrance points would be abandoned as the associated routes would be closed.

Special Management Area Access and Public Information

Area A

The former “Area A” of the Barry M. Goldwater Air Force Range was re-conveyed to the public domain by statute in 2001 and became a part of the SDNM. As a part of this enabling legislation, the Department of the Interior was required to maintain controlled access at the behest of the Department of the Defense. A free access permit is provided to the public after viewing a short informational and safety video that discusses the unique hazards (unexploded ordnance) that may be encountered in the area. Due to the status of this area as a former military training area, the entrance points to this area have unique public information needs.

Figure 7 depicts gate 9A, a remote, lightly used access point to “Area A.”



Figure 7. Public information signs at gate 9A, Area A

Wilderness

The three wilderness areas contained within the boundary of the SDNM were established by the Arizona Desert Wilderness Act of 1990, actually pre-dating establishment of the monument itself. The three wildernesses are the North Maricopa Mountains Wilderness, South Maricopa Mountains Wilderness, and Table Top Wilderness. The boundaries of these wildernesses are surveyed and marked with survey monuments. Where boundaries are established as setbacks from existing vehicle routes, the boundaries are also marked with fiberglass wilderness boundary markers placed approximately every one-tenth mile, with additional markers placed at the intersections of the wilderness boundaries with former vehicle routes.

Unique wilderness boundary features known as “cherry stem roads” are common in the three wildernesses of the SDNM. Cherry stem roads are locations where the wilderness boundary was established as a narrow setback on both sides of a vehicle route, resulting in a long, narrow strip where enhanced motorized access is provided to an area otherwise off limits to vehicles

because of its wilderness status. The entrances to these cherry stem roads currently are posted with signs advising the public that the wilderness boundary extends along the length of the road on both sides, and that vehicle travel is permitted along the length of the road but not to either side. **Figure 8** below provides photographs of wilderness boundary markers currently in use on the SDNM.



Figure 8. Wilderness boundary markers

Juan Bautista de Anza National Historic Trail

The Juan Bautista de Anza National Historic Trail bisects the SDNM between the North Maricopa Mountains and South Maricopa Mountains wildernesses. Popular locations on the historic trail include “Christmas Camp” on the eastern side of the monument, and Butterfield

Pass and Happy Camp farther to the west. Current signing includes fiberglass route markers, educational signs placed at the eastern and western ends of Butterfield Pass, and a sign placed at Happy Camp in cooperation with the Boy Scouts of America.

FUTURE SIGNING

Much of the signing currently present on the SDNM was installed shortly after the monument was established in 2001, or ten years earlier when the Arizona Desert Wilderness Act was passed (1990). The signs generally are faded, out-of-date, and inadequate to meet the information needs of the visiting public.

Although the inventory of boundary entrance and interior access and public information locations depicted by map I indicated there are 152 locations on the SDNM that require public information signing, this number is by no means complete. This map does not depict hazards, temporary area closures, wildlife water catchments, and other such sites that may have a need for public information postings. It is also likely that future planners may identify public information needs from future demand that are not currently anticipated.

The goals of public information signing for the SDNM are:

1. Each boundary entrance and interior access and public information location depicted in map I will be clearly posted so as to advise the visiting public of their entrance onto the SDNM and the opportunities and regulations for use.
2. Abandoned boundary entrance locations will be clearly posted as “closed.”
3. Public information provided at primary boundary entrance and interior access locations will focus on the natural and historical objects for which the monument was designated.

Primary Access and Public Information Points

Primary access and public information locations would be anticipated to have a high degree of infrastructure and signing available for public information. Such infrastructure may consist of the large standard BLM “portal” sign currently approved for such locations together with informational and interpretive sign displays tailored to selected locations that are anticipated to reach a wide audience. The Gap Well / Butterfield area where the Juan Bautista de Anza National Historic Trail and North Maricopa Mountains Wilderness attract numerous interested visitors is a good example of an area where such information would be expected to be provided. The public information signing at such locations may complement other facilities such as trailheads, campgrounds, and day-use picnic areas.

Signs and associated infrastructure are anticipated at 66 locations not identified specifically in **Table 7**. Each of these locations would be anticipated to have additional informational and educational sign infrastructure, including improved vehicle access, small parking areas, and directional signing as required by the site. Signs and infrastructure will be installed as deemed appropriate for the location.

Secondary Access and Public Information Points

These access and public information locations would be clearly posted with the standard BLM “secondary portal” (smaller) sign and would have a “secondary entrance sign” that contained the most important, “need-to-know” public information condensed onto one sign (**Figure 9**). Thus, these entrances and access points would be clearly marked with two signs that advised the public of their entrance into the SDNM and of the most important information needed for their visit. No other public information normally would be provided at these locations, except for occasional temporary signing needs (such as for seasonal fire restrictions) or special emphasis programs, such as increased law enforcement operations.

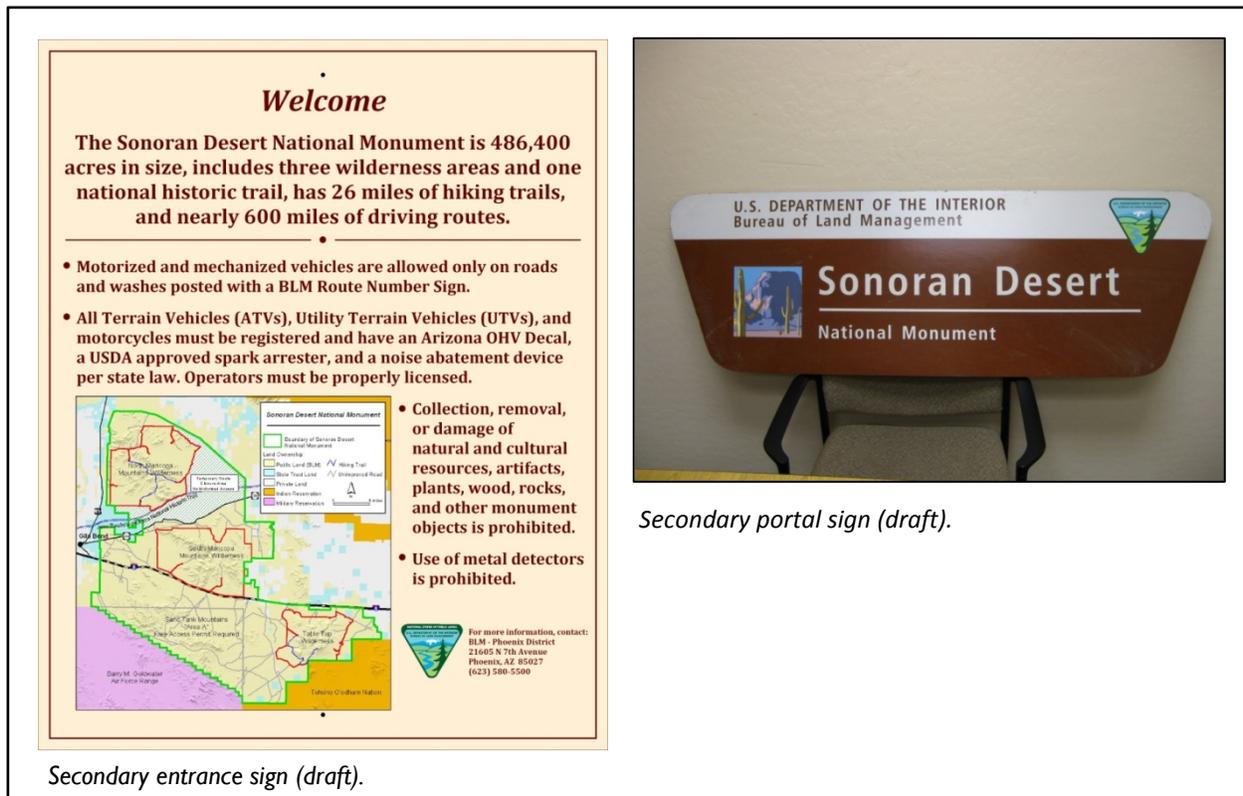


Figure 9. Signs to be posted at each secondary access point of the SDNM

Table 8 on the next page provides a list of secondary access points that would be abandoned as a result of the TMP, generally because there would be no open public vehicle route extending into the monument from the boundary access point. These locations would be clearly marked as closed to public use.

Table 8. Secondary Access Locations to be Closed to Public Use

| Map Number | | | | | |
|------------|----|----|----|----|-----|
| 2 | 17 | 38 | 51 | 65 | 89 |
| 3 | 18 | 39 | 53 | 66 | 91 |
| 5 | 21 | 41 | 55 | 67 | 92 |
| 6 | 22 | 42 | 56 | 70 | 93 |
| 7 | 23 | 43 | 57 | 77 | 94 |
| 9 | 28 | 44 | 60 | 78 | 95 |
| 10 | 29 | 45 | 61 | 79 | 96 |
| 11 | 30 | 46 | 62 | 85 | 135 |
| 12 | 31 | 47 | 63 | 87 | 136 |
| 13 | 32 | 50 | 64 | 88 | |

SPECIAL MANAGEMENT AREA ACCESS AND PUBLIC INFORMATION

Area A

Public access to “Area A” would continue to be managed through the free access permit system as required by statute and administered cooperatively between the BLM, Department of Defense, and U.S. Fish and Wildlife Service. Information signing at these locations would be developed in coordination with the Luke Air Force Base, Department of Defense. At a minimum, these signs would advise the public of the boundary entrance to this special management area, the need to secure a free access permit for legal access, and the reasons for the permit requirement.

Wilderness

In addition to the types of boundary markers currently in use, wilderness portal signs would be placed at all primary access to wilderness areas (**Figure 10**). Wilderness is a large component of the SDNM, and wilderness concepts and management would be an important component of educational sign displays installed at future day-use and overnight facilities

Figure 10. Wilderness portal sign

Juan Bautista de Anza National Historic Trail

Improved educational signing for the national historic trail is a tremendous need and opportunity on the SDNM. The Juan Bautista de Anza National Historic Trail overlaps with several other events of importance in Arizona (and national) history, including the Mormon Battalion Trail and Butterfield Overland Trail; is located in a particularly scenic and popular area of the SDNM; and represents excellent motorized and non-motorized recreational opportunities. Additionally, the historic trail is adjacent to the North Maricopa Mountains Wilderness for much of its length on the SDNM. The area of the Juan Bautista de Anza National Historic Trail, particularly in the vicinity of Gap Well and Butterfield Pass, offers the greatest opportunity for BLM to present a positive public message built around monument values, the historic trail, wilderness, and natural history of the Sonoran Desert.

Temporary and Emergency Signs

Public information signing would be provided as needed to address unforeseen situations, or to advise of temporary restrictions such as seasonal fire restrictions or vehicle closures, or to address emerging or ongoing law enforcement, natural resource, or public health and safety situations.

REFERENCES

Bureau of Land Management. 2004. Sign Guidebook. Denver, CO: BLM/WY/AE-05/010+9130. 170 pp.

ATTACHMENT 3 – SAMPLE ROUTE MANAGEMENT OBJECTIVE FORM

Figure 11. Sample of a Route Management Objective Form

| ROUTE MANAGEMENT OBJECTIVE (RMO) FORM | | | | | | | |
|---------------------------------------|-----------------------|----------------------------------|-------------------------|--------------------------------|------------------------------|------------------------------|--------|
| DRAFT | | | | | | | |
| Trail / Road Name _____ | | Official Route Number _____ | | FAMS # _____ | | | |
| Designated for use by : | 2WD | 4WD | ATV | OHV | BICYCLE | HORSE | HIKING |
| Use Level Expected: | Recreational - | | | Heavy | Moderate | Light | |
| | Commercial - | | | Heavy | Moderate | Light | |
| | Special Rec Permit- | | | Heavy | Moderate | Light | |
| Restrictions Noted: _____ | | | | | | | |
| Route Experience | | Main Access | Loop | Destination | | | |
| Expected Driving Condition | Easiest | More Difficult (not a rating) | | Most Difficult | Very Difficult | | |
| Road/Trail Specifications: | Tread Width _____ | | | Grade %: Avg _____ Max _____ | | | |
| | Sub-grade width _____ | | | | | | |
| | Clearance needed | | | Width _____ ft Height _____ ft | | | |
| | Surface obstacles: | | | Smooth | Moderate | Rough | |
| | Drainage structures | | | Yes | | No | |
| | Cut / Fill: | | | 1/2 | 3/4 | full bench | |
| | Back Slope: | | | 1/1 | 2/1 | 1/2 | |
| Operations, Patrol, Monitoring: | | | | | | | |
| <u>Who will patrol or monitor</u> | | Agency Host | Volunteer Adopt-a-Trail | | How Often _____ | | |
| <u>Type of Patrol</u> | | Law Enforcement Monitoring | | | Maintenance Visitor Services | | |
| Maintenance: | | | | | | | |
| <u>Frequency</u> | | Monthly | Yearly | | Other _____ | | |
| <u>Maintained by</u> | | Agency | Contract | Volunteer | | Hardening / Dust Suppression | |
| <u>Method</u> | | Handwork | | Mechanized | | | |
| Facilities: | | | | | | | |
| Signs: | | Fiberglass | Metal on post | | Portal | | |
| Drainage Structures: | | Drain dips | Ditches | Culverts | | | |
| | | Bridges | Retaining Walls | | | | |
| Notes / Monitoring Site Locations: | | | | | | | |
| Notes: | | UTM | N | E | | | |
| Submitted by: _____ | | | | Authorized By: _____ | | | |
| Date: _____ | | | | Date: _____ | | | |

ATTACHMENT 4 – ENVIRONMENTAL ANALYSIS

FINDING OF NO SIGNIFICANT IMPACT AND DECISION RECORD

For the Sonoran Desert National Monument Travel Management Plan Environmental Assessment

DOI-BLM-AZ-P020-2012-005-EA

FONSI: Based on the analysis of potential environmental impacts contained in the attached environmental assessment, and considering the significance criteria in 40 CFR 1508.27, I have determined that implementing the actions as modified in the Decision Record below, would result in a Finding of No Significant Impacts on the human environment. Therefore, an environmental impact statement is not necessary to further analyze the environmental effects of the proposed actions.

DECISION RECORD:

Introduction: This document explains my decision and rationale for implementing the sign and route rehabilitation plans necessary to execute the travel management system for the Sonoran Desert National Monument (SDNM), administered by the Bureau of Land Management (BLM) Lower Sonoran Field Office (LSFO). These decisions are implementation-level which tier from the higher level Sonoran Desert National Monument Approved Resource Management Plan (RMP). In the RMP, land allocation decisions, in addition to the designation of a 411-mile travel route system, were analyzed and approved in accordance with National Environmental Policy Act (NEPA) and applicable BLM laws, regulations and policies. Appropriate public and internal scoping commensurate with the action were conducted as part of the planning process. Through the interdisciplinary planning phases the public were afforded opportunities to participate in the process, review decisions proposed, and provide comments for consideration. This document only addresses the two remaining implementation-level decisions necessary to initiate the decisions that require further NEPA analysis not already considered in the RMP.

The administrative record is available at the BLM Phoenix District Office, 21605 North 7th Avenue, Phoenix, Arizona. Direct questions about this Decision Record or the associated environmental analysis may be directed to Thomas Bickauskas, Travel Management Coordinator, at 623-580-5502. The Record of Decision for the RMP can be reviewed at the BLM website at www.blm.gov/az/st/en/prog/planning/son_des.html. These implementation decisions are subject to appeal. Appeal procedures are described on page 6 of this document.

Project Description: The environmental assessment (EA), Attachment 4 of the accompanying Travel Management Plan (TMP), analyzed the impacts associated with implementing two components of the TMP: the signing of 411 miles of routes and the rehabilitation and decommissioning of 204 miles of primitive roads located on public lands within the Sonoran Desert National Monument (SDNM). In two action alternatives, the BLM proposes to install approximately 2,150 signs and rehabilitate 204 miles of primitive roads on 486,400 acres of BLM-administered public lands east of Gila Bend, Arizona.

Background: The SDNM was designated in 2001 by Presidential Proclamation 7397. The proclamation mandated a prohibition of off-road driving and directed BLM to designate a travel system. Many miles of dirt roads and trails, in existence prior to the Monument was created, became the interim route system until individual route designations could be made. A thorough mapping of existing roads and trails was completed in 2003. Sensitive resources and Monument Objects were identified and considered in context with the existing roads and trails. Through a nine year planning process, route system alternatives were created to meet the objectives for the corresponding plan alternatives and were presented to the public. Regulations found in 43 CFR 8342.1 formed the basis for reviewing and considering effects on natural and cultural resources. The TMP and this accompanying EA has been written by the BLM to implement all aspects of managing the designated route system.

Decision: The decision to be made is my approval and direction to begin implementing the proposed actions addressed in the EA as modified in this Decision Record. These include the following:

- 1) Selection of a comprehensive signing plan;
- 2) Selection of a strategy and methods for closing routes;
- 3) Identification of actions that conserve special status wildlife species, cultural resources and monument objects.

Signing: About 411 miles of roads, primitive roads and trails will be signed for visitor navigation and information. Additional signs will be placed to delineate Monument boundaries, important locations, points of interest throughout the Monument and other management areas. The installation of approximately 150 large signs and up to 2,000 small fiberglass signs is reasonable and necessary to communicate rules, information and to provide needed visitor services. It is my decision to implement the sign plan as presented in the TMP and EA.

Rehabilitation: Just over 204 miles of closed primitive roads will be decommissioned and rehabilitated. This action is necessary to implement the approved route designations. Considering the ongoing border related activities that have put Monument resources at risk, it is my decision to combine elements from the more mechanized reclamation alternative (identified as the Very Active alternative in the EA) with the more passive, indirect reclamation alternative. The mechanical method of using a harrow towed by an ATV will be heavily

employed in the Vekol Valley and the Smith Road area, east of Table Top Mountain Wilderness. Ripping would not be conducted in this area, thus greatly reducing the likelihood of unearthing buried artifacts. **Table 9**, Approved Rehabilitation Plan by Method and Miles, and **Maps 13 and 14**, Approved Rehabilitation Plan for Closed Routes North and South of I-8, at the end of this document show the Approved Rehabilitation Plan, as modified in this Decision Record.

Table 9. Approved Rehabilitation Plan by Method and Miles

| Rehabilitation Method | Miles |
|--|-------|
| Harrow (south of I-8) | 43.1 |
| Rip/harrow (north of I-8) | 8.0 |
| Berm and sign | 3.6 |
| Vertical mulch/seed with berm and sign | 40.6 |
| Sign | 24.5 |
| Sign and fence | 33.9 |
| Sign and rake out tracks | 7.1 |
| Rake out tracks | 9.0 |
| Passive | 34.6 |
| Total | 204.3 |

Tortoise Habitat: Reclamation, to include route closures, in Category I, II and III desert tortoise habitat will result in the defragmentation of approximately 215 linear acres of habitat. Approximately 215 acres of desert tortoise habitat are being banked as compensation for future projects such as recreation improvements along the Butterfield/Juan Bautista de Anza trail corridor. **Table 10**, Desert Tortoise Habitat Returned to Productive Habitat, describes the category and acreage associated with them.

Table 10. Desert Tortoise Habitat Returned to Productive Habitat

| Habitat Class | Miles Closed | Avg Route Width (Ft) | Ft/Mile | Total Sq. Ft. | Sq. Ft. /Acre | Acres |
|------------------------------|--------------|----------------------|---------|---------------|---------------|-------|
| Category 1 | 59.1 | 12 | 5,280 | 3,747,110.4 | 43,560 | 86.0 |
| Category 2 | 83.8 | 12 | 5,280 | 5,311,468.8 | 43,560 | 121.9 |
| Category 3 | 5.4 | 12 | 5,280 | 344,678.4 | 43,560 | 7.9 |
| Total all habitat categories | | | | | | 215.9 |

Rationale: This decision is based upon conformance with the Monument Proclamation, RMP and the intense level of public involvement and comment during the RMP process. The TMP components implement the primary RMP goal TM-4 that directs the creation of the TMP and management of the route system. Compliance with off-road vehicle regulations in 43 CFR 8342.1 is evident through the management actions contained within the TMP and the proposed actions contained within the accompanying EA.

The BLM analyzed three alternatives in the EA to review methods for completing the closures and signing the routes and areas of the Monument. The analysis shows that using more passive methods would provide a high degree of protection to cultural objects of the Monument while having negligible effects on wildlife. My decision to combine elements of both action alternatives allows for accelerated removal of the routes in the Vekol Valley, the Smith Road area and where otherwise identified by the authorized officer. This will assist with remediation of smuggling impacts. While smuggling is illegal, its effects persist and create a situation whereby well-intentioned citizens will likely find it difficult to comply with the route designations if these closed routes are not aggressively rehabilitated. While cultural resource survey will be completed where required before ground disturbing activities will be authorized, the exclusive use of a harrow towed by an ATV, rather than ripping using a bulldozer in the areas south of I-8, would potentially reduce disturbance to undiscovered cultural resources. The harrow has a shallow cut and can be portaged by lowering the wheels and avoiding ground disturbance in sensitive resource areas.

Banking a tortoise habitat credit of 215 acres will allow future actions intended to support BLM management to be in compliance with tortoise compensation requirements of Instruction Memorandum AZ-2009-010 Desert Tortoise Mitigation Policy. Compensation may be a concern in future activity level planning to allow reopening of the temporary closure area north of SR-238/Maricopa Road. Compensation for additional projects outside SDNM would be considered if a credit remains and is needed elsewhere.

In conclusion, I assert this rationale for my decision because it is based on the completeness and reasonable approach of the TMP and the analysis presented in the EA showing negligible or minor effects to resources. It is my belief that this decision would improve the manageability and condition of SDNM. Upon the signing of this decision, along with the approval of the accompanying TMP, I am ordering all components of the TMP and the proposed actions as modified in this Decision Record to be implemented as described. This decision has no adverse impact on energy development, production, supply and/or distribution.

Mitigation Measures: During the environmental review, no residual effects were identified requiring mitigation providing best management practices and standard operating procedures for such actions are followed.

APPEALS: This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4. Public notification of this decision will be considered to have occurred on September 14, 2012. Within 30 days of this decision, a notice of appeal must be filed in the office of the Authorized Officer at 21605 N. 7th Avenue, Phoenix, AZ 85027. The last day to file an appeal is October 15, 2012. If a statement of reasons for the appeal is not included with the notice, it must be filed with the Interior Board of Land Appeals, Office of Hearings and Appeals, U.S. Department of the

Interior, 801 North Quincy St., Suite 300, Arlington, VA 22203 within 30 days after the notice of appeal is filed with the Authorized Officer.

If you wish to file a petition for stay pursuant to regulation 43 CFR Part 4.21(b), the petition for stay should accompany your notice of appeal and shall show sufficient justification based on the following standards:

1. The relative harm to the parties if the stay is granted or denied,
2. The likelihood of the appellant's success on the merits,
3. The likelihood of immediate and irreparable harm if the stay is not granted,
4. Whether the public interest favors a granting the stay.

If a petition for stay is submitted with the notice of appeal, a copy of the notice of appeal and petition for stay must be served on each party in the decision from which the appeal is taken, and with the IBLA at the same time it is filed with the Authorized Officer. A copy of the notice of appeal, any statement of reasons and all pertinent documents must be served on each adverse party named in the decision from which the appeal is taken to: Field Solicitor, U.S. Department of the Interior, 401 West Washington Street, Suite 404, Phoenix Arizona, 85003, not later than 15 days after filing the document with the Authorized Officer and/or the IBLA.

FIELD MANAGER APPROVAL

The decision described above will not have any significant impacts on the human environment and the analysis included in the environmental assessment is sufficient. I have determined that the decision and proposed actions as modified above are in conformance with the land use plan. It is my decision to implement the proposed actions as modified above with the special considerations for rehabilitation as noted.

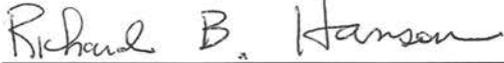


 Emily Garber
 Manager, Lower Sonoran Field Office

9/14/12

 Date

MONUMENT MANAGER CONCURRENCE

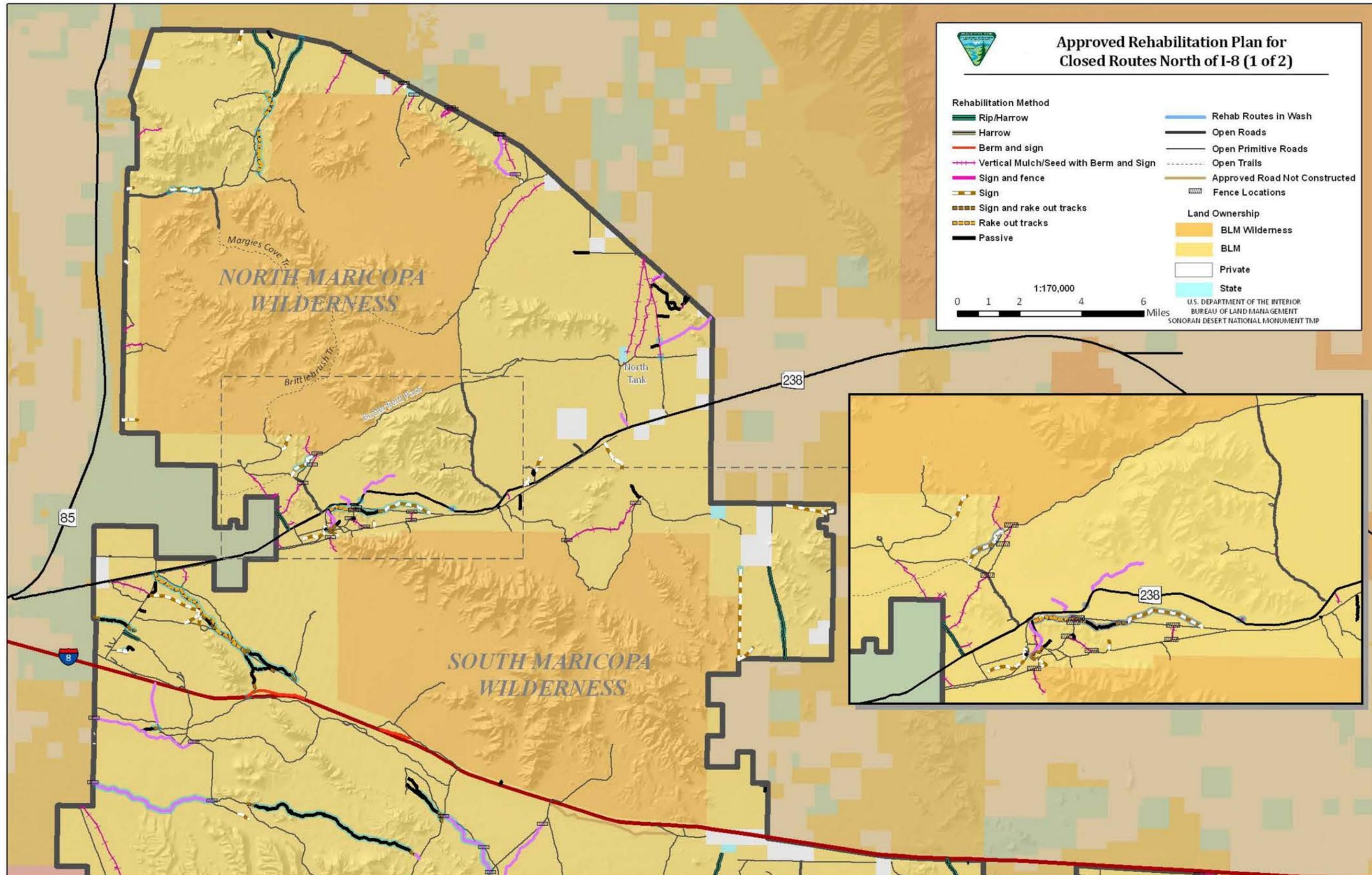


 Richard B Hanson
 Manager, Sonoran Desert National Monument

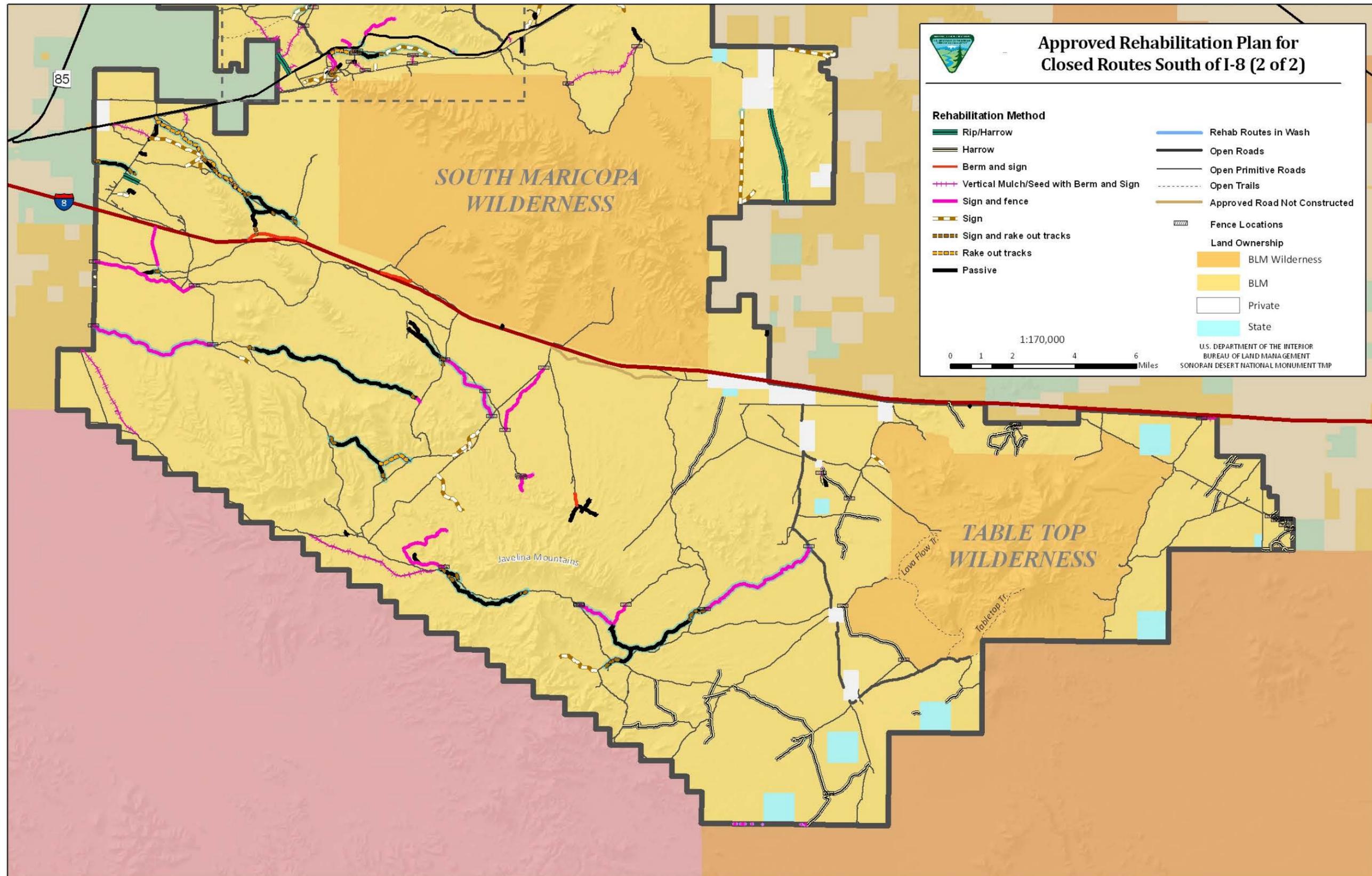
9/14/12

 Date

Map 13. Approved Rehabilitation Plan for Closed Routes North of I-8



Map 14. Approved Rehabilitation Plan for Closed Routes South of I-8



United States Department of the Interior
Bureau of Land Management
Lower Sonoran Field Office
Sonoran Desert National Monument

**SONORAN DESERT NATIONAL MONUMENT
TRAVEL MANAGEMENT PLAN
ENVIRONMENTAL ASSESSMENT**

DOI-BLM-AZ-P020-2012-005-EA

September 14, 2012

PURPOSE AND NEED

INTRODUCTION

This environmental assessment (EA) is prepared to disclose and analyze the environmental consequences of the rehabilitation and decommissioning of 204 miles of primitive roads, and the signing of 411 miles of routes located on public lands within the Sonoran Desert National Monument (SDNM) as identified in the SDNM Travel Management Plan (TMP) through two action alternatives. The project area is the SDNM. (See **Table II**, Location of Project Area, below, for legal descriptions of the project area). The EA analyzes potential impacts that could result with the implementation of the proposed action and alternatives identified. It is expected that additional site-specific environmental analyses may be necessary before such actions take place if it is determined that the analysis in this EA is not sufficient (such as site-specific analysis for aggressive rehabilitation actions).

Table II. Location of Project Area

| Township/Range | Sections | Township/Range | Sections | Township/Range | Sections |
|----------------|-----------------------------------|----------------|-----------------------------|----------------|--------------------|
| T2S, R4W | 36 | T5S, R1W | 1-36 | T7S, R1W | 1-36 |
| T2S, R3W | 31, 32, 33, 34, 35, 36 | T5S, R3W | 1-6, 9-14, 16, 23-27, 29-36 | T7S, R4W | 1-3, 10-14 |
| T2S, R2W | 31 | T5S, R4W | 23-26, 35, 36 | T7S, R4E | 30-31 |
| T3S, R4W | 1, 12, 13, 23, 24, 25, 26, 35, 36 | T6S, R1W | 1-36 | T8S, R3W | 1 |
| T3S, R3W | 1-36 | T6S, R2W | 1-36 | T8S, R2W | 1-16, 23-25 |
| T3S, R2W | 5, 6, 7, 8, 9, 10, 11, 13-36 | T6S, R1E | 3-7, 18-19, 29-32 | T8S, R1W | 1-30, 32-36 |
| T3S, R1W | 19, 29, 30, 31, 32, 33, 34 | T6S, R3W | 1-36 | T8S, R1E | 1-36 |
| T4S, R3W | 1-36 | T6S, R4W | 1-2, 11-14, 23-26, 35, 36 | T8S, R2E | 1-13, 19-21, 28-33 |
| T4S, R2W | 1-36 | T7S, R3W | 1-29, 34-36 | T8S, R3E | 4-9, 16-18 |
| T4S, R1E | 2-36 | T7S, R2W | 1-36 | T9S, R1E | 1-18 |
| T4S, R4W | 2, 11, 14, 23, 26, 35 | T7S, R2E | 7-36 | T9S, R1W | 1-3, 12 |
| T5S, R1E | 15-22, 27-34 | T7S, R1E | 3-36 | | |
| T5S, R2W | 1-36 | T7S, R3E | 7-11, 14-36 | | |

PURPOSE AND NEED FOR ACTION

The Sonoran Desert National Monument (SDNM) proclamation identifies Monument objects that need protection. The SDNM Travel Management Plan (TMP) has been created to implement route designations that are intended to meet this purpose while providing access for allowable uses and management. The purpose for this environmental assessment is to review the expected and potential environmental effects of actions identified in the TMP. Actions for rehabilitation and signing have been identified as activities that require environmental review through an environmental assessment.

DECISIONS TO BE MADE

Decisions to be made include:

- 1) Selection of a comprehensive signing plan;
- 2) Selection of a strategy and methods for closing routes;
- 3) Identification of actions that conserve special status wildlife species, cultural resources and monument objects.

APPLICABLE LAWS, REGULATIONS AND ORDERS

The following are the applicable laws, regulations, manuals and policies specific to the proposed action. A more comprehensive list of general laws governing land management actions can be found in the Lower Sonoran-SDNM Proposed RMP/Final EIS in Appendix B. Additional guidance is provided through Bureau of Land Management (BLM) Instruction Memoranda, manuals and handbooks:

- National Historic Preservation Act of 1966, as amended.
- BLM Manual 1626 -Travel and Transportation Management
- BLM Handbook 8342 -Travel and Transportation Management
- BLM Instruction Memorandum 2012-067, *Clarification of Cultural Resource Considerations for Off-Highway Vehicle(OHV) Designations and Travel Management*
- BLM Instruction Memorandum AZ-2009-010 Desert Tortoise Mitigation Policy

LAND USE PLAN CONFORMANCE

This proposed action is in conformance with the SDNM Record of Decision and Approved Resource Management Plan (RMP) (September 14, 2012) and implements portions of the recreation, cultural resources, vegetation, soils and air quality sections. The following RMP decision provided the primary guidance by this plan.

TM-4: Protect Monument objects and resources, meet conservation and restoration goals, ensure sustainable public use and enjoyment, and satisfy public safety and regulatory requirements by developing a travel management plan and implement a sustainable and compatible travel management system.

BACKGROUND

Route Designations and Implementation

Designating a system of routes was completed in the RMP. **Maps 15 and 16**, Travel System North and South of I-8, show the numbered routes designated in the RMP. Since this process of creating the TMP has been concurrent with the RMP process, route alternatives that reflect the resource decisions were proposed in the draft and proposed RMP alternatives. All TMP plan sections presented align with the routes designated in the RMP.

The actions to be analyzed, in two action alternatives, are those to rehabilitate, or return to a natural condition, 204 miles of primitive roads. These roads have been assigned a maintenance intensity of 0 through the route designation process.

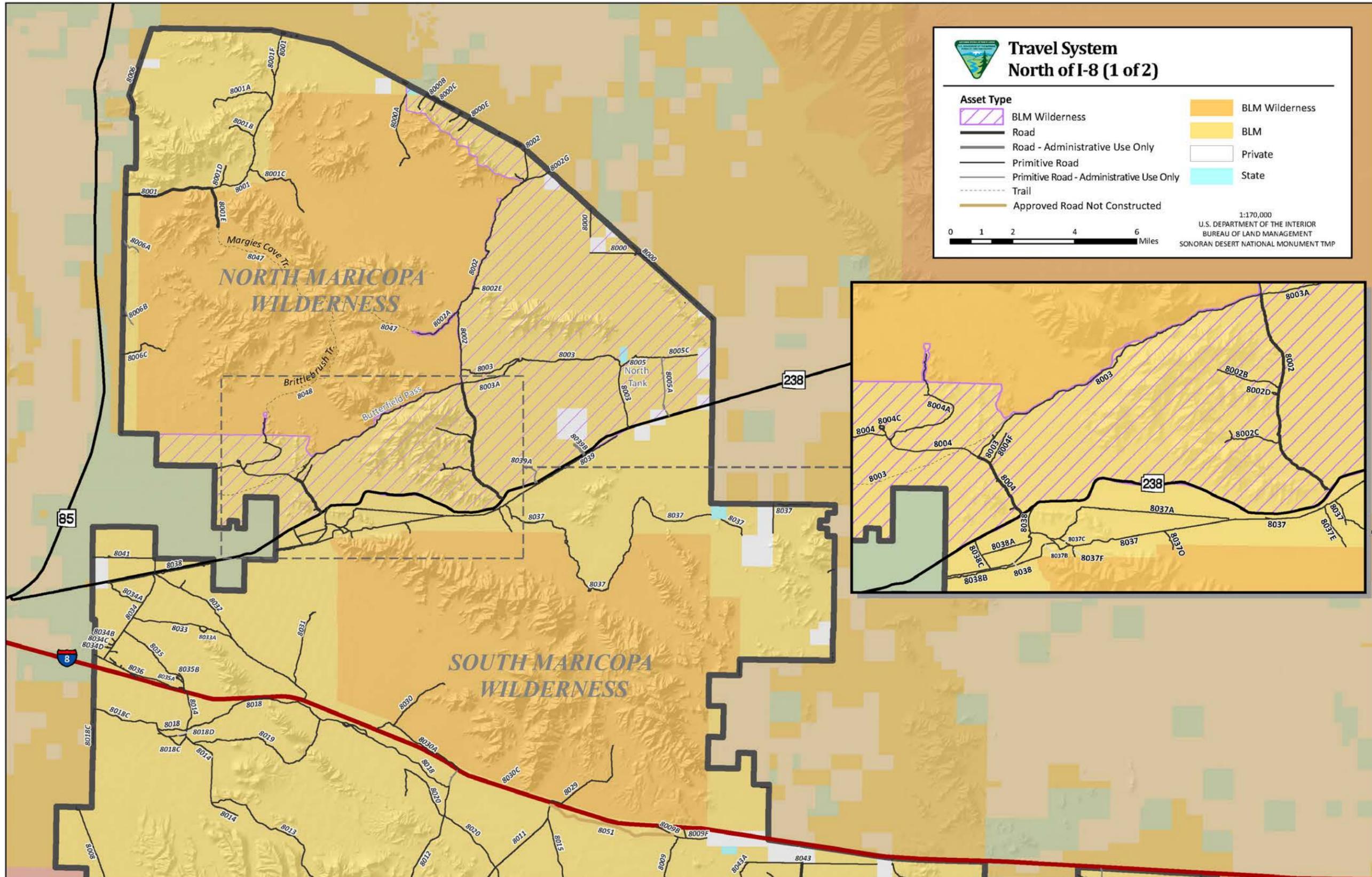
The sign plan is common to both action alternatives and is intended to implement the route designations and communicate travel information for visitor use on 411 miles of open roads, primitive roads and trails. Environmental review is needed for the installation of 2,000+ signs ranging from slender fiberglass route marking posts to multiple panel information kiosks.

Maps in the TMP Sign Plan (Attachment 2) display the currently identified locations for larger signage such as portal access (primary) signs, boundary identification (secondary) signs and information kiosk boards (special management area signs). 152 of these larger type signs have been identified. **Maps 11 and 12**, SDNM Access Points & Visitor Information Sign Locations North of I-8, (Attachment 2) displays the planned sign locations.

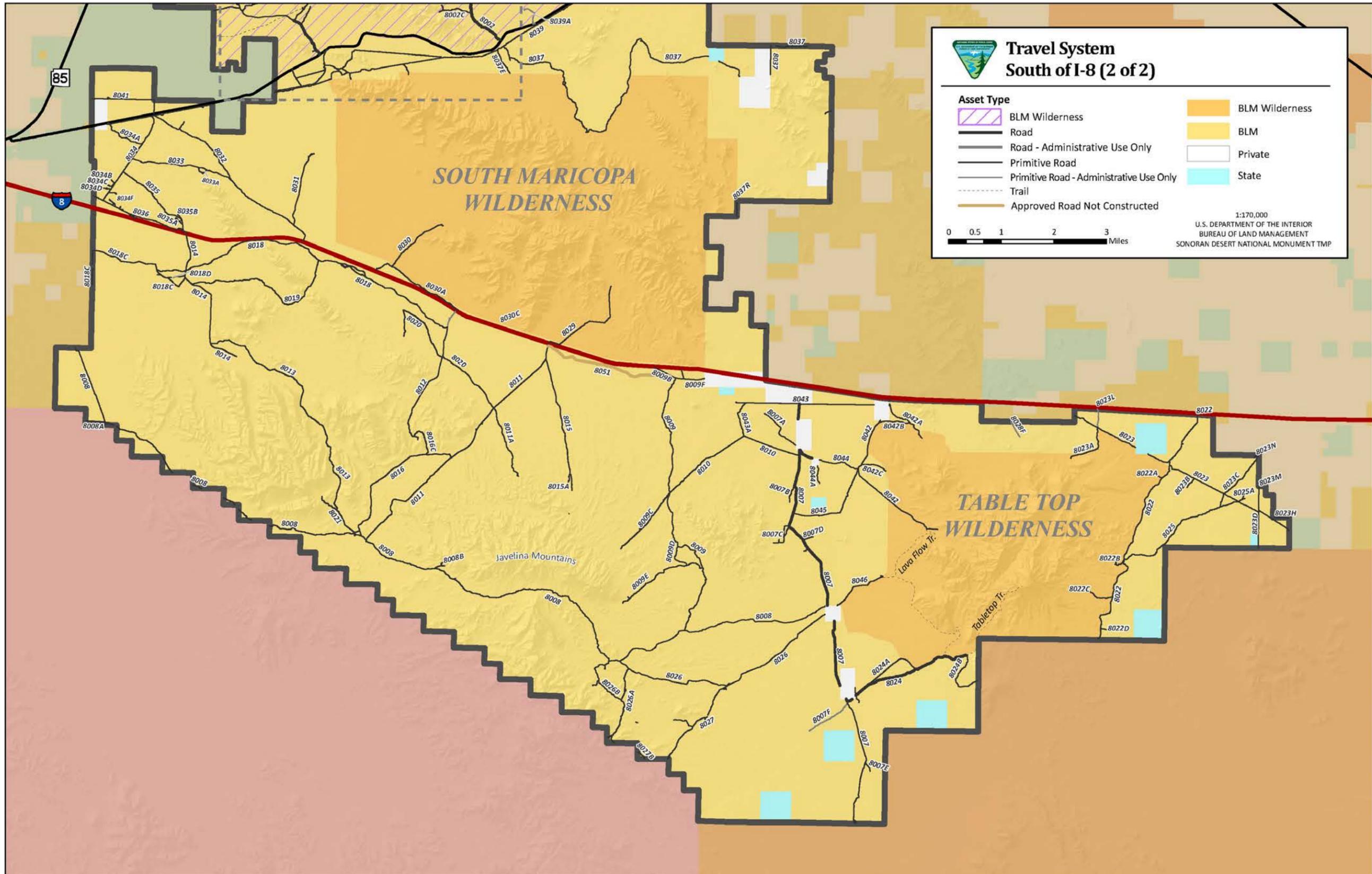
SCOPING & PUBLIC PARTICIPATION

Specialists and managers participated in internal scoping to determine the issues and range of alternatives required for this analysis. The SDNM Scoping Report (2003) was consulted to consider any issues or suggestions that were raised during the RMP process that would warrant creation of an alternative.

Map 15. Travel System North of I-8



Map 16. Travel System South of I-8



DESCRIPTION OF ALTERNATIVES

INTRODUCTION

BLM specialists determined that three alternatives cover the range of reasonable scenarios required for environmental effects review. The actions considered include a common-to-all-alternatives plan for signing the open designated routes and two action alternatives for potential rehabilitation strategies. As required by NEPA, a no-action alternative is also considered.

The Travel Management Plan contains many implementation components that are necessary for management of a designated route system. BLM specialists determined that most of these components do not involve surface disturbance activities and are not, therefore, analyzed further in this section. These include: Education and Information, Monitoring, Adaptive Management, Enforcement, Legal Public Access/Landowner Access.

DESCRIPTION OF SIGNING ACTION– COMMON TO BOTH ACTION ALTERNATIVES

The methods and locations of signs to be placed are contained in the TMP section named Travel Management Sign Implementation. Signs of varying size and type will be installed throughout SDNM to aid visitors, manage where vehicles are allowed and identify wilderness and monument boundaries and other areas within the Monument. Sign types will vary from slender fiberglass posts to large information boards measuring 4 feet by 4 feet. A more detailed version of the sign plan is found in the TMP in **Attachment 2**, SDNM Sign Plan.

Individual routes will be signed using a slender fiber glass post with a cross sectional area of two inches. This type of sign will be used to mark routes as open or closed, where necessary. Currently, approximately 1,000 of this type of sign are in use on SDNM. This number would be increased to approximately 2,000.

Larger signs would be used at up to 152 locations as shown in the Sign Plan. These signs would be constructed of metal or wood and used to mark key locations such as boundaries, trailheads, important junctions and provide information to visitors. Parking would be delineated near information kiosk boards for 1-2 cars and would be provided at approximately 20 locations. The total area expected to be disturbed through parking and sign installation totals up to 6 acres throughout the SDNM. The sign plan does not change between action alternatives.

REHABILITATION ACTIONS – COMMON TO BOTH ACTION ALTERNATIVES

In both action alternatives, routes will be rehabilitated using various techniques ranging from allowing the route to naturally reclaim passively to complete mechanical ripping the route. Rehabilitation actions fall into a gradient between completely passive to very active. Completely

passive methods allow the route to reclaim naturally without outside work. Very active methods exert vigorous reclamation work to the ground to speed rehabilitation.

Two action alternatives are presented to analyze the effects of conducting work to rehabilitate routes in a more passive and more active manner. Each alternative's approach has positive and negative attributes and the environmental effects of each will be analyzed. Techniques and methodologies will be analyzed for their potential for promoting successful reclamation and outcomes while protecting monument objects in the short- and long-term.

Best Management Practices, Criteria, Assumptions and Considerations Common to All Rehabilitation Actions:

- Seeding will be done where it would reasonably aid rehabilitation of closed routes. Appropriate native seed mixtures would be selected for each site based on site conditions. Seed application would occur prior to the winter rainy season. Some areas would be temporarily fenced to prevent disturbance.
- Barren areas near main roads where camping or parking is closed would be targeted for placement of such barriers.
- Lockable steel gates may be employed as a last resort where an area has been closed to public access yet administrative access is required to enforce area closures.
- Wire fencing will be employed in up to 300 ft sections to discourage vehicular travel around signage. Typical disturbance areas will total 0.034 acre per fence (fence project will be about five feet in width by up to 300 feet, totaling 1,500 sq. ft. (0.034 ac) per fence installation).
- Rehabilitation projects may be completed by BLM, volunteers, youth interns, conservation corps, or non-profit organizations through partnerships or contracts.
- Invasive species vegetation treatment control measures will be implemented as needed to promote re-vegetation with native plants and prevent new weed establishment and/or control of existing weed sources.
- Fencing may be included in rehabilitation projects where adjustments to grazing allotments or pastures are needed.
- Ripping/harrowing work will generally be completed when soil moisture is present to aid in the loosening soil compaction and reduce equipment wear. This may necessitate project implementation during the summer monsoon season.
- Rehabilitation and/or maintenance activities using tracked or full size vehicles, excluding ATV/UTV types, will be conducted with a Sonoran desert tortoise monitor or spotter present when conducting work during the tortoise active season. All work crews will be briefed on methods to avoid injuring tortoises.
- Site-specific NEPA-sufficient analyses will be conducted, as necessary, prior to implementing rehabilitation or maintenance actions or developing new routes or re-

routes. These analyses will address cultural resource clearances, changes in status of any object or wildlife species and project management issues.

ALTERNATIVE I - PASSIVE REHABILITATION METHODS

This action alternative encompasses the following actions:

- Placement of signs on open and closed routes
- Placement of entry signs/kiosk boards
- Rehabilitation of closed routes by using less active methods

Rehabilitation of closed routes will be accomplished by a range of mostly passive methods. Alternative I proposes to implement the sign plan and conduct route rehabilitation using more passive methods to maintain existing vegetation, reduce the disturbance to wildlife and cultural resources and allow for using more unskilled labor for hand work tasks. (See **Table 12**, Rehabilitation Methods by Miles for Alternative I). Refer to the TMP for a description of the rehabilitation methods proposed.

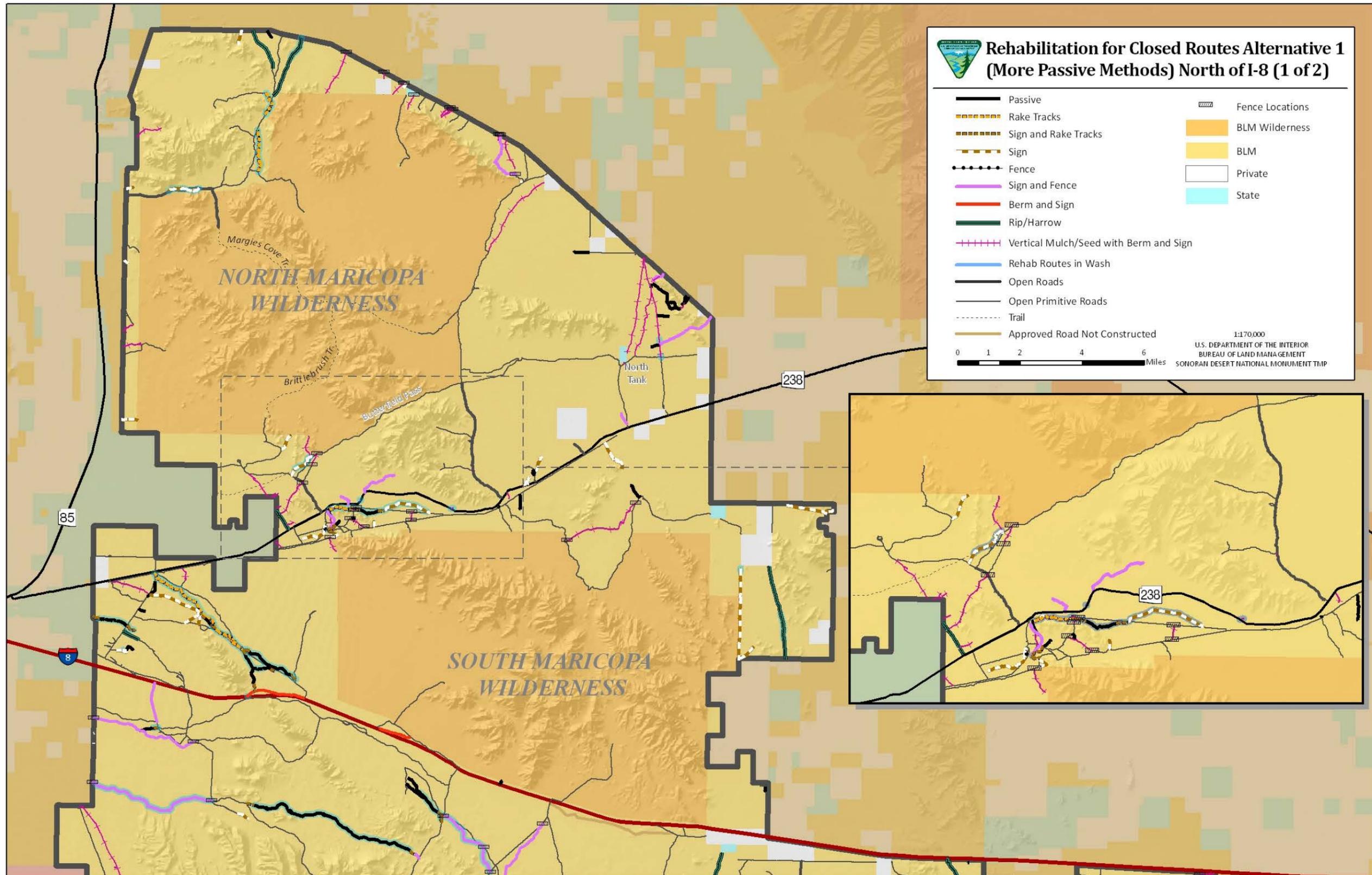
Table 12. Rehabilitation Methods by Miles for Alternative I

| Rehabilitation Method | Miles |
|--|-------|
| Berm and sign | 5.4 |
| Passive | 40.7 |
| Rake out tracks | 9.0 |
| Rip/harrow | 10.8 |
| Sign | 42.0 |
| Sign and fence | 41.1 |
| Sign and rake out tracks | 7.1 |
| Vertical mulch/seed with berm and sign | 48.2 |
| Total | 204.3 |

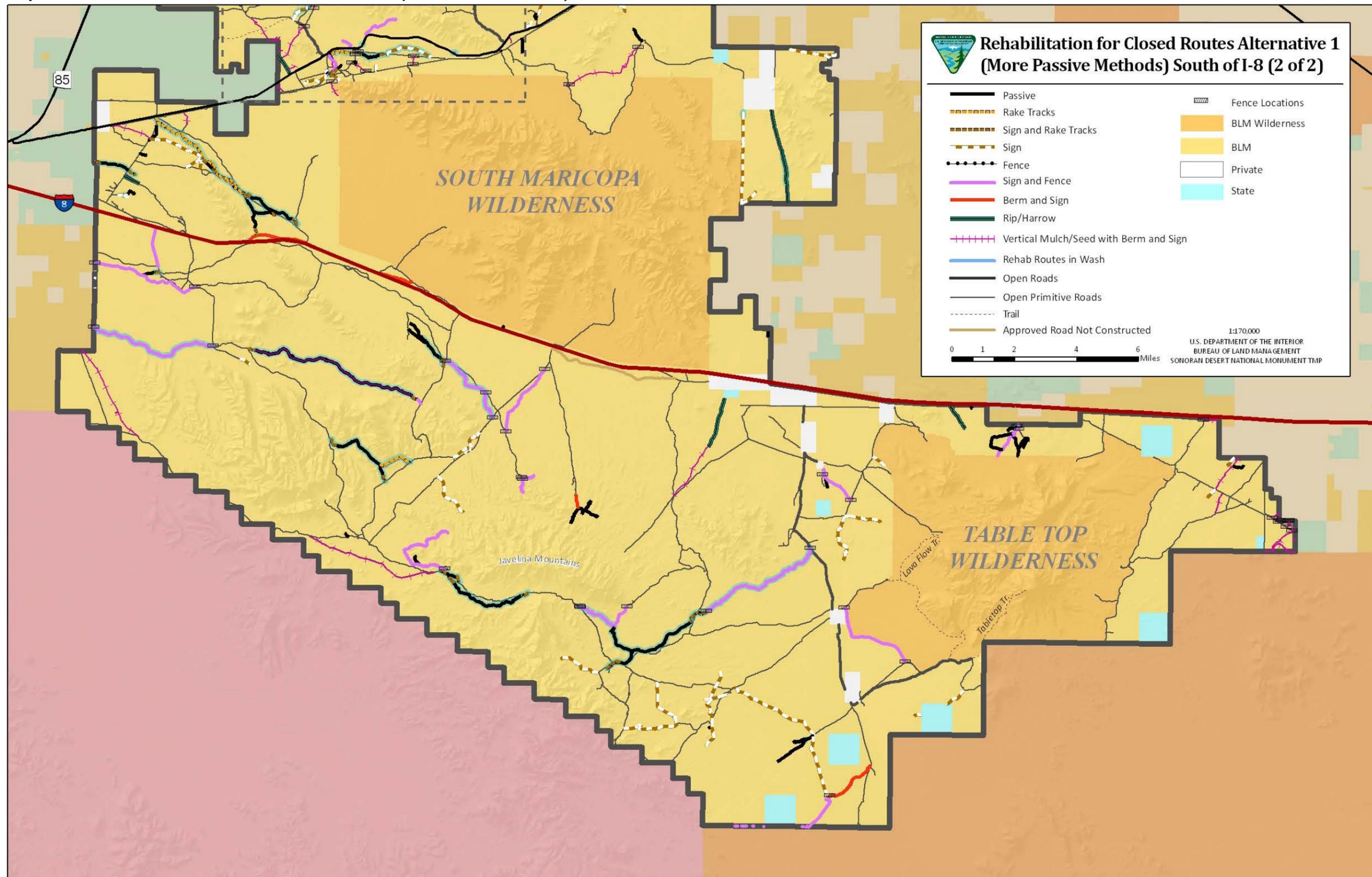
Fences will generally be the barrier of choice. Where fence cutting is prevalent, sites may need to be bolstered by upgrading to a buried post with two strands of cable type, pipe rail or steel rail type. Closed signs would be employed as necessary.

The rehabilitation plan would rip soils at eight locations, resulting in new temporary short-term disturbance of up to 13.0 acres along existing routes. Placement of fences at 48 locations would create a new disturbance of up to 1.6 acres. The total area of rehabilitation for the 204 miles of routes, assuming a 12 foot width average, equals 297.2 acres. Locations of project work are shown on **Maps 17 and 18**, Rehabilitation for Closed Routes for Alternative I (More Passive Method) North and South of I-8.

Map 17. Rehabilitation for Closed Routes for Alternative 1 (More Passive Method) North of I-8



Map 18. Rehabilitation for Closed Routes Alternative 1 (More Passive Methods) South of I-8



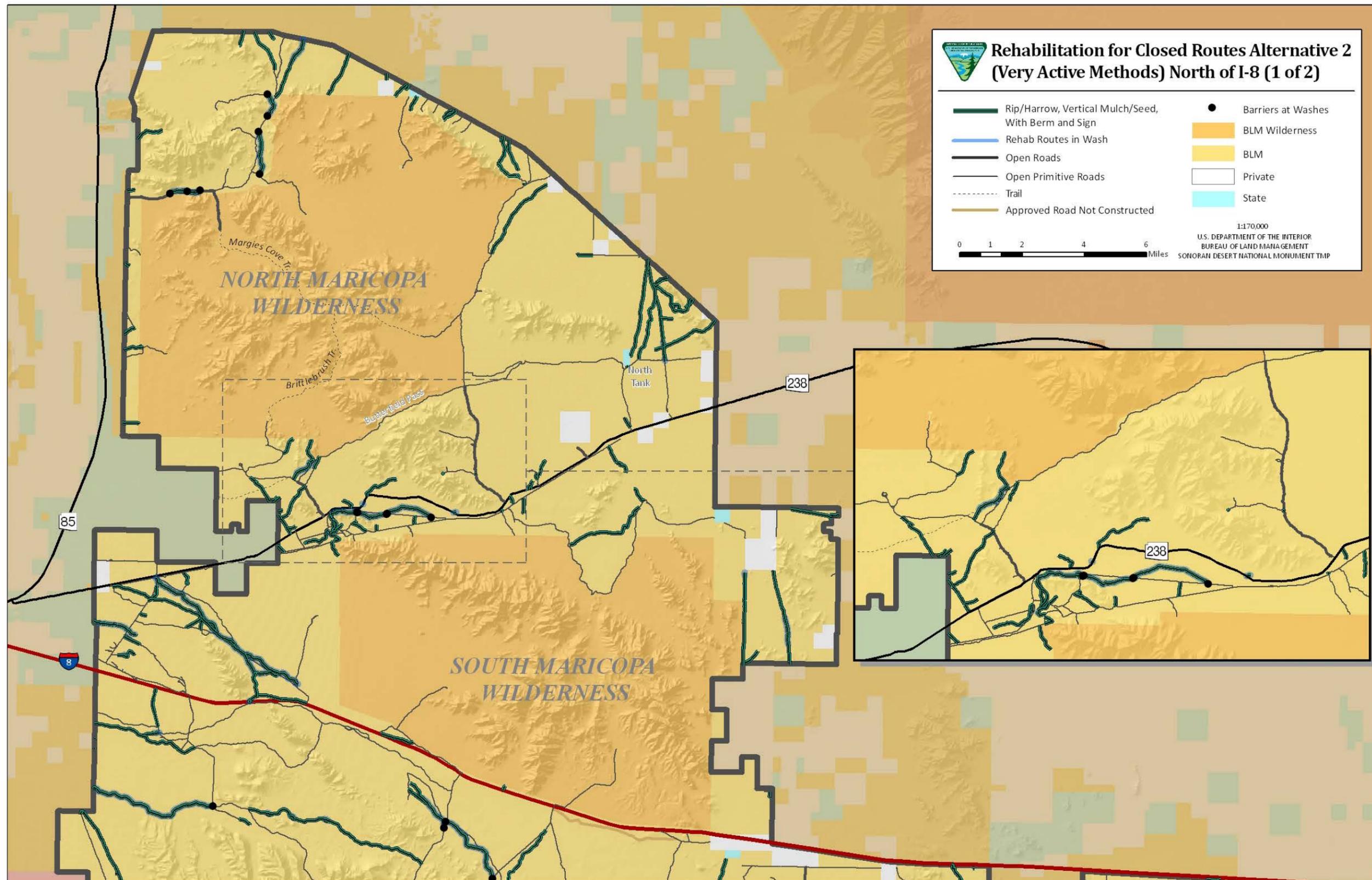
ALTERNATIVE 2 – VERY ACTIVE APPROACH TO REHABILITATION METHODS

Alternative 2 proposes to implement the sign plan and conduct route rehabilitation by active mechanical methods that disturb the entire route bed and loosen compacted soils for better plant establishment. (See **Table 13**, Rehabilitation Methods by Miles for Alternative 2). A tractor towed disc harrow or a finger type ripper mounted on a tractor or bulldozer would be used on all closed routes. Skilled labor would be required; dirt berms would be created at the end of upland routes. Heavy duty barriers of the post and cable type could be installed at intersections with washes. Signing would occur throughout the SDNM in the same manner as described in Alternative 1.

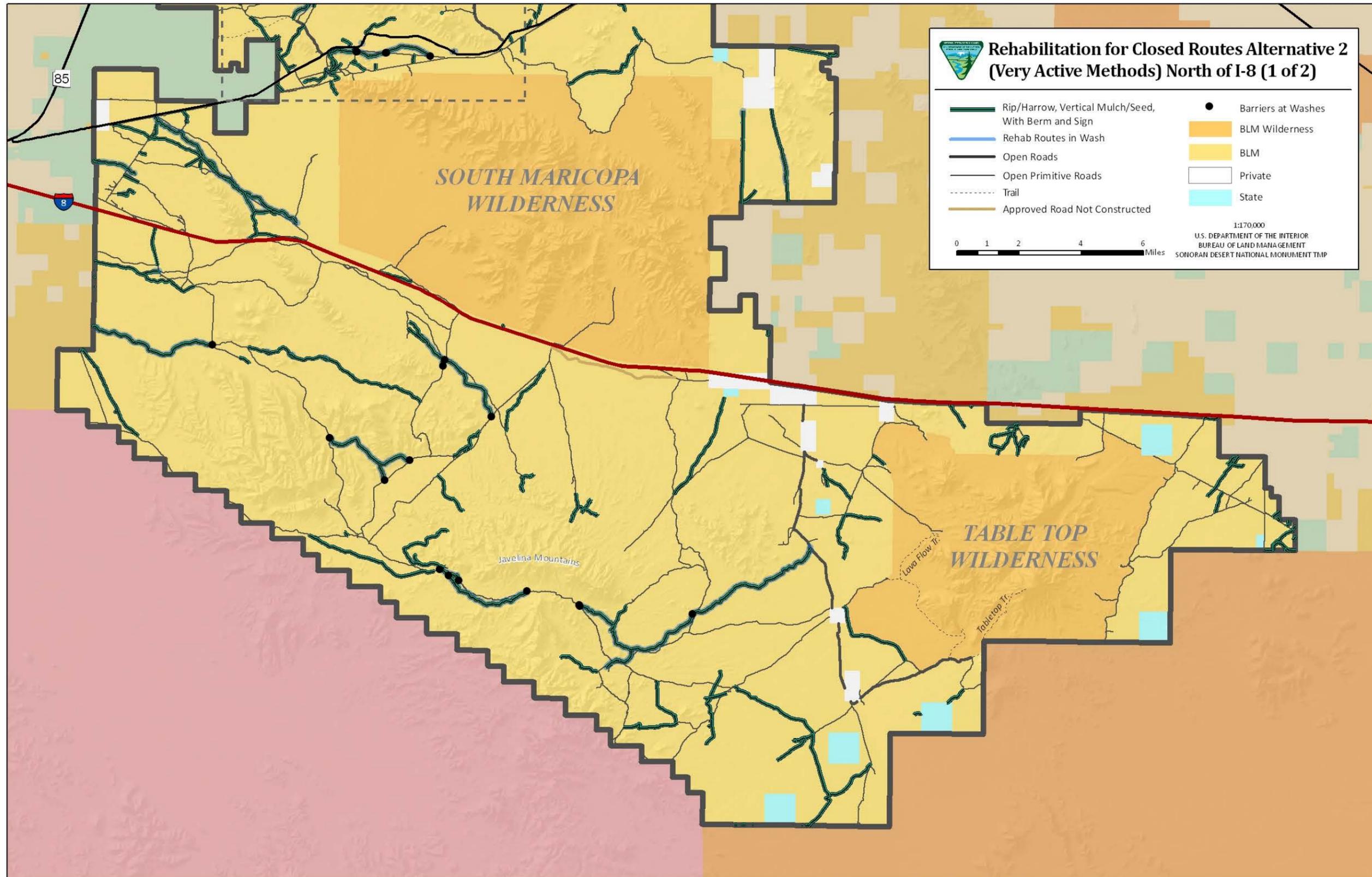
Table 13. Rehabilitation Methods by Miles for Alternative 2

| Rehabilitation Method | Miles | Miles in Wash |
|------------------------------------|-------------|----------------|
| Rip/Harrow | 204.3 | 47.4 |
| | | |
| Rehabilitation Method | Total Count | Number in Wash |
| Barriers (Cutting off Wash Access) | 43 | 43 |

Map 19. Rehabilitation for Closed Routes Alternative 2 (Very Active Methods) North of I-8



Map 20. Rehabilitation for Closed Routes Alternative 2 (Very Active Methods) North of I-8



In this alternative, post and cable type or other metal structures will be the barrier of choice and would be employed in all wash routes being closed. In upland sites, a berm would be created to block access to closed routes. Closed signs would be installed at all locations.

NO ACTION ALTERNATIVE

Under the No Action alternative BLM would not implement a comprehensive sign plan or the route rehabilitation actions necessary to comply with the RMP route designations. Routes would be allowed to decommission by passive, hands-off means and subsequent additional signing of open routes would not occur. Signs would be limited to those existing. Alternatives Considered but Removed from Detailed Analysis

BLM staff conceived an alternative for conducting closed route rehabilitation using only passive methods whereby all routes would be allowed to reclaim without intervention. The sign plan would be implemented as in other action alternatives. Benefits to using completely passive rehabilitation methods would come from the prevention of ground disturbing activities. On the surface, this appears to be beneficial to protecting Monument Objects, however, the prospect of routes rehabilitating with little active management, while being continually used, or even occasionally used, would be unlikely. Existing problems of erosion would continue unabated, likely adversely impacting monument objects. Therefore, this alternative was eliminated from further consideration.

AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

DEFINITION OF TERMS

Common terms used to describe potential environmental impacts are defined as follows:

Adverse: The effect is negative on a particular resource or a number of resources. *In this document, the term impact is assumed to be adverse unless otherwise stated.*

Beneficial: The effect is positive effects on a particular resource or a number of resources.

Direct: The effect which is caused by the action and occur at the same time and place.

Indirect: The effect which is caused by the action and is later in time or farther removed in distance, but still reasonably foreseeable. Indirect effects may include growth-inducing effects, and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on water and air and other natural systems, including ecosystems.

Cumulative: Effects that result from the incremental effect of an action when considered with other past, present, and reasonably foreseeable future actions.

Negligible: The effect is at the lower level of detection; change would be difficult to measure.

Minor: The effect might result in a slight but detectable change but would not be expected to have an overall effect.

Moderate: The effect would likely result in a measureable change and could have an appreciable effect.

Major: The effect would likely result in a substantial change.

Short-Term: The effect occurs only for a short-time (during construction) after implementation of the action.

Long-Term: The effect occurs for an extended period (more than 5 years) after implementation of the action.

RESOURCES NOT AFFECTED BY PROPOSED ACTION

The following resources have been evaluated and they are either not present in the project area or it has been determined by resource specialists that based on current information they would not be affected by the proposed action.

Air Quality (see AP42 analysis and modeling completed in Air Quality Conformity Analysis, LSFO-SDNM PRMP/FEIS 2012)

Areas of Critical Environmental Concern

Floodplains

Invasive, Non-native species Minerals

Native America Religious Concerns

Prime or Unique Farmlands

Solid or Hazardous Wastes

Water Quality (Surface and Ground)

Wild and Scenic Rivers

Wild Horses and Burros

Many of the planned TMP components do not involve surface disturbance nor have effects to the human environment. For that reason, they are not analyzed further in this section. These include: Education and Information Messaging, Monitoring, Adaptive Management, Enforcement, Legal Public Access and Landowner Access. Engineering and Maintenance activities will be addressed through another environmental assessment.

AFFECTED RESOURCES

Soil Resources

Affected Environment

There are over twenty different soil types in SDNM, however, only a few are affected by the rehabilitation actions proposed in alternatives. Signing would occur throughout the SDNM, but the effects are so wide spread and expected to be of such a minor footprint that they will not be considered in this discussion of soil types. **Table 14**, Soil Types Occurring in the Location of Closed Route Rehabilitation, displays the soil types in the project areas and their susceptibility to erosion.

Table 14. Soil Types Occurring in the Location of Closed Route Rehabilitation

| Soil Types in Project Areas for Route Rehabilitation | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
|--|---------------------------|--------------------------|--------------------------|
| Carrizo-Momoli complex, 0 to 3 percent slopes | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | Highly erodible land | Not highly erodible land | Highly erodible land |
| Gunsight-Chuckawalla complex, 1 to 15 percent slopes | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Gunsight-Pinamt complex, 1 to 15 percent slopes | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Not Complete (Area A) | Varies | Varies | Varies |

Erosion can occur whenever there is insufficient cover or litter to shield soils from the effects of wind and water. Soils can be affected during rehabilitation projects in the short and long term. In the short term, soils may be disturbed by mechanical or manual means. When this occurs, wind erosion can carry soil away. Conversely, when not already stabilized, rain events can carry soils through concentrated flow. In both cases, the short term effect can be minimized by planning work times coincident with suitable soil or weather conditions such as adequate soil moisture, or low wind speed. In the long term, if soils are not stabilized, or crusted on top, such wind and water effects can become great, resulting in head cutting or gullying.

Impacts

No Action Alternative

The effects of not conducting route rehabilitation would have the effect of continuing to lose soil through wind and water erosion due to closed routes lacking vegetative cover. Surface layers would be unlikely to stabilize due to the probability of continually being used by vehicles, regardless of designation status as closed. Soil loss would have a minor to moderate adverse effect over the long term due to the continuous effects of wind and water eroding the route bed, causing head cuts or gullies.

Alternative I – (Passive)

Table 15 displays the soil types in the rehabilitation areas, their acreage in these soil types and a rating of their erosion potential. Highlighted values represent soil types where caution would be necessary not to create large unstabilized areas during projects.

Table 15. Soils in Rehabilitation Areas - Alternative I (Very Active Method)

| Rehab Method: Berm and Sign | | | | |
|--|--------------|----------------------------------|--------------------------------|-------------------------------|
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 0.09 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Rehab Method: Berm and Fence | | | | |
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Not Complete (Area A not Surveyed) | 11.24 | N/A | N/A | N/A |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 7.03 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Gunsight-Chuckawalla complex, 1 to 15 percent slopes | 2.80 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 1.37 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Rehab Method: Rake Out Tracks | | | | |
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 3.05 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 2.65 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Gunsight-Chuckawalla complex, 1 to 15 percent slopes | 2.97 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Not Complete (Area A) | 1.35 | N/A | N/A | N/A |

| Rehab Method: Rip/Harrow | | | | |
|---|--------------|----------------------------------|--------------------------------|-------------------------------|
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 0.92 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Rehab Method: Sign | | | | |
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 3.08 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 1.16 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Rehab Method: Sign and Fence | | | | |
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 9.70 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Not Complete (Area A Not Surveyed) | 1.74 | N/A | N/A | N/A |
| Gunsight-Pinamt complex, 1 to 15 percent slopes | 1.43 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 1.08 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Others < 1 acre | | | | |
| Rehab Method: Sign and Rake Out Tracks | | | | |
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Not Complete (Area A Not Surveyed) | 3.40 | N/A | N/A | N/A |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 2.04 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Others < 1 acre | | | | |

| Rehab Method: Sign and Rake Out Tracks | | | | |
|---|--------------|----------------------------------|--------------------------------|-------------------------------|
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 0.25 | Not highly erodible land | Not highly erodible land | Not highly erodible land |

The types of rehabilitation would have negligible effects on the erosion prone Denure-Rillito-Why soil complex since the methods proposed would leave most of the route bed being rehabilitated as undisturbed. Only a sign, fence or berm would generally be placed at the beginning or end of the route, leaving the majority of the route to reclaim passively.

Alternative 2 – (Very Active)

Table 16 displays the soil types in the rehabilitation areas, their acreage in these soil types and a rating of their erosion potential. Highlighted values represent areas where caution would be necessary not to create large, unstabilized areas during projects.

Table 16. Soils in Rehabilitation areas - Alternative 2 (Very Active)

| Rehab Method: Rip/Harrow, Vertical Mulch/Seed with Berm and Sign | | | | |
|---|--------------|----------------------------------|--------------------------------|-------------------------------|
| Soil Type | Acres | Overall Erosion Potential | Water Erosion Potential | Wind Erosion Potential |
| Carrizo-Momoli complex, 0 to 3 percent slopes | 26.06 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Not Complete (Area A) | 17.72 | N/A | N/A | N/A |
| Denure-Rillito-Why complex, 1 to 5 percent slopes | 7.02 | Highly erodible land | Not highly erodible land | Highly erodible land |
| Gunsight-Chuckawalla complex, 1 to 15 percent slopes | 6.72 | Not highly erodible land | Not highly erodible land | Not highly erodible land |
| Gunsight-Pinamt complex, 1 to 15 percent slopes | 1.44 | Not highly erodible land | Not highly erodible land | Not highly erodible land |

The types of rehabilitation would have minor to moderate adverse effects on the erosion prone Denure-Rillito-Why complex since the methods proposed would affect most of the route bed being rehabilitated, creating areas of silt beds. To avoid soil loss, earth work would need to be conducted at the sufficient soil moisture content, which would be difficult to plan.

Cultural Resources

Affected Environment

At least 190 cultural resource studies have been completed within the public lands in the SDNM. This translates to 6.2 percent of the area of public lands in the SDNM have been inventoried for cultural resources. These studies have identified and documented 291 cultural sites on the public lands within the Monument. Roughly 77% of these sites can be attributed to aboriginal use of the area. About 4% have a mixture of historic period and aboriginal components. Estimates add up to 13 % of the sites having historical Euro-American period, and 7% have not been determined temporally or culturally. This information was drawn from the *Draft Cultural Resource Overview for the Phoenix South and Sonoran Desert National Monument* (2005), by URS. A discussion of the culture history of the area is available in the RMP, in Section 3.2.4, Cultural and Heritage Resources.

A variety of site types have been identified on the SDNM through different inventory projects. Although this is not a comprehensive list of surveys performed, it gives a sense of the types of sites and the density of them. Site types include: habitations, petroglyphs, lithic quarries, artifact scatters, mines, mining camps, ranching sites, trash dumps, village sites, historic trash scatters, historic railroad construction and maintenance sites, and historic homestead sites.

Homburg, Altschul, Vanderpot (1994) inventoried a habitation, rock shelters, hunting blinds, rock art, lithic quarries, lithic scatters, ceramic scatters, and artifact scatters, mines, mining camps, prospector's camps, ranching sites, military sites, and trash dumps. This survey covered a total of 15,000 acres. 130 new cultural sites were recorded. The extensive block surveys included segments of many routes discussed in this Travel Management Plan Environmental Assessment.

In 2007, Shirley and Grant surveyed a combined total of 258 acres. This survey of 45 miles of routes and three block survey areas resulted in the recordation of 13 new sites. These included village sites, hamlets, a multi-component site with prehistoric village and a standing historic house, a multi-component site with prehistoric artifact scatter and historic mining claim, an artifact scatter, and a mining complex.

A total of 12 new sites were recorded by Bungart and Raney in 2007, during their inventory of 1,477 acres on the SDNM. The survey was concentrated along certain routes in order to ascertain impacts. This work resulted in the identification of artifact scatters, petroglyphs, and a stone circle.

In 2002, Blanchard and Sullivan surveyed along a 14-mile stretch of Vekol Road. Surveyors observed a number of artifact scatters, a historic trash scatter, and a small village or hamlet. This inventory resulted in the recordation of 15 sites on a total of 1,496 acres.

Cultural surveys have been performed along some of the routes proposed for rehabilitation. Those routes that have not been inventoried will be prioritized for cultural resource surveys as funding is available. According to AZ Site data, 19 sites occur in proximity to the rehabilitation project areas. Inventory to identify cultural resources that may be affected by the proposed activities will be conducted prior to the initiation of any surface disturbing activities.

Impacts

Overview

Cultural resources may be affected by the variety of activities proposed in this action. It is therefore important to assure the identification of any cultural sites present through the performance of inventory in the affected areas, when projects are proposed. All identified sites would be evaluated for their potential eligibility for listing on the National Register of Historic Places (NRHP). Proposed activities will be designed to avoid impact to cultural sites eligible for listing on the NRHP and to implement measures to reduce or minimize the effects. If any rehabilitation activity cannot be redesigned or minimized on an NRHP eligible site, it could result in an adverse effect on the site. This would prompt the development and implementation of a treatment plan for mitigation of these effects.

Methods of Analysis

Section 4.5.1 in the RMP contains a discussion on the methods of analysis used to assess impact. The assessment of impacts on cultural resources is based on specific indicators that are applied. Cultural resources are evaluated for their integrity of location, design, setting, materials, workmanship, feeling, and association. This list of indicators describes many of the most common types of impacts on cultural resources that may diminish or destroy integrity.

Indicators of contextual elements:

- Site features or arrangement of artifacts and features disturbed.
- Artifacts missing or rearranged.
- Site elements rearranged.
- Ground surface disturbed.
- Sub-surface cultural deposits disturbed, and
- Impacts on site setting/visual integrity:
 - Damage to physical environment of site
 - Damage to historic sense of a particular period of feeling of site's context.

Assumptions

Ground- and surface-disturbing activities can vary. Ground-disturbing activities from mechanical and vehicular sources are assumed to have the potential to impact cultural resources by damaging features, crushing or compacting subterranean features, rearranging features, pushing soils to remove or excavate the original surface, or disturbing the contextual arrangement of features and artifacts.

Natural processes, such as erosion or weathering, degrade the integrity of many types of cultural resources over time. Human visitation, recreation, OHV use, livestock grazing, fire and non-fire vegetation treatments, and other activities can increase the rate of deterioration through natural processes. While the effect of a few incidents may be negligible, the effect of repeated actions or visits over time is likely to intensify impacts.

Vandalism or unauthorized collecting can destroy cultural resources in a single incident. Increased access to areas where cultural resources are present can raise the risk of vandalism or unauthorized collection of cultural resources.

No Action Alternative

If certain routes are not closed with a physical barrier, vehicles would continue to use these access routes and areas. This would likely lead to direct and indirect impacts to sites. If rehabilitation is not done, routes will continue to be used by the public, even though they were selected to be closed. There are some routes that were selected for closure due to their conflicts with cultural sites, if these routes are not closed with barriers or rehabilitated, impacts would likely continue or increase in volume and intensity.

Alternative 1 - (Passive)

If low impact techniques and reduced mechanized use of equipment are used for rehabilitation, cultural resource identification and evaluation would be required on only those areas proposed for surface disturbing work. As compared to the No Action alternative, the possibility of disturbing undiscovered resources is higher. The list of indicators and assumptions outlined previously would apply. When cultural resources are identified and evaluated as having the characteristics that would make them eligible for the NRHP and they lie within the Area of Potential Effect (APE), the project would be redesigned to avoid, reduce, or minimize the effects. Therefore, some forms of minimal rehabilitation activities would need to be redirected from NRHP eligible sites. If these activities cannot be redirected or redesigned, the result may be an adverse effect on the site. This would prompt the development and implementation of a treatment plan for mitigation of these effects. Completing the rehabilitation of closed routes by lower impact methods would have a generally beneficial effect of preventing continued driving in areas where parking for vandalism and/or looting might occur.

Alternative 2 - (Very Active)

If mechanized techniques and equipment are used for rehabilitation, cultural resource identification and evaluation would be required on all areas proposed for this work. The list of indicators and assumptions would apply that are expressed above, under Alternative 1.

The application of mechanized techniques would include a ripping tool capable of penetrating the ground surface to a depth of two feet and loosening the surrounding ground as it is pulled. A disc harrow would penetrate the ground surface and turn the earth over in chunks up to eight inches deep. A tine rake would scarify the ground surface and disturb surface deposits,

primarily. All of these methods would disturb cultural site surface and / or sub-surface features, artifacts, context, and arrangement of site attributes. A total of 19 sites are known to be present in these project areas.

Placement of barriers in closed wash routes would occur in proximity to 4 known sites. Survey and cordoning off of areas prior to beginning work would ensure avoidance or a treatment would be devised to avoid adverse effects to this Monument object.

When cultural resources are identified and evaluated as having the characteristics that would make them eligible for the NRHP and they lie with the Area of Potential Effect (APE), the project would be redesigned to avoid, reduce, or minimize the effects. Therefore, highly mechanized rehabilitation activities would be redirected from NRHP eligible sites. If these activities cannot be redirected or redesigned, the result would have an adverse effect on the site. This would prompt the development and implementation of a treatment plan for mitigation of these adverse effects.

Special Designations: Juan Bautista de Anza National Historic Trail

Affected Environment

The Juan Bautista de Anza National Historic Trail (NHT) is a 1,200-mile historic trail corridor commemorating the 1775-1776 land route that Spanish commander Juan Bautista de Anza followed from Mexico through Arizona to California in an effort to establish a mission and presidio on San Francisco Bay. A segment of this trail corridor cuts through the mid-section of the SDNM. Although this trail has no known surviving trail signature on the ground, the diaries and journals allowed historians to determine the alignment of the corridor. The corridor was designated by Congress in 1990 as a part of the National Trails System.

Conservation of the natural visual setting along the trail corridor and constructing a recreational retracement route for non-motorized use are two important objectives. In the "Comprehensive Management and Use Plan Final Environmental Impact Statement for the Juan Bautista de Anza National Historic Trail" (NPS 1996) (Anza CMP), the nature and purpose of the trail is to create a vicarious experience for the visitor through the interpretation and preservation of significant trail resources.

On the SDNM, the Juan Bautista de Anza National Historic Trail Management Area has been designated in the RMP. This segment of the NHT through the SDNM qualifies as a "high potential route segment" since it would afford a high quality recreation experience.

An expanded discussion about the NHT can be found in the RMP, in section 3.4.2.2. and in section 2.12.3.

Impacts

The Juan Bautista de Anza NHT may be affected by the activities proposed in this EA. These activities may impact the natural visual setting or interfere with the nature and purpose of the trail. Section 4.18.1 in the RMP contains a discussion on the methods of analysis used to assess impacts.

Assumptions

Before the BLM may authorize any project with potential to affect cultural resources, law and regulation require that the agency conduct site-specific inventory, evaluate potentially impacted sites for National Register of Historic Places eligibility, and stipulate measures to reduce effects, as necessary. Impacts may be reduced by avoidance or mitigation measures, such as data collection or project redesign. Vandalism or unauthorized collecting can destroy historic trails and associated cultural resources in a single incident. Exposure or access to areas where these resources are present can increase the risk of vandalism or unauthorized collection of artifacts. Assumptions are the same as the Cultural Resources section above.

Impact Indicators:

Damage to the arrangement or structure of features

- Artifacts missing or rearranged
- Site or historic trail elements re-arranged
- Ground surface disturbed
- Subsurface cultural and historic deposits disturbed and/ or re-arranged
- Damage to physical environment of historic trail and/or associated cultural site
- Damage to historic sense of a particular period of time or feeling of historic trail or associated site's context
- Changes to the landscape settings, to the level that historic trail and associated site values are diminished.

No Action

If areas of the routes are neither rehabilitated nor have a barrier installed, compliance by the vehicle-using public will not be realized. Vehicles would continue to be used on routes that were scheduled for closure. Routes would continue to be used, which would increase the likelihood that impacts to NHT values would increase in volume and intensity over time.

Alternative I – (Passive)

If low use mechanized techniques and equipment are used for rehabilitation, cultural resource identification and evaluation would be required on only those areas proposed for surface disturbing work. As compared to the No Action alternative, the possibility of disturbing undiscovered resources is higher. The list of indicators and assumptions would apply to NHT values that are expressed above, under Alternative I. When cultural resources are identified

and evaluated as having the characteristics that would make them eligible for the NRHP and they lie with the Area of Potential Effect (APE), the project would be redesigned to avoid, reduce, or minimize the effects. Therefore, some forms of rehabilitation activity would need to be redirected from NRHP eligible sites. If these activities cannot be redirected or redesigned, the result would be an adverse effect on the site. This would prompt the development and implementation of a treatment plan for mitigation of these effects.

Alternative 2 – (Very Active)

If mechanized techniques and equipment are used for rehabilitation, the same cultural resource identification and evaluation would be required on all areas proposed for this work. The list of indicators and assumptions would apply to national trail values that are expressed above, under Alternative 1.

The application of mechanized techniques would include a ripping tool, that is capable of penetrating the ground surface to a depth of two feet and ripping the ground as it is pulled. A disc harrow would penetrate the ground surface and turn the earth over in large chunks. A tine rake would scarify the ground surface and disturb surface deposits, primarily. All of these methods would disturb NHT-related cultural site surface and/or sub-surface features, artifacts, context, and arrangement of site attributes.

When cultural resources are identified and evaluated as having the characteristics that would make them eligible for the NRHP and they lie with the Area of Potential Effect (APE), the project would be redesigned to avoid, reduce, or minimize the effects. Therefore, highly mechanized rehabilitation activities would need to be redirected from NRHP eligible sites. If these activities cannot be redirected or redesigned, the result would be an adverse effect on the site. This would prompt the development and implementation of a treatment plan for mitigation of these effects.

Areas within the NHT corridor and/ or within the Management Area that are found to be outside of a physical cultural site may not experience impacts to NHT values in the same way as a cultural site. Highly mechanized rehabilitation may allow for soil and vegetation conditions to be restored to a condition resembling its historic one.

Wildlife Resources

Affected Environment

General wildlife species of the project area include, but are not limited to; desert mule deer (*Odocoileus hemionus*), black-tailed jackrabbit (*Lepus californicus*), coyote (*Canis latrans*), round-tailed ground squirrel (*Spermophilus tereticaudus*), red-tailed hawk (*Buteo jamaicensis*), turkey vulture (*Cathartes aura*), white-winged dove (*Zenaida asiatica*), Gambel's quail (*Lophortyx gambelii*), desert iguana (*Dipsosaurus dorsalis*), zebra-tailed lizard (*Callisaurus draconoides*), western whiptail (*Aspidoscelis tigris*), and diamondback rattlesnake (*Crotalus atrox*). A more expansive

listing of species and descriptions of habitat condition and needs can be found in the SDNM Final RMP in sections 3.2.13.3 and 3.2.13.4.

Sonoran desert tortoise

A species of particular interest in the project area is the desert tortoise (*Gopherus agassizii*). There is approximately 166,000 acres of Category I, 124,700 acres of Category II and 3,500 acres of Category III desert tortoise habitat allocated and occur within the monument. The total tortoise habitat within SDNM is 294,200 acres out of 486,400 acres in the SDNM. Tortoise habitat is associated with bajadas, rough, rocky slopes, and ridges. Tortoises also use caliche caves in washes for burrows as well as washes as travel ways.

Desert bighorn sheep

Approximately 290,411 acres of Desert bighorn sheep habitat lies within the monument. Desert bighorn have been documented from all the mountain ranges on the SDNM. Important features of Desert bighorn habitat are cliffs, rock outcrops, and talus slopes which are used as escape terrain. Desert bighorn are closely associated with Paloverde mixed cacti-mixed scrub on Rocky slopes, mountain upland and rock outcrop natural communities. However, desert bighorn sheep move seasonally between the uplands and bajadas and also travel across desert valleys between mountain ranges. Recent population estimates for the Sand Tank, North and South Maricopa Mountains have been low, presumably due to severe drought conditions over the past several years.

Lesser long-nosed bat

The Lesser long-nosed bat was listed, as endangered, in September, 1988 without critical habitat (USFWS 1988). The lesser long-nosed bat consumes high energy nectar, pollen and fruit produced by a variety of columnar cacti and agaves. The migratory nature of the lesser long-nosed bat allows it to take advantage of the seasonal availability of these cacti and agave species. Cactus flowers and fruit are available during the spring and early summer; agave flowers are available from July through October.

Tucson shovel nosed snake

The Tucson shovel-nosed snake is a nocturnal animal that burrows in loose sand by “sand swimming” (wriggling through sand rather than tunneling) (Stebbins 1985). Little is known about the specific habitat needs of this subspecies, but because of its burrowing habits, the shovel-nosed snake is found in areas with soft sandy loams, loose soil, fine, wind-blown sands, such as in washes, or occasionally on rocky hillsides with pockets of sand among rocks (Stebbins 1985). There are two known occurrences of the snake one along I-8 (to the east of the monument) and the other along Highway 85, west of the monument. Both occurrences are outside of the monument boundary. It can be assumed that the snake does occupy areas of the monument where habitat is conducive for the needs of the species.

Impacts

No Action Alternative

Under the no action alternative it can be assumed that the closed routes would continue to be utilized by OHVs and other public and the areas where wildlife species such as bighorn sheep, are present could become avoidance areas in the event that such use disrupts species lifecycles.

Sonoran desert tortoise can be directly impacted by off-highway vehicles from road kill, interruption of tortoise movements, and removal as pets, and indirectly from impacts to vegetation used for cover and forage, and fragmentation of contiguous areas of vegetative habitat.

Tucson shovel nose snake mortality is unknown but it is expected that mortality would remain at essentially the same levels as current level due to likelihood of closed routes to be used in their creosote-bursage flat habitat.

It can be assumed that foraging habitat for the Lesser long-nosed bat would continue to be affected at current levels. Indirectly mortality of cactus pups and nurse plants could continue under the no action alternative.

Alternative I – (Passive)

Impacts to general wildlife species would range from negligible to minor under the proposed action. Ripping/harrowing of upland locations could impact wildlife during construction activities and would be short term in nature. Wildlife could avoid the area that is under rehabilitation dependent on location and amount of human activity and noise associated with the project. However, once the project is completed it can be assumed that wildlife would return to the area. Some small slow moving animals and small burrows could be destroyed or removed as construction activities are conducted; however, this would not lead to decreases in local species populations as a whole. The action of restoration through natural vegetation would have no effect on species in the area. Natural restoration processes would occur without human presence or construction activities. However, due to routes remaining in place and existing soil compaction, vegetation could take longer to regenerate or reoccupy the area.

Decommissioning routes within the SDNM could benefit the tortoise due to the expected reduction of human activity. This would allow the tortoise to forage, travel, and move and breed around and near the areas of route closure with no impediments from human activity. The proposed ground disturbing actions would have a negligible impact to the Sonoran desert tortoise in the short term until disturbed areas are rehabilitated. Acres of tortoise habitat returned to productivity by rehabilitation activities are shown in **Table 17** below. Comparative to the total acres of tortoise habitat existing in SDNM, the short term negative effects and long term benefits would both be minor, representing only 0.8% of the total tortoise habitat in SDNM.

Table 17. Sonoran Desert Tortoise Habitat Acres Returned Productivity

| Habitat Class | Miles Closed | Avg Route ¹ Width (ft) | Ft/Mile | Total Sq/Ft | Sq Ft/Ac | Acres |
|------------------------------|--------------|-----------------------------------|---------|-------------|----------|-------|
| Category 1 | 59.1 | 12 | 5,280 | 3,747,110.4 | 43,560 | 86.0 |
| Category 2 | 83.8 | 12 | 5,280 | 5,311,468.8 | 43,560 | 121.9 |
| Category 3 | 5.4 | 12 | 5,280 | 344,678.4 | 43,560 | 7.9 |
| Total all habitat categories | | | | | | 215.9 |

¹ All routes being closed are primitive roads

Route decommissioning within the SDNM could have beneficial effects to the species by removing OHV activity and allowing bighorn sheep to travel, move, forage, breed and kid near and around the areas of route closure without disruptions from human activity. The proposed action would have a negligible impact to bighorn sheep as a result of the improved habitat conditions and reduced opportunity for human interaction.

Potential conflicts between OHV use and Lesser long-nosed bat foraging habitat may include an increase in non-native plant species, which could result in an increase in fire frequency in the Sonoran desert. Other potential conflicts include soil compaction, squishing of young saguaro, and crushing/destruction of saguaro nurse plants. The proposed action would have a negligible impact to Lesser long-nosed bat resulting from the temporary nature of the disturbance and the long term improvements to both vegetation and visitor management. Mature saguaros and other columnar cactus would be unaffected during signing and rehabilitation actions having no effect on foraging of the bat.

Potential conflicts between OHVs and Tucson shovel-nosed snakes could result from soil compaction, accidental vehicular mortality and the alteration of vegetative communities through the introduction of non-native plant species. The proposed signing and rehabilitation actions would have a negligible impact to Tucson shovel-nosed snake in the short and minor beneficial effect in the long term due to activities subsiding in disturbed areas where snakes could be present. Night time work would be avoided, thus having no road kill effect on snakes. Considering that 50% of the rehabilitation, 101.6 miles, is to occur in creosote-bursage vegetation community, this species is likely to benefit from reduced presence of roads over the long term.

Alternative 2 - (Very Active)

Impacts to wildlife would be similar to those in proposed action, except that this alternative would increase the amount of surface disturbance and human activity in the short term. The increase in surface disturbance, being a more intense action than the No Action or Alternative 1, including increased human activity could lead to species avoiding areas for extended periods of time and occupying other available habitats in the immediate area. This alternative could increase the likelihood of some small slow moving animals and small burrows being destroyed

or removed as construction activities are conducted, however this would not lead to decreases in local species populations as a whole. Effects overall would be minor to negligible in the long term.

Vegetation Resources

Affected Environment

In the areas affected by the rehabilitation action, there are six different vegetation communities, all of which are associated with Monument objects. The vegetation community acreages in SDNM are shown in **Table 18**.

Table 18. Vegetation Community Acreage Table

| Vegetation Community | Acreage |
|---------------------------|---------|
| Creosote-Bursage | 179,600 |
| Palo Verde-Mixed cacti | 303,300 |
| Other (incl. desert wash) | 3,500 |
| Total | 486,400 |

Project areas for include 47.4 miles of desert washes containing stands of mature trees such as Palo verde, ironwood and mesquite. Activities that cause damage to vegetation communities include those that denude areas, compact soils to prevent root penetration or allow invasive species to proliferate.

Impacts

No Action Alternative

There would be continuing impacts to vegetation communities through continued loss of vegetation from camping, vehicle parking and driving. A lack of maintenance would continue the practice of driving around bad spots, thus causing additional vegetation loss along roads and primitive roads. Roads designated as closed would likely not rehabilitate in a short enough time to prevent them from being continually used and restoration would not be achieved.

Alternative I – (Passive)

Using lower impact techniques for route rehabilitation would have a minor effect on short term growth of all types of vegetation. As compared to the No Action alternative, growing conditions would be improved due to the presence of barriers and signage to prevent vehicle use leading to soil compaction. In the long term, effects would be minor, yet beneficial, in returning areas to productivity and large swaths of land would be undisturbed.

Table 19. Vegetation Communities Acreage Affected

| Vegetation Community | Closed Route Miles | Affected Acres (12 ft Avg. Width) | Percent of Project Area |
|--|--------------------|-----------------------------------|-------------------------|
| Sonoran Paloverde-Mixed Cacti Desert Scrub | 98.1 | 142.6 | 48.4 |
| Sonora-Mojave Creosote bush-White Bursage Desert Scrub | 101.6 | 147.8 | 50.1 |
| Other – combined (including desert wash) | 3.1 | 4.6 | 1.5 |

Rehabilitation activities could disturb up to 1.3 acres of previously undisturbed area along project areas due to parking or other activities associated with this work. This is based on an assumption that 5% of a 10 foot buffer zone along project areas using heavy equipment (i.e. ripping) would be impacted.

Installing new portal signage and delineation of pull off areas where visitors park to read information boards would disturb up to 6 acres of new area throughout SDNM, having a negligible effect on long term productivity of any of the vegetation communities.

Conducting vertical mulching activities would have the short term effect of reducing vegetation density along either side of the route being rehabilitated due to the moving of small live cacti such as barrel cactus, trimming of cactus limbs such as prickly pear and staghorn cholla and shrubs into the route bed. The long term effect would be an increase in production for the entire area.

Desert washes would generally increase in vegetation density. Strata would improve resulting from a lack of vehicles passing, whereby plants and trees could grow without injury.

The rehabilitating routes would occur in the two major vegetation communities and four other smaller communities, including desert washes, and have the effect of returning 295 acres to productive plan communities throughout SDNM. Rehabilitation project area would occurring in Palo verde-mixed cacti community are attributable to 0.05% of the total acres in SDNM. In Creosote-Bursage community, the project area would cover 0.06% of the total acres in SDNM. Due to the low amount of new and existing acres disturbed, the rehabilitation action would have a negligible effect on this resource.

Alternative 2 - (Very Active)

Using high impact methods for rehabilitation would reduce recovery time and possibility increase recruitment of high value plants, trees and cacti due to increased rooting depth potential. All existing vegetation in the path of ripping or harrowing would be removed, having a moderate short term effect on the percent of cover in project areas. In the long term, acres returned to full productivity would be the same as Alternative 1. The potential for proliferation of invasive weeds is greater than alternative 1 or the No Action Alternative. Acres of disturbed area from rehabilitation activities, as compared to the No Action and Alternative 1, would

increase due to greater use of equipment to rip each and every route, however the level of disturbance would still remain low considering the small work area relative to SDNM, thus effects would be negligible. Effects to desert washes would be the same as Alternative I, although rehabilitation of strata would occur sooner resulting from better protection from vehicle related impacts

Wilderness Characteristics

Affected Environment

Inventories for wilderness characteristics were conducted by BLM between 2003 and 2012. BLM assessed the SDNM for wilderness characteristics as part of the land use planning process, in response to input received during scoping, and in response to public comments provided on the draft LSFO/SDNM land use plan. The following is a description of six areas within the SDNM, totaling 154,849 acres, determined to possess wilderness characteristics. Three areas totaling 107,800 acres, including Blue Plateau, Javelina Mountain and White Hills, will be managed to protect their wilderness characteristics:

Blue Plateau (Sand Tank Mountains West): This large and natural area has wilderness characteristics as documented in BLM's 2004 and 2011 wilderness characteristic assessments.

Butterfield Stage Memorial: The unit retains borderline wilderness characteristics as documented in BLM's 1980 wilderness inventory and 2011 re-assessment. The area, however, is less natural than documented in 1980 due to impacts on naturalness from OHV use, trail and route creation, campsite proliferation, and damage to plants and rocks from target shooting.

Javelina Mountain (Sand Tank Mountains East): This large area is natural and has outstanding wilderness characteristics as documented by BLM's 2004 and 2011 wilderness characteristic assessments.

Margie's Peak: Outstanding opportunities are present for solitude and primitive and unconfined recreation, but these opportunities are limited to small areas and restrained to some degree by the unit's size and location.

South Maricopa Mountain Wilderness Extension: The area retains wilderness characteristics as documented in BLM's 1980 intensive wilderness inventory and the 2011 inventory re-assessment.

White Hills: The unit is near-pristine in character and possesses wilderness characteristics as documented by BLM's 2004 and 2011 wilderness field inventory assessments. Long vegetation-lined desert washes and groupings of rolling disarrayed hills offer outstanding opportunities for solitude and primitive and unconfined recreation.

No Action

Current management would continue under No Action. Motorized vehicle use could persist on closed vehicle routes into the foreseeable future, preventing natural restoration through non-use. Impacts on wilderness characteristics from the sights and sounds of motorized travel could continue indefinitely. Closed vehicle routes would not be reclaimed through natural processes (weathering) or active mechanical reclamation. Consequently, wilderness characteristic landscapes would be less natural as these vehicle routes would not reclaim and potentially still be subject to varying levels of motorized recreation use. These impacts would occur in both areas allocated and not allocated to protect wilderness characteristics.

Alternative I – (Passive)

Alternative I would apply mainly passive (signing, education, minor raking) closure techniques on closed vehicle routes within the six SDNM areas allocated and not allocated to protect wilderness characteristics. The emphasis under this alternative would lean toward less-intensive and hands-off reclamation methods with limited to no surface disturbance.

Signing, user education, and some minor hand tool restoration of 71.4 miles of primitive vehicle route would, over the long-term, contribute to the protection of wilderness characteristics by reducing motorized recreation use within the six areas with wilderness characteristics. These actions would slightly and directly increase natural conditions on 104 acres of area directly impacted by the presence and use of the vehicle routes, while indirectly increasing a visitor's perception of naturalness and their solitude opportunities on 11,424 acres adjacent to the closed vehicle routes.

The sights and sounds of motorized recreation activities on closed routes within the Blue Plateau area, Javelina Mountain area and the White Hills area, three areas allocated to the protection of their wilderness characteristics, would be gradually inhibited upon the signing and closure of vehicle routes, based on the compliance of visitors with the passive closure measures. These areas have 62.5 miles of closed vehicle route, so in aggregate the impact would be gradually noticeable. Moreover, desert washes within these three areas that are not part of an approved route system would be immediately signed and closed. These drainages would naturally and quickly reclaim during seasonal flash floods. Overall, natural conditions and opportunities for solitude and primitive and unconfined recreation on about 10,000 acres surrounding the closed vehicle routes would be enhanced over the long term.

As described in the paragraph above, the sights and sounds of motorized recreation activities on closed routes within the Butterfield Stage Memorial, South Maricopa Mountains Extension and Margie's Peak areas, three areas not allocated to the protection of their wilderness characteristics, would also be gradually curtailed. Overall, the effects would be dependent on the compliance of visitors with the passive closure measures. The overall effects on wilderness characteristics would proportionally be much less as these three areas have less than nine miles of closed vehicle route.

Passive reclamation techniques like signing and raking would have less direct impact on the wilderness characteristic of naturalness over the short term since ground disturbances would be minimal, but with the concession that motorized use might continue for longer periods of time on vehicle routes not aggressively reclaimed or closed. Consequently, vehicle routes may not reclaim naturally for decades and motorized uses might continue, diminishing wilderness characteristics and the associated non-motorized recreation settings in areas neighboring the closed vehicle routes. It may take 20 or more years for primitive roads to naturally reclaim when only passive or natural reclamation techniques are applied. Wilderness characteristic protection and enhancement would not occur or would be achieved much slower under this alternative.

In summary, this alternative embodies moderate protective enhancement for lands with wilderness characteristics, both within lands allocated and lands not allocated, to protect wilderness characteristics. Overall, the naturalness of six areas could be slightly too moderately enhanced by the passive reclamation actions proposed. However, overall success under this alternative over the long term would mainly be correlated with the visitor's volunteer compliance with the subject route closures.

Alternative 2 – (More Active)

This alternative would apply a combination of passive (signing, education) and more aggressive mechanical (fencing, berming, barriers, harrowing, ripping, vertical mulching) reclamation techniques on closed vehicle routes within the six areas allocated and not allocated to protect wilderness characteristics. More active mechanical reclamation processes and vehicle barriers would be directly applied on routes when more passive reclamation measures fail to work or are unlikely to quickly achieve desired route restoration conditions both in the short and

Signing, closure and decommissioning of over 71.4 miles of primitive vehicle route would, over the long-term, contribute to the protection of wilderness characteristics in the six areas by directly escalating the natural character of the landscape over 104 acres, enhancing an individual's perception of naturalness, increasing opportunities for non-motorized primitive and unconfined recreation, and curtailing motorized use in areas allocated and not allocated to protect wilderness characteristics. Wilderness characteristics would also be improved and maintained in 11,424 acres of land surrounding these closed vehicle routes.

The sights and sounds of motorized recreation activities on closed routes within the Blue Plateau area, Javelina Mountain area and White Hills area, three areas allocated to the protection of their wilderness characteristics, would be quickly inhibited upon the signing and closure of vehicle routes, based on the active closure and removal closure measures. These areas have 62.5 miles of closed vehicle route, so in aggregate the impact would be immediately noticeable. Moreover, desert washes within these three areas that are not part of an approved route system would be immediately signed and closed. These drainages would naturally and quickly reclaim during seasonal flash floods. Overall, natural conditions and opportunities for

solitude and primitive and unconfined recreation would be directly enhanced on 91 acres and indirectly improved on 10,000 acres surrounding the closed vehicle routes. Natural conditions would be more rapidly achieved over both the short and long terms.

Where aggressive reclamation techniques are applied, results and desired outcomes would be quickly achieved. Wilderness characteristic protection and enhancement would occur faster in areas where vehicle routes are decommissioned with aggressive hand crew and mechanical reclamation techniques like vertical mulching, harrowing, or road bed ripping, along with combinations to dress and contour the mechanical reclamation work. The application of active mechanical reclamation techniques like mulching, ripping or harrowing would disturb soils and harm and kill plants, contributing to short-term effects on naturalness. Such activities would also create short-term impacts on solitude opportunities, lasting one to four weeks, from the sights of sounds of work crews and machinery. On-the-other-hand, vehicle routes would be eradicated and natural conditions restored more quickly in landscapes with aggressive mechanical reclamation techniques, as well as the near instantaneous potential of fewer vehicle incursions.

About nine miles of closed vehicle routes would also be decommissioned in Margie’s Peak, the South Maricopa Mountains Extension, and the Butterfield Stage Memorial, areas not allocated to protect wilderness characteristics. Decommissioning routes in these three areas would enhance the documented wilderness characteristics as the landscapes would become more natural over the long term and potentially more available for non-motorized recreation activities like hiking, hunting and backpacking.

In summary, this alternative quickly achieves protective enhancement for lands with wilderness characteristics, both within lands allocated and lands not allocated, to protect wilderness characteristics. Overall, the naturalness of up to 104 acres would be directly reclaimed by the active decommissioning actions proposed under this alternative, and the perception of wilderness characteristics improved on the 11,424 acres flanking the closed vehicle routes.

CUMULATIVE ACTIONS

Table 20. Cumulative Actions: Past, Present and Future Actions

| Action | Description | Resources Affected | Impact Area |
|-------------------|---|---|--|
| Past (since 1912) | Increase in Arizona population, leading to increased road building /associated impacts in SDNM and surrounding areas. | All Monument objects (-), recreation (+/-) | Entire state, long term beginning at statehood |
| Present | Designation of routes in SDNM, resulting in 35% closure of existing routes. | All Monument objects (+) plus recreation (+/-), air quality (+) | SDNM area immediate connecting area |
| Present | Improvement of travel management in SDNM such as licensing requirements. | All Monument objects (+) plus recreation (+) | SDNM area immediate connecting area |

| Action | Description | Resources Affected | Impact Area |
|-------------------|--|---|-------------------------------------|
| Future (5-10yrs) | Designation of routes on public lands outside SDNM. | Recreation including OHV (+/-), wildlife (+), wilderness characteristics (+), lands & realty (-), cultural (+), air quality (-) | Southwestern AZ |
| Future (5+ years) | Population increase leading to increased visitation in SDNM from adjacent towns by vehicle. | All Monument objects (-), recreation (-), air quality (-) | SDNM area immediate connecting area |
| Future (5+ years) | Increases in technology (i.e. alt. fuel vehicles, remote sensing technology) leading to better monitoring, resource conditions and lower impact use and management. Greenhouse gas emissions affected. | All Monument objects (+), recreation (+), air quality (+) | Southwestern AZ |

Cumulative effects to SDNM resources and objects began around the time of Arizona statehood in 1912. The continuous flow of people into the state increased human presence and use throughout the region. This led to an increase of paved and unpaved roads which affects many resources both positively and negatively. Implementing the route designations in SDNM reduces the number and density of unpaved roads. In the future, Arizona population is likely to continue rising and surrounding towns will increase in population, making SDNM their new backyard. Increased eco-tourism will also increase visitation to the SDNM. In the future (20+ years), more visitors will come to SDNM and will likely travel by motor vehicle. Increases in technology appear to reduce the carbon footprint of vehicle driving. BLM's capability to monitor lands using remote sensing technologies is likely to be increased to point where minor changes will be detectable leading to reduced response time to correct management issues.

The net effect of the negative past and present actions of population increase, road building and expected future population growth is that it is likely to be offset by the designation of the routes in SDNM, leading to better management of the SDNM and future increases in technology that allow for lower impact visitation. Air quality and green-house gas (GHG) emissions are likely to remain at current levels as fuel economy and alternative fuel vehicles increase. As visitors live closer to SDNM, trips will become shorter and emit fewer GHGs, thus offsetting increases in population.

TRIBES, INDIVIDUALS, ORGANIZATIONS OR AGENCIES CONSULTED

Consultation regarding travel and vehicle management was conducted during the process of completing the SDNM RMP. A complete listing of organizations, individuals, agencies and tribes consulted during the RMP process is discussed in the Proposed RMP/Final EIS -Chapter 5. The RMP Scoping Report (2003) includes a detailed list of the interested parties and their issues. Below is a listing of parties consulted during the preparation of the RMP and the associated actions presented in this EA

Ak-Chin Indian Community
Arizona Game and Fish Department
Arizona Wilderness Coalition
Sierra Club
Tohono O'odham Nation
Town of Gila Bend
U.S. Air Force – Barry M. Goldwater Range
U.S. Border Patrol
U.S. Fish and Wildlife Service
The Wilderness Society

LIST OF PREPARERS

Table 21. List of Preparers

| Contributing BLM Specialists | |
|------------------------------|---|
| Name | Role / Expertise |
| Tom Bickauskas | TMP Project Lead, Travel Management Coordinator, Vegetation and Soils Analyst |
| Steve Bird | Wildlife Biologist |
| Cheryl Blanchard | Archaeologist |
| Sharisse Fisher | GIS Specialist |
| Penny Foreman | SDNM RMP Planning Coordinator, Recreation Planner, Writer/Editor |
| Rich Hanson | Wilderness Specialist, SDNM Manager, Advisor |
| Dave Scarbrough | Recreation Planner, Sign Plan Author |

REFERENCES

_____. 1990. Strategy for Desert Tortoise Habitat Management on Public Lands in Arizona. Bureau of Land Management, Arizona State Office, Phoenix. 19pp.

Blanchard, Cheryl L. and Tammi Sullivan, 2004, *A Cultural Resource Survey Along 14 Miles of Vekol Road, Maricopa County, Arizona*. Bureau of Land Management, Cultural Resource Project Record Form, BLM – 020 – 12 – 254.

Bureau of Land Management (BLM), U.S. Department of the Interior (USDI). 1988. Desert Tortoise Habitat Management on the Public Lands: A Range wide Plan. Bureau of Land Management, Washington, D.C. 23 pp.

Bungart, Peter W. and Anne E. Raney, 2007, *Cultural Resource Survey Along Selected Roads & Routes in the Sonoran Desert National Monument*. Circa Cultural Consulting, Cultural Report No. 06-30, Flagstaff, Arizona.

Homburg, Jeffrey A., Jeffrey H. Altschul, and Rein Vanderpot, *Intermontane Settlement Trends in the Eastern Papageria: Cultural Resources Sample Survey in the Northeastern Barry M. Goldwater Range, Maricopa County, Arizona*. Statistical Research Technical Series No. 37, Tucson. 1994

Morrison, P.H., H.M. Smith IV and S.D. Snetsinger. 2003. The Natural Communities and Ecological Condition of the Sonoran Desert National Monument and Adjacent Areas. Winthrop, Washington: Pacific Biodiversity Institute.

Shirley, Shirley Lynn and Marcus P. Grant, *Revised Cultural Resource Survey Sonoran Desert National Monument, Former Area A, Barry M. Goldwater Range, Luke AFB, Arizona*. Geo-Marine, Inc., Las Vegas, Nevada, 2007

Stebbins, Robert C. 1985. *Western Reptiles and Amphibians*. Houghton Mifflin Company: Boston. pp. 153.

U.S. Fish and Wildlife Service (USFWS). 1988. Determination of Endangered status for two long-nosed bats, Final Rule. Federal Register 53(190): 38456-38460.