Environmental Assessment and
Draft CDCA Plan Amendment

Western Mojave Desert Off Road Vehicle Designation Project

March 2003

United States
Department of the Interior
BUREAU OF LAND MANAGEMENT
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

March, 2002

Dear Reader:

Enclosed for your review is the draft California Desert Conservation Area (CDCA) Plan Amendment for the Western Mojave Desert Off Road Vehicle Designation Project (Designation Project), and associated Environmental Assessment (EA). The draft plan amendment will update the 1980 CDCA Plan by incorporating into that plan a network of motorized vehicle access routes in Inyo, Kern, Los Angeles and San Bernardino Counties, California. The Bureau of Land Management (BLM) prepared these documents in fulfillment of its responsibilities under the Federal Land Policy and Management Act of 1976, the National Environmental Policy Act of 1969, the Federal Endangered Species Act of 1973, and the Bureau of Land Management's Off-Road Vehicle Regulations (43 CFR 8340).

The planning area includes about 3.2 million acres of public lands within the western Mojave Desert. The purpose of the Designation Project is to establish a network of motorized vehicle access routes on those lands and to incorporate the network into the CDCA Plan. The EA assesses the impacts of incorporating BLM's existing off road vehicle designations into the CDCA Plan, as well as the effects of adopting a revised network on 1.4 million acres of desert tortoise critical habitat and other sensitive areas.

Thirty (30) days are being provided for public review of the EA. Comments should be directed to:

Designation Project
Bureau of Land Management
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

Final plan approval will be documented in a Record of Decision. A new environmental assessment is not anticipated. The Record of Decision will be made available to the public and mailed to all interested parties.

Sincerely,

Linda Hansen
California Desert District Manager

Environmental Assessment and Draft CDCA Plan Amendment

For The

Western Mojave Desert Off Road Vehicle Designation Project

Bureau of Land Management
California Desert District Office
22835 Calle San Juan De Los Lagos
Moreno Valley, CA 92553

CONTENTS

CHAPTER ONE
PURPOSE AND NEED

1.1 OVERVIEW
1.2 HISTORY OF THE DESIGNATION PROJECT
1.2.1 Data Base
1.2.2 Task Groups Develop the ORV Designations
1.3 RELATIONSHIP TO STATUTES, REGULATIONS AND POLICIES
1.4 RELATIONSHIP TO OTHER REGIONAL PLANS

CHAPTER TWO
ALTERNATIVES

2.1 INTRODUCTION
2.1.1 Overview
2.2 ALTERNATIVE A: PROPOSED ACTION
2.2.1 Background
2.2.2 Criteria
2.2.3 Route Designation Methodology
2.2.4 El Paso Collaborative Access Planning Area
2.2.5 California Back Country Discovery Trail
2.2.6 Implementation
2.2.7 Modification of Route Network
2.3 ALTERNATIVE B: ENHANCED ECOSYSTEM PROTECTION
2.4 ALTERNATIVE C: ENHANCED RECREATION OPPORTUNITIES
2.5 ALTERNATIVE D: NO ACTION
2.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED CONSIDERATION

CHAPTER THREE
AFFECTED ENVIRONMENT

3.1 PLANNING AND REGULATORY FRAMEWORK
3.1.1 Federal Land Policy and Management Act
3.1.2 Executive Order 1164
3.1.3 Federal Regulations

3.1.4 California Desert Conservation Area Plan
3.2 AIR QUALITY, SOILS AND WATER
3.2.1 Air Quality
3.2.2 Soils
3.2.3 Water
3.3 BIOLOGICAL RESOURCES
3.3.1 Natural Communities
3.3.2 Desert Tortoise
3.3.3 Mohave Ground Squirrel
3.3.4 Other Species
3.4 LIVESTOCK GRAZING
3.5 RECREATION
3.5.1 Patterns of Use
3.5.2 Off-Highway Vehicle Use
3.6 MOTORIZED VEHICLE ACCESS NETWORK
3.6.1 Off Road Vehicle Designations Prior to 2002
3.6.2 OHV Route Subregions
3.7 CULTURAL RESOURCES
3.7.1 Archaeological, Historical, Paleontological and Ethnographic Resources
3.7.2 Tribal Governments and Policies

CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION
4.2 ALTERNATIVE A: PROPOSED ACTION
4.2.1 Air Quality, Soils and Water
4.2.2 Biological Resources
4.2.3 Motorized Access
4.2.4 Cultural Resources
4.3 ALTERNATIVE B: ENHANCED ECOSYSTEM PROTECTION
4.3.1 Air Quality, Soils and Water
4.3.2 Biological Resources
4.3.3 Motorized Access
4.3.4 Cultural Resources
4.4 ALTERNATIVE C: ENHANCED RECREATION OPPORTUNITIES
4.4.1 Air Quality, Soils and Water
4.4.2 Biological Resources
4.4.3 Motorized Access
4.4.4 Cultural Resources
4.5 ALTERNATIVE D: NO ACTION
4.5.1 Air Quality, Soils and Water

4.5.2 Biological Environment
4.5.3 Motorized Access
4.5.4 Cultural Resources

APPENDICES

Appendix A Decision Tree
Appendix B Subregions
Appendix C Route Designation Maps and Tables

MAPS

Maps of the route network can be found on the attached compact disk (CD Rom). Maps are full color, 1:24,000 scale USGS topographic quads; where applicable, the route number is attached for easy cross-referencing to the tables presented in Appendix C. Maps can be viewed using the Adobe reader on your home or local library computer. You will find that this will enable you to view any section of the route network at a variety of scales, and to print your own maps from the attached files. Please note that an index map is also provided. Subregion and motorized access zone boundaries are indicated on the maps.

CHAPTER ONE
PURPOSE AND NEED

1.1 OVERVIEW

The western Mojave Desert includes over 3.2 million acres of public lands that are administered by the Bureau of Land Management's (BLM) California Desert District Office. It is located just north of the Los Angeles metropolitan area. The northwestern portion of this region is under the jurisdiction of the BLM's Ridgecrest Field office, while the BLM's Barstow Field Office administers the remainder. The Sierra Nevada and Tehachapi mountain ranges bound the area on the west, the San Gabriel and San Bernardino Mountains border the south, while the Mojave National Preserve and Death Valley National Park lie to the east and northeast.

The BLM is required to designate off-road vehicle routes on public lands as open or closed to motorized vehicle access, or as open on a limited basis. This designation process is a requirement of federal regulation, BLM policy and the BLM's California Desert Conservation Area (CDCA) Plan. Two steps are involved in this process: (1) the designation of routes as open, closed or limited, and (2) amendment of the applicable BLM land use plan (in this case, the CDCA Plan) to incorporate the network of open and limited routes as a component of the Plan.

BLM must take into account the conservation of threatened and endangered plant and animal species and the ecosystems on which they depend as it designs a motorized vehicle access network for the 3.2 million acres of public lands within the western Mojave Desert. This area is rich in biological diversity because of its varied vegetation communities and landforms and because of its location adjacent to the Transverse Ranges, the Sierra Nevada, the Colorado Desert and the Great Basin. With its proximity to the growing cities of the Los Angeles basin, the western Mojave Desert is subject to increasing demand for community development, recreation and resource utilization. One result is an increasing loss and fragmentation of species habitat. This situation has led to the need for a motorized vehicle access network in the western Mojave Desert that meets the public's recreational and commercial access needs, but does so in a manner that is compatible with ongoing programs to conserve plant and animal species and their habitats and prevent future listings as threatened or endangered.

In the years since 1980, when the CDCA Plan was adopted, BLM completed the first step of that process: the designation of motorized vehicle routes throughout the western Mojave Desert. The most far-reaching designation effort took place between 1985 and 1987, and encompassed most of the region's public lands. Other significant efforts to designate motorized routes occurred both before and after the 1985-1987 effort as part of various planning efforts, primarily in connection with the preparation of management plans for Areas of Critical Environmental Concern (ACEC), and in the late 1990s during a "pilot" designation process for the Ord Mountain region. The second step – amendment of the CDCA Plan – has not yet occurred.

The Western Mojave Desert Off Road Vehicle Designation Project (Designation Project) builds upon those earlier efforts. Its updates the previous route designation efforts, taking into account new or significant planning issues, such as the listing of the desert tortoise as a threatened species in 1990. It also ensures that all of the many designation efforts undertaken since 1980 complement each other and, collectively, form a seamless route network.

This Environmental Assessment addresses the impacts of adopting a motorized vehicle access network as a component of the CDCA Plan through amendment of that plan, and of implementing that network. The EA examines the environmental effects of both BLM's existing off road vehicle designations, and of a revised network on 1.4 million acres of desert tortoise critical habitat and other sensitive areas.

Relationship between the Designation Project and the West Mojave Plan: The Designation Project's public lands are within the region that is also being addressed by the West Mojave Plan, an interagency habitat conservation plan that is developing conservation strategies for over 100 sensitive plants and animals (including the threatened desert tortoise). Local cities and counties, along with state and federal agencies are collaborating to prepare the West Mojave Plan. A draft environmental impact report and statement (EIR/S) for the West Mojave Plan will be released in May 2003 for a 90-day public review. A federal decision on the West Mojave Plan will be made early in 2004, following the publication of a final Plan and EIR/S.

To ensure that the route network proposed by the BLM's Designation Project is compatible with the Plan's conservation strategies, the agencies preparing the West Mojave Plan will include a complete assessment of the Designation Project's route network in both the Draft and Final EIR/S. This will ensure that the Plan's conservation strategies and the Designation Project's route network complement each other, and that any additional cumulative impacts are addressed. Since the West Mojave Plan will also involve amendments to the BLM's CDCA Plan, any minor modifications of the network expected to be approved on or before June 30, 2003 by the Designation Project could be made through the West Mojave planning process, or by subsequent BLM CDCA plan amendments.

Organization of the EA: The EA is organized into the following parts:

?? **Chapter One - Introduction** provides an overview of the Designation Project, applicable statutes, regulations, and policies, and the history of the project.
?? **Chapter Two - Alternatives** describes the proposed and existing motorized vehicle access networks.
?? **Chapter Three - Affected Environment** describes those aspects of the natural and human environment that are likely to be affected by the adoption of the alternatives described in Chapter 2.
?? **Chapter Four - Environmental Consequences** presents an analysis of the effects that adoption of each of the alternatives could have on the natural and human environment.
?? **Appendices** that include supporting technical materials and a table describing the reasons why each route was recommended as open, limited or closed by the proposed action.

1.2 HISTORY OF THE DESIGNATION PROJECT

1.2.1 Data Base

The Designation Project is based upon the best science reasonably available. Between September 2001 and March 2002, thirteen field crews inventoried nearly 8,000 miles of motorized vehicle access routes within the western Mojave Desert. Both four wheel drive and motorcycle crews participated in the survey. Routes were recorded using global positioning system technology. The nature of the route (graded gravel, good dirt, motorcycle trail) was recorded, and nearly two-dozen types of pertinent desert features mapped (including campsites, mines, trailheads, and water sources). This information was transferred into the planning team's digital Geographic Information System (GIS) database. In addition, data collected by BLM field survey crews in 1985 and 1987, and during the preparation of BLM management plans for ACECs between 1980 and the late 1990s, was digitized and stored in the GIS database. This data was supplemented by digital analysis of routes identified from aerial photography taken in 1995 and 1996 covering most public lands within the planning area. As a route network was designed, this information, together with extensive biological data assembled for the West Mojave Plan, was applied to ensure that the network met both access and resource needs.

1.2.2 Task Groups Help Develop the ORV Designations

In November 1999, as part of the West Mojave planning process, task groups were established to help develop components of the West Mojave Plan. One of these task groups (Task Group 2) was established to assist with the development of a motorized vehicle access network for the western Mojave Desert. Task group 2 met 12 times between December 1999 and the conclusion of their work in May 2002. To assist Task Group 2 and the route designation process, two subcommittees were formed: a field survey advisory group and a route designation technical committee.

As the task group process evolved, certain issues would emerge that would result in considerable public interest or controversy, including the design of the motorized vehicle access network and the role of equestrians. As a result, public information meetings were held throughout the desert on an irregular basis. Many persons who first became involved through these meetings later joined Task Group 2.

1.2.3 BLM Decisions and Approvals

Implementation of the Designation Project on public lands requires approval by the BLM's California Desert District Manager through a Record of Decision (ROD), following the resolution of any protests. This approval includes the amendment of the CDCA Plan to incorporate the route network as a component of that plan.

1.3 RELATIONSHIP TO STATUTES, REGULATIONS AND POLICIES

All BLM decisions and approvals must be consistent with applicable statutes, regulations and policies, including but not limited to the following:

- ?? Federal Endangered Species Act
- ?? National Environmental Policy Act
- ?? Federal Land Policy and Management Act
- ?? National Historic Preservation Act
- ?? California Desert Protection Act
- ?? Clean Water Act
- ?? Clean Air Act
- ?? Wilderness Act
- ?? Taylor Grazing Act
- ?? Sikes Act
- ?? Mining and Minerals Policy, and National Materials and Minerals Research and Development Acts
- ?? Mining, Mineral Leasing, Material Disposal and Reclamation Acts
- ?? Federal Executive Orders and Congressional Mandates

1.4 RELATIONSHIP TO OTHER REGIONAL PLANS

Southern California and southern Nevada are the sites of a number of important regional planning efforts. These include regional habitat conservation plans, natural community conservation plans and federal land use plans and amendments. In fact, most of the land surface between Las Vegas, Nevada and San Diego, California lies within the scope of an ecosystem-planning program.

The West Mojave Plan was discussed in Section 1.1 above. The following is a brief summary of other major planning efforts being undertaken immediately adjacent to or within the western Mojave Desert.

Coachella Valley Multiple Species Conservation Plan (CVMSCP): The lead for this plan is the Coachella Valley Association of Governments. The planning area includes most of the urban and urbanizing area of the Coachella Valley as well as the Santa Rosa Mountains, within Riverside County, and lies adjacent to and southeast of the western Mojave Desert. As part of this planning effort, BLM has prepared a CDCA plan amendment applicable to CVMSCP's federal lands. Routes were designated for the Morongo subregion, a small area within the West Mojave administered by the Palm Springs Field Office. A Record of Decision for the BLM Coachella Valley CDCA Plan Amendments was signed in December 2002.

Northern and Eastern Mojave Plan (NEMO): The BLM's NEMO plan addresses recovery of the desert tortoise and management of a few additional species of concern on public lands. The NEMO planning area lies to the northeast of the western Mojave Desert, in the area that generally lies between Death Valley National Park and the Mojave National Preserve. The NEMO Plan included a motorized vehicle access network for public lands within desert tortoise conservation areas, or "DWMAs" (Desert Wildlife Management Areas). A Record of Decision for NEMO adopting both the plan and the access network was signed in December 2002. The route network for the remaining public lands within NEMO is currently under development and will be completed by June 30, 2004.

Northern and Eastern Colorado Plan (NECO): The NECO plan, like NEMO, primarily concerns the management of BLM lands located to the east and southeast of the western Mojave Desert. A motorized vehicle access network was developed for public lands within the NECO planning area. A Record of Decision for NECO adopting both the plan and the access network was signed in December 2002.

Southern California Province Forest Plan: This plan is being prepared by four National Forests located in Southern California, including the Angelus and San Bernardino National Forests, which are adjacent to and south of the western Mojave Desert. Decisions reached by the Southern California Province Plan would affect National Forest lands only. The most important cross-boundary issues that affect both the Forest Service planning efforts and the Designation Project involve the development of motorized vehicle access networks. The Forest Service was consulted on route designation where roads and trails enter the San Bernardino National Forest from the West Mojave Plan area.

Military Integrated Resource Management Plans (INRMPs): Each of the five military bases located within the western Mojave Desert has prepared, or is preparing, an INRMP to guide the management of natural resources on each base. The INRMPs affect military lands only, and do not include the development of motorized vehicle access network for public use.

CHAPTER TWO
ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes four alternative strategies to accomplish off road vehicle designations in the western Mojave Desert. The four alternatives include the following:

- ?? **Alternative A: Proposed Action.** This alternative presents a motorized vehicle access network that is composed in part of the existing BLM route designations in the western Mojave Desert, and in part of a revised network within desert tortoise critical habitat, and other locations having sensitive resource values.
- ?? **Alternative B: Enhanced Ecosystem Protection.** This alternative places a high priority on the conservation of sensitive plants and animals, even if adoption of those recommendations would limit motorized vehicle access to and multiple use of the western Mojave Desert.
- ?? **Alternative C: Enhanced Recreation Opportunities.** This alternative places a priority on providing a high degree of recreation access to the western Mojave Desert.
- ?? **Alternative D: No Action.** This alternative would retain BLM's existing motorized vehicle access network, which would be incorporated into the CDCA Plan.

Alternative A is discussed first and in depth. The description of each of the other alternatives incorporates the Alternative A discussion by reference; only those components that differ from Alternative A are presented.

2.2 ALTERNATIVE A: PROPOSED ACTION

2.2.1 Background

The Western Mojave Desert Off Road Vehicle Designation Project would designate routes on public lands managed by the BLM as open or closed to motorized vehicle access, or as open on a limited basis. This designation of motorized routes is a requirement of federal regulation, BLM policy and the BLM's CDCA Plan, and is one of the recommendations of the USFWS Desert Tortoise Recovery Plan. Two steps are involved in this process: (1) the designation of routes as open, closed or limited, and (2) amendment of the CDCA Plan to incorporate the network of open and limited routes as a component of the CDCA Plan.

Since 1980, when the CDCA Plan was adopted, BLM completed the first step of the process: the designation of motorized vehicle routes on public lands within the planning area. The most far -reaching designation effort took place between 1985 and 1987, and encompassed most of the western Mojave Desert. Other significant efforts to designate motorized routes occurred both before and after the 1985-1987 effort as part of various planning efforts, primarily in connection with the preparation of ACEC plans, and in the late 1990s during a "pilot"

designation process for the Ord Mountain region[1]. The second step – amendment of the CDCA Plan – has not yet occurred.

The Designation Project builds upon those earlier efforts. It updates the previous route designation efforts, taking into account new or significant planning issues (e.g. the need for a "second look" at the route network within desert tortoise critical habitat; the existing route network was designated before the tortoise was listed as threatened in 1990). It also ensures that all of the many designation efforts undertaken since 1980 complement each other and, collectively, form a seamless route network.

This discussion of the BLM's proposed motorized vehicle access network is organized as follows:

?? Criteria
?? Methodology
?? El Paso Collaborative Access Planning Area
?? California Back Country Discovery Trail
?? Implementation
?? Modification of Route Network

2.2.2 Criteria

The planning team endeavored to develop a route designation process that would employ the successful aspects of past efforts, avoid their pitfalls and involve the public extensively in its development. Consultation with the architects of past designation efforts, other land use planners and extensive conversations and meetings with the public identified a number of issues and concerns that needed to be addressed if a designation process was to be successful. As a result, it was decided to base route designation decisions on the following:

?? A variety of data, including biological, cultural, and recreational resources, commercial uses and land ownership.

?? Current ground-truthed maps that displayed not only route location, but also route type, use level, and recreational points of interest such as campsites and staging areas.

?? A process that
  ?? Is standardized, repeatable and that can be logically followed.
  ?? Assesses each route on its own merits and issues, and documents that assessment.
  ?? Identifies desired future condition and implements a process to attain that condition.
  ?? Creates a system of routes that work together in positive synergy.

1 In addition, in 2001, as stipulated by court order, BLM implemented route closures within the Fremont, Kramer, Red Mountain, Newberry/Rodman and Superior subregions. These closures were to remain in effect until the issuance of a record of decision for the West Mojave Plan, currently scheduled to be signed in February 2004.

- ?? Systematically assesses both individually and cumulatively the effects of each route on biological, cultural and recreational resources, as well as the general access requirements of commercial and private property interests.
- ?? Establishes a clear link between the route designation decision and the rationale for that decision.
- ?? Involves the public and clearly incorporates their input.
- ?? Considers the history of use, public safety, the intensity and season of use and the effect of concentrating versus dispersing use.
- ?? Takes into account the variety of recreational visitors by offering a variety of routes (e.g. 4WD vs. motorcycle).
- ?? Considers the length of the typical visitor's stay by providing enough recreational opportunity for that stay (which would decrease route proliferation).
- ?? Protects or maintains "feeder" and historic routes, as well as commercial and private property access.

The process should consider: (1) the level of impact of each route; (2) the number, density and intensity of use of each route and its relationship to habitat fragmentation and cumulative effects; and (3) ways to minimize the number and intensity of conflicting land uses (e.g. urban interface, noise, dust, visual impacts).

Recognizing and attempting to address the issues and concerns raised by the public represents only one, albeit very important, aspect to be considered in the development of a route designation process. A second aspect included compliance with statutory guidelines. An abbreviated summary of the primary legal requirements and their most important criteria relative to route designation is presented in Table 2-1.

Table 2-1
Statutory Route Designation Criteria

STATUTE	PRINCIPAL GUIDING CRITERIA AFFECTING MOTORIZED ACCESS
FESA	-Section 7 requires that the plan (i.e. "action") include steps to assist in the "recovery" of the federally threatened or endangered species.
NEPA	- Fully disclose to the public the purpose, the full range of issues and considerations (including environmental) and details of the proposed action and a reasonable range of alternatives. -Carefully evaluate the cumulative effects of the proposed action. Such an analysis is to include: both the current situation, as well as the foreseeable future; evaluate both direct and indirect impacts both within the geographical borders of the action, as well as beyond and; include as part of its cumulative impact analysis not only an evaluation of biological and cultural factors, but also include an evaluation of economic and sociological factors (including recreation).
FLMPA	-Manage public lands on the basis of multiple use and sustained yield ; -resource values to be protected; -certain lands are to be preserved in their natural condition; -wild, as well as domestic habitat is to be provided for; -provide for a balanced and diverse combination of recreational uses; -provide for human occupancy and use -provide for economic uses (e.g. range, timber, minerals).

National Historic Preservation Act	-Protect identified significant cultural sites; -Confer with Native American Nations on project or action (i.e. Nation to Nation conference)
Code of Federal Regulations 43 CFR 8342.1	-trails shall be located in a manner to minimize impacts to the physical resources (i.e. soils, watershed, vegetation, air and other resources) and to prevent impairment of wilderness suitability; -trails shall be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention would be given to protect endangered or threatened species and their habitats; -trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
Taylor Grazing Act Mining Acts	-Guarantee the conditional issuance of permits allowing the use of public lands for livestock grazing and mining.
State Fish & Game Codes	-Establishes requirements protecting nesting birds of prey, particularly with respect to governing allowable levels of disturbance; -Establishes requirements protecting riparian habitat, particularly with respect to governing allowable levels of disturbance.

A third principal aspect of a successful designation process is the inclusion of steps to ensure that the eventual system or network of routes helps significantly in achieving the desired future condition.

The final principal aspect is the inclusion of steps that carefully consider area specific planning issues and challenges, and then carefully weighs how management protocols designed to remedy those issues can best be implemented.

Landscape Factors: There are many factors that go into deciding which existing vehicle routes should be designated as open. The final designated route network needs to provide for the needs of public land users as much as possible while also minimizing potential vehicle use impacts. Routes that are retained as open are those that provide the best public access through public lands, routes that provide access to significant points of interest and those that have inherit value for recreational driving (i.e. a challenging 4-WD road through a scenic area).

The topography of the west Mojave region varies greatly from sandy bajadas to rugged rock mountains. The process of inventorying routes of travel revealed several observations that offer insight into the management of vehicle travel in the desert. Generally, it was found that there was a higher density of routes in areas with topography than those without it. In flat bajada areas, routes were generally long and straight, leading from one destination to another, often from one set of hills to another. Routes traversing through hills and mountains tended to be shorter and windier. Routes in hills and mountains typically either circumnavigate the hills, wind their way to the top of the mountains for a view, or go to some destination such as a spring in a canyon, a mine, or a cabin. In some cases, the routes are there only to provide a challenging recreational opportunity. The mountains and hills also provide shelter; therefore, campsites were more prevalent where there was topography.

The development of the route network utilized these observations to provide access to

recreation destinations and opportunities while eliminating superfluous routes that did not add to the network by providing necessary access or opportunities.

2.2.3 Route Designation Methodology

Given the enormity of the task of designating all motorized routes in the western Mojave Desert, the region was divided into manageable and recognizable route designation planning units. These included twenty "subregions[2]" (see Appendix B), as well as the numerous ACECs for which designations have been completed, the Ord Mountain Pilot Area, and subdivisions of the remaining areas covered by the1985-87 designation effort (see Table 2-2, Map 1 and Maps on attached CD Rom). Each of the previous route designation efforts was assessed to determine its need for updating to ensure that its routes meshed smoothly with the network designated on adjacent lands.

Table 2-2
Route Designation Planning Units

SUBREGIONS	OTHER PLANNING UNITS
Bighorn	Afton Canyon ACEC
Coyote	Amboy Crater National Natural Landmark ACEC
East Sierra	Barstow Woolly Sunflower ACEC
El Mirage	Bedrock Spring ACEC
El Paso	Big Morongo Canyon ACEC
Fremont	Black Mountain ACEC
Granite	Calico Mountain Early Man Site ACEC
Juniper	Christmas Canyon ACEC
Kramer	Cronese Basin ACEC
Middle Knob	Desert Tortoise Research Natural Area ACEC
Morongo	Fossil Falls ACEC
Newberry-Rodman	Great Falls Basin ACEC
North Searles	Harper Dry Lake ACEC
Ord	Jawbone/Butterbread ACEC
Pinto	Juniper Flats ACEC
Ridgecrest	Last Chance Canyon ACEC
Red Mountain	Manix ACEC
Sleeping Beauty	Mojave Fishhook ACEC
South Searles	Rainbow Basin/Owl Canyon ACEC
Superior	Red Mountain Spring (formerly Squaw Spring) ACEC
	Rodman Mountains Cultural Area ACEC
	Rose Spring ACEC
	Sand Canyon ACEC
	Short Canyon ACEC
	Soggy Dry Lake ACEC
	Steam Well ACEC
	Trona Pinnacles ACEC
	Upper Johnson Valley ACEC
	Western Rand Mountains ACEC

2 A twenty-first subregion, Amboy, encompassing a narrow slice of land located just east of the Marine Corps' Air Ground combat Center at Twentynine Palms, is administered by BLM's Needles Field Office being designated through a Needles Field Office off road vehicle designation process.

	Whitewater Canyon ACEC 1985-87 Inyo County 1985-87 Cady Mountains

2002 Off Road Vehicle Designations: Based upon various new and significant concerns (e.g. desert tortoise and other sensitive species habitat) eleven of the sub regions were selected for detailed designation updates. These eleven sub regions are (from north to south): Ridgecrest, El Paso, Middle Knob, Red Mountain, Fremont, Kramer, El Mirage, Superior, Coyote, Newberry-Rodman and Juniper. The Red Mountain, Fremont, Kramer, Superior and Newberry-Rodman sub regions were selected because they include a large portion of tortoise critical habitat, and because they are the subregions for which interim networks were established in response to court order. The El Mirage and Coyote sub regions were selected because they too are part of the tortoise critical habitat. The Ridgecrest and El Paso sub regions were primarily selected because of their significant recreational opportunities, proximity to the local community of Ridgecrest, and sensitive cultural resource and ecological values. The Middle Knob sub region was selected because of its biodiversity and Juniper sub region was primarily selected because of the interests expressed by the local equestrian community.

The first step in developing the 2002 route designations was to conduct a detailed field inventory in ten of the eleven subregions[3]. This inventory took place between September 2001 and March 2002. Approximately 4,400 miles of motorized routes were inventoried on public lands during this effort. By utilizing sophisticated Trimble Pro XRS Global Positioning System (GPS) units, motorized routes were mapped for location to within sub-five meter accuracy. Coincident with the mapping of the routes, information was collected on the type of route (e.g. two-track versus single-track), route condition (e.g. graded vs. rough) and estimated level of use (based upon woody vegetative cover, e.g. low-intermediate to high use). Additionally, the field data protocol was designed to allow for the collection and storage of information about various points encountered along the route (e.g. campsites, staging areas, mine claims, utility facilities). This data collected by this field effort was downloaded into Geographic Information System (GIS) database where it could be integrated with other GIS coverages (e.g. desert tortoise data) to construct the maps that were then utilized as part of the route designation process.

Once the field data was collected, designation teams began the work of identifying a revised network of open, closed and limited routes within the eleven subregions. Each subregion was divided into Motorized Access Zones (MAZ). These MAZs typically reflected areas with similar management issues or constraints. The precise boundary of each MAZ was usually delineated by significant routes of travel, highways, ACEC boundaries, environmental polygons of concern or topographical constraints.

3 The Juniper sub region was not subjected to a detailed field inventory due to time constraints and the availability of route inventory data that adequately met the needs of the more detailed designation update.

Insert Map 1 Here

Management issues and goals were identified for each MAZ. Whenever possible, areas with similar management goals or issues were delineated as one MAZ. Issues and goals address both the conservation of sensitive species and public access needs (including recreation, commercial and business concerns) (see Table 2-3 and maps on attached CD Rom).

Table 2-3
Motorized Access Zones
Issues and Goals

SUB-REGION	MAZ	MANAGEMENT ISSUES	GOALS
Coyote	MAZ-1	-Includes a portion of Paradise Valley, an area of greater than average tortoise sign. -Dispersed commercial mining interests.	-Facilitate tortoise recovery, giving special attention to lands in Paradise Valley and lands to the west and north of Coyote Lake. -Maintain access to active mine sites.
Coyote	MAZ-2	-Recognize historical use of Manix tank route.	-Maintain access via the Manix tank route.
Coyote	MAZ-3	-Commercial mining interests.	-Maintain access to Alvord mine & other active claims.
Coyote	MAZ-4	-Active cattle allotment.	-Allow routes for the maintenance of the ranching operation and its facilities.
Coyote	ALL	-Dispersed private property. -Many non-competitive organized OHV events. -Communication & electrical transmission tower sites throughout region. - CBDT System planned through the sub-region. -Sub region is part of Desert Tortoise critical habitat.	-Provide adequate private property access. -Maintain adequate route network for continuation of special events. -Provide adequate, non-redundant access for maintenance of numerous utility sites. -Allow for connectivity of the CBDT system through this sub region. -Facilitate desert tortoise recovery: eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met.
El Mirage	MAZ-1	-Shadow Mtn's south side motorcycle routes create noise and visual impacts to the community of Shadow Mtn. -Shadow Mtn private property owner conflicts with off-road MC use. -Shadow Mtn communication towers.	-Close redundant routes, particularly those that are impacting community of Shadow Mtn. - Allow recreational opportunity while minimizing land use conflicts. -Provide adequate access for maintenance of communication towers
El Mirage	MAZ-2	-Edwards Bowl Management Plan Issues	- Address issues in the Edwards Bowl Plan to the extent possible.

El Mirage	ALL	-Area of occupied private lands known to have conflict with MC use. -Dispersed private property checker-boarded with BLM lands. -Tortoise critical habitat: significant areas of greater than average tortoise sign. -The California Back Country Trail System would cross the sub-region. -Provide for continuation of non-competitive organized OHV events. -Dispersed private property.	-Minimize private land use/ownership conflicts. -Provide adequate private property access. - Facilitate desert tortoise recovery: eliminate redundant routes, particularly those determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow for connectivity of the CBDT system. -Allow for continuation of events where appropriate (i.e. with particular respect to desert tortoise concerns).
Fremont	MAZ-1	-Zone surrounds Harper Lake ACEC and abuts the southern portion of Black Mountain ACEC. -Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities. -The CBDT System is planned through the subregion.	-Protect the intent of the ACEC and minimize creation of "volunteer" access routes into the ACEC. - Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in the more mountainous terrain found in portions of MAZs 3 and 4. - Allow for connectivity of the CBDT system.
Fremont	MAZ-2	-Includes desert cymopterus populations and CDFG lands set aside for conservation. -Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. Topography generally consists of slopes of less than 20%, conducive to tortoises but generally not as desirable for many recreational activities.	-Maximize protection for desert cymopterus populations. Minimize fragmentation of its range and maximize the integrity of the CDFG lands. - Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in the more mountainous terrain found in portions of MAZs 3 and 4.
Fremont	MAZ-3	- Abuts the western boundary of the Black Mtn. ACEC. - Location of long-term popular use by campers and motorcyclists, much of which is on/around mountainous terrain (i.e. slopes greater than 20%). -The CBDT System is planned through the sub-region.	- Protect the intent of the ACEC and minimize the creation of "volunteer" access routes into the ACECs. - Minimize route redundancy, yet provide enough network connectivity to minimize the creation of "volunteer" routes. - Allow for connectivity of the CBDT.
Fremont	MAZ-4	Zone is the location (e.g. "Hamburger Mill", Gravel Hills) of long-term popular use by campers and motorcyclists, much of which is on/around mountainous terrain (i.e. with slopes greater than 20%).	-Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes.

Fremont	MAZ-5	-Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities. -The CBDT System is planned through the sub-region.	-Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in the more mountainous terrain found in portions of MAZs 3 and 4. -Allow connectivity of the CBDT system through this sub region.
Fremont	ALL	-Provide for continuation of non-competitive organized OHV events. -Part of desert tortoise critical habitat; significant areas of historic and current greater than average tortoise sign. -Dispersed private property.	-Allow for continuation of events where appropriate (i.e. with particular respect to desert tortoise, desert cymopterus and other species concerns). - Facilitate desert tortoise recovery: Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Provide adequate private property access and minimize land use conflicts.
Kramer	MAZ-1	-Route proliferation from the adjoining private lands at Silver Lakes. -Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities.	-Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat
Kramer	MAZ-2	-Rock hounding and target shooting in the Kramer Hills -Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. -The CBDT System is planned through the sub-region.	-Allow access to historic rock-hounding areas, and consolidate and minimize the proliferation of shooting areas. -Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met -Allow for connectivity of the CBDT system.

Kramer	MAZ-3	-Light use relative to other zones within Kramer. Many of the existing single-track routes created by competitive events in the 1970's before most of those activities were shifted over to the Open Areas. -Location of significant areas of current greater than average tortoise sign. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities. -The CBDT System is planned through the sub-region.	-Provide adequate private and commercial access and maintain intraregional network connectivity. -Eliminate routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat (e.g. portions of the more mountainous terrain found in MAZs 3 and 4). - Allow for connectivity of the CBDT system.
Kramer	MAZ-4	-Varied use, including dispersed camping from neighboring Hinkley into the Iron Mtns. -The CBDT System is planned through the sub-region.	-Provide varied opportunity and network connectivity particularly in those areas of rougher terrain. -Allow for connectivity of the CBDT system.
Kramer	ALL	-Part of desert tortoise critical habitat: Zone is location of significant areas of historic and/or current greater than average tortoise sign. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities. -Sub region is the location of permitted non-competitive organized OHV events. -Dispersed private property.	- Facilitate desert tortoise recovery: eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow for continuation of permitted non-competitive events where appropriate. -Provide adequate private property access and minimize land use conflicts.
Middle Knob		-Pacific Crest Trail passes through area. -Area known forhigh biodiversity. -Location of the very rare Kern buckwheat -Dispersed private property. -Location of significant wind-farm facilities.	-Allow access to the PCT; minimize conflicts with other uses. -Minimize real or potential impacts to sensitive species. -Avoid occupied habitat of Kern buckwheat -Provide adequate private property access and minimize land use conflicts. -Provide adequate access for maintenance of facilities (including fire protection).
Newberry – Rodman	MAZ-1	-Surrounds wilderness area. -Location of numerous golden eagle and prairie falcon nests.	-Provide wilderness access while minimizing motorized wilderness trespass. -Minimize the impact to nesting raptors.
Newberry – Rodman	MAZ-2	-Surrounds wilderness area. -Subject to ranching by permitees.	-Provide wilderness access while minimizing motorized wilderness trespass. -Minimize land-use conflicts (ranching-recreation-resource protection).
Newberry – Rodman	MAZ-3	-The CBDT System is planned through this zone. -Adjoins wilderness area.	-Allow for connectivity of the CBDT system. -Provide wilderness access while minimizing motorized wilderness trespass.

Newberry - Rodman	ALL	-Part of desert tortoise critical habitat. -Rock-hounding opportunity, sightseeing, and dispersed camping. -Dispersed commercial mines and private property.	- Facilitate desert tortoise recovery: eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow for the diverse range of recreational opportunities, yet is protective of the resources by eliminating unnecessary and/or redundant routes. -Maintain adequate access to commercial and private properties.
Red Mountain	MAZ-1	-Location of historic popular use by miners, campers, motorcyclists, etc. -Much of this zone is mountainous terrain (i.e. with slopes greater than 20%).	-Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Recognize that better tortoise habitat is typically found in areas with slopes less than 20%; therefore allow for adequate recreational, commercial, private property access, yet eliminate duplicity in order to minimize impacts to physical, biological and cultural resources (43 CFR 8342.1).
Red Mountain	MAZ-2	-Substantial historic and current commercial mining activity. -Much of this zone is mountainous terrain (i.e. with slopes greater than 20%).	-Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Recognize that better tortoise habitat is typically found in areas with slopes less than 20%; therefore allow for adequate recreational, commercial, private property access, yet eliminate duplicity in order to minimize impacts to physical, biological and cultural resources (43 CFR 8342.1).
Red Mountain	MAZ-3	-Northwest portion of zone is location of historic popular use by miners, campers, motorcyclists, etc. -Southern portion of zone is location of historic high tortoise sign densities. -Location of Cuddeback Dry Lake, utilized by for commercial photography/filming, sight seeing, OHV recreation.	-Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow adequate access for commercial and recreational interests, but eliminate redundant routes in order to minimize impact to historically important tortoise habitat.

Red Mountain	MAZ-4	-Northeast portion of this zone is mountainous (i.e. with slopes greater than 20%). -Northeast portion of this zone has dispersed occupied private in-holdings. -Zone partially encircles wilderness area.	-Recognize that better tortoise habitat is typically found in areas with slopes less than 20%; therefore allow for adequate recreational, commercial, private property access, yet eliminate duplicity in order to minimize impacts to physical, biological and cultural resources (43 CFR 8342.1). -Allow adequate private property access, yet minimizes land use conflicts. -Provide access to wilderness area in a manner that minimizes motorized incursions.
Red Mountain	ALL	-Part of desert tortoise critical habitat. -Rock-hounding opportunities, sightseeing, and dispersed camping. -Dispersed commercial mines and private property.	- Facilitate desert tortoise recovery: eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow for the diverse range of recreational opportunities, yet is protective of the resources by eliminating unnecessary and/or redundant routes. -Maintain adequate access to commercial and private properties.
Superior	MAZ-1	-Significant illegal dumping from the community of Barstow. -Mountainous terrain interspersed with bajadas characterized by higher than average of tortoise sign. -Illegal activities (e.g. “party spots”, “meth” labs) due to proximity to urban areas. -Provides primary access to Rainbow Basin and Owl Canyon.	-Minimize illegal dumping (e.g. close short route spurs that do not serve camping, trailhead or other legitimate opportunities.) -Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable esert tortoise habitat. -Eliminate isolated loops or spurs that are not otherwise utilized for legitimate recreational or commercial use or private property access -Maintain access to these popular recreation areas (e.g. camping, equestrian, hiking, photography, geologic interpretation) in the most efficient manner possible in order to minimize habitat degradation. .

Superior	MAZ-2	-Zone abuts the northeastern boundary of the Black Mtn. ACEC and eastern boundary of the Black Mtn. wilderness area. -Location of long-term popular use (i.e. just east of the very popular Gravel Hills area in the Fremont subregion) by campers, motorcyclists, etc. much of which is on/around rough terrain (i.e. with slopes greater than 20%). -Mountainous terrain interspersed with bajadas characterized by higher than average of tortoise sign.	-Protect the intent of the ACEC (i.e. to protect its cultural resources) and the wilderness area by minimizing the likelihood of the creation of new "volunteer" routes. -Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Facilitate tortoise recovery. -Eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat.
Superior	MAZ-3	-Some of highest densities of tortoise sign in the planning area. Topography is generally with slopes less than 20%, conducive to tortoises but generally not as desirable for many recreational activities. -Abuts the eastern boundary of the Black Mtn. ACEC and southeastern boundary of the Black Mtn. wilderness area. -Includes the northwest portion of the North Paradise Conservation Area.	-Eliminate routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Protect the intent of the ACEC (i.e. to protect its cultural resources) and the wilderness area by minimizing the likelihood of the creation of new "volunteer" routes. -Minimize redundancy while providing enough network connectivity to minimize the creation of "volunteer" routes. -Provide adequate commercial and private property access. Provide adequate intraregional connectivity in recreational route network in order to minimize the proliferation of "volunteer" routes. Eliminate routes that are redundant and don't meet the above criteria. -Avoid Lane Mountain milkvetch
Superior	MAZ-4	-Northern portion is occupied by Paradise Valley, an area characterized by some of the highest historic and current densities of tortoise sign in the planning area. -Southern portion is characterized by both substantial historic and current commercial mining activity.	-Eliminate routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Maintain access to active mines and patented claims.

Superior	MAZ-5	-Includes the eastern portion of the North Paradise Conservation Area. -Eastern portion of this zone is occupied by Paradise Valley, an area characterized by some of the highest historic and current densities of tortoise sign in the planning area.	-Provide adequate commercial and private property access. -Provide adequate intraregional connectivity in recreational route network in order to minimize the proliferation of "volunteer" routes. -Eliminate routes that are redundant and don't meet the above criteria. -Eliminate routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Avoid Lane Mountain milkvetch
Superior	ALL	-Sub region is part of desert tortoise critical habitat. -Sub region is known for rock-hounding opportunity, touring of old mines, sight-seeing, and dispersed camping. -Dispersed commercial mines and private property. -Includes portions of the CBDT System. -Location of permitted non-competitive organized OHV events.	- Facilitate desert tortoise recovery: eliminate redundant routes, particularly those that are determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities is determined to already be adequately met or better met by maintaining recreational opportunities in those areas with less desirable desert tortoise habitat. -Allow for a diverse range of recreational opportunity, yet be protective of the resources by eliminating unnecessary and/or redundant routes. -Maintain adequate access to commercial and private properties. -Allow for connectivity of the CBDT system through this sub region. -Allow for continuation of permitted non-competitive events where appropriate.

Using 1:24,000 scale maps of each MAZ, the designation team was able to make full use of background data while determining whether a given route should be opened or closed. This data included existing as well as potential environmental concerns that might constrain a route network, such as:

?? T&E and sensitive species and their habitats,
?? Sensitive cultural sites,
?? Highly erosive soils,
?? Private property (to assess access needs as well as potential land use conflicts), and
?? Commercial operations (e.g. ranching, mining and utility sites).

Access needs and other land use data were also mapped, including the following:

?? Route information (e.g. route type, condition and use level),
?? Recreation point data (e.g. campsites, staging areas, viewpoints, rock hounding areas),
?? Topographical and hydrological information (seeps, washes, springs, water tanks)

?? Commercial information (mining sites, claims, debris), utility lines and facilities, ranching facilities (water tanks, out buildings) and land ownership (private, state, military, BLM).

Maps also indicated areas of high biological importance ("biology polygons") and areas of high human disturbance ("disturbance polygons"). The basis for these two mapped units is described below:

?? **Biology Polygons:** These were created using recent field survey data gathered from the tortoise critical habitat. The polygons identify areas where tortoise sign (scat, burrows, live animals) was higher than average. Within biology polygons, special emphasis was to be placed on eliminating routes determined to be unnecessary for commercial or private property access or whose contribution to recreational opportunities was adequately or better met by maintaining recreational opportunities in other areas with either less tortoise sign or habitat of lesser quality.

?? **Disturbance Polygons:** These were also created from recent field survey data. The polygons indicated areas within critical habitat where the amount vehicle-related/dependent disturbance (roads, trails or tracks; dumping; evidence of shooting) was greater than average. Route designation within these polygons was conducted with a goal of reducing vehicle-related disturbance by closing redundant or unnecessary routes. Access would be provided to private property and commercial sites, but only at a level that would meet minimum requirements. Route redundancy was also taken into account, not only for private property and commercial access needs, but also for recreational opportunity. A route was closed if its contribution to recreational opportunities was better met by maintaining recreational opportunities in other areas with either less tortoise sign or habitat of lesser quality.

The next step involved the identification of a motorized vehicle access network using a decision-tree process. BLM staff and management first reviewed each sub region and MAZ. Past, present and future management concerns and issues were considered, including the effect the use of various motorized routes was having on natural resource conservation, the distribution of recreation, types of recreation, resource impacts, law enforcement issues, land use conflicts, mineral development, livestock grazing and maintenance issues. Consideration also focused on changing use patterns and trends, specific problem areas and the effect of routes on adjoining non-BLM lands (e.g. Silver Lakes, El Mirage property owners). Based upon this, the decision tree was applied (see Appendix A).

The decision tree was applied to each of more than 5,200 enumerated vehicle routes within the planning area. For each route, the decision tree poses a series of questions, which fall sequentially into the five following categories: (1) legal easements and rights-of–way; (2) T&E species; (3) other environmental issues; (4) the special qualities of a route, including safety concerns, recreational qualities and user conflict; and (5) route redundancy. The manner in which each question is answered determines which decision tree "limb" or pathway is followed. Footnotes to the tree identify other concerns that need to be taken into consideration as each question is answered. By following a decision tree pathway, the route designator would reach a

recommended designation of "Open" or "Closed". Each answer is alphanumerically coded such that the exact sequence of questions, as well as how they were answered can be recorded for each vehicle route. These codes then enable each recommended decision to be easily entered into a database for future use and analysis. The result was a systematic, documented and repeatable framework for the evaluation of each route.

Appendix C includes a table that summarizes the reasons why each of the enumerated routes that were considered during the 2002 off road vehicle designations was recommended as open or closed.

Revision of 1985-87 and ACEC Off Road Vehicle Designations: Those portions of the existing motorized vehicle access network that were not included in the 2002 route designations were reviewed to ensure that they were compatible with the conservation strategy being developed by the West Mojave Plan and were in compliance with federal regulations (specifically, 43 CFR 8342). In some cases, minor adjustments were necessary, based upon available new information (resource, law enforcement, land use or recreation concerns). This arose, in part, due to the comparatively incomplete nature of the field survey conducted for the 1985-87 network, which lacked modern GPS equipment (not in existence in the mid-1980s) and which did not include most technical 4WD and motorcycle routes. Some examples of this updating information follow:

?? *North Searles Sub Region:* Route designations were updated to take into consideration changing visitor use patterns. To allow loop tours of the area by day users (e.g. picnickers), some new short routes were added. The addition of these short routes is intended to minimize some route proliferation through sensitive resources that is occurring as a result of the public's effort to create looping opportunities.

?? *El Mirage Sub Region:* Route designations were altered to address land use conflicts between private property owners and public recreationists on BLM lands. A few routes that were designated open as part of the Edwards Bowl Plan were closed because of the manner in which they might inadvertently direct the public onto adjoining private lands. In order to maintain the looping touring recreation opportunities provided by those closed routes, other routes that had been designated closed by the Edwards Bowl Plan were opened. The net effect of these changes should be decreased conflicts between the private property owners and the public recreating on BLM lands. This action was carried out in accordance with 43 CFR 8342.1(3): *Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.*

?? *El Mirage Sub Region:* Route designations were altered to address new information regarding desert tortoise distribution. Specifically, those routes in areas of higher than average tortoise sign that were located on bajadas and that did not provide necessary access to private property or commercial interests (e.g. active mines) or that did not serve as intra- or inter- regional connectors for recreational opportunity were designated closed.

However, those non-redundant routes above the bajadas, generally on slopes greater than 20% were designated open to provide greater recreational opportunity (e.g. on the northern and eastern shoulders of the Shadow Mountain complex).

?? *Black Mountain ACEC:* Route designations were altered to reflect new route information gathered during the 2001 field inventory of the adjoining Fremont and Superior sub regions. Along the mountainous western boundary of this ACEC a few routes previously designated closed were re-designated as open. These minor alterations would create a route system or "network" that would have fewer dead-ends and greater inter connectivity between routes (e.g. more looping route opportunities). This part of the Fremont sub region is a very popular recreation area with a higher probability of route proliferation and incursions into sensitive areas (in this case cultural). Past experience has shown that by providing route systems that are interesting, challenging and logical as networks, compliance level can be substantially increased. These changes should result in greater compliance in spite of the increased use that this area is experiencing.

?? *Edge-matching Designation Boundaries:* At twenty-five locations, the ACEC, 1985-87 and 2002 networks bounded each other. It was necessary to adjust the location of some routes at the borders to ensure that these networks, developed at different times and based upon differing field information, would constitute a single seamless and consistent motorized vehicle access network. This effort took into account the latest information concerning recreation uses and patterns, as well as new resource concerns (e.g. recently listed T&E species).

Maps of the Proposed Off Road Vehicle Designations: Appendix C includes a CD-Rom on which are maps of the proposed West Mojave Off Road Vehicle Designations, including the 2002 designations, the remaining 1985-87 network and the ACEC off-road vehicle designations, as well as the existing route network (see below, Alternative D, No Action).

2.2.4 El Paso Collaborative Access Planning Area

The public lands within the El Paso Mountains and Ridgecrest subregions possess many unique recreational attractions, and are located immediately adjacent to the City of Ridgecrest. As a result, these two subregions are very popular with the recreating public. Opportunities to encourage the growth of eco-tourism, special OHV events and commercial filming in this area could benefit the local economy. These two subregions also possess many sensitive and important natural and cultural features, including a National Register District and habitat for the state-listed Mohave ground squirrel and other sensitive species. Finally, there are a number of private access needs that need to be addressed, including private parcels, commercial operations (such as quarries), and permitted facilities (guzzlers, water tanks, stock ponds and communications sites). Due to all of these factors, local community interest in the nature of the motorized access to be provided is very high.

The Designation Project would establish an El Paso Collaborative Access Planning Area (El Paso CAPA) for the El Paso Mountains and Ridgecrest subregions. A motorized vehicle access network would be designed for the El Paso CAPA through the collaboration of the BLM with local jurisdictions (including the City of Ridgecrest and the County of Kern) and the general public. The intent is to adopt this network as a component of the CDCA Plan by no later than December 31, 2005.

The process would be conducted subject to certain biological and cultural resource criteria that would assure that the routes to be designated as open, closed, or limited would follow the principles of species and habitat protection used in the West Mojave Plan. These "sideboards" to the process are listed below:

?? Adequate protection of raptor nests, particularly golden eagle and prairie falcon;

?? Adequate protection of the Red Rock poppy and Red Rock tarplant, two species endemic to the El Paso Mountains;

?? Limitation of vehicle access to wildlife springs and artificial water sources "guzzlers;" and

?? Protection of riparian habitat adjoining significant roosts for Townsend's big-eared bat (if any roost sites are located).

?? Full compliance with the National Historic Preservation Act, and the cultural resources element of the California Desert Conservation Area Plan.

?? Protection of significant cultural resources, including those listed in the National Register of Historic Places or within the boundaries of the Last Chance Canyon National Register District and Area of Critical Environmental Concern.

?? Protection of unevaluated cultural resources until their significance has been determined through formal evaluation.

?? Protection of the cultural landscape within the El Paso Mountains;

?? Protection of significant fossil-bearing units within the El Paso Mountains.

The Designation Project's Record of Decision would amend the CDCA Plan to incorporate the existing 1985-87 network for the El Paso Mountains and Ridgecrest subregions, pending the completion of the collaborative planning effort.

A timeline for completing the El Paso CAPA process follows:

?? June 30, 2003: Designation Project Record of Decision signed, amending CDCA Plan and adopting the existing 1985-87 network for the El Paso Mountains and Ridgecrest

subregions.

?? December 31, 2004: Revised motorized vehicle access network developed through the El Paso CAPA process for the El Paso Mountains and Ridgecrest subregions.

?? December 31, 2005: Subsequent NEPA analysis completed and Record of Decision signed, amending CDCA Plan to adopt the network developed through the El Paso CAPA process.

2.2.5 California Back Country Discovery Trail

Certain segments of the open route network would be nominated for inclusion by the California Department of Parks and Recreation, Off-Highway Motor Vehicle Recreation Division (OHMVRD) as part of the California Back Country Discovery Trail (CBDT), a part of the California Statewide Motorized Trail System. The CBDT is a system of existing motorized routes that when formally designated would offer long distinct backcountry touring opportunities from Mexico to Oregon and throughout the state of California. Utilizing an OHVMRD grant, the BLM California Desert District commissioned a study that identified a proposed system of routes for inclusion as part of the CBDT. That proposed system of routes would be included as a component of the CDCA Plan by the Designation Project.

2.2.6 Implementation

Past experience in the West Mojave has generally shown that the most effective signing protocol (i.e. greatest public compliance) is one in which the routes designated open would be signed. Closed routes would not be signed and would either be reclaimed naturally or vertically mulched. Due to monetary and staffing constraints, as well as the remoteness of much of the West Mojave region, most of the routes designated closed would be left to natural reclamation. In those areas where environmental concerns are more profound (e.g. in areas where the amount of tortoise sign is above average or within the desert tortoise biology polygons) or where the intensity of use is such that it is necessitated, vertical mulching to the line-of-sight would be favored over natural reclamation.

Each BLM Field Office would prioritize the areas (e.g. sub regions, MAZs) and the routes to be addressed first. The range of actions and their intensity would vary based upon a number of factors (assessed need, available resources) and could include law enforcement, various forms of public education and other means, as well as signing and vertical mulching. A BLM Field Office might choose to involve the public as it prioritized these efforts and could employ options like those discussed below for monitoring route needs or prioritizing the maintenance of routes.

Discussions regarding route implementation and maintenance often prematurely place too much emphasis on route rehabilitation. Although rehabilitation has its place in the set of “tools” available to a field maintenance crew, it should only be undertaken after other route maintenance options have been exhausted. Delaying rehabilitation of routes in favor of more proactive maintenance steps is necessary if a field maintenance team is to successfully avoid the pitfalls of engaging in a program (such as rehabilitation) that can quickly become a “black hole” for scarce

personnel and resources (e.g. heavy equipment, plant material). Placing premature emphasis on rehabilitation often creates its own set of new larger logistical problems, reducing if not eliminating any chance of successful implementation. Although the rehabilitation of routes would always remain an option, due to the requirements of extensive commitments of staff and resources it should not be called upon until other more proactive means of route maintenance are exhausted.

The implementation of the route system and its maintenance would begin with a first phase consisting of route management actions such as:

- ?? Open route signing.
- ?? Open route maintenance, with an emphasis on making the open network of routes more obvious and attractive to use than the closed routes. Existing park ranger and maintenance staff would do this during route signing and sign maintenance.
- ?? Hand raking and disguise of prominent closed routes, including lining small rocks across closed routes to help discourage use.

Route rehabilitation work would begin only as a second phase on those routes where the first phase not proven to be successful or where route conditions were clearly beyond the capability of the first phase to address. Although rehabilitation is recognized as a second phase, planning for this phase, including the securing of funding, should begin early. Having route designations in place would enhance the availability of funds, and would allow the BLM to pursue external sources of rehabilitation funding such as OHMVR, the National Fish and Wildlife Habitat Fund (USFWS), and contributions of volunteer labor from local, state, and national interest organizations.

Specific prioritization of work areas/sites would be guided by four factors, all of which are related to the location of the route:

- ?? Factor 1: Are located within tortoise critical habitat,
- ?? Factor 2: Have above-average tortoise sign or are important to other sensitive species (i.e. located within biology polygons),
- ?? Factor 3: Have higher than average vehicle disturbance (i.e. located within disturbance polygons) and
- ?? Factor 4: Have significant urban interface issues.

Examples of areas where all of these factors come into play would include portions of:

- ?? Kramer sub region west of the community of Silver Lakes;
- ?? El Mirage sub region east of the Edwards Bowl area and
- ?? Superior sub region northwest of Barstow.

The highest priority would be given to areas for which all four factors apply. The second priority would be those routes characterized by factors 1-3; the third priority would be routes characterized by factors 1 and 2; fourth priority to routes characterized by factor 1 only; and fifth

priority to remaining routes.

Past experience, such as that obtained through the implementation of the Ord Mountain route designation pilot, can give valuable insight into not only which actions, but in what order they should occur. Implementation of the Ord Mountain Pilot plan revealed that the most effective short-term action taken was an increase in enforcement and visitor service patrolling, which resulted in a commensurate increase in visitor contacts. Through this increased number of contacts visitors realized that BLM was aggressively and successfully implementing the new network. Visitors generally responded to this in one of two ways. Those who were seeking a cross-country driving experience and did not want to be limited to routes gradually moved to the "Open Areas" where they could continue to recreate in a more unrestricted manner. Others continued to recreate in the Ord Mountains, generally staying on open routes.

The least effective short-term action taken in the Ord Mountains was signing the closed route network. Not only did this effort consume a great deal of staff time; in addition, signs were removed almost as quickly as they were put up. The need to resign routes placed additional demands on scarce staff time and material.

Given the lessons learned from the Ord Mountain experience, the successful implementation of a new route network should proceed by carrying out these steps in the following order:

- ?? Pursue funding for signage and the staff necessary to implement the route signing effort (i.e. both law enforcement and maintenance staff).
- ?? Pursue funding for route rehabilitation.
- ?? Sign the open route network (do not sign the closed route network).
- ?? Maintain the open route network with the principal goal being to make the open route network more attractive for use than the closed route network. Make ample use of the tools such as the York Rock Rake to shape, clear and contour the open route network.
- ?? Install informational kiosks and interpretive signing where it would be most effective. Site these facilities where it would reach the greatest number of visitors and where it would target an audience that might be the most receptive to such facilities. For example, in the Kramer sub region such facilities might be most beneficial at major trailheads and campgrounds in the eastern portion of the sub region that are heavily visited by families enjoying camping.
- ?? Develop and publish maps that are up-to-date, readily available and have a readily understandable and useful format. For example, many visitors are familiar with the informational format employed by USGS quadrangle sheets. The Friends of Jawbone have published a map which has proven very popular amongst users to that region and that might serve as a good "for purchase" template. The Off-Highway Motor Vehicle Recreation Division of California State Parks has produced a series of inexpensive pocket maps for each of its facilities that may serve as a good template for very inexpensive or free maps.
- ?? Regularly maintain signs, kiosks, routes, maps and brochures.

At this point in the new route implementation process, if no new funding for law enforcement has been forthcoming, then all that can be done to obtain voluntary compliance has already taken place. Voluntary compliance would be slow in the beginning, but would increase over time (within the next 2 – 10 years).

At such time as additional funds are available for law enforcement and rehabilitation, the following steps should be taken:

?? Begin route rehabilitation in priority areas.
  - Route rehabilitation would require active maintenance for at least 1 year.

?? Initiate enforcement and visitor service patrols with the following caveats:
  - Do not over-commit; funding must be available to sustain the new patrol for a period of at least 2 years.
  - As enforcement efforts move into new areas, inappropriate use could migrate back to areas where the program had already been implemented. Address this by allocating more funding to new areas, as there would still be a residual cost to maintain the first (earlier implemented) area.
  - Keep in mind that it typically takes one year from the date funding becomes available until the time that a new fully delegated ranger is deployed into the field.
  - Consider that turnover among law enforcement staff is high, which will reduce the efficiency of enforcement efforts both due to vacancies and the need for new training.

Table 2-4 presents an implementation time frame. Table 2-5 lays out the cost of implementation actions.

Table 2-4
Implementation Time Frames

ACTION	COMPLETION TIME	COMMENTS
Pursue funding and FTE for enforcement, visitor services, and maintenance.	Year 3 – Ongoing	BLM works on a three-year budget cycle. There may be some infusion earlier.
Pursue funding for route rehabilitation.	Year 2 – Ongoing	This would likely come from both federal appropriations and external sources. Someone should be given this as a task.
Sign open route network.	Year 1- Ongoing	Assumes funding in year 1
Maintain open route network.	Year 1- Ongoing	Assumes funding in year 1
Install informational kiosks and interpretive signing.	Year 1- Ongoing	Assumes funding in year 1
Develop and publish maps and brochures.	Year 1- Ongoing	Assumes funding in year 1
Routinely maintain signs, kiosks, routes, maps, and brochures.	Year 2- Ongoing	Assumes ongoing funding

Table 2-5
Implementation Costs

ACTION	COST	PRIORITY
Pursue funding and FTEs for enforcement, visitor services, and maintenance.	$100,000 annually per Law Enforcement Officer w/vehicle X 5 $75,000 annually per Visitor Service Staffer w/Vehicle X 5 $75,000 annually per Maintenance Staffter. w/ Vehicle X 5 Total Annual funding needed: $1,2500,000	1
Pursue funding for route rehabilitation.	$100,000 annually	1
Sign open route network.	$10,000 one time cost	2
Maintain open route network.	Included in staff cost	2
Install informational kiosks and interpretive signing.	$50,000 one time cost	1
Develop and publish maps and brochures.	$20,000 one time cost	2
Routinely maintain signs, kiosks, routes, maps, and brochures.	$30,000 annually	2

2.2.7 Modification of Route Network

The Designation Project Record of Decision would amend the CDCA Plan to adopt the motorized vehicle access network as a component of that Plan. Any significant future modifications of the network, therefore, could only occur through an amendment to the CDCA Plan, including full NEPA compliance, public involvement, interagency coordination, and the preparation of a Record of Decision for the amendment.

Minor modifications of the network during plan implementation would be allowed, however, without the necessity of a formal plan amendment. FLPMA allows BLM resource management plans (such as the CDCA Plan) to be "maintained as necessary to reflect minor changes in data" (Section 1610.5-4.) Plan maintenance is limited, in that it cannot result in the expansion of the scope of resource uses or restrictions, or change the terms, conditions and decisions of the approved plan. It is limited to further refining or documenting a previously approved decision incorporated in the plan. In view of these limitations, "minor realignments" of the route network would be considered to be plan maintenance, and could be made without formal amendment of the plan. "Minor realignments" would include the following:

- ?? Minor realignments of a route necessary to avoid cultural resources sites identified during the process of complying with Section 106 of the National Historic Preservation Act.
- ?? Minor realignments of a route necessary to reduce impact on sensitive species or their habitats.
- ?? Minor realignments of a route that would substantially increase the quality of a recreational experience, but that would not affect sensitive species or their habitat, or any other sensitive resource value.

The term "minor realignment" refers to a change of no more than one linear mile of one designated route. It could include the opening of an existing, but previously closed, route that

serves the same access need as the open route that is to be "realigned". It does not include the construction of a new access route involving new ground disturbance, except where new construction is necessary to avoid a cultural resource site or sensitive species.

Minor realignments must be documented in the official record. The reason for the alignment change shall be recorded and kept on file in the affected BLM Field Office, and the change noted in the CDCA Plan.

Route designation on newly acquired lands would occur every five years (or sooner, if judged to be prudent), would comply with applicable federal regulations and statutes, and be incorporated into the overall route implementation process. New route networks on acquired lands would be required to facilitate conservation programs and be complimentary to the network resulting from alternative implementation.

2.3 ALTERNATIVE B: ENHANCED ECOSYSTEM PROTECTION

Alternative B grew out of discussions among agencies and members of the public during the development of Alternative A. Many suggestions were offered that called for placing a very high priority on the conservation of species and ecosystems, even if adoption of these recommendations would limit human access to and multiple use of the western Mojave Desert. Alternative B incorporates many of these suggestions.

All aspects of this alternative's conservation strategy would be as described for Alternative A, except as specifically described below.

Additional motorized vehicle access restrictions would be imposed in several of the motorized access zones within tortoise critical habitat. Within biologically sensitive MAZ's, only street-legal vehicles (i.e. licensed by the California Department of Motor Vehicles in accordance with the State Vehicular Code as legal for operation on California's public roads and highways) would be permitted. These include street-legal four-wheel drive vehicles and dual-sport motorcycles. Vehicles that are not street-legal but are only eligible for "green sticker" licensing (that is, approved for use off of highways) would be prohibited. These include many types of dune buggies, sand rails, all terrain vehicles, quads and dirt bikes. The restricted MAZ's are listed in Table 2-6.

Table 2-6
Motorized Access Zones
Limited to Street-Legal Vehicles Only

SUBREGION OR SPECIAL MANAGEMENT AREA	MOTORIZED ACCESS ZONE	REASONS FOR VEHICLE RESTRICTIONS
El Mirage	1,2	Total Corrected Sign for desert tortoise significantly above average; would help to address long-standing private property conflict issues
Kramer	1	Total Corrected Sign for desert tortoise significantly above average; would assist in addressing urban interface issues (i.e. Silver Lakes)
Kramer	2,3,4	Total Corrected Sign for desert tortoise significantly above average
Fremont	1,2,5	Total Corrected Sign for desert tortoise significantly above average
Superior	1	Total Corrected Sign for desert tortoise significantly above average; closure would help address significant law enforcement issues
Superior	3	Total Corrected Sign for desert tortoise significantly above average
Superior	4	Total Corrected Sign for desert tortoise significantly above average; offers protection to Paradise Valley
Superior	5	Total Corrected Sign for desert tortoise significantly above average; offers further protection for the Lane Mountain milkvetch
Newberry Rodman	3	Total Corrected Sign for desert tortoise significantly above average; conflicts with permitted ranching operation
Coyote	1	Total Corrected Sign for desert tortoise significantly above average; offers protection to Paradise Valley
Western Rand ACEC	---	Important tortoise habitat, adjacent to Desert Tortoise Research Natural Area

During periods of prolonged drought (lasting three or more years), the BLM would consider emergency route closures (generally referred to as “quarantine areas”) in higher density areas, or identified motorized access zones. Such quarantines would be lifted immediately following break of the drought, which would be identified by the Implementation Team in coordination with BLM, USFWS, and CDFG.

2.6 ALTERNATIVE C: ENHANCED RECREATION OPPORTUNITIES

Alternative C’s conservation strategy, like Alternative B’s, grew out of discussions among agencies and members of the public during the development of Alternative A. Many suggestions were offered that called for placing a very high priority on multiple use and motorized vehicle access to the desert, even if this might affect some of the programs that could be implemented to conserve of species and ecosystems.

All aspects of this alternative would be as described for Alternative A, except as specifically described below.

?? Between Highway 395 and the Trona Road, reopen the competitive “C” routes.

?? Establish a Fremont Recreation Area on lands north and west of Fremont Peak, surrounding Cuddeback Dry Lake. Change the BLM multiple use class to Class M within this area. Allow competitive off highway vehicle speed events within this area on designated motorized vehicle routes. Prepare a management plan for this area that emphasizes vehicle access, camping, and competitive event support. A denser network of off highway vehicle routes than that proposed by Alternative A could be established through this planning process in the area close to Cuddeback Dry Lake, following completion of this plan and amendment of the CDCA Plan.

2.8 ALTERNATIVE D: NO ACTION

Off road vehicle designations in the western Mojave Desert would remain unchanged from those already in effect. Motorized vehicle networks developed during the preparation of ACEC management plans since 1980 would provide the network that would apply within those ACECs. These include the following ACECs: Afton Canyon, Barstow Woolly Sunflower, Bedrock Spring, Big Morongo Canyon, Black Mountain, Calico Mountain Early Man Site, Christmas Canyon, Cronese Basin, Desert Tortoise Research Natural Area, Fossil Falls, Great Falls Basin, Harper Dry Lake, Jawbone/ Butterbredt, Juniper Flats, Last Chance Canyon, Mojave Fishhook Cactus, Rainbow Basin/Owl Canyon, Red Mountain Spring (formerly Squaw Spring), Rodman Mountains Cultural Area, Rose Spring, Sand Canyon, Short Canyon, Steam Well, Trona Pinnacles, Western Rand Mountains, and Whitewater Canyon.

In all other areas, the 1985-87 off road vehicle designations would remain in place.

2.9 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED CONSIDERATION

Interim Management Alternative: As a result of a January 2001 consent decree commitment on a settlement agreement arising out of litigation between BLM and the Center for Biological Diversity and others, the BLM was required to "implement an emergency route closure" for the Red Mountain, Fremont, Kramer, Superior and Newberry-Rodman subregions This measure was to remain in effect until the issuance of the West Mojave Plan Record of Decision. BLM implemented this measure by adopting route closures, based upon the preliminary and relatively incomplete information available at that time.

The closures were identified before the field survey work described above was completed, at a time when the route designation planning process was still at a relatively early stage. Prior to March 2002, the results of this field survey were not available to help identify the location of routes of travel on the ground, the nature of those routes (graded, 4WD, single track, level of use), and vehicle destination points (campgrounds, staging areas, popular recreation sites, and other features). The results of the field survey indicate that the design of the resulting access network did not provide for all motorized vehicle access needs, nor for the most effective protection for species of concern.

2.10 OVERVIEW OF ALTERNATIVES

Table 2-7 indicates the mileage of open routes in each alternative. Also presented, where applicable, is the total public land mileage inventoried by field teams in 2001-2, as well as the miles of washes remaining open and closed under Alternative A (figures not available for the 1985-87 network which, not being recorded by GPS, could not be directly compared to the location of washes mapped in 2001-2).

SUBREGION	TOTAL MILES 2001 INVENTORY (PUBLIC LAND)	MILES OPEN			2002 NON-MC OPEN	MILES OF WASHES 2002	
		1985-87	ACEC	2002		OPEN	CLOSED
BIGHORN		218					
COYOTE	411	178		255	255	16	22
EAST SIERRA		109					
EL MIRAGE	267	49		60	59	0	1
EL PASO	465	324					
FREMONT	582	214		372	291	18	15
GRANITE		38					
JUNIPER		108		152	126		
KRAMER	642	254		362	315	11	35
MIDDLE KNOB	91	0		83	82		
MORONGO		18					
NEWBERRY-RODMAN	210	142		171	171	4	12
NORTH SEARLES		99					
ORD	549	38	159*		N/a		
RED MOUNTAIN	733	234		362	313	4	20
RIDGECREST	328	106					
SLEEPING BEAUTY		58					
SOUTH SEARLES		36					
SUPERIOR	668	396		417	417	9	14
INYO COUNTY 1985-87		330					
AFTON CANYON ACEC			26				
BLACK MOUNTAIN ACEC				26			
GREAT FALLS BASIN ACEC			N/a				
JAWBONE BUTTERBREDT ACEC			133	N/a			
RAINBOW BASIN ACEC			30	133			
WESTERN RAND MOUNTAINS ACEC			128				

*Ord mileage is for Ord Pilot Project.
MC = Motorcycle

CHAPTER THREE
AFFECTED ENVIRONMENT

3.1 PLANNING AND REGULATORY FRAMEWORK

3.1.1 Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA), of 1976, long considered the landmark legislation that changed the operations of BLM forever, provides a multiple use framework for managing the nation's public lands that focuses on the needs of both present and future generations. Under FLPMA, land managers are required to take into account the long term needs of present and future generations as they make important decisions in the management of renewable and nonrenewable resources, including recreation, timber, minerals, watershed, fish, wildlife, rangeland, scientific and historical values. The Act requires BLM to execute its management powers under a land use planning process that is based on multiple use and sustained yield principles.

The BLM is an agency of the U.S. Department of the Interior with responsibility for managing more than 264 million surface acres of America's public lands, and also administers 700 million acres of sub-surface mineral estate throughout the nation. The BLM accomplishes this by planning and managing such resources as outdoor recreation, livestock grazing and mineral development, and by conserving natural, historical, cultural, and other resources on the public lands. Most of the public lands managed by BLM are located in 12 Western states, which includes California. The 25-million-acre California Desert Conservation Area (CDCA) contains over 12 million acres of public lands.

3.1.2 Executive Order No. 11644

In 1971, Presidential Executive Order No. 11644 established the first uniform policies regarding OHV use on public lands. Each land management agency was directed by this Order to issue directions as to which trails and areas were open for OHV use and which were not. The Order required that OHV use be monitored to assess and minimize associated impacts.

3.1.3 Federal Regulations

The CDCA Plan’s motorized-vehicle access element was amended (1982 Plan Amendment Three, approved May 17, 1983) to conform with 43 CFR 8342.1 which requires route approval to be based on the following criteria:

?? Areas and trails would be located to minimize damage to soil, watershed, vegetation, air, or other resources of the public lands, and to prevent impairment of wilderness suitability.
?? Areas and trails would be located to minimize harassment of wildlife or significant disruption of wildlife habitats. Special attention would be given to protect endangered or threatened species and their habitats.

?? Areas and trails would be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.
?? Areas and trails would not be located in officially designated wilderness areas or primitive areas.
?? Areas and trails would be located in natural areas only if the authorized officer determines that vehicle use in such locations would not adversely affect their natural, esthetic, scenic, or other values for which such areas are established.

3.1.4 California Desert Conservation Area Plan

Section 601 of FLPMA was included by Congress to give direction about the California Desert Conservation Area. In section 601, Congress required the preparation of a comprehensive, long-range plan for the CDCA. The purpose of the CDCA Plan is to establish guidance for the management of the public lands located in the California Desert by BLM in clear accordance with the Congressional intent as stated in the law.

Goals of CDCA Plan: The goals stated in the CDCA Plan's Motorized-Vehicle Access Element follow:

?? Provide for constrained motorized vehicle access in a manner that balances the needs of all desert users, private landowners, and other public agencies.
?? When designating or amending areas or routes for motorized vehicle access, to the degree possible, avoid adverse impacts to desert resources.
?? Use maps, signs, and published information to communicate the motorized vehicle access situation to desert users, making sure all information materials are understandable and easy to follow.

The goals in the CDCA Plan's Recreation Element follow:

?? Provide for a wide range of quality recreation opportunities and experiences, emphasizing dispersed undeveloped use.
?? Provide a minimum of recreation facilities. Those facilities should emphasize resource protection and visitor safety.
?? Manage recreation use to minimize user conflicts, provide a safe recreation environment, and protect desert resources.
?? Emphasize the use of public information and education techniques to increase public awareness, enjoyment, and sensitivity to desert resources.
?? Adjust management approach to accommodate changing visitor use patterns and preferences.
?? Encourage the use and enjoyment of desert recreation opportunities by special populations, and provide facilities to meet the needs of those groups.

The goals for motorized-vehicle access / routes of travel designations / recreation are to:

?? Designate routes of travel consistent with the criteria at 43 CFR 8342.1, discussed above.
?? Provide for competitive off-highway vehicle events in a manner that protects desert resources.
?? Establish stopping, parking, and vehicle camping limitations consistently.

The CDCA Plan defined open and closed routes as follows:

?? Open Route. Access on the route by motorized vehicles is allowed. Specific uses with potential for resource damage or significant conflict with other use may require specific authorization.

?? Closed Route. Access on route by motorized vehicles is prohibited except for: (1) fire, military, emergency or law enforcement vehicles when used for emergency purposes; (2) combat or combat support vehicles when used for national defense purposes: (3) vehicles used for official purposes by employees, agents, or designated representatives of the federal government or one of its contractors. Use must be consistent with the multiple use guidelines for that area.

Route designations apply only to routes and portions thereof on public lands; the designation of routes as "open," and "closed" is not applicable on non-public lands.

3.2 AIR QUALITY, SOILS AND WATER

3.2.1 Air Quality

Much of the time, air quality in the western Mojave Desert is good. There are, however, times that localized areas have not met air quality standards due to locally generated and/or transported in pollutants. The entire planning area has been classified as non-attainment areas for ozone, PM10, sulfates, carbon monoxide and/or hydrogen sulfide under the state and/or national standards. In addition, there is concern for visibility reducing particles and PM10 precursor emissions including oxides of nitrogen (NOx), oxides of sulfur (SOx) and reactive organic gases (ROG). The designation of attainment/non-attainment areas for the new PM2.5 and 8-hour ozone standards will occur in the future. The state Air Resources Board has recommended to the United States Environmental Protection Agency (USEPA) that most of the Mojave Desert Air Basin be classified as federal ozone nonattainment areas under the new 8 hour standard.

The CAA and the California Clean Air Act contain the primary provisions relating to air quality. Among the most important provisions are the sections relating to the establishment of the National and State Ambient Air Quality Standards, nonattainment areas, the development of state implementation plans (SIP), prevention of significant deterioration (PSD), air toxics and federal conformity. The USEPA and the California Air Resources Control Board have issued rules to implement the federal and California Clean Air Acts.

The federal and state Clean Air Acts regulate certain forms of pollution under three main categories. These are criteria pollutants, air toxics and global warming and ozone-depleting

gases. There is also regulation of a more general category of emissions that reduce visibility. These come under the titles of regional haze, prevention of significant deterioration (PSD) and visibility reducing particulates (VRP).

The definitions used in determining whether or not an area meets air quality standards are found in the federal and state Clean Air Acts and their associated ambient air quality standards. Criteria pollutants are defined as those pollutants for which the federal and state government have established ambient air quality standards, or criteria, for concentrations in order to protect public health. Under the federal Clean Air Act, the USEPA has established National Ambient Air Quality Standards (NAAQS) for seven criteria pollutants (ozone, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), carbon monoxide, nitrogen dioxide, lead and sulfur dioxide). These standards are used to classify all areas as to whether they are in attainment, in nonattainment or are unclassified for any of the NAAQS. California has established California Ambient Air Quality Standards for the same federal criteria pollutants plus an additional 3 pollutants (visibility reducing particulates, sulfates and hydrogen sulfide).

Air quality degradation and exceedances of the ambient air quality standards have been episodal in nature. High PM_{10} concentrations that violated the National Ambient Air Quality Standards peaked in the early 1990s. In recent years, good monitoring data has led to reclassification requests to the USEPA for most of the region. Implementation of dust control rules and controls on a number of critical sources have led to the reductions in PM_{10} concentrations. The numbers of violations of the NAAQS for ozone has declined, but violations have continued. Rules establishing controls for Ozone precursor emissions have been implemented, but overwhelming transport of pollutants from the South Coast Air Basin and the San Joaquin Valley Air Basin continually impacts the desert. Both the South Coast and the San Joaquin Valley are both classified as serious nonattainment areas (see Table 3-1). The Southern California Association of Governments (SCAG) has projected population growth and future pollution levels through 2025. The projections are for a population increase of over 50%, a reduction in ozone precursor levels over 30% and increases in PM_{10} levels of nearly 30%.

Table 3-1
Attainment Status By Air Basin and Air District

AIR BASIN	AIR QUALITY DISTRICT	POLLUTANT	PLANNING AREA NAME	FEDERAL DESIGNATION	STATE DESIGNATION
GBVAB	GBUAPCD	PM_{10} (federal)	Owens Valley	Severe Nonattainment	
		PM_{10} (federal)	Rose Valley	Moderate Nonattainment	
		PM_{10} (state)	GBVAB		Nonattainment
		All others	GBVAB	Unclassified/ attainment	Attainment
MDAB	KCAPCD	PM_{10} (federal)	Indian Wells Valley	Moderate Nonattainment	
		PM_{10} (state)	MDAB		Nonattainment

		Ozone (federal)	Eastern Kern County*	Nonattainment	
		Ozone (state)	MDAB		Nonattainment
		All others	Eastern Kern County	Unclassified/ attainment	Attainment
	MDAQMD	PM_{10} (federal)	Searles Valley	Moderate Nonattainment	
		PM_{10} (federal)	Mojave Desert	Moderate Nonattainment	
		Ozone (federal)	Mojave Desert modified	Nonattainment	
		Ozone (state)	San Bernardino Co. Wide		Nonattainment
		Sulfates (state)	Searles Valley		Nonattainment
		Hydrogen Sulfide (state)	Searles Valley		Nonattainment
		PM_{10} (state)	San Bernardino Co. wide		Nonattainment
		All others	MDAQMD Wide	Unclassified/ attainment	Nonattainment
	AVAQMD	Ozone (federal)	Mojave Desert modified	Nonattainment	
		PM_{10} (state)	Basin wide		Nonattainment
		Ozone (state)	Basin wide		Nonattainment
		All Others	Basin wide	Unclassified/ attainment	Nonattainment
SSAB	SCAQMD	Ozone (federal)	Coachella Valley	Nonattainment	
		PM_{10} (state)	SSAB		Nonattainment
		Ozone (state)	SSAB		Nonattainment
		All others	SSAB	Unclassified/ attainment	Attainment

Respirable Particulate Matter (PM_{10}): PM_{10} is the most important air pollutant in the West Mojave planning area. PM_{10} in the atmosphere can be caused by both environmental factors and human activities. Human activities that contribute to the PM_{10} emissions include combustion sources such as stack emissions, diesel exhaust and smoke from prescribed fire and wild fire, fugitive dust sources such as construction and demolition activities, off highway vehicle travel, unpaved public roads and parking lots, industrial activities, OHV open areas and military activities. The combustion sources tend to produce smaller particulates (less than 5 μ) while fugitive sources tend to produce larger particulates (larger than 5μ).

One of the reasons for the concern with PM_{10} emissions is their adverse effect on human health. All of the PM_{10} particles are considered respirable particulate because they can be inhaled into the nose, throat and/or lungs. The fine PM_{10} particles are the largest threat to health

because they tend to deposit in the air sacks. In addition, many of the fine particles are from precursor emissions many of which are toxic or carcinogenic. Fugitive dust is primarily coarse particulate that is not as likely to contain toxic materials. The newest studies report that a 100µ gm/m^3 increase in daily PM_{10} concentrations would increase mortality by 10%. The state PM_{10} standards are considered public health goals. The EPA has established new NAAQS standards for $PM_{2.5}$ emissions. These standards are for particles at or below 2.5 µ. These fine particles have been implicated as an increased health risk and consist of chemical compounds that mostly result from combustion processes.

Nearly all of the planning area has recorded concentrations of PM_{10} in excess of the national and state ambient air quality standards for PM_{10} emissions. The EPA has classified five areas within the West Mojave planning area as federal PM_{10} nonattainment areas. The five current federal nonattainment areas are: the Owens Valley PM_{10} Planning Area, the Coso Junction PM_{10} Planning Area, the Indian Wells Valley PM_{10} Planning Area, the Trona PM_{10} Planning Area and the San Bernardino County PM_{10} Area. The Owens Valley planning area is one of five serious federal nonattainment PM_{10} planning areas in the nation. Southeast Kern County and northeastern Los Angeles County (Antelope Valley) are currently listed as unclassified by the USEPA.

The Antelope Valley Area has recorded levels above the national threshold, but has not been classified as nonattainment by EPA yet. The Air Quality Management District has been working directly with EPA to successfully reduce the PM_{10} concentration levels and avoid having the Antelope Valley Planning Area designated as a federal nonattainment area. Part of this effort is through the adoption and implementation of rules to control fugitive dust that constituted a majority of the total PM_{10} emissions.

The original Searles Valley PM_{10} Planning Area abutted the Owens Valley PM_{10} Planning area on the north and included Rose Valley, Indian Wells Valley and Searles Valley. The EPA recently separated the federal nonattainment area into three separate nonattainment areas based upon the county lines. These three new federal nonattainment areas are called the Coso Junction, the Indian Wells Valley and the Trona PM_{10} nonattainment areas. Emission sources identified in the SIP include construction/demolition, public unpaved roads, paved roads, mobile sources, unplanned fires, public disturbed areas, fuel combustion (cogeneration boiler and stacks at Trona), industrial roads, agricultural fields and military activities. In 1990 there was an estimated 3.98, 4.76 and 9.18 tons/day of PM_{10} emissions in the Coso Junction, Indian Wells Valley and Trona nonattainment areas respectively. Activities on BLM lands are estimated to contribute 8% of the total PM_{10} emissions in the Trona nonattainment area. The primary source of BLM emissions is OHV activity and unpaved road travel in the Spangler Hills Open Area and surrounding areas. The Trona PM_{10} SIP targets the BLM emissions for a 20% reduction. The Kern County APCD and Mojave Desert AQMD have developed rules to implement the SIPs. Current monitoring data has not indicated any recent exceedances of the NAAQS in any of these three nonattainment areas. As a result, documents have been prepared for the three areas requesting a reclassification from nonattainment to maintenance.

The EPA classified the San Bernardino County desert area as a PM_{10} non-attainment area on January 20, 1994. The Mojave Desert AQMD prepared a "Particulate Matter (PM_{10}) Control

Strategy Plan" and submitted it to the state for inclusion into the state SIP. The EPA recently disapproved the plan and returned it to the Mojave Desert AQMD for revision. Emission sources identified in the plan include construction/ demolition, city and county unpaved roads travel and wind erosion, paved road entrainment, city and county disturbed areas and industrial activities. Four BLM open areas (Stoddard Valley, Johnson Valley, Rasor, and El Mirage) are within the nonattainment area and the western Mojave Desert. The draft plan called for BLM to prepare a Dust Control Plan for activities within the core problem area of the nonattainment area. At the present time there is no approved SIP for the nonattainment area to guide actions there. Currently new rules are being drafted to come into compliance with EPA. These new rules will likely require BLM to prepare dust control plans for the entire federal nonattainment area.

Ozone: The South Coast Air Basin and the San Joaquin Valley Air Basin are both federal non-attainment areas for ozone. Much of the ozone pollution in the desert has been transported in from those two areas. Several studies have looked at the ozone pollution problem in the desert areas. The studies show that the peak ozone levels do not correspond to the peak temperatures and ultraviolet (UV) levels, but are occurring much later in the day indicating that the ozone is being formed down wind and is being transported into the area from its source by the prevailing winds. Heavily impacted areas by ozone transport include the Victorville-Barstow area, the Antelope Valley and Joshua Tree National Park. The NAAQS for ozone do not recognize transport as a factor in their standards. As a result, the EPA has classified most of the Salton Sea and Mojave Desert Air Basins as non-attainment areas for ozone. The only exception is a strip along the northern and eastern edge of San Bernardino County that is excluded from the federal ozone nonattainment area. The state standards allow for the subtraction of transported ozone in determining attainment / nonattainment areas. However, the state standards are much tighter. As a result, all of the West Mojave planning area outside of Inyo County is in nonattainment of the California ozone standards.

Conformity Determination: The classification of an area as a federal nonattainment area brings an additional requirement for federal agencies. Section 176(c) of the Clean Air Act (CAA), as amended (42 U.S.C. 7401 et seq.), and regulations under 40 CFR, part 93,subpart W, state that "no department, agency or instrumentality of the Federal Government shall engage in, support in any way or provide financial assistance for, license or permit, or approve any activity which does not conform to an applicable implementation plan." This means that under the CAA 176(c) and 40 CFR, part 93, subpart W, (conformity rules), federal agencies must make a determination that proposed actions in federal nonattainment areas conform to the applicable implementation plan (SIP) before the action is taken.

3.2.2 Soils

The general soil information and maps provide information on broad areas that have a distinctive pattern of soils, relief, and drainage. Many different kinds of soil have formed thoughout the planning area. Ongoing soil forming processes are evident in desert soils. Several processes are involved in the formation of soils. These processes are the accumulation of organic matter, the formation of and translocation of silicate clay, the accumulation of silica and lime, weathering of parent material and the formation of desert pavement. General soils are divided into mapping units that represents a unique natural landscape. Typically a mapping unit

consists of one or more major soils or miscellaneous areas and some minor soils. The soils in any map unit may differ from place to place in slope, depth, drainage, and other characteristics that affect management. The general map units have been grouped for broad interpretive purposes.

The San Bernardino County Mojave River Area is comprised of three groups:

?? Soils of the Mojave Desert on flood plains, alluvial fans, and terraces and in basins are dominantly in low positions in arid areas and are comprised of seven map units. Slopes are nearly level to strongly sloping. Elevation ranges from about 1,700 feet to about 4,000 feet. Soils are very deep and shallow and are moderately to somewhat excessively drained. The surface layer is sand, loamy sand, loamy fine sand, sandy loam, loam, and clay. Soils are used mainly for irrigated crops, homesite development, wildlife habitat, and livestock grazing.

?? Soils of the Mojave Desert on old terraces that have a desert pavement and on alluvial fans, foothills, and mountains are dominantly on scattered rock desert uplands on adjacent high terraces in the central and northern parts of the survey area. Elevation ranges from about 1,800 to 4,500 feet. The four mapping units in this group range in depth from very shallow, shallow, moderately deep to very deep. They are well drained and the surface layer is gravelly sand, very gravelly sand, cobbly sandy loam, gravelly sandy loam, sandy loam, and loam. Soils are used for wildlife habitat, grazing, and a source of gravel.

?? Soils of the San Gabriel and San Bernardino Mountains on mountains, foothills, alluvial fans, and terraces are gently sloping to steep and range in elevation from 3,400 to 6,200 feet. The four mapping units in this group are moderately deep and very deep and are well drained and somewhat excessively drained. The surface layer is sandy loam and loamy fine sand. Soils are used for wildlife habitat, grazing, homesite development, irrigated crops and pasturelands.

The Southeastern Part of Kern County Soil Survey is comprised of two groups within the West Mojave Planning Area:

?? Soils of the Mojave Desert occupy several different landscapes that range from low basins to high mountain ridges. Seven mapping units are incorporated into this group. Soils are nearly level to very steep ranging from 2,000 to 4,200 feet elevation and are shallow, deep, or very deep, and well to excessively drained. Surface layers range from sand to clay loam. Soils are used for rangeland, recreation, or wildlife habitat. Where water is available, a few of the soils are used for cropland or homesites.

Soil limitations include a high susceptibility to blowing of the sand surface layers and excessive erosion hazard due to slopes with inadequate plant cover.

?? Soils on the Eastern Foot Slopes of the Sierra Nevada and Tehachapi Mountains are dominantly strongly to very steep with some soils in mountain valleys that are nearly

level. Elevation ranges from 2,000 to 8,000 feet. Soils are shallow to very deep and well drained to somewhat excessively drained. Surface layers are gravelly sandy loam, gravelly loam, or sandy loam. Four mapping units in this group are used for woodland, rangeland, recreation, and wildlife habitat. Those soils in the more level mountain valleys are used irrigated cropland.

The Fort Irwin National Training Center Soil Survey is comprised of five groups and can be used to extrapolate information about soils for surrounding areas:

?? Soils in basins and on basin rims are comprised of one mapping unit occupying alluvial flats, fan skirts, and playas landforms. Soils are somewhat poorly to excessively drained, very deep soils formed in mixed alluvial or lacustrine materials on nearly level to gentle slopes. Surface layers are sandy loam to fine sandy loam, coarse sand, loamy coarse sand, silty clay loam, silty clay or clay.

?? Soils on alluvial fans and alluvial fan remnants are comprised of four mapping units. The surface layer is composed of sand, coarse sand, loamy coarse sand, sandy loam, loamy sand, loam, or silt loam. Soils are well drained and very shallow to very deep and are gently to strongly sloping.

?? Soils on granitic pediments and inselbergs are comprised of one mapping unit somewhat excessively drained, very shallow over granitic bedrock soils formed in residuum. The surface layer is coarse sandy loam or sandy loam. Slopes are undulating to steep.

?? Soils on fan remnants, erosion remnants, and ballenas are comprised of two mapping units. Landforms are undulating to hilly with very shallow to very deep, well-drained soils. Surface layers are loamy coarse sand, coarse sandy loam, sandy loam, or loam.

?? Soils on hills and mountains are comprised of three mapping units. Landforms are rolling to very steep with very shallow to shallow well drained to excessively well-drained soils. Surface layers are sand clay loam, sandy loam, or loam.

Soils within the National Training Center are used for military exercises and wildlife habitat. Soils outside the National Training Center are used for grazing, wildlife habitat, recreation, and homesite development.

The Marine Corps Air Ground Combat Center Twentynine Palms soils are comprised of three groups:

?? Soils on bolson floors are comprised of one mapping unit with very deep, clayey or coarse loamy, salt affected soils formed in lacustrine deposits. The landform setting is smooth lake plains and playas. Elevation ranges from 600 to 2,900 feet. Soils are somewhat poorly drained to well drained.

?? Soils on fan piedmonts are comprised of five mapping units located on fan remnants, alluvial fans, and fan aprons. Soils are very shallow to very deep, well to excessively

drained. Elevation is 1,800 to 4,000 feet with gently to moderately steep slopes. Surface layers are coarse sand, loamy sand, loamy fine sand, loamy coarse sand, sandy loam, extremely gravelly sand, very gravelly sandy loam.

?? Soils on mountains and hills are comprised of three mapping units. Soils are very shallow to bedrock, well drained to somewhat excessively drained. Elevation is 800 to 4,600 feet with moderate to steep slopes. Surface layers are extremely gravelly sand, very cobbly fine sandy loam, very gravelly loamy coarse sand, or extremely stony sandy loam.

The Edwards Air Force Base Soil Survey is comprised of three basic geomorphic units. These include the hills and rock pediments are scattered throughout the area and are surrounded by fan piedmonts and sand sheets, which for the most part internally drained to the alluvial flats and ultimately to the playas.

?? The hills and rock piedments tend to be moderately steep, to steep. Soils are shallow or moderately deep; therefore, water runoff is somewhat high.

?? The fan piedmonts and sand sheets are rarely flooded during thunderstorms when water moves from the surrounding hills and rock pediments down slope toward to the playas. Drainage of soils on these landscapes is somewhat to excessively drained.

?? The alluvial flats between the playas and surrounding fan piedmonts and sand sheets are subject to occasional flooding as water moves down slope to the playas. Ponding occasionally occurs on the alluvial flats. Soils on the alluvial flats are dominantly moderately well drained.

Soil blowing is a major hazard in the survey area; especially those with coarse-textured surface layer of loamy fine sand and sand and are susceptible to soil blowing. Wind erosion occurs whenever bare, loose, dry soil is exposed to wind of sufficient speed to cause soil movement. The process will be accelerated whenever the natural equilibrium between climate, soils, and vegetation is disturbed. Wind speeds as low as 13 to 15 miles per hour one foot above the soil surface can initiate soil blowing under highly erodible conditions. The mere passing of vehicle tires or tracks over an erodible surface provides sufficient energy to initiate soil blowing. As medium size particles are detached they may enter the wind stream momentarily but then are pulled back by gravity. This causes them to impact other particles and set them into motions and can account to 50 to 80 percent of total soil movement.

3.2.3 Water

The planning area is one of the most arid areas in the nation; the potential annual water loss through evapotranspiration exceeds the annual water gain from precipitation even at the higher elevations. On the valley floor the evaporation exceeds the precipitation by at least 25:1.

Prominent mountain ranges have an important influence on moisture distribution within the plan area. As moist, unstable air masses from the Pacific Ocean rise up the windward slopes

of the Southern Sierra, San Gabriel and San Bernardino Mountains, the air is cooled and water vapor condenses and falls as rain, snow, or ice. When these air masses descend the leeward slopes, they become warmer and more stable and thus retain most of the remaining moisture. Consequently, precipitation amounts are much greater on the windward slopes of the mountain ranges, whereas arid conditions prevail leeward of the mountains. All of the study area, except the Kelso Creek area is on the leeward side of these major mountain areas.

Surface water is very scarce. Streams that originate high in surrounding mountains on the west and south may have perennial flow in the higher altitudes; at the lower altitudes and throughout the area virtually no water exists in streambeds or riverbeds, except locally after infrequent, heavy cloudbursts. The playas may be covered by water from the runoff for as long as two months a year. There are many locally important springs and seeps most of which are associated with the mountain areas.

Water Quality: Although there are vast quantities of water within the ground water basins, some of the water is of poor quality. The mineral quality of the ground water within the study area varies greatly. The geologic setting of the basins directly affects the degree of ground water mineralization. In general, basins near the source of recharge are less mineralized than those that are more distant.

Very short flow paths generally characterize small local flow systems, usually no more than a few miles in length. Springs connected to these systems are usually located in or near the mountains and have highly variable annual ranges in discharge which respond to the precipitation that year or a few years previous. Discharge waters have small concentrations of dissolved sodium plus potassium and chloride plus sulfate, large concentrations of tritium, and water temperatures that commonly approach average air temperatures.

Large local flow systems are characterized by interbasin flow or flow confined to one basin with longer flow paths. Springs connected to these systems have moderate concentrations of the major salts, no significant concentrations of tritium and water temperatures from 50 to 60 degrees Fahrenheit.

Surface water was and is the major transport agent of the rock material from the mountains to the alluvial fans to the valleys. The intense short duration storms result in rapid floodwaters that have the energy to transport rock material both in the water column and along the beds of the arroyos. Longer duration storms with less intensity will still have the energy to transport finer sediment materials. All ephemeral streams in this area will have naturally high sediment concentrations. Flows resulting from groundwater sources will have low sediment concentrations until the runoff water predominates the flow. Playa water will usually have a high concentration of very fine sediment mixed into the column by wind action and will have varying salt concentrations depending on the geology of the area.

3.3 BIOLOGICAL RESOURCES

3.3.1 Natural Communities

The western Mojave Desert comprises a distinct area of the Mojave Desert biome, where the flora and fauna has adapted to the local conditions and formed distinct natural communities and species found nowhere else (i.e. "endemics"). It also incorporates the transitional ecotones from the Sierra Nevada, Tehachapi, San Gabriel, and San Bernardino Mountains and the Colorado Desert.

The predominant aspect of the West Mojave is a flat, sparsely vegetated region interspersed with mountain ranges and dry lakes. The area is a part of the high desert, large portions of which lie at elevations between 2500 and 4000 feet. Freezing temperatures are limited to a few days in the winter in most of the region, while summer temperatures regularly exceed 100 degrees Fahrenheit. The characteristic creosote bush and saltbush plant communities are covered with wildflowers in years of above-normal winter rainfall, and up to 90% of the flora is composed of annual plants.

Thirty-two distinct plant communities are found within the western Mojave Desert. By far the moist common communities are creosote bush scrub and saltbush scrub, which occupy over 90% of the natural lands. The remaining plant communities are found in isolated areas with unique conditions, such as the alkali seeps, springs, and meadows or the fan palm oases, or occur along the south and west edges of the planning area, where the desert transitions into mountains. In the transition areas are several types of chaparral, woodland and scrub communities not found on the desert floor.

3.3.2 Desert Tortoise

The following consists of short excerpts taken from the comprehensive treatment of the desert tortoise that is being prepared for the West Mojave Plan EIR/S (expected to be published in May 2003). The discussion below is limited to a general overview of tortoise status and life history, as well as those materials that have a direct bearing on the relationship between dispersed off highway vehicle use and desert tortoises and their habitat.

3.3.2.1 Regulatory Status

The Mojave population of the desert tortoise includes those animals living north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, southwestern Utah, and in the Colorado Desert in California. On August 4, 1989, the USFWS published an emergency rule listing the Mojave population of the desert tortoise as endangered (54 *Federal Register* 32326). In its final rule, dated April 2, 1990, the USFWS determined the Mojave population of the desert tortoise to be threatened (55 *Federal Register* 12178). The USFWS designated critical habitat for the desert tortoise in portions of California, Nevada, Arizona, and Utah in a final rule, published February 8, 1994 (59 *Federal Register* 5820). (USFWS 2002.) The tortoise was also listed as threatened throughout its known range in California by the California Fish and Game Commission in 1989.

The desert tortoise was designated a "sensitive species" in California in 1979 by BLM, which is authorized to designate species on public lands as "sensitive" after consultation with CDFG. The purpose of the designation was to provide increased management attention to prevent population and habitat declines that might result in federal or State listing as endangered or threatened. The designation raises the level of concern for desert tortoises in the environmental review process. No particular habitat or population management action is required or prohibited by the sensitive species designation, although other federal statutes (such as FESA and CESA) apply. (BLM and CDFG 1992.)

3.3.2.2 Tortoise Habitat Designations

During the past two decades, the BLM and USFWS have identified habitats that are important to tortoise management, conservation, and recovery (see Table 3-2).

Table 3-2
Current And Historic Tortoise Management Areas

NAME	DATE ESTABLISHED	NOTES
Crucial Habitat	1980	California Desert Conservation Area Plan Designation
Category I, II, and III	1993	California Desert Conservation Area Plan Designation
Critical Habitat	1994	Designation pursuant to FESA
Recovery Plan	1994	Suggests that DWMAs be established

BLM Crucial Habitat: Desert tortoise *crucial habitat* was first identified in the BLM's 1980 CDCA Plan (Map 4, CDCA Plan, 1980). The crucial habitat area was considered to be "…essential to the continued existence of the species." The BLM (1987) described crucial habitat as follows: "*Crucial habitat* includes portions of the habitats of officially designated BLM sensitive species that if destroyed or adversely modified could result in their being listed as threatened or endangered pursuant to Section 4 of the Endangered Species Act of 1973, as amended."

BLM Category I, II, and III Habitat: In 1992, the BLM and CDFG adopted a *California Statewide Desert Tortoise Management Policy.* The crucial habitat designation was expressly dropped in 1992 in favor of BLM tortoise Category I, II, and III habitat areas (BLM and CDFG 1992). This policy included management goals for Category I, II, and III tortoise habitats, as follows: *Category I:* maintain stable, viable populations and increase populations where possible; *Category II:* maintain stable, viable populations; *Category III:* limit declines to the extent possible using mitigation measures. In April 1993, the BLM amended the CDCA plan to delineate these three categories of desert tortoise habitat on public lands (Map 1A, CDCA Plan, as amended, 1999).

USFWS Critical Habitat: Critical habitat is defined as (a) the specific areas within the geographical area occupied by the species at the time it is listed on which are found those physical or biological features which are essential to the conservation of the species and which may require special management considerations or protection; and (b) specific areas outside the

geographic area occupied by the species at the time it is listed upon a determination by the Secretary of the Interior that such areas are essential for the conservation of the species (FESA Section 3(5)(A)). In 1994, the Service designated four critical habitat units in the planning area: Fremont-Kramer (518,000 acres), Superior-Cronese (766,900), Ord-Rodman (253,200), and Pinto Mountain (171,700) units (USFWS 1994a).

USFWS Recovery Units and Desert Wildlife Management Areas: The Desert Tortoise (Mojave Population) Recovery Plan (USFWS 1994b) established recovery goals and objectives for six "recovery units." The Western Mojave Recovery Unit is conterminous with the West Mojave planning area. The Recovery Plan stated that recovery units are "...essential to the long-term recovery, viability, and genetic diversity of the species." The Recovery Plan also recommended that Desert Wildlife Management Areas (DWMA) be established within each recovery unit. DWMAs were characterized as areas in which "...recovery actions will be implemented to provide for the long-term persistence of viable desert tortoise populations and the ecosystems upon which they depend."

The West Mojave Plan is considering the establishment of the four DWMAs recommended by the Recovery Plan, which generally correspond to the four critical habitat units: Fremont-Kramer, Superior-Cronese, Ord-Rodman and Pinto Mountains.

3.3.2.3 Tortoise Life History

The following life history information is taken from U.S. Fish and Wildlife Service (2002). The desert tortoise is a large, herbivorous reptile found in portions of the California, Arizona, Nevada, and Utah deserts. It also occurs in Sonora and Sinaloa, Mexico. In California, the desert tortoise occurs primarily within the creosote, shadscale, and Joshua tree series of Mojave Desert scrub, and the lower Colorado River Valley subdivision of Sonoran desert scrub. Optimal habitat has been characterized as creosote bush scrub in which precipitation ranges from 2 to 8 inches, diversity of perennial plants is relatively high, and production of ephemerals is high (Luckenbach 1982, Turner and Brown 1982, Schamberger and Turner 1986). Soils must be friable enough for digging of burrows, but firm enough so that burrows do not collapse. In California, desert tortoises are typically associated with gravelly flats or sandy soils with some clay, but are occasionally found in windblown sand or in rocky terrain (Luckenbach 1982). Desert tortoises occur in the California desert from below sea level to an elevation of 7,300 feet, but the most favorable habitat occurs at elevations of approximately 1,000 to 3,000 feet (Luckenbach 1982, Schamberger and Turner 1986).

Adult desert tortoises are most active in California during the spring and early summer when annual plants are most common although juvenile tortoises have been observed outside burrows throughout the year, including December through January when adults are generally in a state of hibernation (Dave Morafka, pers. comm.). Additional adult activity occurs during warmer fall months and occasionally after summer rainstorms. Adult desert tortoises spend most of the remainder of the year in burrows, escaping the extreme conditions of the desert. Further information on the range, biology, and ecology of the desert tortoise can be found in Burge (1978), Burge and Bradley (1976), Hovik and Hardenbrook (1989), Luckenbach (1982), Weinstein *et al.* (1987), and USFWS (1994b).

Tortoise activity is heavily influenced by the amount and timing of rainfall. Annual plants, which make up most of the tortoise's diet in the western Mojave Desert, vary depending on the timing of winter precipitation and the ensuing temperatures. Annual forbs, which are relatively more nutritionally balanced for tortoises, generally emerge following early winter rains with relatively warmer temperatures preceding and during the spring growing season. If winter rains do not come until late January or February, and temperatures are relatively cooler, native and non-native annual grasses will often emerge instead of native forbs. Such forage, particularly non-native grasses, offers little nutritional quality to tortoises.

Male tortoises may be more active during the fall, when their testosterone and viable sperm levels are higher than during the spring. Data collected between 1998 and 2001, which were mostly restricted to the summer and fall periods (i.e., July through October), show that twice as many males were encountered in each of the three survey years as compared to females. This was not observed during distance sampling, where surveys were performed in the spring. In 2001 and 2002, 87 males (40% of all animals where gender could be determined) and 69 (32%) females (1:1.26 ratio) were observed. This probably indicates that males were somewhat more detectable than females in the summer and fall months when males are actively courting and mating with female tortoises, which is supported by numerous field observations.

Food resources for desert tortoises are dependent on the availability and nutritional quality of annual and perennial vegetation, which is greatly influenced by climatic factors, such as the timing and amount of rainfall, temperatures, and wind (Beatley 1969, 1974, Congdon 1989, Karasov 1989, Polis 1991 in Avery 1998). In the Mojave Desert, these climatic factors are typically highly variable; this variability can limit the desert tortoise's food resources.

Desert tortoises will eat many species of plants. However, at any time, most of their diet often consists of a few species (Nagy and Medica 1986, Jennings 1993 in Avery 1998). Additionally, their preferences can change during the course of a season (Avery 1998) and over several seasons (Esque 1994 in Avery 1998). Possible reasons for desert tortoises to alter their preferences may include changes in nutrient concentrations in plant species, the availability of plants, and the nutrient requirements of individual animals (Avery 1998). In Avery's (1998) study in the Ivanpah Valley, desert tortoises consumed primarily green annual plants in spring; cacti and herbaceous perennials were eaten once the winter annuals began to disappear. Medica *et al.* (1982 in Avery 1998) found that desert tortoises ate increased amounts of green perennial grass when winter annuals were sparse or unavailable; Avery (1998) found that desert tortoises rarely ate perennial grasses.

Desert tortoises can produce from one to three clutches of eggs per year. On rare occasions, clutches can contain up to 15 eggs; most clutches contain 3 to 7 eggs. Multi-decade studies of the Blanding's turtle (*Emydoidea blandingii*), which, like the desert tortoise, is long lived and matures late, indicate that approximately 70 percent of the young animals survive each year until they reach adult size; after this time, annual survivorship exceeds 90 percent (Congdon *et al.* 1993). Research has indicated that 50 to 60 percent of young desert tortoises typically survive from year to year, even in the first and most vulnerable year of life. Insufficient information on the demography of the desert tortoise is available to determine whether this rate

is sufficient to maintain viable populations; however, it does indicate that maintaining favorable habitat conditions for small desert tortoises is crucial for the continued viability of the species.

Desert tortoises typically hatch from late August through early October. At the time of hatching, the desert tortoise has a substantial yolk sac; the yolk can sustain them through the fall and winter months until forage is available in the late winter or early spring. However, neonates will eat if food is available to them at the time of hatching; when food is available, they can reduce their reliance on the yolk sac to conserve this source of nutrition. Neonate desert tortoises use abandoned rodent burrows for daily and winter shelter, which are often shallowly excavated and run parallel to the surface of the ground.

Neonate desert tortoises emerge from their winter burrows as early as late January to take advantage of freshly germinating annual plants; if appropriate temperatures and rainfall are present, at least some plants will continue to germinate later in the spring. Freshly germinating plants and plant species that remain small throughout their phenological development are important to neonate desert tortoises because their size prohibits access to taller plants. As plants grow taller during the spring, some species become inaccessible to small desert tortoises.

The ecological requirements and behavior of neonate and juvenile desert tortoises are substantially different than those of sub-adults and adults. Smaller desert tortoises use abandoned rodent burrows, which are typically more fragile than the larger ones constructed by adults. They are active earlier in the season. Finally, small desert tortoises rely on smaller annual plants with greater protein content to be able to gain access to food and to grow.

3.3.2.4 Tortoise Populations

Between 1998 and 2001, 3,362 transects covering 3,378 mi^2 were surveyed, typically at a density of one transect per square mile. Of the 3,362 transects, 1,405 (42%) did not have any tortoise sign, with some tortoise sign found on the remaining 1,957 (58%) transects. The distribution of above-average sign counts reveals that higher density tortoise areas occur on a northeast-southwest axis, between Fort Irwin and south of Edwards Air Force Base. There were three higher concentration areas in the DWMA proposed by the West Mojave Plan for Ord-Rodman, and none was observed in the proposed Pinto Mountain DWMA. No higher density tortoise areas were found in the northern and western portions of the proposed Fremont-Kramer and Superior-Cronese DWMAs, respectively.

Evidence of Tortoise Population Declines Between 1980 and 2002: Comparing sign count data collected prior to 1984 (“older data”) with those of 1998-2002 (“newer data”) shows a decline in the abundance of tortoise sign per transect. There were 213 older and 3,362 newer transects surveyed throughout the planning area. Comparisons are given in Table 3-3.

Table 3-3
Tortoise Total Corrected Sign Found in West Mojave Planning Area
Between 1975 to 1982 and Between 1998 to 2002

TCS CATEGORIES	PREVALENCE OF TOTAL CORRECTED SIGN			
	1975 to 1982 Transects		1998 to 2002 Transects	
	Total No.	% Of Total	Total No.	% Of Total
0	38	18	1,405	42
1 to 3	57	27	1,113	33
4 to 8	45	21	583	17
9 to 16	46	22	195	6
17 to 28	20	9	56	1
29 to 50	6	3	10	<1
> 50	1	0	0	0
Totals	213	100%	3,362	100%

In comparing the earliest survey efforts with later ones, it appears that there have been substantial declines in tortoise numbers in the northwest portion of the proposed Fremont-Kramer DWMA. This area is bounded by Highway 58 to the south, Red Mountain to the north, Fremont Peak to the east, and the DTNA to the west. It encompasses the three DTNA study plots and those at Fremont Peak and Fremont Valley, where Dr. Berry documented tortoise declines ranging from 93% at Fremont Peak to 72% at the Fremont Valley study plot. No above-average tortoise sign polygons were identified anywhere within this region. Although there were a few transects with above-average tortoise sign, these were insufficiently concentrated for the polygon criteria to be met.

There are few regions within West Mojave Plan's proposed DWMAs where tortoises are completely extirpated, or for other reasons, do not occur. It identifies areas where high sign counts were found on 261 transects, or conversely, no sign was found (transects along the Sierra Nevada, west of the aqueduct). In many cases, low-density areas may be adjacent to or surrounded by relatively higher density areas.

Several safe assumptions can be made about tortoise distribution in the western Mojave Desert since the 1970s:

?? Tortoises are mostly absent from dry lakebeds.

?? Tortoises are absent from areas above 5,000 feet elevation, and nearly so at 4,500 feet. In 1999, only 5 of 609 (0.8%) transects with tortoise sign occurred above 4,000 feet; similarly, in 2001, only 12 of 991 (1.2%) transects with tortoise sign occurred above 4,000 feet. In 1998, all 875 transects were located below 4,500 feet.

?? Tortoises may be naturally sparse in the northern portion of the range, from the Avawatz Mountains, through China Lake Naval Air Weapons Station, up to Rose Valley along Highway 395. Much of this area is protected on military installations or otherwise inaccessible to most casual desert visitors, yet no surveys since the 1970's have found

significant areas of above-average tortoise sign. Weinstein (1989) found that latitude was a contributing factor to tortoise occurrence, and that in general densities decreased with increasing northern latitudes.

There are also places where local geological and hydrological factors may be responsible for relatively low tortoise numbers. The lava flows associated with Black Mountain, north of Harper Lake, may be sufficiently unsuitable that tortoises are naturally uncommon, although there is an apparent abundance of tortoises at Pisgah Crater, a similar formation. During 1994, on the south-central and southwestern portions of Edwards Air Force Base (between South Rogers Dry Lake and Rosamond Dry Lake, including Buckhorn Dry Lake), the only tortoises found were restricted to a small hill that rose above the surrounding saltbush scrub, which was vegetated by the only creosote bush scrub observed in the region (LaRue, pers. obs.).

3.3.2.5 Threats to Tortoises: Mortality Factors

Available literature presents many threats that are known or suspected to affect tortoises and their habitats. Dr. William Boarman (2002) identified 22 impacts that may affect tortoises throughout the listed population: agriculture, collecting, construction, disease, drought, energy and mineral development, fire, garbage and litter, handling and manipulation, invasive weeds, landfills, livestock grazing, military operations, noise, non off-highway vehicle recreation, off-highway vehicles, predation, roads and highways, urbanization and development, utility corridors, vandalism, and wild horses and burros.

Dr. Boarman's discussion of threats is general and is not restricted to physical impacts and miscellaneous threats that are known to occur in the western Mojave Desert. The following discussion focuses on relationship between off highway vehicles and tortoises.

3.3.2.6 Tortoises and Off Highway Vehicles

3.3.2.6.1 Dispersed Casual OHV Use

Off highway vehicles users visit the desert for many purposes. They explore the desert, hunt, and drive to campsites and trailheads for hiking or horseback riding, rockhounding and other activities. Commercial uses are also common, for mineral exploration, maintenance of existing facilities, and administrative or law enforcement purposes. This use occurs in a more dispersed manner than, for example, concentrated competitive events, and results in a low-density but continuing presence of vehicles throughout the desert. The following discussion addresses effects that have occurred as a consequence of such dispersed, casual use of the planning area by off highway vehicles.

Boarman (2002) conducted a literature review of 56 references that addressed OHV-based impacts on desert tortoises. His conclusion follows:

> Although each study comparing tortoise densities inside and outside of [OHV] areas has limitations, they all lend evidence to reductions in tortoise population densities in heavy [OHV] use areas. The causes for these declines are less certain. Tortoises and their burrows are crushed by [OHVs], although it is difficult to evaluate the full impact this activity currently has on tortoise

> populations, partly because there are probably relatively few tortoises in most open use areas. [OHVs] damage and destroy vegetation. Density, cover, and biomass are all reduced inside versus outside of [OHV] use areas, particularly following multiple passes by vehicles. Split grass (*Schismus barbatus*), a weedy introduced grass, in particular appears to benefit from [OHV] activity. Very light, basically non-repeated, vehicle use probably has relatively little long-term impact. Soil becomes compacted by vehicles. The compaction increases with moisture content of the soil, weight of vehicle (particularly high weight to tire surface area ratio), and soil type. Cohesionless sand, such as in sand dunes and washes, [is] largely immune to compaction while moist soils are much more susceptible than dry ones. Compaction, lower infiltration rates, loss of plants and cryptogamic soils all contribute to increased wind and water erosion and fugitive dust, particularly when such areas are several meters in width. More research is needed to understand the effect light [OHV] use has on tortoise populations and habitat.

Boarman (2002) reported that tortoise densities have been reduced through (a) *direct effects*, including crushing of tortoises and burrows, and (b) *indirect effects* of (i) compaction of soil, (ii) destruction of cryptogamic soils, (iii) changes in vegetation, (iv) erosion and loss of soil, (v) light OHV use, and (vi) human access to tortoise habitat.

The USFWS (2002) indicated that the degree of threat posed to desert tortoises by recreation increases with the speed, weight, and numbers of recreational units involved. They indicated, for example, that a small group of hikers posed much less threat to the desert tortoise and its habitat than a race that involved numerous all-terrain vehicles.

Positive Benefits of Motorized Vehicle Routes: Haskell (2000) reported that roads provided benefits to society such as opportunities for recreation and natural resource extraction. The USFWS (2002) felt that recreational use of the desert might benefit the desert tortoise in an indirect manner. They concluded that many people viewed the California desert as a unique place to enjoy nature and solitude, and that the enjoyment of the desert could promote citizens to assist in volunteer projects to restore habitats, clean up trash, report problems to the BLM, and educate other users. The BLM's existing educational programs were identified as striving for these goals (USFWS 2002).

3.3.2.6.2 Direct Impacts of OHVs on Desert Tortoise Populations

As of 1980, the USFWS (2002) reported that OHV activities had affected approximately 25% of desert tortoise habitat in California. In 1986, Dodd (1986) concluded that nearly 70% of the remaining high-density tortoise populations in the California desert were subject to OHV impacts. In 1990, Chambers Group, Inc. (1990) found that 413 square miles (2.9%) of the planning area had been directly disturbed by OHVs, and that much of the disturbance had occurred in open areas or in unauthorized OHV-use areas.

Sign count data collected between 1998 and 2002 indicate that vehicle-based impacts are prevalent throughout tortoise habitats, including the proposed DWMAs. Within the Fremont-Kramer and Superior-Cronese DWMAs, cross-country travel was observed on 833 of 1,572 (53%) transects and roads were observed on 702 (45%) transects. There were 447 mi^2 with higher tortoise sign counts, 159 mi^2 (36%) of which overlapped with above-average vehicle-based impacts.

Although most of the above-average vehicle impacts are contained within BLM Open Areas, similar vehicle impact areas were observed from California City north through the Rand Mountains into Fremont Valley. In effect, this is a heavy OHV use area affecting both private lands around California City and about half of the region that is proposed by the West Mojave Plan for DWMA management. Data from permanent study plots indicate that tortoises decreased between 72% to 93% in this region from the early 1980s to 2002.

Reduced Tortoise Numbers Attributed to OHV Impacts: The literature suggests that OHV use has resulted in reduced tortoise numbers (National Ecology Research Center 1990, USFWS 1994b), including juveniles next to well-used dirt roads (USFWS 1994b). Berry (1996) found that tortoise populations decreased significantly with (a) increasing mileages of linear disturbances associated with roads, trails, routes, and tracks ($P<0.01$) and (b) increasing numbers of human visitors ($P<0.05$). She observed that stable or increasing tortoise populations had low mileages of linear disturbances and vehicle use, few human visitors, and relatively low percentages of introduced annual plants. For example, two of the 15 plots she surveyed in the northern Colorado Desert had stable or increasing populations and disturbance levels that were generally lower than elsewhere in the California deserts.

In 1994, the USFWS (1994b) concluded: (a) The density of paved and dirt roads, routes, trails, and ways in desert tortoise habitat has had a direct effect on mortality rates and losses of desert tortoises; (b) as mileage of roads, trails, and tracks increased on BLM study plots in California, desert tortoise populations declined at greater rates; (c) even relatively low vehicle use had contributed to depressed desert tortoise densities in local areas; and, (d) the presence of routes of travel through or near the habitats of listed species presented an ongoing level of threat to those species from illegal vehicle use. In 2002, the USFWS (2002) concluded, "Given the precariousness of the desert tortoise in large areas of the California desert and the likelihood that declines will continue to spread at least for some time, the loss of even a few individuals could impede recovery of the species."

Data indicate that significant declines have occurred through much of the northern and northeastern portions of the West Mojave Plan's proposed Fremont-Kramer DWMA. URTD has been implicated, but sign count data reveal that it is also a region of very heavy vehicle impacts and persistent sheep grazing. These data also reveal that there are still higher density tortoise areas in the northern part of the Stoddard Valley Open Area and along the western boundary of the Johnson Valley Open Area.

One may interpret these data to indicate that OHV impacts have eliminated tortoises between California City and Fremont Valley, or conversely that OHV impacts are negligible in open areas, as evidenced by persisting regions of higher tortoise densities. Both arguments have inherent weaknesses, as do the literature sources that refer to "reduced numbers" and "significant decreases" of tortoises caused by OHV impacts. Both arguments are weakened by the lack of baseline data from the 1950's, for example, to which current population levels can be compared. Recent sign count data provide a static look at relative tortoise densities and distribution. Except for where numerous freshly dead carcasses have been found, or declines have been documented on BLM study plots and other places, the current distribution suggests nothing about population trends.

Tortoises and Burrows Crushed: Vehicle collisions are responsible for tortoise injury and mortality on dirt roads (Berry 1996), including lightly traveled roads (USFWS 1994b). Given the prevalence of cross-country OHV travel (WMP 1998-2002 data), tortoises have also been crushed in areas adjacent to roads (see also USFWS 2002), and mortality has likely occurred both above- and belowground (USFWS 1994b). Such cross-country travel has also resulted in loss (Jennings 1993) or damage (USFWS 1994b) of tortoise burrows.

Relative Impacts Attributed To Trucks versus Motorcycles: Data do not indicate if the tortoises (or carcasses) were crushed by motorcycles or trucks, but it was more likely by trucks, given the larger surface area affected by four large tires, and the following considerations. The location of tortoises and burrows likely affects the potential for them to be differentially crushed by trucks or motorcycles. Compared to trucks, motorcyclists are less likely to ride through and crush shrubs, so tortoises and burrows under shrubs are somewhat less vulnerable to this impact. The visibility from a motorcycle also makes it likely that cyclists can more readily see and avoid tortoises. Comparatively, operators of four-wheel drive trucks often crush shrubs, have limited visibility from inside the vehicle, and are probably more likely to crush tortoises and burrows than are cyclists.

Cross-country travel by both trucks and motorcycles results in degradation of habitat, which may result in poor forage quality and reduced burrowing potential. Motorcycles are significantly more maneuverable between shrubs, in mountainous areas above 20% slope, and many other places that are less accommodating to trucks. This maneuverability has resulted in more cross-country travel by motorcycles than by trucks, although there are exceptions in localized areas. The 27% increase of trails between 1979 and 1995 observed in the southern part of the proposed Ord-Rodman DWMA was predominantly due to motorcycle traffic, and likely due to the proximity with Johnson Valley Open Area, which is immediately east. Therefore, although cyclists are less likely to crush tortoises than truck operators, they are more likely to leave roads, and are more likely to degrade habitats in areas with few roads, compared to trucks.

Prevalence of Vehicle Crushing: Sign count data indicate that vehicles crushed 28 (27%) of the 104 carcasses where the cause of death could be ascertained. These results are remarkably similar to those of distance sampling in the West Mojave Plan's proposed Fremont-Kramer and Superior-Cronese DWMAs, where vehicle crushing accounted for 32% (14 of 44) of all observed carcasses where cause of death was given.

Vehicle crushing has resulted in about a third of the tortoise deaths observed where cause could be determined, with only mammalian predation being more prevalent. Unlike catastrophic die-offs, where the cause of death is unknown, and mammalian predation, which is widespread and may not be controllable, vehicle impacts may be controlled. Route reductions, signing and fencing programs, restriction on competitive events in the proposed DWMAs, education program, and increased law enforcement are pragmatic ways of minimizing vehicle impacts.

Adult Versus Subadult Tortoises Crushed: The data suggest that adult tortoises are more likely to be crushed than subadult tortoises, although the lower detectability of smaller carcasses may, in part, account for the difference. Sign count data for the 28 crushed carcasses indicate

that 23 (82%) were adults, 4 (14%) were subadults, and 1 (4%) was unknown. Similarly, distance-sampling data indicate that 12 of the 14 (86%) crushed carcasses were of adult tortoises, 1 (7%) was a subadult, and 1 (7%) was unknown.

Aboveground Tortoise Activity in Response to Wet versus Dry Years: Sign count and distance-sampling data indicated within a give year, tortoises are more likely to be aboveground (i.e., active) in the spring and in burrows (i.e., inactive) in the summer-fall. The distance sampling data suggest that increased activity patterns occur on a *regional* scale, not just on a *local* scale. This may the first evidence that increased tortoise activity patterns in response to rainfall occur on a population level instead of at the individual level.

These observations are significant for the following reasons:

?? Heightened activity in wetter years may put more tortoises at risk to being crushed by vehicles, both on and adjacent to designated routes. This impact is more likely to occur in higher density areas where operators are more likely to encounter tortoises.

?? Illegal activities that are facilitated by roads (i.e., poaching, pet collection, inter-regional translocations, intentional vandalism, etc.), may occur more frequently in wetter years, given that tortoises are substantially more visible aboveground than in burrows. Increased law enforcement in higher density areas during such conditions may minimize these impacts when and where they are most likely to occur.

?? Vehicles traveling in washes in wetter years may impact relatively more tortoises than in dry years. It has been suggested that vehicle travel in washes during drought periods would result in more impacts. This may not be true if tortoise activity in washes occurs at reduced levels, although tortoises in burrows would still be affected by vehicle travel in washes.

Locations of Tortoises: There were 491 sign count and distance sampling tortoises observed between 1998 and 2002. Their locations and other information are given in Table 3-4. Distance sampling tortoises for 2001 and 2002 are given in the middle two rows of the table. Arrows show the directions to which percentages apply; the two middle rows are relative to "Distance Both Years" shown in the fourth row of data.

OHV Impacts to Tortoises in Washes: During his studies at the Desert Tortoise Natural Area in the early 1990's, Jennings (1993, 1997a, 1997b) found that tortoises systematically located preferred forage along the margins of small washes. They spent a considerable amount of time traveling along washes, and apparently used washes as navigational aids to relocate burrows. For example, more than 25 percent of all plants on which tortoises fed, and three of the ten most-preferred plants, were in the washes and washlets, even though washes comprised only 10.3% of the study area habitats (1997). Given this information, he concluded that OHV use may disorient tortoises (1993) and that tortoises will be forced to select other less-preferred and possibly less-nutritious plant species (1997a).

Table 3-4
Characteristics of 491 Tortoises Found Between 1998 and 2002

LOCATIONS OF TORTOISES[1]										
		288 IN BURROWS					203 ABOVEGROUND			
Type Years	Total	No Obs	Shrubs Rocks	Open	Wash Banks	Unk	No Obs	Open	Shrubs Rocks	Washes
Sign Count 98-99-01	275 ?56%	202 ? 74 ?70%	116 ? 57%	58 ? 29%	20 ? 10%	8 ? 4%	73 ? 26% ?36%	67 ? 92% ?40%	3 ? 4% ?9%	3 ? 4% ?4%
Distance 2001	104 ?21%	29 ? 28% ?10%	29 in Burrows; no location data				75 ? 72% ?37%	58 ? 77% ?34%	17 ? 23% ?37%	See footnote
Distance 2002	112 ?23%	57 ? 51% ?20	57 in Burrows; no location data				55 ? 49% ?27%	43 ? 78% ?26%	12 ? 22% ?37%	
Distance Both Years	216 ?44%	86 ? 40% ?30%	86 in both years				130 ? 60% ?64%	101 ? 78% ?60%	29 ? 22% ?91%	
Total	491	288 ? 59%					203 ? 41%	168 ? 84%	32 ? 16%	

Jennings (1997a) also found that tortoises generally spent more time traveling and foraging in hills, washes, and washlets than on the flats, and that hills and washes were favored in the planning area for use by OHV recreationists. Given this overlap, he concluded that tortoises are more likely to suffer direct mortality from vehicles than if they used the habitat randomly.

3.3.2.6.3 Direct Impacts of OHVs on Desert Tortoise Habitat

Habitat Degradation: Lovich and Bainbridge (1999) found that the wheel tracks of a full-size OHV vehicle operating in an undisturbed area could damage almost 1.25 acres (0.5 ha) with every 4 miles (6.44 km) traveled. Goodlett and Goodlett (1991) reported that impacts in the Rand Mountain area were highest close to open routes. Open routes may induce negative impacts for substantial distances; even at 500-feet from an open route, unauthorized tracks were observed at a rate of almost one per 20 linear feet.

Negative effects on the desert environment have been summarized (National Ecology Research Center 1990, USFWS 1994b). Impacts include damage to and loss of habitat (Jennings 1997a, USFWS 2002) and severe declines in biomass of plants and vertebrates (USFWS 1994b). Both annual and perennial plants are affected (Jennings 1997a, National Ecology Research Center 1990), which in turn affect forage quality, water availability, and thermoregulation (USFWS 1994b).

[1] Sign count data are shown in the 1st row for 275 tortoises, and in the 4th row for 216 distance-sampling tortoises 86 animals found in burrows during distance sampling, but was provided for aboveground tortoises. The total aboveground estimates of 84% in the open and 16% under shrubs are for 200 tortoises observed outside washes. It would be incorrect to conclude that only 3 of 203 tortoises were in washes; the correct conclusion is that 3 of 73 (4%) were found in washes, in the summer to fall period; even this number is likely an underestimate, as surveyors likely failed to indicate all tortoises and burrows associated with washes.

Vollmer *et al.* (1976) reported that cross-country OHV travel impaired annual plant productivity, retarded shrub regrowth, resulted in less plant cover and density, and conspicuously decreased shrub biomass. In comparing areas of different disturbance levels, Webb *et al.* (1983) concluded that light OHV use might not cause the severity of impact that occurs in some ghost towns, but OHV pit areas have more soil and vegetation disruption than naturally recovering ghost towns. Berry (1996) indicated that OHV use directly affects plants and animals by disrupting the distribution, composition, structure, diversity, and biomass of animal and plant communities; changing the watershed; and promoting desertification.

The USFWS (2002) concluded that unauthorized activities, particularly OHV use, have degraded desert tortoise habitat. The access provided by the BLM for legitimate uses, such as recreation, facilitates some degree of unauthorized use (USFWS 2002). In addition to unauthorized roads and trails, areas that are frequently used for loading and unloading vehicles can be severely degraded (USFWS 2002).

Habitat Regeneration: Vollmer *et al.* (1976), upon revisiting their study plot 18 months after the tests were conducted, found that little damage to shrubs was apparent from a distance, but that when viewed from nearby, tracks were clearly discernible. They concluded that truck tracks can persist at least 10 to 12 years depending on the substrate, and that shrub cover may be re-established within a couple of decades if there is no further damage. National Ecology Research Center (1990) estimated full-recovery time required to ameliorate severe OHV impacts should probably be estimated in terms of human life spans; and that hundreds or thousands of years may be necessary for disturbed areas to recover. Stowe (1988) found that many of the older, smaller trails that were identified 1977-78 appeared to be unused in 1988, and in some cases the vegetation appeared to be growing back over the edges of the trails.

OHV Impacts to Wash Habitats: Jennings (1993, 1997a) found that vehicles' driving in washes disturbed relatively rare species of plants that were restricted to washes. LaRue (1997) found catclaw acacia and desert willow mostly restricted to washes in the Ord Mountain area. Damage observed in the Ord Mountains included disturbed soil and terrain, crushed shrubs, and eroded margins of washes, which led to widening of the washes. He found that some routes in washes became impassable when banks and boulders were encountered, which necessitated turning around and resulted in new shrub damage.

OHV Impacts to Soils: OHV use has resulted in the following impacts to soils (see also National Ecology Research Center 1990): damage or destruction of soil crusts (24), soil erosion (Trombulak and Frissell 2000, USFWS 1994b), and interrupted run-off patterns (Trombulak and Frissell 2000). Vollmer *et al.* (1976) found that OHV use changed soil compaction and permeability, and that disruption of soils may not be fully expressed until years after the original impact. Berry (1996) found alterations to and erosion (wind, water) of soil and soil crusts, and adverse effects to soil porosity, chemistry, moisture, and temperature. Lovich and Bainbridge (1999) observed that areas they considered least susceptible to water and wind erosion, following OHV use, were dunes, playas, and areas with abundant coarse surface material.

3.3.2.6.4 Indirect Impacts of OHVs on Desert Tortoises and Habitat

Human Access: Berry (1996) indicated that human access results in increased damage to plants, animals, and soils. This access results in exploitation, removal, unintentional or intentional disturbance, and harassment of wildlife. She also reported adverse effects on other visitors and increased deposition of garbage and refuse. Fire regimes are altered as a result of human-induced fires and the proliferation of alien or non-indigenous plants.

USFWS (1994b) indicated that the presence of routes facilitates the removal of desert tortoises (predation for food, collecting for pets, and commercial trade), vandalism, and release of captive desert tortoises. Dumping, numbers and locations of wild fires, harvest and vandalism of vegetation, and predation by dogs and ravens may increase proportionate to available access. Routes have been implicated in the proliferation of weeds, resulting in more wildfire (USFWS 2002, USFWS 1994b). Berry (1996) found that tortoise populations decreased with increasing percentages of introduced annual plants.

Spread of Weeds: Lovich (1992) concluded that, among other things, tortoise habitats have been negatively affected by construction of roads and utility corridors. Brooks (1998) and Frenkel (1970) concluded that dominance of alien annual plants is the highest where road densities are high, and that minimizing the number of paved and dirt roads and maintaining non-roaded wilderness areas may reduce the dominance of aliens.

Trombulak and Frissell (2000) listed seven general effects of roads, including spread of exotic species, and indicated that roads are commonly identified as important correlates or indicators of loss of ecological health. They reported that roads provide dispersal of exotic species via three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement by wild or human vectors. Hourdequin (2000) found that, whereas roads negatively affect some species, others may benefit; that many exotic plant species thrive along roadsides; that roads can act as corridors for the dispersal of plant seeds; and that roads may also provide habitat and movement corridors for opportunistic species such as weeds. Tracy (1995) showed that fires are mainly started along roads, and that a majority of those are along paved roads.

Route Proliferation: USFWS (1994b) identified route proliferation as a threat. LaRue (1997) reported that there had been a 27% increase in detectable routes between 1978 and 1989 in the Ord Mountain area. Much of it resulted from motorcycle use in the southern parts of the proposed Ord-Rodman DWMA, west of and including the Cinnamon Hills. The USFWS (2002) reported that recreationists used legal routes to gain access to popular staging and camping sites, and that impacts emanated out from such areas, impacting less disturbed habitats. Stow (1988) reported that light OHV activity escalated into heavier use and more impacts. Vollmer *et al.* (1976) expressed concern that once an area was heavily used, recreationists would abandon the area in search of new and intact environments.

No OHV Impacts or Minimal Impacts Observed: Vollmer *et al.* (1976) found no indication that driving interfered with rodent reproduction, side-blotched lizard reproduction, or animal population trends. Few shrubs were outright killed, and plant density and diversity

remained essentially unaltered. They found creosote bush recovered if root crowns were not destroyed; damaged plants were scarcely distinguishable after10 years. It was not clear that the density of annuals was reduced by vehicular traffic during their study.

OHV Impacts Uncertain: In 2002, the USFWS concluded that reductions in the amount of open routes are likely to provide some level of benefit to the desert tortoise. However, neither the BLM nor the USFWS had definitive information on how differing route networks may affect the desert tortoise; presumably, roadless areas would have the least adverse effect on desert tortoises and their habitat. Vollmer *et al.* (1976) found it difficult to gauge the impact of less intensive OHV-use areas. The extent that any changes in the access network affect the desert tortoise would be difficult to measure because of the slow reproductive rate of the species and other factors, such as disease, drought, and predation, that may be affecting the number of individuals in a region. No quantitative information was available concerning how frequently desert users leave routes of travel to camp, stop, and park outside of existing disturbed areas. In at least some areas that are occupied by the desert tortoise, the density of vegetation would likely prevent most desert users from leaving the routes of travel (USFWS 2002).

3.3.3 Mohave Ground Squirrel

The following consists of short excerpts taken from the comprehensive treatment of the Mohave ground squirrel (MGS) that is being prepared for the West Mojave Plan EIR/S (expected to be published in May 2003). The discussion below is limited to a general overview of MGS life history, as well as those materials that have a direct bearing on the relationship between dispersed off highway vehicle use and MGS.

3.3.3.1 Mohave Ground Squirrel Range

The entire known range of the Mohave ground squirrel (MGS) is within the planning area (except for a very small area northeast of Searles Valley, in the NEMO planning area). The known range (Gustafson 1993) is bounded to the south by the San Gabriel and San Bernardino mountains, to the east and southeast by the Mojave River, to the west by Palmdale and Lancaster[2], to the west and northwest by the Sierra Nevada, to the north by the Coso Range and Olancha, and to the northeast by the Avawatz and Granite mountains on the Fort Irwin National Training Center.

The MGS has apparently been eliminated from Lucerne Valley (Wessman 1977), where it was first trapped (at Rabbit Springs) in 1886. The most recent (1993) range map no longer includes the western portion of the Antelope Valley east to Highway 14 between Palmdale and Mojave, an area previously considered within the MGS's range (CDFG 1980). No new data collected since 1993 support either extensions or reductions of the known range.

The known range of the MGS is probably associated with elevation, rainfall patterns, temperature, suitable plant communities and substrates, topographical barriers, and other factors. In reviewing available records, Gustafson (1993) found that the highest known elevation was at

2 Laabs (1998) found no records for the Antelope Valley west of Palmdale and Mojave.

5,600 (1,728 meters) feet on China Lake NAWS (Michael Brandman Associates 1988). Laabs (1998) reported the highest known elevation at about 5,000 feet (1,524 meters), which occurred along the eastern slope of the Sierra (Freeman Canyon, Bird Spring Canyon, and Jawbone Canyon). The California Natural Diversity Data Base (CNDDB) has reported them from an elevation range of 1,800 to 5,000 feet (548-1524 meters).

3.3.3.2 Life History[3]

Species Description: The MGS is one of two members of the subgenus *Xerospermophilus*, which also includes the round-tailed ground squirrel (*Spermophilus tereticaudus*) of the eastern Mojave and Sonoran deserts (Hall 1981; Nowak 1991). The MGS measures 8.3-9.1 inches (210-230 mm) in total length, 2.2-2.8 inches (57-72 mm) in tail length, and 1.3-1.5 inches (32-38 mm) in hind foot length (Hall 1981), which helps differentiate it from the smaller antelope ground squirrel (*Ammospermophilus leucurus*) and the considerably larger California ground squirrel (*Spermophilus beecheyi*). Of these four species, the MGS is the only one found entirely within the western Mojave Desert.

Seasonal Activity: The MGS exhibits a strongly seasonal cycle of activity and torpor (like hibernation), emerging from dormancy as early as January, but more typically in mid-February or March (Leitner and Leitner 1996). Dates of emergence appear to vary geographically. Males typically emerge one or two weeks prior to females (Recht, pers. comm.). Once a sufficient amount of fat has been accumulated, individuals enter a period of aestivation and hibernation (Bartholomew and Hudson 1961). Aestivation generally begins sometime between July and September, but may begin as early as April or May during drought conditions (Leitner, et al., 1995).

MGS population dynamics are dependent on the amount of fall and winter precipitation (Leitner and Leitner 1996). The failure to reproduce may result in dramatic population declines and, if poor conditions persist for several seasons, may become extirpated from a given area. This may be especially true in less optimal habitats. Therefore, entirely suitable habitats can be unoccupied during some years and become reoccupied in others.

Substrate Affinities and Burrow Use: The MGS generally occurs in flat to moderate terrain and is not found in steep terrain. Substrates in occupied habitats have ranged from being very sandy to, less frequently, very rocky (Best 1995, Wessman 1977). For example, of 102 transects surveyed in 1998 (see below) where the MGS had been previously detected, 91 (89%) were identified as predominantly sandy and 11 (11%) were identified as being rocky. The MGS is considered to be absent, or nearly so, on dry lakebeds, lava flows, and steep, rocky slopes (Clark 1993), although juveniles may disperse through such areas (Leitner, pers. comm. in Laabs 1998), probably excluding larger playas.

---

3 Unless otherwise noted, most of the following information is taken from the species account provided for the West Mojave planning effort by long-time MGS trapper, David Laabs, of Biosearch Wildlife Surveys, Santa Cruz, California (referenced as Laabs 1998). Many of the supporting documents were originally cited in Laabs (1998), and are herein included in the literature-cited section.

Individuals may maintain several residence burrows that are used at night, as well as accessory burrows that are used for temperature control and predator avoidance (Laabs 1998). Aestivation burrows are dug specifically for use during the summer and winter period of dormancy (Best 1995), and often occur beneath large shrubs (Leitner et al. 1995).

Home Ranges: Home ranges of adults vary between seasons and throughout a season, presumably in response to quantity and quality of food resources. The Leitners' studies in the Coso Range have indicated that there is considerable overlap in the home ranges of individual males and females, though there is no clear evidence that home ranges are defended (Laabs 1998). Juveniles are gregarious, initially staying close to their natal burrows. However, juveniles have demonstrated considerable dispersal abilities, having traveled up to four miles from their birthplace in a matter of a few months.

Reproduction: The reproductive success of the MGS is dependent on the amount of fall and winter rains (Laabs 1998) and the new growth of annual forage materials that result. Leitner and Leitner (1992) hypothesized that a standing crop of about 1 gram per square foot may be necessary for MGS reproduction to occur. Leitner and Leitner (1996) found a clear correlation between fall and winter precipitation and the number of juveniles appearing on the same plots in subsequent years. Following low rainfall, annual herbaceous plants are not readily available, the MGS is unable to attain a minimum amount of body fat (identified by the Leitners as 180 g total body weight), and in such years the species forgoes breeding (Recht, pers. comm. in Laabs 1998; Leitner et al. 1995).

The Leitners have consistently observed that in years of poor rainfall (i.e., less than 75 mm since the MGS entered hibernation), the MGS foregoes reproduction in favor of attaining sufficient body fat to make it through the winter. This is likely a physiological adaptation to ensure adult survival, and to avoid birthing young when resources are not sufficient for juveniles to acquire necessary body fat to hibernate. Gustafson (1993) indicated that the "evolutionary strategy of suspending reproductive activity and concentrating on gaining weight ensures the survival of the species (Leitner and Leitner 1990), as long as droughts are of short duration and sufficiently large areas of habitat exist."

MGS adults are solitary except during breeding, which occurs soon after emergence from hibernation. Gestation lasts 28-30 days, at which time between 4 and 10 young are born per litter. Juveniles emerge from natal burrows within four to six weeks, and begin to establish their own home ranges by about mid-May. Mortality is high during the first year (Leitner and Leitner 1996). Females breed in the spring if environmental conditions are appropriate, while males do not normally mate until two years of age (Leitner and Leitner 1996). Laabs (1998) indicated that sex ratio is consistently female biased, with ratios as high as seven females for each male.

Dispersal: Juveniles begin making exploratory movements away from the natal burrow by about mid-May to early June, and some individuals eventually make long-distance movements (Leitner et al. 1997). Recent radio-telemetry data suggest that females are more likely than males to remain near their natal burrows (Leitner et al. 1997). In 1997, the majority of radio-collared juvenile males moved greater than 0.6 miles (1 km.), up to a maximum of 3.9

miles (6.2 km.). Juveniles can apparently traverse steep terrain during dispersal (Leitner, pers. comm. in Laabs 1998), and some are known to disperse 3-4 miles from their birthplace (Leitner 1998).

The current, 2002 status of the MGS, in terms of numbers of individuals and amount of occupied habitat, is difficult to assess due to the limitations of available data. The data that are available, the potential associations between MGS historic occurrences and existing habitat characteristics, and results of recent trapping studies are compared and discussed in the following sections.

3.3.3.3 Threats

This section provides a general discussion of threats and impacts that are cited in the literature, and includes recent data for comparison. Except for the first section, which describes human disturbances observed during the 1998 survey, the threats are presented in alphabetical order (as opposed to severity or importance of a given threat).

Human Disturbances Observed During 1998 Vegetation Studies: During the 1998 survey, biologists collected information on human disturbances observed along each of 310 transects, including those located near previous MGS reports (102 transects) and those located in high and medium quality habitats (208 transects). Table 3-5 indicates the prevalence of disturbance types found along these transects[4].

Table 3-5
Prevalence of 10 Types of Disturbances
Observed within the Known Range of the MGS During the 1998 Survey

TRANSECTS			DISTURBANCE TYPES										
Total	Disturbances		OHV	Road	Sheep	Gun	Dump	Cow	Dog	Mine	Ord	Burn	Total
	None	Yes											
310	168	142	145	116	56	23	20	20	12	6	3	2	403
% of 310 transects			47%	37%	18%	7%	6%	6%	4%	2%	<1%	<1%	
% of 403 disturbances			36%	29%	14%	6%	5%	5%	3%	1%	<1%	<1%	

Surveyors found one or more disturbance categories on 142 (46%) transects, and none of the disturbances on 168 (54%) transects. The three most prevalent disturbances were cross-country travel on 145 (47%) of the 310 transects, roads on 116 (37%) transects, and sheep sign on 56 (18%) transects. Importantly, this represents another, independent data set showing the same relative levels of occurrence of these impact types. In an earlier table comparing impacts

[4] "OHV" refers to cross-country vehicle tracks, which were created by trucks, motorcycles, and all-terrain vehicles. "Road" includes trails, and usually included routes passable by trucks. Sheep, cow, and dog sign were usually feces. "Guns" does not differentiate between legal activities (e.g., hunting, regulated target practice, etc.) and illegal ones (e.g., shooting glass and articles at dump sites). "Dumps" generally required a vehicle to off-load the materials, so does not include litter. "Mines" may have included pits and adits, exploratory excavations, borrow pits, etc. "Ord" refers to military ordnance, which typically included spent cartridges and clips from aircraft. Two transects occurred in areas previously burned. Most of the transects (237 of 310, 76%) were surveyed by LaRue, so subjective determinations among surveyors is not considered a significant problem.

in proposed West Mojave Plan DWMAs with urban areas, disturbances were reported for sign count data collected on 1,572 transects in the Fremont-Kramer and Superior-Cronese DWMAs between 1998 and 2002 (see tortoise section). In that independent data set, cross country travel was observed on 45% of transects (compared to 47% above), dirt roads on 53% of transects (37% above), and sheep sign on 13% of transects (18% above).

Off Highway Vehicles: Off-highway vehicles may pose a threat to the MGS by crushing individuals or burrows, and degrading habitats (Gustafson 1993, Laabs 1998). With time, the plant diversity and abundance decreases in areas with intense OHV use (Laabs 1998), which reduces cover needed by the species for shade and forage. Gustafson (1993; citing Bury and Luckenbach 1977), reported that even light OHV use in the Mojave Desert can result in lost or compacted topsoil, unavailability of seeds for birds and mammals, and disrupted soil mantles. Gustafson (1993) reported, "…it is known that the squirrel is run over by vehicle[s]," but did not provide any specific reports.

There is anecdotal evidence that the MGS may be killed on both paved and dirt roads, although it has been suggested that they are too quick for this to happen. For example, during tortoise surveys conducted near Water Valley, northwest of Barstow, in 1998, LaRue crushed a juvenile male MGS on a dirt road as it attempted to cross in front of his truck. In 1997, LaRue observed a juvenile male (likely a hybrid) as it was crushed on National Trails Highway, several miles north of Helendale. One of the nine MGS observed in 1998 (LaRue, unpublished data) darted into burrows that were located in the berms of a dirt road. The juvenile female was observed for about 20 minutes eating cryptantha alongside the road, and later using two different burrows located in berms on opposite sides of the road. Recht (1977) also observed MGS feeding on Russian thistle that was congregated along shoulders of roads in northeastern Los Angeles County.

Goodlett and Goodlett (1991) have shown, in the Rand Mountains, that the heaviest vehicle impacts occur immediately adjacent to both open and closed routes. It is plausible, then, that individual MGS using resources adjacent to roads are more likely to be in harm's way than those animals occurring in roadless areas. It is also plausible that juvenile MGS, which are most likely to travel longer distances than adults, are somewhat more susceptible to vehicle impacts than adults. Although adults may still be susceptible to vehicle impacts within their somewhat-fixed home ranges, dispersing juveniles are likely to encounter more roads than an adult living within a fixed region.

The potential to crush squirrels likely increases as the prevalence and use of roads increases in a given region. Given the relatively higher incidence of cross-country travel in open areas (1998-2001 WMP data), vehicle impacts are more likely to occur there and other places with similar densities of cross-country tracks, depending on resident and dispersing populations of the MGS. This would suggest that there may be relatively more impacts in the Spangler Hills, Jawbone Canyon, Dove Springs and El Mirage open areas, which occur within the range, but does not negate the possibility that impacts may also be prevalent in heavy OHV use areas, such as occur in the vicinity of "Camp C" near the western end of the Rand Mountains.

In Table 3-6, incidences of six vehicle-based disturbances observed between 1998 and

2002 are compared between designated open areas and one heavy OHV use area, between California City and the Rand Mountains. The first table lists data for trails, tracks, and litter; followed by targets, hunting, and camping in the second table.

Table 3-6
Prevalence of Vehicle-Based Disturbances in Four Areas of Comparison

AREA	SQUARE MILES, SUM, AND AVERAGE VEHICLE-BASED DISTURBANCES OBSERVED (1998-2002) IN THREE OPEN AREAS AND ONE HEAVY OHV USE AREA								
	Trails			Tracks			Litter		
	Mi^2	Sum	Ave	Mi^2	Sum	Ave	Mi^2	Sum	Ave
Spangler	121	2336	19.3	127	12140	95.6	121	4734	39.1
El Mirage	19	322	16.9	19	2294	120.7	20	437	21.9
Jawbone/Dove	24	370	15.4	22	406	18.5	22	381	17.3
Cal. City/Rands	110	878	8.0	156	8162	52.3	156	3295	21.1
Totals	274	3906	14.3	324	23002	71.0	319	8847	27.7

AREA	SQUARE MILES, SUM, AND AVERAGE VEHICLE-BASED DISTURBANCES IN HEAVY OHV USE AREA								
	Target			Hunting			Camping		
	Mi^2	Sum	Ave	Mi^2	Sum	Ave	Mi^2	Sum	Ave
Spangler	56	1006	18.0	12	13	1.1	7	18	2.4
El Mirage	12	136	11.3	6	14	2.3	2	2	1.0
Jawbone/Dove	16	281	17.6	1	1	1.0	2	5	2.5
Cal. City/Rands	76	498	6.5	19	28	1.5	14	21	1.5
Totals	160	1921	12.0	38	56	1.5	25	46	1.8

The tables document the types of heaviest vehicle-based impacts observed within the range of the MGS in three open areas (excluding Olancha, which was not surveyed) and one hevy OHV use area. All vehicle-based impacts in these areas were above average, as described in the tortoise section. The data include vehicle impacts both inside and outside the open areas, the latter of which are clearly associated with the vehicle impacts emanating from open areas.

One can see that the Spangler Hills Open Area had the highest incidences of trails (19.3/mi^2 compared to 16.9/mi^2 at the next highest incidence at El Mirage), litter (39.1/mi^2 compared to 21.0/mi^2 at El Mirage), and target shooting (18.0/mi^2 compared to 17.6 at Jawbone Canyon/Dove Springs). El Mirage had the highest incidence of cross-country vehicle tracks (at 120.7/mi^2 compared to Spangler Hills at 95.6/mi^2) and hunting areas (2.3/mi^2 compared to 1.5/mi^2 in the heavy OHV use area).

Cumulatively, one finds there to be 274 mi^2 affected by above average trails, 324 mi^2 impacted by tracks, 319 mi^2 by litter, 160 mi^2 by target shooting, 38 mi^2 by hunting, and 25 mi^2 by camping. Tracks and trails are most likely to affect the MGS, as shooting has not been identified as a direct threat to the species. These impacts were most prevalent in the open areas, where this sort of activity will likely remain or increase under present and future management on these class I lands.

Two of the 23 sites trapped for the MGS in 2002 included the El Mirage and Spangler Hills open areas (Leitner, pers. comm. 2002) where no MGS were trapped. However, the absence of squirrels cannot be attributed to vehicle use in those two areas. El Mirage is located south of Highway 58, where no MGS were captured on eight of the nine trapping grids, including the one in the open area. Nor were any of the high concentrations of winterfat and hopsage identified in 1998 (LaRue, unpublished data) associated with either open area.

Data show that there is a "spill-over" effect from the open areas, where relatively higher incidences of vehicle impacts were found in adjacent areas, compared to non-adjacent lands. The prevalence of cross-country vehicle tracks north of El Mirage Open Area will probably be reduced due to boundary fencing installed in the late 1990's. Other areas, adjacent to Jawbone and Spangler Hills, remain susceptible to open area-related impacts as no fences have been installed.

Vehicle-based impacts may be prevalent in areas that are not adjacent to open areas. Within the MGS Conservation Area, these areas include lands within the Rand Mountains, west of Silver Lakes, within Kramer Hills, north of Hinkley, and southwest of Fort Irwin. Smaller areas also exist east and northeast of Fremont Peak, Fremont Valley, Iron Mountains north of Silver Lakes, Superior Valley (one 4-mile region), and southeast of Harper Lake.

Citing Bury and Luckenbach (1977), Gustafson indicated "One result [of OHV activity] is a reduction in the number of spring annuals in areas of off-highway vehicle use" and "…off-highway vehicles detrimentally affect wildlife and creosote bush scrub habitat in the Mojave Desert." Brooks (1999a, 2000) found non-native plant species were more common alongside roads, and that roads served as dispersal corridors for weed species. Weeds, in turn, provide fuels that result in hotter fires and relatively larger burned areas. Non-native annuals serve to spread fires between shrubs far more readily than the native annual flora (Brooks 1999b). Gustafson (1993) indicated wildfires are probably hot enough to kill seeds, sprouting shrubs, and squirrels within their burrows. He felt this was a temporary impact that would be remedied when vegetation became re-established.

Rand Mountains Fremont Valley Management Plan: The BLM completed a Rand Mountains Fremont Valley Management Plan (Rand Plan) in August 1993 (U.S. Bureau of Land Management 1993), which included 65,020 acres (101.6 mi^2) of public lands 35 miles south of Ridgecrest and immediately north of California City. The area encompasses about 24,320 acres (38 mi^2) of previously designated MGS Crucial Habitat. The Rand Plan ranked the MGS as second only to the desert tortoise on its list of the most sensitive wildlife resources in the management area. The Rand Plan called for: (1) amendment of the CDCA Plan to reflect a proposed 13,120 acre (20.5 mi^2) expansion of the Rand ACEC and a BLM multiple use class change from class M to class L; (2) acquisition of private lands; and (3) a mineral withdrawal. To date, the CDCA Plan has not been amended for the ACEC expansion and multiple use class change; acquisitions of private lands and mineral withdrawal have not occurred. Facilitating implementation of the Rand Plan is considered a high priority for MGS conservation in the West Mojave Plan.

3.3.4 Other Species

The following discussion addresses only those special status plants and animals that might be sensitive to impacts from off highway vehicles. These are short excerpts taken from the comprehensive treatment of over 100 species that is being prepared for the West Mojave Plan EIR/S (expected to be published in May 2003). The discussion below is limited to a general overview of the species in question.

3.3.4.1 Bats (BLM sensitive, California Species of Special Concern)

Six species of special status bats are found within the West Mojave: long-legged myotis, California leaf-nosed bat, spotted bat, pallid bat, Western mastiff bat and Townsend's big-eared bat.

The California leaf-nosed bat and Townsend's big-eared bat are colonial cave dwellers thought to have declining populations. The California leaf-nosed bat is known to be dependent on desert wash foraging habitat near the roosts. The Townsend's big-eared bat is dependent on riparian habitat within five miles of the roosts.

The spotted bat, pallid bat, and western mastiff bat are cliff dwellers. However, roosts of pallid bat have been located in mine adits within the planning area. The long-legged myotis is primarily a tree-dweller occurring at higher elevations than those found in the planning area.

All except one of the identified significant roosts are on public (NPS and BLM) lands. The Dale Mining District in the Pinto Mountains, including portions of Joshua Tree National Park, contains many shafts and adits known to harbor bats of several species. Six significant roosts have been located, and the potential for several more is present.

Threats: The most serious direct threats to bats are disturbances of hibernation and maternity roosts and destruction of roosting habitat, primarily old mines and natural caves. Old buildings and bridges also provide roosts for some species. Loss and degradation of foraging areas threatens certain species. Potential recreation impacts include access to significant roosts and degradation of foraging habitat for Townsend's big-eared bat and California leaf-nosed bat.

3.3.4.2 Bighorn Sheep (BLM Sensitive, California Fully Protected)

Within the West Mojave planning area, 16 bighorn sheep populations are known to have existed as defined by mountain range complexes. Five of these 16 areas no longer contain populations, three have been reintroduced, and two have been augmented with sheep from another population. Radio telemetry studies of bighorn sheep in the Mojave Desert have found considerable movement of these sheep between mountain ranges. This is especially true of males, but also of ewes. Within individual mountain ranges, populations often are small.

Surface water is an essential element of desert bighorn habitat. Male and female bighorn sheep inhabiting desert ecosystems can survive without consuming surface water, and males

appear to drink infrequently in many situations; however, there are no known large populations of bighorn sheep in the desert region that lack access to surface water.

The majority of bighorn sheep herds are located on military bases, especially China Lake NAWS and Twentynine Palms MCAGCC. Additional populations are found in the Rodman and Ord Mountains (occasionally ranging west onto Sidewinder and Stoddard ridges), Newberry Mountains, and on the north slope of the San Bernardino Mountains. Much of the habitat is within designated Wilderness.

Threats: Potential threats to bighorn include loss or disturbance of springs and waterholes, incremental loss of habitat, contact with domestic sheep that can introduce disease, and blockage of linkages by roads, canals, or fences. Vehicle intrusion into occupied habitat, especially lambing areas, can be a minor threat.

3.3.4.3 Mojave River Vole (BLM Sensitive, California Species Of Special Concern)

The Mojave River vole occupies moist habitats along the middle reaches of the Mojave River. The range of this subspecies is entirely within the West Mojave planning area. It is found in wetland and riparian habitats along the Mojave River between Victorville and Helendale. Additional potential habitat lies upstream of Victorville towards Hesperia. Voles have been captured at Harper Lake, Edwards Air Force Base near Piute Ponds and Rogers Dry Lake, and at China Lake Naval Air Weapons Station. It is unknown which subspecies these specimens are.

Threats: Habitat destruction and fragmentation due to agriculture and urbanization are the primary threats. Concentrated off-highway-vehicle use and other surface-disturbing activities are also threats. Virtually all the potential habitat along the Mojave River, with the exception of the Mojave Narrows Regional Park, is in private ownership.

3.3.4.4 Yellow-eared Pocket Mouse (BLM Sensitive)

This mouse inhabits the eastern slopes of the Piute Mountains and Sierra Nevada along the western fringe of the Mojave Desert. Little information is available regarding habitat requirements except that it has been found in Joshua tree woodland, desert scrub, pinyon-juniper, mixed and montane chaparral, sagebrush and bunchgrass habitats. It occurs primarily in sandy soils with sparse to moderate shrub cover with elevations of known localities ranging between 1030-1615 meters. Most of the range is within the West Mojave on the eastern slope of the Sierra Nevada and Piute Mountains. The species is known from Kelso Valley, Horse Canyon, Sage Canyon, Freeman Canyon, Indian Wells Canyon and Sand Canyon. Similar habitat, which may harbor the species, is present both north and south of this region, as well as in intervening canyons.

Threats: Given the small range of the yellow-eared pocket mouse, any major disturbance of its known or suspected habitat could have significant deleterious effects. Cattle and sheep grazing pose a potential threat due to the effects on plant assemblages or erosion of soils. Off-highway vehicle activity and mineral extraction are other potential threats, due to their effects on native vegetation. Most of the canyons supporting the species have roads and are

therefore accessible. Wind-energy production also poses a potential threat, resulting from impacts associated with road networks.

3.3.4.5 Bendire's Thrasher (California Species of Special Concern)

This species breeds in desert areas containing cactus, Mojave yuccas, and Joshua trees. The western Mojave Desert comprises a small portion of the total range, which extends east to the east Mojave and Arizona. The historical range in the West Mojave was considerably larger than at present, and the occupied habitat in 1986 consisted of six disjunct populations: 1) Yucca Valley; 2) Kelso Valley; 3) Coolgardie Mesa; 4) Joshua Tree National Park; 5) SE Apple Valley; and 6) N. Lucerne Valley. Surveys conducted in 2001 failed to detect Bendire's thrasher at most of these locations or at a control site in the east Mojave. Only Coolgardie Mesa and Joshua Tree National Park had nesting birds.

Threats: Identified threats include rural and urban development, off-road vehicle activity during the nesting season, and removal of yuccas and cholla cacti. Grazing has shown both positive and negative effects on this species. Fragmentation of the small remaining populations is a serious long-term threat.

3.3.4.6 Burrowing Owl (California Species of Special Concern)

This raptor is found in level grassland, prairie or desert floor habitat. It has adapted well to locations on the urban fringe, such as flood control channels or agricultural areas. Existing records of burrowing owls include 53 records within the western Mojave Desert. These represent only a small sample of the locations at which burrowing owls have recently been or currently are present. Of the 53 records, 23 (43%) are from within Edwards Air Force Base; all of these have no specific locale or date. Of the other 30 records, only 13 have specific locales and dates. Probable or confirmed breeding was noted at five locales.

Threats: Potential threats include direct mortality from man (including vehicle collisions), pesticide and rodenticide poisoning; habitat degradation, destruction and loss; and predators. Disturbance by vehicles at nest sites is a threat.

3.3.4.7 Golden eagle (California Fully Protected, Species of Special Concern)

This species uses rugged and remote mountain ranges for nesting. It forages over open desert in a range approaching 100 square miles. The golden eagle is widespread in mountainous areas of the planning area. The Argus Mountains, El Paso Mountains, Newberry Mountains, Red Mountain and the southern Sierra Nevada Mountains contain several golden eagle nest sites. Golden eagles sometimes make new nests on electrical transmission lines, as in Adelanto.

Threats: The three main threats to the Golden Eagle are: 1) shooting; 2) electrocution from electrical distribution and transmission lines; and 3) lead poisoning from eating carrion with bullet fragments. Disturbance from vehicles or human activities at nest sites is a minor threat.

3.3.4.8 Inyo California Towhee (Federal Threatened, California Endangered)

The Inyo California towhee is a narrow endemic whose range is almost entirely within the planning area. The USFWS has prepared a Recovery Plan and critical habitat has been designated. In 1998, an extensive survey of the entire range of this bird was conducted. The bird nests near riparian vegetation, including very small springs and seeps, and forages in mixed Mojave desert scrub. It ranges from 2680 feet to 5630 feet in elevation. All towhee sightings have been within 700 yards of a water source. This bird is restricted to the southern half of the Argus Range in Inyo County. The extent of occupied habitat has been estimated at 24,176 acres. This figure does not include mountainous areas between nesting territories that may be used for dispersal or in the non-nesting season.

Threats: Destruction and degradation of habitat by feral burros and horses is a primary threat. Other potential threats include cattle grazing, off-highway vehicle activities, mining, and encroachment by rural residents. Water exportation from occupied springs (Bainter Spring, Alpha Spring, Benko Spring, North Ruth Spring #3) is a current threat or potential threat. Trespass camping and hunting near the springs may impact the birds and their habitat. Invasive exotic plants are present at some of the water sources that can reduce the quality of the nesting habitat.

3.3.4.9 LeConte's Thrasher (California Species of Special Concern)

The habitat for this species is creosote bush scrub with stands of cholla cactus, Joshua trees, and thorny shrubs. LeConte's thrasher is widespread throughout the planning area, favoring areas of cacti, Joshua trees, and desert washes. It is absent from playas and mountainous areas.

Threats: The primary threat is loss of habitat and fragmentation of habitat into segments too small to support a viable population in the long term. LeConte's thrashers are sensitive to vehicle traffic during the nesting season, especially off road travel in washes.

3.3.4.10 Prairie Falcon (California Species of Special Concern)

The prairie falcon is found throughout the western Mojave Desert, although it generally avoids urbanized areas. Nests are located on cliffs in rugged mountain ranges, often within ½ mile of a water source. Mountain ranges near agricultural areas also are favored because of increased prey density near nest sites. In winter, birds disperse widely, and are joined by migratory birds from northern latitudes.

Threats: Human disturbance at certain prairie falcon nest sites is a threat. Urbanization surrounding an historical eyrie gradually degrades the foraging habitat and increases disturbance at the nest site so that they are abandoned. New mining projects occasionally threaten selected nest sites.

3.3.4.11 Western Snowy Plover (California Species of Special Concern)

The Western snowy plover nests in the West Mojave on certain playas and wetland areas. Most appear to depart for the winter, but migrants and wintering birds are known from a few localities. They favor playas, seasonal wetlands, and sewage treatment ponds or ponds managed for wintering waterfowl. Western snowy plover appears to nest with regularity on Edwards AFB at Piute Ponds. Other reported nest locations are Harper Dry Lake, Koehn Lake, China Lake, Rosamond Lake, Dale Lake, and the evaporation ponds at the Edison facility in Daggett, although the birds may not use these sites every year. A survey of nesting sites for this species at Searles Lake in 2001 recorded 14 broods of chicks and 2 nests were found (LaBerteaux, 2001). No plovers were detected at Koehn Lake in spring 2001 (Cunningham, 2001). No plovers or habitat were detected at Superior Dry Lake or at East and West Cronese Lakes (Wehjte, 2001). Six plovers (five males, one female) were seen at Harper Dry Lake on May 30, 2001, but none were seen on July 6. One pair was judged to be breeding at Harper Dry Lake. The bird may use all of these sites in winter.

Threats: Nests are vulnerable to human disturbance, including vehicle traffic and pets. Insufficient water supply to permanent and seasonal wetlands is a problem in many areas, including Harper Dry Lake. Rising water levels that inundate nests is a problem at managed ponds and during exceptional wet years at natural playas. They are very susceptible to predators, including ravens, coyotes, foxes and feral dogs and cats.

3.3.4.12 Mojave Fringe-Toed Lizard (California Species of Special Concern)

This species is an obligate sand-dweller, found in dunes, sand fields, sand hummocks, and other sand deposits throughout the Mojave Desert in California. Its elevation ranges from 300 to 3000 feet. Its survival requires conservation of the blowsand ecosystem processes, including the sand source, fluvial sand transport areas, aeolian sand transport areas, wind corridors, and the occupied habitat. Mojave fringe-toed lizards occur at several disjunct localities in the planning area. Occupied habitat is found at the Saddleback Buttes region of Los Angeles County, Edwards Air Force Base, El Mirage (historical records), Mojave River near Barstow, Mojave Valley, Alvord Mountain, Pisgah, Cronese Lakes, Dale Lake, Twentynine Palms, and near Harper Dry Lake.

Threats: Urban and rural development has fragmented populations along the Mojave River and at Twentynine Palms. Agricultural development has eliminated and fragmented populations in the Mojave Valley. These threats will continue in the foreseeable future. Other major threats are flood control structures which prevent the waterborne flow of sand towards the occupied habitat, windbreaks that impede the aeolian transport of sand to the occupied habitat and vehicle use within the occupied habitat.

3.3.4.13 San Diego Horned Lizard (California Species of Special Concern)

This lizard prefers areas with loose, fine soils, an abundance of open areas for basking, and plenty of native ants and other insects. Within the planning area, the San Diego horned lizard is restricted to juniper woodland, Mojave mixed woody scrub and chaparral habitats above 3,000 feet elevation. The San Diego horned lizard is found in the Antelope Valley California Poppy State Reserve, east along the base of the San Gabriel and San Bernardino Mountains to

Joshua Tree National Park. This lizard is believed to be extirpated from the Mojave River near Oro Grande and from many areas near Palmdale.

Threats: Urban and rural development on the north slope of the San Gabriel Mountains is the primary threat to the long-term viability of the desert populations. Increased predation by cats and dogs are a threat. Collection by collectors and children has contributed to the decline in numbers of this species, and this threat may continue today. Off-road vehicles pose a potential threat, particularly at the Mojave Forks dam.

3.3.4.14 Panamint Alligator Lizard (BLM Sensitive, California Species of Special Concern)

The Panamint alligator lizard is found most often in canyons with riparian habitat and nearby permanent springs. They forage in thick brush and along talus slopes where they may be observed basking on rocks in open areas, near thick vegetation. The Panamint alligator lizard is endemic to California, where it is known only from 16 disjunct localities in the Panamint Mountains (Brewery and Limekiln Springs, Surprise Canyon, Pleasant Canyon), Nelson Mountains (Grapevine Canyon), Inyo Mountains (Daisy Canyon, Lime Hill), and White Mountains (Batchelder Spring, Marble Canyon, Tollhouse Spring, Westgard Pass) of Inyo County, California. Sight records (12) have been reported for the eastern Argus, Cosos, Panamint, Inyo, and White Mountains of Inyo and southeastern Mono counties, California. Surveys conducted in 2002 at the China Lake NAWS have located the Panamint alligator lizard in the Argus Mountains at Mountain Springs Canyon.

Threats: A potential decline in Panamint alligator lizard populations may be attributed to the direct loss of riparian habitat. Although there are no baseline data that suggests a current decline in population numbers, habitat loss or alteration due to expanded mining operations, off-highway vehicle activity, grazing (domestic and feral), and introduction of non-native invasive plant species (e.g., tamarisk) could have serious adverse effects in riparian areas where this species occurs.

.3.4.15 Barstow Woolly Sunflower (BLM Sensitive)

This species is a western Mojave Desert endemic. It is found on bare areas with little soil, often containing a shallow subsurface caliche layer. Most known locations are between Kramer Junction and Harper Dry Lake. The range of Barstow woolly sunflower, however, extends west of Kramer Junction and includes Edwards Air Force Base. It is also located east of Harper Dry Lake on the Coolgardie Mesa. The BLM has established a 320-acre ACEC for protection of this species east of Kramer Junction. CDFG mitigation lands northeast of Kramer Junction are believed to support this species.

Threats: Populations are subject to removal within the utility corridor between Kramer Junction and Harper Dry Lake. Military operations at Edwards AFB could be a threat in the future. Current management at EAFB is compatible with protection of this species. Off-road vehicle travel is a threat.

3.3.4.16 Carbonate Endemic Plants (Cushenbury Buckwheat, Cushenbury Milkvetch,Cushenbury Oxytheca = Federal Endangered, Parish's Daisy = Federal Threatened)

These species are restricted to limestone and dolomite substrates in the San Bernardino Mountains at the southern edge of western Mojave Desert. The majority of the range of these species is on the adjoining San Bernardino National Forest. These plants are habitat (substrate) dependent and conservation of habitat generally protects all species in the plant community. The distribution of Parish's daisy extends east to the Town of Yucca Valley.

Threats: The primary threat is mining, which has fragmented some existing populations and eliminated others. Vehicle travel on occupied habitat is a minor potential threat and travel off roads could adversely modify designated critical habitat.

3.3.4.17 Charlotte's Phacelia (BLM Sensitive)

Parish's phacelia is a striking blue and white annual wildflower, about seven inches tall, blooming from April to June. It is generally associated with naturally disturbed or unstable habitats such as loose sand, talus, and washes, and is most often found on open, arid slopes ranging in elevation from 2,500 to 7,200 feet. Population numbers fluctuate considerably from year to year, probably depending on rainfall. This species occurs in the high Sierra Nevada, its desert-facing foothills, and the adjacent El Paso Mountains, mostly from the foothills above Fremont Valley, north through Red Rock Canyon State Park, to east-facing canyons above Indian Wells Valley. The range is almost entirely within the western Mojave Desert. Most documented populations are near roads or trails in the lower canyons and washes, or are in high-interest natural areas (e.g., Red Rock Canyon State Park). Several locations are associated with the Los Angeles Aqueduct and its various access roads. In view of the documented locations at the Sierra Nevada crest and on its lower slopes, it is likely that additional undocumented populations occur on the inaccessible mountain slopes above the foothills, washes, and lower canyons. Additional populations also are likely to occur within the China Lake Naval Air Weapons Center.

Threats: Most of the known populations are within grazing allotments. Grazing is mentioned repeatedly in CNDDB records, but there appears to be no documentation of population declines in response to grazing. Other potential threats are off-road vehicles and wildflower collecting.

3.3.4.18 Crucifixion Thorn (No Special Status)

Crucifixion thorn is long-lived, thorny leafless shrub or small tree of washes and other sites where water accumulates. It is particularly characteristic of non-saline dry lakes. It is mostly restricted to outwash plains and reported not to occur on rocky slopes. Plants occur as scattered colonies of fairly small size that never extend far across the landscape. Fruits remain on the plant for long periods, up to several years, and may be distributed by vertebrate herbivores. The plants are dioecious, that is, male and female flowers occur on separate plants. In the West Mojave this species is disjunct from its primary range and is found in the sand fields

and washes north and east of Pisgah Crater and southeast of Fort Irwin, where it forms a distinct community, termed crucifixion thorn woodland. . Another site is located near Amboy, just outside the planning area. A single plant was located near Newberry Springs during the 1999 tortoise surveys.

Threats: Off-road vehicle use of the occupied habitat is a threat. Firewood collection by campers may be a minor threat.

3.3.4.19 Desert Cymopterus (BLM Sensitive)

Desert cymopterus is a long-lived herbaceous perennial, which has conspicuous purple flowers during early spring, but dies back completely aboveground in the summer, fall and early winter. It survives drought by storage of food in its large taproot, and is termed a geophyte. Flowering and seed production appear to be episodic, with large numbers of viable seed produced in wet years and little or no flowering and seed production in dry years. Desert cymopterus is generally found on sandy soil. This species is a western Mojave Desert endemic, found from California City east to the Superior Valley and from the Cuddeback Lake area south to near Kramer Junction. Early collections of this plant from Lucerne Valley, Victorville and Apple Valley are from areas now developed, and the most recent records date from 1941.

Desert cymopterus is found in low densities and is widely dispersed. The vast majority of known recent occurrences (>90%) are from Edwards AFB. Several studies of utility corridors have verified presence northeast of Kramer Junction on BLM and private lands, and additional locations were detected in 2000 and 2001 near Hinkley and in the Superior Valley, the latter on lands transferred to the Army for the Fort Irwin expansion. Desert cymopterus remains one of the rarest and least known of the West Mojave sensitive plant species. The pattern of distribution of desert cymopterus suggests that it favors lands on the east side of desert playas where blowsand has accumulated.

Threats: Threats to the desert cymopterus are not obvious. Urbanization in the Victor Valley and utility development east of Kramer Junction have eliminated some plants or reduced available habitat. Off-road vehicle travel has been cited as a threat, but documentation of loss of plants is missing. Cattle and sheep formerly grazed in occupied habitat, but livestock grazing is mostly restricted at known populations. Herbivory to the leaves by native insects, rodents, and perhaps tortoises is apparent, but the extent of damage to population size is not documented.

3.3.4.20 Kelso Creek Monkeyflower (Federal Candidate)

The Kelso Creek monkeyflower occurs on loamy, coarse sands on alluvial fans and deposits of granitic origin within the Joshua tree and juniper woodlands of the Kelso Valley in Kern County. Seven of eight known occurrences are within a 12 square mile area in the Kelso Valley, with the remaining occurrence outside the planning area nine miles to the northwest. Approximately 990 acres of public land and 1,000 acres of private land are occupied habitat. An additional 1,600 acres of potential habitat on public land has been identified.

Threats: Identified threats include firewood harvesting, trampling by cattle, and off-highway vehicle activity. Mobile home and subdivision developments, including road access, threaten populations on private land. Fire-fighting operations have damaged one population.

3.3.4.21 Kern Buckwheat (BLM Sensitive)

Kern buckwheat is found on ridge tops in poorly draining depressions in white bentonite clay soils thought to be from volcanic ash. These depressions have pebbles, gravel and rock cemented into the soil surface. All of the known populations are within the planning area. There are two to four populations on public land and one or two on private land. All are located in the southern Sierra Nevada Mountains in Kern County either west of Middle Knob and south of Pine Tree Canyon, or on Sweet Ridge. There are four populations east of Sand Canyon.

Threats: Maintenance of wind energy facilities poses a threat to this species. Other potential threats are off highway vehicle use, future construction and grazing.

3.3.4.22 Lane Mountain Milkvetch (Federal Endangered)

Lane Mountain milkvetch is an herbaceous perennial that grows up within a host plant, which it uses for support. Plants occur on granitic substrates with shallow soils. The Lane Mountain milkvetch is a very local endemic species found primarily on public and military land. Its entire known range is within the western Mojave Desert between Goldstone and Barstow, San Bernardino County, in an area no more than 13 miles in diameter. Extensive surveys in 2001 were conducted by the Army to better define the numbers and range of this species. Four primary population areas have been recorded. These are found on public (BLM) lands, on Fort Irwin National Training Center, at the Goldstone Deep Space Communications Complex, and on private lands on the Coolgardie Mesa. The Fort Irwin population is fenced, and most training activities take place outside the fence.

Threats: Few threats now exist for Lane Mountain milkvetch. Its low numbers make it susceptible to extinction from stochastic (unanticipated random) events. Expansion of training corridors at Fort Irwin could threaten this species. Increased activity within Fort Irwin or Goldstone Deep Space Communications Complex could threaten undiscovered populations of this species. Club mining activities on Coolgardie Mesa are a potential threat. Off-road travel within occupied habitat is a potential threat.

3.3.4.23 Little San Bernardino Mountains Gilia (BLM Sensitive)

This plant is found in dry canyons and along desert washes on alluvial fans. It requires sandy, well-aerated soil on flat ground with few or no competing species. Dense stands of weedy annuals are never present at occupied sites, which are all at the margins of streambeds. The plant is restricted to the Little San Bernardino Mountains and the northeast portion of the San Bernardino Mountains. Of twelve major areas of occurrence, ten are within the western Mojave Desert. These are scattered into a number of discrete population segments, generally defined by drainage basins and washes.

Threats: Rural and suburban development occurs near Yucca Valley and the community of Joshua Tree. A secondary threat is OHV recreation in washes. Future channelization or flood control projects could threaten the occupied drainages. Two of the ten West Mojave occurrences are within Joshua Tree National Park, one is on BLM lands, and seven are on private land. In the Coachella Valley, one (the smaller) occurrence is on BLM land and one is on private land.

3.3.4.24 Mojave Monkeyflower (BLM Sensitive)

Mojave monkeyflower is found in Joshua tree woodland and creosote bush scrub communities. It favors granitic soils, and is most often found on gravelly banks of desert washes. Occasionally it is found in sandy openings between creosote bushes and on rocky slopes above washes, areas that are not subject to regular water flows. The Mojave monkeyflower is a restricted endemic whose entire range is within the western Mojave Desert. All occurrences are east of the Mojave River, and most are south of Barstow. Major populations are found between Victorville and Barstow west of Interstate 15, and in the Ord-Rodman-Newberry Mountains area. Populations in the Waterman Hills north of Barstow are not threatened.

Threats: Populations between the Mojave River and Interstate 15 are situated in a patchwork of private and public lands. Quarries and rural development on private land have fragmented some populations, a trend which may continue. Exchange of BLM lands for the Air Force Land Tenure Adjustment program could lead to loss of occurrences on public lands in the Brisbane Valley. Populations south of Barstow and Dagget are threatened by off-road vehicle activity. Several populations are in or adjacent to the Stoddard Valley OHV open area. Some populations are bisected by Stoddard Valley Road and Camp Rock Road, and adjacent OHV trails have eliminated some plants. Other threats include livestock grazing, development of utility corridors, and inbreeding, genetic bottlenecks, and lack of sufficient pollinators.

3.3.4.25 Mojave Tarplant (BLM Sensitive, California Endangered)

Mojave tarplant is found in Joshua tree woodland, creosote bush scrub, and mixed desert scrub communities at scattered locations throughout the planning area. Within the planning area, the Mojave tarplant occurs in fairly large numbers at the base of the southern Sierra Nevada Mountains. An historical locality at Mojave Forks apparently no longer supports this species. Outside the planning area, this species occurs in the Peninsular Ranges of Riverside and San Diego counties.

Threats: Few threats are known to Mojave tarplant. At the historical Mojave Forks locality, extensive off-road vehicle activity has degraded the habitat.

3.3.4.26 Parish's Phacelia (No Special Status)

Parish's phacelia is found on alkaline flats, that is, playas and dry lakebeds. It is most common on the silty and clayey soils of the lowest portion of the dry lakebeds south of Fort Irwin. This species has a large population in California, disjunct from its primary range in Nevada. It occurs on the series of unnamed dry lakes (playas) south of Fort Irwin between the Manix tank trail and Coyote Dry Lake.

Threats: No threats have been identified, but vehicle activity, including military vehicles, could be a major impact to the population. Surface disturbance on the private lands could eliminate the plants in those locations. The likelihood of development of these lands is very low.

3.3.4.27 Red Rock Poppy (BLM Sensitive)

This species occurs at elevations between 2300 and 3280 ft. It appears to be found in a rather common rock type of rhyolite tuffs, granitics and similar rocks. All known occurrences of Red Rock poppy, including a probable occurrence on Edwards Air Force Base, are within the western Mojave Desert. A possible location in the Black Mountains is outside the eastern boundary of the planning area. The taxon is definitely known from only four locations: Red Rock Canyon State Park; Mesquite Canyon; 2 miles southeast of Searles Station; and on an "unnamed road" north of Red Rock-Randsburg Road.

Threats: The CNPS inventory (Skinner and Pavlik, 1994) states that vehicles threaten the Red Rock poppy, but the extent of this threat is unknown. There may be other threats in various areas, but so little is known about this plant that it is impossible at this time to outline the nature of any additional threats.

3.3.4.28 Red Rock Tarplant (California Rare)

The Red Rock tarplant is found in seeps, springs and seasonally moist alluvium in an extremely hot and arid part of the Mojave Desert in the rain shadow of the southern Sierra Nevada Mountains. Specifically, it is found in: 1) sandy to gravelly washes, 2) moist alkaline margins of seeps and springs, 3) sandy alluvium at the foot of ridges and cliffs, and 4) ledges of dry colluvium supported by ribs of bedrock on cliffs. The Red Rock tarplant is a very local endemic of the western El Paso Mountains. Once thought to only occur in Red Rock Canyon, it is now known to occur in adjacent Last Chance Canyon as well. Within Red Rock Canyon it occurs along the bottom of the canyon for about 4-5 miles.

Threats: Repeated disturbance is the biggest threat to this species. OHV activity posed the greatest threat in the past, but it is now restricted within the Red Rock Canyon State Park.

3.3.4.29 Shockley's Rock-cress (No Special Status)

Shockley's rock cress is a perennial herb found on limestone and quartzite outcrops and gravelly substrates at 3,000 - 6,000 feet elevation. It occurs primarily in the San Bernardino National Forest on the north slope of the San Bernardino Mountains, although it ranges to Inyo County, Nevada, and Utah. Nine occurrences have been reported by the NDDB within the planning area, 3 on public lands and 6 on private lands. In 1998, this plant was found within 51 plots randomly placed across the carbonate plants habitat, mainly within the San Bernardino National Forest. One isolated historical record is from Highway 247 north of its junction with Highway 18 in Lucerne Valley.

Threats: Populations have been reduced by large-scale mining operations and this threat continues. The majority of public lands where this plant occurs have mining claims. Off road travel within occupied habitat is a minor potential threat.

3.3.4.30 Short-joint Beavertail Cactus (BLM Sensitive)

Short-joint beavertail cactus is mostly associated with Joshua tree, pinyon pine, and juniper woodlands, although it also occurs in chaparral and Mojave Desert scrub communities. It has been reported from a wide variety of well-drained soils, from sandy to rocky, in open streambeds and on rocky slopes. Short-joint beavertail cactus is found along the north slopes of the San Gabriel Mountains from the Anaverde Valley west of Palmdale east to the Cajon Pass. It occurs between elevations of 3000 – 6500 feet, and is found within the Angeles National Forest south of the West Mojave boundary. At the eastern edge of its range, between Cajon Pass and the Mojave River Forks Dam in the San Bernardino Mountains, the populations show intergradation with *Opuntia basilaris* var. *basilaris.*

Threats: Nearly all of the occurrences of short-joint beavertail in the western Mojave Desert are on private land, and the primary threat is rural development in the Pinon Hills, Oak Hills, and Phelan areas in San Bernardino County, and suburban development in and near Palmdale. Large-scale developments at Las Flores Ranch and Summit Valley may threaten this species or the intergrade populations. Off-road vehicle activity in the hills south and east of Phelan has damaged some habitat, and may eliminate plants.

3.3.4.30 Triple-ribbed milkvetch (Federal Endangered)

This species is only found in California and it is primarily known from the vicinity of Whitewater Canyon (the type locality) and from Dry Morongo Canyon along Highway 62, as well as from scattered occurrences farther east in the Little San Bernardino Mountains, including an anomalous, relatively high elevation site at Key's Ranch in Joshua Tree National Park. It is restricted to sandy or gravelly soils in arid canyons. No well-established permanent population of any size has ever been found.

Most of the populations occur just outside of the planning area; but there are three locations within the western Mojave Desert: Key's Ranch in Joshua Tree National Park, Big Morongo Canyon, and in Dry Morongo Canyon just north of the San Bernardino County line. Additional habitat along the southern part of the planning area that is not well explored may have additional populations, especially in the upper reaches of Mission, Dry Morongo and Big Morongo Creeks, as well as in the western lobe of Joshua Tree National Park.

Threats: Threats are not well known because this species is not well studied and it is often difficult to find in remote and rugged areas. Vehicle travel in desert canyons and washes of the Little San Bernardino Mountains is a potential threat.

3.3.4.24 White-Margined Beardtongue (BLM Sensitive)

This species is disjunct from its primary range and is found in the sand fields and washes north of Pisgah Crater. This plant is found in the Pisgah Crater area. Twenty-two occurrences have been recorded. Three of these are on private lands. The BLM/Wildlands Conservancy purchase of lands from Catellus Development Corporation in January 2000 put three occurrences into public ownership. Populations at Twentynine Palms MCAGCC have been disturbed by military activities in the past. A new population was recorded from the base in 1998.

Threats: Vehicle use of the occupied habitat is a threat. Maintenance of utility access roads and facilities has been a threat in the past. Military operations at Twentynine Palms MCAGCC have potential to damage the small population(s) on the base.

3.4 LIVESTOCK GRAZING

There are a total of 31 public land grazing allotments (a designated area suitable for grazing) within the West Mojave planning area. The type of livestock and type of forage allocation for allotments have been designated in the BLM's CDCA Plan. Allotments are designated as ephemeral, perennial, or ephemeral/perennial based on the type of forage that is available on the allotment. Cattle, sheep, and, horses, or a combination of these may be authorized to graze on an allotment.

The allotments are classified as either Taylor Grazing Act Section 3 grazing permits or Section 15 grazing leases. Allotments with perennial forage have an established limit of forage based on the quality and quantity of perennial plants, stated in animal unit months (AUMs) for a defined period of grazing use. An AUM is a measure of perennial or ephemeral feed that will support a cow and its calf, a ewe and its lambs, or a bull for one month. Perennial forage consumption is typically authorized at the same level from year to year unless forage production does not meet seasonal norms. In contrast, grazing use in allotments with ephemeral forage does not have an established level or specified period of use. Instead the amount and length of grazing use is based on ephemeral production and determined just prior to authorizing the grazing use.

3.5 RECREATION

Located only 90 minutes from downtown Los Angeles, the West Mojave is the recreational backyard of the metropolitan area's 17 million residents, of whom nearly 2 million participate in OHV activities and even greater number camp, hike or drive for pleasure. The Mojave Desert provides an easily accessible, uncrowded recreation experience. The many recreation opportunities of the West Mojave arise from the variety of its mountains, bajadas, dry lakes and badlands, the diversity and affluence of its visitors and the sheer volume of space that its landscape provides.

3.5.1 Patterns of Use

Although most recreational activities are widely dispersed, certaom activities have "hot spots" that have been established over time. How or why they were established varies from case to case, but may be due to the *features* (topography, geology) of the area, *proximity* to urban areas, the availability of *access* into the area, and *publicity*. Understanding recreation patterns and hot spots is critical to the design of an effective motorized vehicle access network.

Particular *features* or land-characteristics may make a given area highly desirable for a certain type (or types) of recreational activity. For instance, flat, expansive terrain is often desirable for recreational activities such as target shooting, plinking, driving for pleasure, and more quick-paced race events. On the other hand, mountainous terrain is often more conducive to such activities as rock (rope) climbing, rock hounding or technical four wheel rock crawling.

The relative *proximity* of the Mojave Desert to urban centers makes it easy and convenient for recreationists to visit those "hot spots" and other areas having the features that they desire. About 85% of all visitors to the Mojave Desert are from the urban areas of Southern California. The BLM public lands are closer to the Los Angeles basin than most other similar recreation areas, such as Death Valley National Park, and offer a far wider variety of recreational experiences.

Motorized vehicle *access*, or at least the degree of access, into areas affects the desirability of that area depending upon the nature of the recreational activity. Access is itself a feature or characteristic that may or may not be sought. For example, a recreationist hoping to photograph or film particular wildlife undisturbed in its natural habitat would not want access so convenient that it attracts a large number of other visitors. Recreationists seeking to hike and camp in remote, difficult to reach areas to experience solitude would not find a location that has ready access from a major highway to be desirable. Conversely, a recreationist seeking to ride his dune buggy over sand dunes with groups of other people would appreciate easy access.

Publicity about an area's recreational opportunity often attracts users. Although some of this publicity can come through the mainstream news media (newspapers, television news reports), much of it comes by "word of mouth." A recreation club (motorcycle riding club, four wheel drive club, dune buggy club, hiking and camping club, equestrian endurance riding club, rock hounding club, rock climbing club, photography club, or wildlife viewing club) may send out newsletters to its members identifying areas that have those features that are considered ideal for the type of recreational activity that the club engages in. This promotes discussion among club members about those areas, and encourages them to recreate there. Recreation clubs are often drawn to hot spots where people participating in that particular type of recreation can gather and socialize.

Publicity is not limited to recreational clubs. Individuals share their experiences with each other through "word of mouth." A camper may learn of an excellent campsite that possesses desirable features or characteristics. Through one-on-one conversations between different campers, such an area can become a "hot spot."

Guidebooks and maps publicize favorite recreation sites. Guidebooks are available that describe areas in the Mojave Desert that offer significant rockhounding and gem collecting opportunities. These guidebooks typically describe the areas of interest in sufficient detail to lead recreationists to the most promising regions for the activity. Maps published by the American Automobile Association are particularly popular, for they indicate areas where different types of recreational activities occur. Because they are widely distributed, areas highlighted on these maps can receive a great deal of notoriety.

Recreationists engage in activities that make use of more than one type of feature or terrain, and often desire to travel to locations where multiple types of terrain are readily available or that are relatively close to other areas having different terrain. In dual sport motorcycle touring, for instance, recreationists use motorcycles that are licensed for use on regular streets and highways but are capable of off-road travel. Recreationists engaged in such touring can ride to the desert on major highways, and then go off-road once a desired trail or special recreation opportunity has been reached. Since a motorcycle is being used, the recreationist can fit through tight spaces that a larger vehicle, even one with four-wheel drive, is unable to access.

The four-wheel drive vehicles have their attractions as well. A single four wheel drive SUV can accommodate more people and items than can a dual sport motorcycle, and can switch from regular highway travel to off-road touring without missing a beat. A trend among some recreationists is to alternate between areas having very different features since the use of their vehicles grants them such access opportunities. This affords the recreationist a much broader range of activities at any given time.

Table 3-7 presents a summary of recreation uses throughout the West Mojave. It describes the primary destinations and recreational activities that occur at particular geographic locations within the planning area. Detailed tables presenting visitor use levels at popular sites throughout the West Mojave are presented in Appendix T.

Table 3-7
Summary of Recreational Activities in the West Mojave Planning Area

AREA	LOCATION	PRIMARY DESTINATIONS AND RECREATIONAL ACTIVITIES
North El Paso	West of Ridgecrest & north of the EL Paso subregion.	This area is dispersed BLM ownership with an approximate size of 60 square miles. The area provides access from Ridgecrest to the El Paso Wilderness and the El Paso subregion.
Central Searles	Between North and South Searles and surrounding the town of Trona.	Central Searles is lightly dispersed BLM ownership comprising about 60 square miles and offering mining opportunities and access to North and South Searles subregions.
East Fremont	West of US 395, north of Edwards Air Force Base and east of California City.	East Fremont BLM area is greatly dispersed BLM ownership with an approximate size of 200 square miles. The area offers desert exploring, rock hounding and mining opportunity in close proximity to California City.
West El Mirage	West of El Mirage subregion and west of El Mirage OHV Recreation Area.	West El Mirage is greatly dispersed BLM ownership with an approximate size of 100 square miles. The area offers access to OHV touring and El Mirage Dry Lake.
South Kramer	Between Kramer subregion and Highway 15, just north of Victorville.	Moderately dispersed BLM ownership with an approximate size of 120 square miles. The area offers OHV touring, exploring, mining opportunity and access to Stoddard Valley OHV Area.

South New-berry/ Rodman	South of the Rodman Mountains Wilderness and on the north edge of the Johnson Valley OHV Area.	This is a consolidated BLM ownership of approximately 8 square miles. The east boundary fronts a transmission line corridor offering OHV touring. Also the area offers access to the Rodman Mountains Wilderness and the Johnson Valley OHV Area.
Johnson Valley South	South of Johnson Valley OHV Area and North of Bighorn subregion.	Johnson Valley South is moderately consolidated BLM ownership of approximately 50 square miles in size, mixed with State Lands and private lands. The area offers access to Johnson Valley OHV Area and the BLM Bighorn subregion and Soggy Lake & Creosote Rings Special Management Areas.
Copper Mountain	North of Joshua Tree National Park and northwest of the City of Twentynine Palms.	The Copper Mountain area is a greatly dispersed BLM ownership of about 100 square miles. The Twentynine Palms Marine Base bounds the area on the north, and Joshua Tree National Monument forms the south border. The area offers OHV touring and dual sport activity.
West Cleghorn	West of the Cleghorn Lakes Wilderness and bounded by Twentynine Palms Marine Base to the north and west.	The West Cleghorn area is a 30 square mile area of consolidated BLM ownership offering access to the Cleghorn Lakes Wilderness.
North Pinto	North of the BLM Pinto subregion and south of the Cleghorn Lakes Wilderness.	The North Pinto is a moderately consolidated BLM area approximately 60 square miles in size, offering OHV touring, mining and rock hounding.
South Coyote	About 30 miles east of Barstow, south of Afton Canyon Natural Area and north of the Sleeping Beauty subregion.	The South Coyote BLM area is a checkerboard ownership and is comprised of about 250 square miles. The Cady Mountains are located in the center of the area. The area serves as access to the Kelso Dunes Wilderness and Afton Canyon Natural Area and Sleeping Beauty subregion.
East Avawatz	About 12 miles north of the City of Baker on Highway 15. Wilderness Study Areas, which surround this area are the Soda Mountains to the south and Avawatz to the west.	The East Avawatz BLM area is about 100 square miles in size and is largely consolidated ownership offering access to Wilderness Study Areas. OHV touring and mining opportunities are available in the area.

BLM's CDCA Plan has designated several areas within the West Mojave as "Open Areas." Within open areas, unlike limited vehicle access areas, there is no "route designation." Motorized vehicles may travel anywhere, so long as the vehicle is operated responsibly in accordance with regulations, and subject to the permission of private landowners.

The OHV Open Areas receive high levels of dispersed OHV riding. Many repetitive OHV routes have been created in these areas that riders generally follow. In areas where the use is particularly concentrated, the density of routes can be very high. Table 3-8 briefly describes each open area, visitor use levels and the principal recreation activities that occur there.

3.5.2 Off-Highway Vehicle Use

Users of off-highway vehicles engage in many different types of recreation in the Mojave Desert. These can be categorized into two general groups: (1) Where the driving of the vehicle is itself the recreational activity, and (2) Where the vehicle is a means of access to other forms of recreation.

Table 3-8
Characteristics of BLM Open Areas

OPEN AREA	SIZE ACRES	VISITS	VISITOR DAYS	PRINCIPAL RECREATION ACTIVITIES	OHV USE PATTERNS
Dove Springs	3,840	82,000	N/A	Motorcycle hill climbing, ATV/Quads, rails; camping, shooting and hunting.	The entire Dove Springs open area is used for camping and OHV driving. OHV driving centers on riding up and down the hillsides using all types of OHVs.
El Mirage	25,600	253,374	391,075	Unrestricted OHV recreation. Approximately 50% of the activity is not classival OHV activity (i.e. motorcycles, quads, jeeps). The dry lakebed attracts visitors with experimental vehicles, aircraft, land wind-sailors, etc. The predominant OHV activity is motorcycle use.	Most of the visitor use is concentrated on and around the dry lakebed. Significant motorcycle use takes place away from the lakebed towards the mountains to the northwest. Visitors generally stay on long-established pre-existing routes. Permitted events, sightseeing, camping, and dispersed camping occurs in the area.
Jawbone Canyon		60,000	N/A	Predominantly dirtbike motorcycle use engaging in hill climbing activities, as well as dual sport motorcycle and 4WD touring/sightseeing	Camping areas are oncentrated along three miles of the Jawbone Canyon Road. OHV users enjoy the challenge of riding up and down hillsides throughout the canyon. The steepness of the hillsides that the riders use varies from moderate to extremely steep.
Johnson Valley	188,160	XXX	XXX	Unrestricted OHV recreation. Predominantly dirt bike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Permitted events, camping, and dispersed camping occur in the area.	Primarily "Green Sticker" motorcycle use participating in "trail riding". Approximately 50% of the Open area's total use occurs in this area. Approximately 50% of that use takes place in the form of permitted "organized" events (e.g. races).
Rasor	22,400	23,702	36,357	Unrestricted OHV recreation. Predominantly dirt bike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Camping, dispersed camping, and sightseeing occur in the area.	Dispersed OHV use
Spangler Hills	62,080	XXX	XXX	Predominantly dirtbike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing on gentle rolling desert terrain. Organized competitive events.	The area provides many OHV routes through open, gentle desert terrain.. There are some more challenging routes through hills along the sides of the open area. Three popular

					camping areas are Teagle Wash, Wagon Wheel and east of US-395.
Stoddard Valley	54,400	XXX	XXX	Unrestricted OHV recreation. Predominantly dirt bike motorcycle use, as well as dual sport motorcycle and 4WD touring/sightseeing. Permitted events, camping, and dispersed camping occur in the area.	OHV use is widely dispersed. Approximately 50% of the use is estimated to be associated with permitted events (e.g. MC, rails, jeeps). Heaviest use at staging areas. Visitors tend to stay on pre-existing routes as the terrain becomes rougher and as they travel away from the staging areas.

3.5.2.1 Driving OHVs for Recreation

There are various types of OHV recreation. These include general vehicular touring, motorcycle recreation, and ATV and four-wheel-drive use.

General Vehicular Touring: Many people engage in recreational touring. Such touring allows visitors to see vast areas of the desert while spending less time on the land itself. OHV touring may occur on both flat and mountainous terrain using jeeps and similar vehicles.

OHV touring vehicles such as the popular SUV have four-wheel-drive capabilities to handle off-road work and are designed to be comfortable for normal street usage. They do not have to be towed by another vehicle to particular staging areas; rather, they can be driven on the highway and, when opportunity presents itself, they can follow a dirt trail. Vehicles that allow for multi-terrain travel have a broader range of access opportunities since they can traverse different types of terrain features.

In the mid-1980s, off-road enthusiasts, and state and local government agencies collaborated to provide a system of interconnected roads and "jeep" trails. Today, over 600 miles of trails have been designated by the State of California as "Back Country Discovery Trails". A goal of this trail system is to provide a backcountry opportunity for non-traditional trail users such as persons with disabilities, senior citizens and families with small children.

The California Backcountry Discovery Trail system is one of shared-use. Equestrians, hikers, and cyclists are welcome, although the trail system is designed for off-road enthusiasts. The existing roads that make up the "principle route" network were selected with a stock, sport utility vehicle in mind. The CBDT network provides recreationists with an abundance of OHV touring opportunities. "Alternate trails" departing and later rejoining the principle route provide more challenging experiences, and are open to greensticker vehicles.

Motorcycle Recreation: Many desert recreationists engage in motorcycling and motorcycle events. In most (but not all) cases, the motorcycles, equipment and supplies have to be transported to the desired locations by street-legal vehicles, such as SUVs.

There are many popular motorcycle events, including enduros, hare n' hound, hare scramble, European scramble, and the grand prix. These events allow participants to ride in varying types of terrain, which present different challenges and require varying degrees of skill.

One popular activity is dual sport motorcycling. Dual sport motorcycles are designed to perform off-road, and they are also "street legal" for operation on regular roads. Therefore, the use of a street-legal vehicle to transport the bike is not necessary. A person using this type of motorcycle can enjoy riding on the highway, and then go off-road when the desired trail is reached. The dual sport motorcycle gives the rider a broader and more flexible recreational experience[5].

Every year there are a few commercial tours and dual sport rides on public land. These activities generally use well-defined public land vehicle routes. These tours typically involve motorcycle and 4-WD sightseeing and exploration.

Each year there are a few commercial tours and dual sport rides on public land. These activities generally use well-defined public land vehicle routes. These tours typically involve motorcycle and 4-WD sightseeing and exploration tours. There are generally two types of commercial tour events: guided and unguided (self-guided):

?? *Guided Tours:* A typical guided tour operator might lead two to three tours each year, with participants following a trail leader. The group stops together several times during the day to see and learn about various natural and man made features. The trip leader is generally an expert on the particular area, and is able to relay information pertaining to natural and historic resources to participants.

?? *Unguided Tours (Dual Sport Events):* Dual Sport Events, those events designed for street legal motorcycles capable of off highway travel, are the best example of unguided tours. In these events, participants are given a map and "Role Chart" that depict the tour route turn by turn. There is no element of competition so participants may arrive at the final destination at their convenience. Often "bail out" opportunities are identified so that participants can safely leave the off highway portion of the route to return to paved roads and the final destination on their own.

All Terrain and "Technical" Four Wheel Drive Recreation: ATVs are small motor vehicles with wheels or tractor treads for traveling over rough ground. They usually have four-wheel-drive capability. ATVs are often viewed as being more agile than other four-wheel drive vehicles and can access relatively narrower roads since they are relatively small and handle like motorcycles. ATVs, however, generally only accommodate one person. ATVs are generally not appropriate for dual sport activities, as they do not operate well for longer distances on regular highways and roads.

5 The use of SUVs to transport dual sport bikes to motorcycle parks, other staging areas, or trailheads may still be the desired method of access. This is due largely to the distance that such recreationists travel, and the bulk of equipment and supplies that are often needed. An SUV allows for safe storage of equipment at the staging area.

Typical four-wheel-drive vehicles (SUVs and jeeps) have fairly similar capabilities, including the capability to travel off-road on rocky terrain. They are significantly larger than ATVs, as they can accommodate several passengers, supplies and equipment. Four-wheel-drive vehicles such as SUVs and jeeps often have "dual sport" capabilities and perform efficiently both on regular streets, roads, and highways, as well as off-road. SUVs are generally used to traverse relatively flat, yet rough, terrain, while jeeps are often used to cover more mountainous ground.

Technical four-wheel-drive vehicles are used to traverse very rocky areas and hills. Movement is relatively slow over and around rocks, in contrast to SUV and even jeep touring. Cables may be used to pull the technical four-wheel-drive vehicle over the more difficult rock formations. The challenge in regards to technical four-wheel-drive use is to test one's knowledge in how to move over the rocks, rather than to tour over more ground and observe different areas that the given trail runs through.

Competitive Events: The BLM Ridgecrest Field Office permits about 30 competitive events annually. These include about 20 OHV events and 10 dual sport, equestrian, mountain biking and running events. There are 50 miles of "C" (i.e. competition) routes established adjacent to the Spangler OHV Area. The use of these routes for competitive events was discontinued in 2001.

The BLM Barstow Field Office permits about 60 competitive events annually. These include about 50 OHV events and 10 dual sport, in addition to other events. Most of these events occur in the Stoddard and Johnson Valley Open Areas. The best known among these events are the Barstow to Vegas motorcycle race (not run in over a decade due to environmental issues) and Johnson Valley to Parker motorcycle race.

Compliance With Regulations: Compliance has generally become better with implementation of the CDCA plan. With the exception of a few areas, OHV free play has gradually moved to the OHV open areas. Compliance is worst in areas of historical OHV use and where adjacent to local communities. Compliance appears to be best achieved when a pro-active approach to vehicle management is used, including the identification of outstanding recreation opportunities to direct recreationists to, such as through quality signing and mapping to help visitors locate appropriate opportunities, as well as through enforcement and additional education efforts.

The best program for achieving compliance in designated route areas involves:

- ?? Keeping open routes well signed.
- ?? Revegetating and otherwise rehabilitating closed routes so that they are not apparent or easy to use.
- ?? Maintain a field presence of BLM personnel to contact, inform visitors, and enforce the law.
- ?? Establishing BLM-trained and supervised volunteer groups who can assist in keeping the routes signed and who can contact visitors in order to explain applicable use policies. The volunteers will follow a BLM operations plan designed to protect the natural environment and thereby help to maintain future recreational opportunities.

Once vehicle routes have been designed, they need to be maintained as a way of keeping users on those open routes. If such routes become too difficult to travel, users will become more likely to utilize closed routes.

3.5.2.2 Driving OHVs to Access Other Recreation

Many visitors use the vehicle as a means to attain a recreation end, rather than as the end itself. These recreation types fall into two classes: (a) point and (b) dispersed forms of recreation.

Point Forms of Recreation: Often an OHV is driven to a specific destination such as a trailhead, staging area, or campsite. For instance, equestrians use an OHV to tow horse trailers and other equipment to designated staging areas where they can set up for horseback riding. The recreational activity is not the driving of the OHV itself; it is merely used to access the starting point for a ride. Similarly, hikers may use an OHV to travel to a trailhead; once there, the recreationist would begin his or her hike.

Dispersed Forms of Recreation: These are more dependent upon vehicle use than point forms, but the use of the vehicle is still not viewed as the primary source of recreation. For instance, a recreationist who desires to photograph a particular species of wildlife or wildflower may hike, ride a horse or use an OHV to search for a subject. Driving a vehicle is not the primary recreation; photography is. Because there is no specific destination, this form of recreation is referred to as "dispersed" rather than "point."

3.5.2.3 Economic Contribution of OHV Recreation

Off highway vehicle recreationists, whether they use OHVs as a means to access other forms of recreation, or find recreation opportunities in the driving of the OHV itself, will contribute to the local economies of the planning area in a variety of ways. These depend on the level of use in areas surrounding desert towns, and the future significance of that contribution depends on the nature of ongoing recreation use trends. Table 3-9 addresses the various ways by which recreation contributes dollars to local economies.

Table 3-9
Recreation Economic Contribution

REGION OR CITY	PRINCIPAL RECREATIONAL ACTIVITIES ON ADJOINING PUBLIC LANDS	OHV USE IN NEARBY AREAS	SOURCES OF ECONOMIC CONTRIBUTION	TRENDS IN GROWTH	COMMENTS
Inyo County -- Pearsonville /Little Lake	Commercial filming Motorcycle touring	Low	Fuel, food	Increasing as the LA Basin grows	Most visitors to the area will acquire supplies in larger communities further south
Kern County	Large range of vehicle dependent	Cummala-tively High	Lodging, meals, supplies, vehicle	Increasing	Given the close proximity of this portion of Kern

	recreational activities		repairs, fuel.		County to the LA Basin and that it serves as the "Gateway" to the Sierras and the Desert growth is high and is expected to increase.
California City	OHV touring in the Rand and El Paso mountains – off road motor cycle play	Moderate	Fuel, camping supplies, and food	Has been increasing with the growth of the LA Basin.	Visitors coming over the Tehachapi and headed to the Rands and El Paso mountains will likely stop in California City, however that number is likely to be moderate and increase will also be low especially with the recent closure of the Rands.
Mojave	SUV touring, Off-Road Events for 4 X 4 and motorcycle and all desert play vehicles	High	Vehicle repairs and vehicle parts, fuel, camping supplies, motels, and food	Increasing significant-ly with growth in LA Basin and the increasing popularity of desert.	The Tehachapi pass carries a significant load of Recreation Traffic from the San Joaquin valley headed to the Mojave Region. Certainly any increase in recreation activity has a potential for economic gain for Mojave.
Ridgecrest	SUV touring, organized OHV events, rock hounding, commercial filming	High	Vehicle repairs and parts, fuel, camping supplies, food, hotels	Increasing	Viewed as both a significant current and future source of economic revenues
San Bernardino County	Large range of vehicle dependent recreational activities	Cummala-tively High	Lodging, meals, supplies, vehicle repairs, fuel.	Increasing	Given the close proximity of this portion of San Bernardino County to the LA Basin and the "Inland Empire" and that it serves via I-15/US 395 as the "Gateway" to the Sierras and the Desert growth is high and is expected to increase.
Baker	SUV Touring, OHV Events, 4WD and motor cycle play, rock hounding, mining exploration	Low	Vehicle repairs and vehicle parts, fuel, camping supplies, motels, and food	Slight increase due to remoteness.	Baker is at the eastern edge of the study area and most users come out of the LA basin and the San Joaquin Valley. Therefore most recreation expenditures for the Mojave come from recreation users not going thru Baker.
Barstow	SUV Touring, OHV events, 4WD and motorcycle play, rock hounding, mining exploration	High	Vehicle repairs and vehicle parts, fuel, camping supplies, motels and food	Increasing	Barstow is at the heart of the Mojave Study Area with traffic coming in from LA via highway 15 and from the west via highway 58. An increase in recreation

					related expenditures could have a significant positive effect on Barstow.
Dagget	SUV touring, OHV Events, 4WD and motorcycle play, rock hound, mining exploration	Low	Fuel, and Food	Increasing Slightly	Dagget is located about 5 miles east of Barstow and majority of travelers will stock up in Barstow and only use Dagget for last minute supplies. Therefore a light increase in recreation activity will have a very slight economic impact to this small community.
Lucerne Valley	SUV Touring, Desert exploring via 4WD and motor cycle, rock hounding, and mining exploration	Low	Fuel, camping supplies, and food	Slight increase; due to the fact that the area is somewhat "off the beaten path" the level of growth is less than other areas.	Lucerne Valley is located just north of the San Bernardino Mountains about 10 miles east of Apple Valley. The following BLM subregions surround Lucerne Valley: Juniper, Granite, Ord, and Bighorn, also to the east is Johnson Valley Off-Highway Vehicle Recreation Area. Lucerne does not serve a large number of travelers.
Ludlow	SUV touring, OHV Events, 4WD and motorcycle play, rock hound, mining exploration	Low	Fuel, and Food	Increasing Slightly	Ludlow is located about 50 miles east of Barstow and majority of travelers will stock up in Barstow. Therefore a light increase in recreation activity will have a very slight economic impact to this small community.
Newberry Springs	SUV touring, OHV Events, 4WD and motorcycle play, rock hound, mining exploration	Low	Fuel, and Food	Increasing Slightly	Newberry Springs is located about 18 miles east of Barstow and majority of travelers will to their business in the bigger city. Therefore a light increase in recreation activity will have a very slight economic impact to this small community.
Trona	Commercial filming, motorcycle touring	Low	Fuel, food	Increasing as visitation increases to Death Valley NP	Although most visitors to the area get supplies in Ridgecrest, the future economic contribution to this economically depressed community is significant
Victorville / Apple Valley	SUV Touring, OHV Event, 4WD and motorcycle play, rock	High	Vehicle repairs and vehicle parts, fuel, camping	Increasing	Victorville does receive a high volume of recreation traffic leaving the LA basin

	hounding, mining exploration		supplies, lodging, food		on Highway 15. It is close to The Stoddard Valley OHV Area, Johnson Valley OHV Area, and Granite, Ord, and Juniper BLM Subregions. Any increases in OHV recreation could result in significant monetary inputs into the local economy.
Yucca Valley	SUV touring, desert exploring via 4WD and motor cycle, rock hounding, and ming exploration	Low	Fuel, camping supplies and food	Slight increase; most of the recreation growth associated with vehicle is to the northwest.	Yucca Valley is located east of the San Bernardino Mountains, and south of the BLM subregion of Bighorn and north of the Morongo subregion. Yucca Valley is not situated on a major highway and relative to other cities does not serve a large volume of recreation traffic

Source: Advance Resource Solutions, Inc.

3.6 MOTORIZED VEHICLE ACCESS NETWORK

There is a close relationship between the pursuit of recreational activities and motorized-vehicle use in the California desert, whether motorized vehicles are used to drive for pleasure or are simply a means of access to recreation destinations such as campgrounds and wilderness trailheads. Given the desert's vast expanse and great distances to recreation sites, it is difficult, if not impossible, in many circumstances, to engage in recreational activities in this region without employing a motorized vehicle in some fashion. Therefore, actions that restrict vehicular access may affect opportunities for recreation depending on the specific activity pursued and/or the specific location at which such restrictions are imposed. Routes of travel designations directly influence opportunities for recreation and affect access for non-recreational pursuits. Accordingly, motorized-vehicle access, routes of travel designations, and recreation are addressed as a single issue.

3.6.1 Off Road Vehicle Designations Prior to 2002

Off-road vehicle designations have been completed by BLM in the West Mojave planning area, although they have not yet been adopted as a component of the CDCA Plan. These designations occurred through a West Mojave-wide effort in the middle 1980s, during the preparation of ACEC plans, and during a late 1990s pilot project at Ord Mountain.

1985-87 Off-Road Vehicle Designations: BLM conducted a field and map inventory of off highway vehicle routes throughout the planning area in the mid-1980s and, based upon that inventory, identified a network of open motorized vehicle access routes. BLM personnel inventoried and evaluated existing routes of travel. Information from existing maps and aerial photos was supplemented by field checks. This information was then utilized to create a known

route inventory that primarily consisted of known "two-track" routes (i.e. "single-track" motorcycle routes were generally not part of the inventory). Public meetings were conducted and members of the public also reviewed these route inventories. Criteria for determining which routes were to remain open was based upon public access needs, recreational values and resource conflicts. Following public meetings, decisions to designate the route network were announced.

On August 21, 1985, BLM published a Notice in the Federal Register titled *Off-Road Vehicle Designation Decisions; Ridgecrest Resource Area, CA* (Federal Register, Vol. 50, No.182). Two years later, on June 19, 1987, BLM published a notice in the Federal Register titled *Off-Road Vehicle Route Designation Decisions for the California Desert District, Barstow Resource Area* (Federal Register, Vol. 52, No.118, p.23364).

ACEC Off Road Vehicle Designations: At various times during the decade following the early 1980s, BLM prepared management plans for ACECs within the West Mojave planning area. Many of these ACEC plans developed motorized vehicle access networks for the ACEC as a component of the ACEC plan. In some cases, when it was available, the information from the 1985-87 designation process was used to supplement the information base. Information about the route system was collected and applied in a manner similar to that used in the 1985-87 designation process. Table 3-10 lists these ACECs, together with the date the route network in each was developed.

Table 3-10
ACEC Route Networks and Principal Recreation Activities

ACEC NAME AND NUMBER	SIZE ACRES	ROUTE DESIGNATION YEAR	ROUTE STATUS	PRINCIPAL RECREATION ACTIVITIES
Afton Canyon (43)	4,726	1989	Mapped designated route system	Camping, vehicular touring, equestrian, rock hounding, recreational mining on outside edges of area.
Amboy Crater National Natural Landmark (87)	679	NA	One access route to parking area.	Geologic exploration, rock hounding
Barstow Woolly Sunflower (36)	314	1982	Mapped routes excluded; vehicles Excluded From NW ¼ of Section 11; T11N; R6W	Non-vehicular dependent: Hiking, botanizing
Bedrock Springs (24)	785	1987	Mapped designated route system	Access to prehistoric values and Northern portion of the Golden Valley Wilderness Area
Big Morongo Canyon (50)	28,274	1982 1996	Mapped designated route system; Routes designated in 2002 Coachella Valley Plan Amendment	Hiking, wildlife viewing, picnicking
Black Mountain (35)	61,806	1988	Mapped designated route system	OHV recreation and touring, equestrian riding, hiking, camping, prehistoric and

				historic interpretation, recreational mining on northeastern fringe of area, wilderness recreation.
Calico Early Man Site (40)	898	1984	Mapped designated route system	OHV touring, hiking, camping, prehistoric and historic interpretation
Christmas Canyon (23)	3,444	NA	No route designation because most of ACEC is within Open area	OHV recreation and touring, historic interpretation. Located in between Spangler Hills OHV area and China Lake Naval Weapons Center.
Cronese Basin	10,226	1984	Mapped designated route system	OHV touring, bird-watching, wildlife viewing
Desert Tortoise Research Natural Area (22)	25,695	1988	Designated closed to vehicular use; protected by perimeter fence	Hiking, wildlife viewing, shooting.
Fossil Falls (10)	1,667	1986	Designated route system	OHV touring, prehistoric appreciation. Located at north end of East Sierra subregion.
Great Falls Basin (12)	9,726	1987	Mapped designated route system	OHV touring, picnicking, bird-watching, wildlife viewing. Located just north of Trona.
Harper Dry Lake (37)	475	1982	Mapped designated route system; all routes within 100 yards of marsh vegetation closed	OHV touring, bird-watching, equestrian riding. Located southwest of Black Mountain Wilderness Area.
Jawbone/Butterbread (20)	187,486	1982	Mapped designated route system	OHV touring, bird-watching, wildlife watching, rock-climbing. Located south of East Sierra subregion.
Juniper Flats (45)	2,528	1988	Mapped designated route system	Equestrian riding, OHV recreation and touring, access to Deep Creek hot springs. Located north of San Bernardino Mountains.
Last Chance Canyon (21)	5,913	1982	Designated route system	OHV recreation and touring, historic appreciation, wildlife viewing. Located south of El Paso Mountains Wilderness Area.
Manix (85)	2,897	NA	None	Paleontological and historic interpretation, OHV touring. Located south of Coyote subregion.
Mojave Fishhook Cactus (77)	628	1990	Designated route system	OHV touring, botanizing
Rainbow Basin (39)	4,087	1991	Mapped designated route system	Camping, OHV touring, equestrian riding, hiking, geologic, paleontological and prehistoric interpretation. Located in middle of Superior subregion.

Red Mountain Spring (formerly Squaw Spring) (26)	717	1987	Mapped designated route system; area closed to vehicular travel	Prehistoric and historic interpretation. Located in northern portion of Red Mountain subregion.
Rodman Mountains Cultural Area (84)	6,204		Routes outside Rodman Mtns. Wilderness were designated as part of Ord-Rodman Plan	OHV touring and recreation, cultural interpretation, hiking, wilderness recreation.
Rose Springs (7)	859	1985	Routes designated closed	Hiking, wildlife viewing, prehistoric interpretation, hunting. Located in north end of East Sierra subregion.
Sand Canyon (11)	2,609	1989	Specific route closures	Hiking, wildlife viewing, bird-watching, hunting, cultural interpretation. Located - in part- in central East Sierra subregion.
Short Canyon (81)	754	1990?	Most of the ACEC routes are closed because they are within wilderness	Hiking, botanizing, wildlife viewing, bird-watching, hunting. Located in East Sierra subregion, borders Owens Peak Wilderness.
Soggy Dry Lake Creosote Rings (47)	186	1982	All vehicular routes closed to protect unique vegetation	Botanizing, hiking. Located just south of Johnson Valley OHV area.
Steam Well (25)	41	1982	Designated route system; All routes closed with inclusion of ACEC in the Golden Valley Wilderness Area	Prehistoric and historic interpretation. Locate din southwest edge of Golden Valley Wilderness area.
Trona Pinnacles (16)	4,055	1989	Designated route system	Sightseeing, commercial filming, OHV touring, geologic interpretation. Located in South Searles subregion.
Upper Johnson Valley Yucca Rings (46)	353	1982	Specific routes designated closed	Botanizing, OHV recreation and touring. Locate din Johnson Valley OHV area.
Western Rand Mountains (2)	17,877	1994	Mapped designated route system	OHV touring and recreation. Located west of Red Mountain subregion.
Whitewater Canyon (49)	16,381	1982	Designated route system	OHV touring, wildlife viewing, hiking

Collectively, the 1985-87 and ACEC networks address all public lands within the planning area outside of wilderness areas and open areas.

Ord Mountain Pilot Off Road Vehicle Designations: In 1995 the BLM undertook a pilot project within the Ord Mountain area to test methods to acquire an inventory of routes of travel. A pilot digital aerial photograph was used together with GIS digitizing equipment to

identify existing routes of travel within the area. From this inventory, two proposed open route systems were identified and addressed in an environmental assessment for designation.

3.6.2 OHV Route Subregions

Twenty "subregions" have been identified for route designation planning purposes. The motorized vehicle access networks proposed by the alternatives were developed using the subregion as the basic planning unit. Several of the subregions are further divided into motorized access zones (MAZ). Table 3-11 describes each of these subregions, as well as the recreational activities and access needs associated with each subregion, and the number of MAZs (if any) into which each is divided. A more detailed narrative discussion can be found in Appendix R, section R.2.

Table 3-11
Off Road Vehicle Designation Subregions

SUBREGION	PRINCIPAL RECREATION ACTIVITIES	NUMBER OF MAZS	COMMENTS
Bighorn	Off-highway touring, sightseeing, equestrian riding.	N/A	Contains Bighorn Mountain Wilderness Area; provides access to San Bernardino National Forest. Transition area of desert valley floor into the mountains.
Coyote	Rock hounding, off-highway touring/ sightseeing, mining.	N/A	Contains Calico Early Man Archaeological Site, Cronese Lakes ACEC, and Soda Mountains Wilderness Study Area. OHV recreation is relatively light compared to most other subregions. Most OHV activity occurs in the southwestern sectors. Northwestern sector part of Paradise Valley, an area known for higher than average tortoise populations
East Sierra	Hiking, camping, rock hounding, OHV, equestrian riding.	N/A	OHV touring allows for other opportunities like hunting, wildlife observation, and equestrian staging. Area important for access to remote backcountry activities.
El Mirage	OHV, recreational mining	N/A	El Mirage OHV recreation area borders subregion to the south. Area of more historic use than current use. Once more popular for races which have since shifted to the Open Areas. Edwards bowl in the western sector popular as a motorcycle area creates some conflicts with adjoining private property owners. Shadow Mountain once very popular with motorcyclists. Use now restricted due to conflicts with hamlet of Shadow Mountain to the south. Bajadas north of Shadow Mountain complex have been found to have higher than average desert tortoise sign.
El Paso	OHV use, rock hounding, shooting/hunting.	N/A	Last Chance Canyon ACEC and El Paso Mountains Wilderness abut the subregion. Very mountainous area universally popular for a variety of visitor types including jeepers, motorcyclists, miners, campers, rock hounders, equestrians, historical explorers and upland game hunters
Fremont	OHV use, shooting/ hunting, rock hounding, equestrian riding, hiking, recreational mining.	5	Contains Barstow Woolly Sunflower ACEC, Harper Dry Lake ACEC, and the Black Mountain Wilderness. Northern hilly sectors very popular longstanding MC area; Gravel Hills and Hamburger Mill northwest of Fremont Peak known for long-term historical use. Bajada areas in the southern sectors not nearly as popular as the above-described areas to the north. These bajadas areas in the south and central sector known for historically high populations of desert tortoise.
Granite	OHV touring, recreational mining,	N/A	Stoddard Valley OHV Area borders subregion to the north. Fairview area in southern portion of region receives moderate to

	rock climbing, hiking, dispersed camping and day use.		high dispersed, day use including hiking, rock climbing, and social gatherings.
Juniper	Equestrian riding, recreational mining, hiking, MC riding, hunting	N/A	Hunting opportunities are found in the Juniper Flats area as well as on national forest lands. Visitors can camp at Bowen Ranch area and at locations throughout the national forest, to the south. OHV touring allowed in appropriate areas.
Kramer	OHV use/dual sport, rock hounding, shooting/ hunting	4	Mining and homestead site established in the late 19th and early 20th century exists in the area, some of which may have historical significance.
Middle Knob	OHV touring/sightseeing, camping, hiking, hunting	N/A	Cultural resources are significant in the subregion. Contains biological values of special concern, including habitat for desert tortoises.
Morongo	Wildlife viewing and education, hiking	N/A	The Big Morongo Canyon Preserve, a wildlife refuge, is located - in part - within the subregion
Newberry-Rodman	Equestrian riding, OHV touring, sightseeing, OHV/ dual sport, rock hounding, recreational mining	3	Subregion contains the Newberry Mountains Wilderness, the Rodman Mountains Wilderness and the adjoining Rodman Mountains ACEC. Rock art and cultural sites are within the subregion.
North Searles	OHV use/dual sport, rock hounding, equestrian rides.	N/A	Shooting/hunting occur in the Argus Range Wilderness that borders the northwestern portion of the subregion. The Great Falls Basin/Argus Range ACEC lies within the subregion.
Ord	Recreational mining, OHV touring/sightseeing	N/A	The historic Ord Mountain Road and the Daggett Wash Road are accessible by four-wheel drive vehicles and motorcycles (OHV/dual sport). The Stoddard Valley OHV Recreation Area to the west and the Johnson Valley OHV area to the southeast of the subregion provide for OHV/dual sport activities.
Pinto	Rock hounding, OHV touring/sightseeing, recreational mining	N/A	The subregion is bordered by the Joshua Tree National Park to the east, west, and the south.
Red Mountain	OHV touring/sightseeing, shooting/hunting, OHV/ dual sport, hiking, equestrian riding, recreational mining.	4	The Grass Valley Wilderness is partly contained in the subregion and the Golden Valley Wilderness borders the subregion to the north. These bajadas areas in the central west sector west of Cuddeback Lake, are known for historically high populations of desert tortoise and extremely high historical mining activity.
Ridgecrest	Hiking, equestrian riding OHV/dual sport	N/A	The Rademacher Hills offers network of trails open to the hiking, jogging, horseback riding and mountain biking.
Sleeping Beauty	Rock hounding, recreational mining.	N/A	Historic Route 66 borders the subregion to the south.
South Searles	Rock hounding, shooting, OHV touring/sightseeing, recreational mining.	N/A	Subregion contains the Trona Pinnacles National Natural Landmark ACEC. Historical and cultural resources are located in the subregion.
Superior	OHV/dual sport, rock hounding, camping, recreational mining.	5	Subregion contains the Rainbow Basin National Natural Landmark ACEC. The Black Mountain Wilderness lies to the west of the subregion and the Calico Mountains lie to the south east of the subregion.

3.7 CULTURAL RESOURCES

The following consists of excerpts taken from the comprehensive treatment of the cultural resources that is being prepared for the West Mojave Plan EIR/S (expected to be published in May 2003).

3.7.1 Archaeological, Historical, Paleontological and Ethnographic Resources

3.7.1.1 Area of Effect

Effects to cultural resources would be generated by specific implementing actions, such as fence construction, structure and debris removal, and route designation. Because specific locations for some actions have not yet been identified, it is not possible at this time to fully identify the entire area of potential effect (APE). Decisions that result in actions that disturb the ground surface or items on the surface would define the actual area of potential effect for most cultural resources. For these actions, all work areas, including parking for equipment, loading and unloading areas, would also fall within the APE. In some cases, actions may affect larger areas, such as landscapes that have cultural, traditional, or sacred values. For route designation, which is the action being considered by the Designation Project with greatest potential to affect cultural resources, the area of effect is the actual routes under consideration plus the 600-foot-wide corridor along open routes that is available for pulling off, parking, and camping, plus areas near or adjacent to routes that may be subject to effects related to use of the route. Such effects include access to historic and prehistoric sites in the area that may be subject to vandalism, artifact theft, removal of wood for campfires, and other similar types of effects. In some cases, presence of vehicle access may have effects on traditional landscapes that extend well beyond the route and 600-foot corridor of use.

3.7.1.2 Existing Database

The existing cultural resources database consists of inventory reports, archaeological site records, and related information maintained by BLM in each field office and a database maintained by the State of California Office of Historic Preservation (SOHP). To a large degree these databases overlap through sharing of information over the years. The state database has been maintained by individual Information Centers around the state and until recently was, like the BLM database, a hard copy system of maps, site records, inventory reports, and photographs. For the past several years a cooperative effort between BLM and the SOHP has been underway to digitize the database and make it available to qualified users in an electronic format that would allow more refined manipulation of the data. This electronic system, the California Historical Resources Information System (CHRIS) is still under development. Currently, a static version of data that has been entered into the CHRIS system has been provided to each BLM field office on a compact disk (CD).

In 1966 the National Historic Preservation Act was passed, which requires that federal agencies take into consideration the effects of decisions on cultural resources. By the mid-1970s BLM archaeologists were surveying project areas for Bureau-initiated and non-Bureau-initiated proposed actions. Similar requirements of state law apply to development of private lands.

Since then, the overwhelming bulk of archaeological inventory carried out within the planning area has been generated by the need to meet legal compliance requirements. Since location of inventory has been almost wholly determined by where development was planned, the available data does not fully reflect the nature, location, and significance of the resource on the ground. The primary exception to this is the archaeological inventory carried out during preparation of the California Desert Conservation Area Plan, beginning in 1969 and continuing until the CDCA Plan was signed in 1980. Each planning unit in the California Desert was subject to systematic sample inventory, stratified by various environmental factors that are thought to influence archaeological site distribution. The sample was low, ranging from 0.5% to 2% per planning unit and averaging 1% desert wide. Nevertheless, approximately 280 square miles were systematically inventoried and another 50 square miles were subject to less intensive reconnaissance. A total of 2,903 historic and prehistoric sites were recorded (USDI, BLM 1980, Appendix VII). This effort substantially increased our knowledge of the distribution of historic and prehistoric sites within the California Desert.

3.7.1.3 Regional Overview: Prehistoric

For detailed regional overviews of the prehistory, history, and ethnography of the study area see Norwood *et al.*, 1980, Stickel *et al.* 1980, Hall *et al.* 1981, Garfinkel 1976, Norris and Carrico 1978, and Warren and Roske 1981. These reports were prepared during preparation of the CDCA Plan and summarized available data at that time. More recent overviews may be found in W & S Consultants 2000 and Whitley, Whitley and Simon n.d.

The California Desert has been inhabited for at least 8,000 to 10,000/12,000 years and perhaps longer, although most of the extant remains date to much later periods. Evidence of the earliest occupations is sparse and difficult to date or interpret. Between 8,000 to 12,000 years ago settlement was centered on lakes, which are now the dry playas so characteristic of the Mojave Desert and Great Basin. These lakes, and especially marsh environments along their edges, were particularly rich in plant and animal species that provided food, fibers, medicines, tools, clothing, and ritual objects necessary for daily existence. From 8,000 to 6,000 years ago, climatic change caused the lakes to dry, necessitating cultural adaptation to the loss of a prime habitat. One of the adaptations included increased use of upland areas. (There is evidence that use of upland areas actually began earlier than this while the lakes were still present.) Around 6,000 years ago, food gathering and land use patterns began to appear that continued into the historic period. These involved use of a greater variety of habitats and plant and animal resources. Grinding implements such as manos and metates made their appearance. Around 2,000 years ago a shift in projectile point types from larger forms (e.g. Elko and Gypsum points) to smaller forms (e.g. Rose Spring and Eastgate Points) may indicate the introduction of the bow and arrow to replace spears and atlatls. The expansion of bow-and-arrow technology is indicated by the late prehistoric introduction of Desert Side-Notched and Cottonwood Triangular points, which are found throughout the area. These point styles are key indicators of the age of archaeological sites in which they occur. By this time, because of the drier climate, primary habitation sites were located near reliable water sources such as springs and flowing streams. Secondary habitation sites were established as needed in areas in which particular resources were seasonally collected. Sites relating to ritual or religious activity, such as rock art sites, sometimes occurred near habitation sites but were also remote from such sites to protect the

sacred nature of the sites and the ritual activities. People generally followed a pattern of exploitation of seasonally available resources by moving through a more-or-less defined homeland, usually returning to a primary habitation ("village") for winters. This pattern of seasonal movement from place to place resulted in use of large areas by relatively small populations, and left the remains that are now archaeological sites widely scattered over the landscape.

3.7.1.4 Regional Overview: Historic

The first documented exploration of the Mojave Desert by non-indigenous peoples occurred in the mid-1700s when Francisco Garces, a Spanish Franciscan priest, looked for a practical route from Arizona to northern California. Between Garces' exploration in 1776 and 1880, only agriculture or precious metals attracted Spanish-Mexican and American settlers. Much of the history of the region turns on its use as a corridor (Warren 1980: 195).

In the early 19th century, fur trappers and caravans crossed the desert. Jedediah Smith led the way in 1826, followed by other mountain men like Ewing Young in 1829; both followed the Mojave Indian Trail. Antonio Armijo is credited with leading the first caravan of pack animals across the Mojave in 1830. Traders William Wolfskill and George C. Yount used the Old Spanish Trail in 1830-1831. Other groups who used the trail during Mexican control of the western Mojave include Don Jose Aveita's commercial caravan in 1833-1834, Jacob P. Leese in 1834, William Slover and Isaac Pope in 1837, and Jose Antonio Salazar's caravan in 1839-1840. John C. Fremont, a lieutenant in the U.S. Army Corps of Topographical Engineers, described his survey and travel in 1844 along a variant route (Warren 1980:201). Other trails arising from commerce include the Mojave Trail and Salt Lake Trail, both of which run through present-day Barstow. Joseph Walker is credited with pioneering a trail across the Sierra Nevada Range, enabling access between the San Joaquin Valley and the desert.

Settlement by Americans and the growth of coastal and inland trade culminated in the annexation of California by the United States in 1848. In that same year, gold was discovered in California and the gold rush was on, ushering in a massive influx of prospectors. The Death Valley forty-niners, led by William Lewis Manly, traveled through the project area along Indians Big Trail, also known as Owens River Road, the Midland Trail, and Bullion Road, which connected the northern Mojave and Owens Valley area with Los Angeles, via connections with the Tehachapi Pass road and Walker's Pass road. In the late-19th century, these roads were used to transport goods, people, livestock, food and ore between the Mojave Desert and Los Angeles. Temporary camps or stage stops were set up along the routes, including Indian Wells Station, Coyote Holes Station, and Panamint Station. The western Mojave Desert became a major contributor to California's mining industry. Small mining towns, such as Calico and Coolgardie, and ranching operations were established and proposed.

The California Gold Rush contributed to pressure to establish railroad routes across the desert. Railroad surveys began in 1853 with Lieutenant Amiel Weeks Whipple and Lieutenant Robert Stockton Williamson conducting surveys in the western Mojave. The San Pedro, Los Angeles and Salt Lake Line, predecessor of the Union Pacific through the Mojave Desert, was completed in 1905, and the Tonopah and Tidewater finished its line from Ludlow on the Atlantic

& Pacific via Death Valley Junction to Beatty, Nevada in 1907 (Warren 1980:207). Spur lines were constructed to serve mines and mining camps. The Harvey house originated from an early railroad roadhouse located at the junction of the Santa Fe Mojave-Needles line and the California Southern line coming north from Cajon Pass.

Development of automobile routes began in the early-20th century and increased in importance in the second quarter of the 20th century (Warren 1980:239). Following completion of the Atlantic & Pacific Railroad, a road was constructed in 1914 parallel to the tracks, which road became the precursor of U.S. 66. In 1925, construction began on U.S. 91, a new alignment of an older trail, which opened up the desert to the general public.

Ranching and agricultural industries at the beginning of the 20th century and increasing populations in Los Angeles created a need for more water than the immediate landscape could supply. In rural areas, the demand was met by small irrigation ditches and canals, but Los Angeles' need was met by construction of the Los Angeles Aqueducts in 1908-1913 and in the 1920s.

Military bases were established in the desert prior to U.S. entry into World War II. Large tracts of land were set aside for military use near Ridgecrest, Barstow, Lancaster, and Twentynine Palms.

3.7.1.5 Known Significant Sites

Prehistoric and historic properties and traditional cultural properties on federal lands are formally identified as significant by being listed in the National Register of Historic Places or determined eligible for listing (see Tables 3-12). Properties on state or private lands are formally identified as significant by being listed in the California Register of Historic Resources or designated as a California Historic Landmark or California Point of Historical Interest. Some local governments also offer designation/registration programs for local properties. These lists are not comprehensive; they include only those properties that have been selected for special attention or have been evaluated as part of project development. Most sites have not been evaluated for significance. Federal regulation requires that caution be exercised when dealing with unevaluated properties to avoid damage or alterations that might affect qualities that could make them eligible for listing in the National Register of Historic Places.

Table 3-12
West Mojave Sites Administered by BLM Ridgecrest Field Office area listed in the National Register of Historic Places

RIDGECREST FIELD OFFICE			
PROPERTY NAME	COUNTY	SITES INCLUDED	KNOWN VALUES
Bandit Rock (Robber's Roost)	Kern	1 (several sites present were not included in nomination)	Historic (sites not included in nomination are prehistoric)
Blackwater Well	Kern	17	Prehistoric
Last Chance Canyon (Includes Last Chance	Kern	160 (an additional 55 sites within 2 mile radius of	Prehistoric/historic/ Native American

Canyon ACEC within boundaries)		boundary)	
Red Mountain Spring Archaeological District	San Bernardino	23 formally recorded; a number of others being documented as a result of recent research	Mostly prehistoric but some historic remains
Fossil Falls Archaeological District (includes part of Fossil Falls ACEC)	Inyo	32	Prehistoric
Steam Well Archaeological District	San Bernardino	4	Prehistoric
BARSTOW FIELD OFFICE			
Fossil Canyon	San Bernardino	SBR2841, SBR2058	Scientific, conservation, traditional use, public
Rodman Mountain Petroglyphs	San Bernardino	SBR307A, B, C (Deep Tank), SBR306A, B, C (Surprise Tank)	Scientific, conservation, traditional use, public
Black Mountain Rock Art District	San Bernardino		Scientific, conservation, traditional use, public
Newberry Cave	San Bernardino		Conservation, traditional use
Harvey House	San Bernardino		Conservation, public; 1911 Railroad station.
Alf's Blacksmith Shop	San Bernardino		Conservation, public; Only known complete blacksmith shop remaining in San Bernardino County.
Lake Mojave	San Bernardino	CA-SBE-140	Scientific

Table 3-13 lists sites of significance on public lands administered by the BLM Barstow Field Office.

Table 3-13
West Mojave Sites of Significance Administered by BLM Barstow Field Office

NAME	CULTURAL RESOURCE VALUES
CA-SBR-1606	Scientific
CA-SBR-2081	Scientific
CA-SBR-2085	Scientific
CA-SBR-2094	Scientific
Pinto Basin	Scientific
Salt Springs	Scientific
Amargosa Canyon	Scientific, conservation, public
Awl	Scientific
Rock Spring	Scientific, public
Saratoga Springs	Scientific
Oro Grande	Scientific
Rustler Rockshelter	Scientific
Deep Creek	Scientific

China Ranch	Scientific
Shoshone Rockshelter	Scientific
Fort (Camp) Cady	Scientific, conservation, public; 1860 military fort built by Major James H. Carleton.
Deadmans Point	Public
Finger Rock (Hercules' Finger)	Public; site of 1840 battle between ranchers and rustlers.
Black Canyon	Scientific, conservation, traditional use, public
Calico Ghost Town/Mining District	Public; silver mining district
Coolgardie Camp	Public; 1890s gold mining camp.
Inscription Canyon	Scientific, conservation, traditional use; public

A number of other sites/districts are currently being nominated for listing in the National Register and many sites have been determined to be eligible for listing in the National Register.

Table 3-14 describes the areas of critical environmental concern that have been designated within the West Mojave planning area.

Table 3-14
Cultural Resource ACECs in Western Mojave Desert

RIDGECREST FIELD OFFICE	
ACEC	CULTURAL RESOURCE VALUES
Rose Spring	Contains several prehistoric sites. Research at these sites started in the 1950s and continues (Lanning 1963, Riddell 1956). These sites are type sites for cultural chronology of the western Great Basin.
Fossil Falls	Large complex of prehistoric sites associated with Pleistocene Owens River, 32 of which are listed in the National Register. Research here dates back to work of M.R. Harrington in the 1950s. Area includes the Stahl site, on private land, also an important type site for explication of western Great Basin/Northern Mojave cultural chronology.
Last Chance Canyon	Prehistoric. Part of the Last Chance Canyon National Register District; the portion of the District considered to be most at risk was selected for ACEC status. Also includes important historic resources.
Jawbone-Butterbredt	Native American values. Contains a number of locations that were identified by a Kawaiisu elder whose family had lived in the area, including prehistoric and proto-historic/historic archaeological sites, sacred areas, and areas that were known or thought to contain burials.
Christmas Canyon	Prehistoric. Subject of current research that is revealing a large and very significant complex of sites, including examples of rare cultural phenomena. Some sites are related to various stands of Pleistocene Lake Searles and preliminary dates indicate great age for some of them, while at least one site contains historic materials, indicating a very long period of use.
Bedrock Spring	Prehistoric. Subject to current research by BLM, this ACEC also contains a variety of site types including habitation sites, rock shelters, rock art, milling, and others. Publication of current research will add materially to our understanding of prehistory in this portion of the Mojave Desert.
Steam Well	Prehistoric. Contains four petroglyph sites
Red Mountain Spring	Prehistoric. Contains 23 recorded sites and other sites that have been located during recent research by Cal Poly Pomona archaeologists. Site types include habitation sites, lithic scatters, milling features, rock art, trails, stacked stone structures, and hunting blinds. Although the ACEC was designated for prehistoric resources there are also historic materials within the ACEC.

BARSTOW FIELD OFFICE	
Afton Canyon	Moderate density and complexity of sites. Twenty recorded prehistoric sites, including quarries, lithic scatters with ground stone, and occupation/multi-use sites. Represent riparian and lacustrine resource exploitation, tool manufacture, trade, and desert settlement (Bureau of Land Management 1989:38). Scientific use.
Calico Early Man Site	Lithic tools and debitage are associated with possibly the earliest human occupation on the North American continent. Continued research investigates human occupation and settlement of the Western Hemisphere (Bureau of Land Management 1984:2.1). Public use.
Black Mountain	Area contains the most extensive assemblages of prehistoric petroglyphs within California. Quarry and lithic workshops are found within the ACEC as well as evidence for obsidian trade (Bureau of Land Management 1988:6). Scientific, traditional use.
Cronese Lakes	This area contains sites representing occupation beginning 8,000 years ago. Cultural remains provide information regarding subsistence and settlement patterns in the Great Basin (Bureau of Land Management 1985:1-5). Scientific use.
Denning Spring	Cultural resource values include at least four major resource locations. In addition to historic resources not formally recorded, prehistoric sites are designated SBR3828 and SBR 3829B and 3829C (Bureau of Land Management 1982:3). Scientific use.
Greenwater Canyon	Contains multi-purpose sites indicative of occupation beginning about 12,000 years ago to historic contact. Sites include rockshelters, petroglyphs, pictographs, hunting blinds, and diagnostic lithic tools (Bureau of Land Management 1988:6-10). Scientific, traditional, public use.
Juniper Flats	Numerous sites have open trash middens, evidence of cooking, tool manufacture, hunting, and plant/animal processing. An occupied rockshelter is also present. Early historic remains are related to homesteading and mining (Bureau of Land Management 1988:9). Scientific use.
Rodman Mountains	
Rainbow Basin	The badlands within the planning area expose one of the best known and most intensively studied late Miocene age fossil assemblages in the United States. Fourteen archaeological sites have been located, characterized by temporary habitation, flake scatter, petroglyphs, historic mining remnants (Bureau of Land Management 1991:32, 36). Scientific, traditional, public use.
Salt Creek Hills	Site of the first hard rock gold mine in the Mojave Desert (Bureau of Land Management 1992:5). Public use.

Most archaeological sites have not been evaluated for their significance or eligibility for listing in any formal roster of significant sites. Because one of the criteria for determining whether or not a site may be eligible for listing in the National Register is that the site has "yielded, or may be likely to yield, information important in prehistory or history" (36 CFR 60) many site types are *a priori* eligible for listing and are treated as such for management purposes regardless of whether or not formal determinations have been made. Such site types include permanent or semi-permanent habitation sites ("villages"); temporary camps containing multiple tool types, especially if they contain obsidian; and utilized shelters or caves that contain the same types of materials. As analytical techniques improve or new technologies are perfected, the kinds of data that can be extracted from archaeological materials increase. In contrast to most archaeological sites, which generally provide information on aspects of material culture and relationships between sites and groups of people, sites containing rock art (petroglyphs and pictographs) can provide glimpses into the intellectual and spiritual aspects of culture.

Historic sites may yield information on industrial technologies and how they were used or adapted in individual situations; ethnic, gender and age make-up of working populations; food

preferences; availability of luxury items to various groups; and even how speculation on Wall Street affected small mining operations in the western United States (Barnes 2001).

All of this means that many, many archaeological sites, both recorded and unrecorded, are likely to be found to be significant and eligible for listing in the National Register of Historic Places if formally evaluated. For these reasons the actual number of sites listed in the National Register is not an accurate indicator of the significance of the resource base as a whole.

3.7.1.6 Potentially Significant Areas

All of the lands within the planning area that are administered by the BLM's Ridgecrest Field Office may be characterized as sensitive for cultural resources with a few exceptions. Reasons for the intensity of prehistoric occupation include the presence in the past of a series of Pleistocene lakes and the Owens River as well as the fact that this area is on the boundary between the Mojave Desert and the Great Basin and presents a greater than usual variety of environments and associated natural resources.

The area including the shore of Owens Lake, Haiwee Reservoir, Rose Valley, Cactus Flat, and McCloud Flat down to the Fossil Falls-Little Lake area is characterized by extremely high prehistoric site densities related to the presence of Owens Lake and Owens River and the nearby Coso and Sugarloaf obsidian quarries. Sites from this area have been important in defining cultural chronologies for the western Great Basin. Many more prehistoric sites may be expected in this area than have been formally recorded. The area also contains examples of Coso-style rock art, both painted and pecked. Recent archaeological and ethnohistorical research, moreover, suggests that the Numic religious and artistic tradition in the Coso region may represent 10,000 or more years of continuity (Whitley et al. 1999a, 1999b) – thus making this the longest-lived religious tradition so far identified in the world (National Register Nomination Form, Whitley2002). The Coso Mountains and adjacent areas were an important center of Shoshone habitation during the late prehistoric period.

The west edge of the planning area includes a series of canyons along the east flank of the Sierra Nevada. Nearly all of these canyons contain significant prehistoric sites and almost no formal inventory has been carried out in any of the canyons. They may be expected to contain sites that relate to middle to late-prehistoric settlement-subsistence patterns whereby resources at various elevations were exploited seasonally. The lower portions of the canyons that fall within the western Mojave Desert are known to contain what were probably winter habitation sites. Although a number of these sites are known, none have been subject to scientific study. These canyons extend into the Jawbone-Butterbredt ACEC south of Walker Pass.

The El Paso Mountains are known to contain extremely high site densities. Black Mountain in the El Pasos (and now in wilderness) was considered a sacred mountain by late prehistoric peoples. The entire mountain range is characterized by complexes of sites such as habitation sites, stone quarry sites, rock art sites (both painted and pecked), rock shelters, milling stations, rock alignments, and other site types. The total acreage that has been inventoried in the El Pasos is relatively small, so there are undoubtedly many unrecorded sites.

On the east side of the planning area there are complexes of prehistoric sites that appear to be related to the presence of Pleistocene Searles Lake, as well as sites relating to later periods. In the past year BLM archaeologists have inventoried approximately 1200 acres near Searles Lake and have found very high site densities as well as uncommon archaeological manifestations such as rock alignments, trails, and stacked stone features. Materials from some of these sites have been dated by radiocarbon and other dating methods and the area appears to have been inhabited from the late Pleistocene-Early Holocene (c. 11,000 years ago) down to the historic period. The Lava Mountains should also be included in this high sensitivity area.

Historic mining occurred in a number of areas, including Darwin and adjacent areas, and Homewood Canyon. Extraction of borax and borates from Searles Lake that began in the late 1800s left historic remains on and adjacent to Searles Lake. Red Mountain, Randsburg, and Johannesburg all began as centers for historic mining operations in the area and remains of historic mining, milling, and prospecting are abundant.

The very low inventory levels, less than 1% in most areas, leaves the probability that there are many unrecorded prehistoric and historic resources and areas of high sensitivity that have not yet been identified.

3.7.1.7 Ethno-historic Overview

The ethnohistoric period begins with European contact in the 18th century, and is documented in diaries, official documents, narratives, and scholarly studies, the latter including interviews with native peoples. At the time of European contact, Paiute, Shoshone, Kawaiisu, Kitanemuk, Serrano, Vanyume, Chemehuevi, and Mojave occupied the planning area. Owens Valley Paiute occupied the far northern edge of the planning area, near Owens Lake, although this was peripheral to their primary areas around Owens Lake and River. The Western Shoshone lived south and east of Owens Lake, as far south as Little Lake. Kawaiisu occupied the southern Sierra, as well as Indian Wells Valley, El Paso Mountains, Tehachapi Mountains, and adjacent areas. Kitanemuk and Serrano occupied the southwestern portion of the planning area, as far south as the San Bernardino Mountains. The Vanyume lived along the Mojave River, north and east of Victorville. The Chemehuevi are the southernmost band of the Southern Paiute, and their extensive traditional territory included the eastern Mojave Desert. By the mid-19th century, they had settled along the Colorado River in traditional Mojave territory. The Mojave controlled the area north of Bill Williams River up to the Nevada border, but their main settlements were in the Mojave Valley.

The Owens Valley Paiute, Mojave, and Chemehuevi, after the latter's relocation to the Colorado River, farmed as well as harvested native wild plant foods. There is no record of farming among the other tribes. Ethnographic and ethnohistoric accounts indicate native populations had efficient processes to obtain food and raw materials, and had extensive knowledge of plants, animals, and the environment. Group settlement and subsistence patterns were within well-defined territories, but the length of time spent in any one camp varied among the tribes. Organization of society also varied among tribes, but can generally be described as loosely structured, allowing families to be self-determining while recognizing an importance of kinship lines. A sense of tribal identity, including language, customs, history, and religious

beliefs, held members of each tribe together.

Under the National Historic Preservation Act, a federal agency consults with tribes so that they might identify traditional cultural properties of cultural and religious importance, and consider the effect of its actions on those places. Places meeting the criteria for traditional cultural properties are then evaluated under criteria for the National Register. Under the American Indian Religious Freedom Act and Executive Order 13007, a federal agency must consider the effects of its actions on Native American spiritual places and on access to such places by religious practitioners. Consultation usually combines compliance with both laws. A traditional cultural property is a place that is eligible for inclusion in the National Register of Historic Places because of its association with cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community. Traditional cultural properties may overlap a number of categories of cultural resources such as archaeological sites, historic sites, areas where natural materials are collected, sacred sites, or sacred landscapes.

3.7.2 Tribal Governments and Policies

Eight tribal governments who might attach religious and cultural significance to historic properties within the planning area were contacted in June 2000 and from May to July 2001. These included the Lone Pine Paiute Shoshone, Timbisha Shoshone, San Manuel Band, Morongo Band, 29 Palms Band, Fort Mojave Tribe, Chemehuevi Tribe, and Colorado River Indian Tribes. Contact was made via letter and phone. When contacted by phone in July 2001, the Lone Pine Paiute Shoshone, Timbisha Shoshone, Fort Mojave Tribe, Chemehuevi Tribe, and Colorado River Indian Tribes requested additional information, and information packets were sent to those tribes. In August 2001 a briefing was presented to the Native American Lands Conservancy at their request. As a consequence of contact, no tribe or band identified religious or cultural significance to historic properties within the planning area.

CHAPTER FOUR
ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

Chapter 4 presents the environmental impacts of each of the four alternatives described in Chapter 2. These include the following:

?? Alternative A: Proposed Action
?? Alternative B: Enhanced Ecosystem Protection
?? Alternative C: Enhanced Recreation Opportunities
?? Alternative D: No Action

4.2 ALTERNATIVE A: PROPOSED ACTION

4.2.1 Air Quality, Soils and Water

4.2.1.1 Air Quality

Introduction: Impacts would be in the form of gaseous and particulate mater that is emitted into the air as a result of the activities being analyzed. All of the pollutants subject to analysis are addressed in federal, state and local laws, statutes, regulations and rules. The federal and state ambient air quality standards define the criteria pollutants that are part of the emissions that are typically analyzed. In addition to the criteria pollutants, there are criteria for air toxics, hazardous air pollutants (HAPs), Prevention of Significant Deterioration (PSD), fugitive dust and regional haze.

The analysis is based upon various activities' potential to emit. In the case of the Designation Project, there are only a few pollutants that have the potential to be emitted. The analysis is further limited by the need to look at changes in emissions that would occur as a result of various alternative actions. Most activities that produce emissions would not be impacted by the Project alternatives and would not be addressed in this analysis. The activities associated with the Designation Project that would have an impact on air quality include OHV activities, vehicle routes and designations, and restoration. Changes in these activities would result in changes in disturbance rates to soil surfaces and would result in changes in PM_{10} and $PM_{2.5}$ emissions. Activities associated with growth and development may emit particulates such as PM_{10} and $PM_{2.5}$ and ozone precursors including nitrous oxides and reactive organic gases. Based upon the potential to emit and emissions that are likely to be affected by the Project, the analysis would primarily address the particulate emissions PM_{10} and secondarily the ozone precursor emissions. In addition, these two pollutants are important because large portions of the project area are classified as federal nonattainment areas for PM_{10} and/or ozone.

Planning Assumptions for Air Quality: State Implementation Plans (SIPs) are prepared for the federal nonattainment areas. These SIPs are designed to result in compliance with the NAAQS by federal deadlines. The SIPs are implemented through a series of rules. In addition, air quality is highly regulated by a number of additional federal, state and regional regulations and rules. These regulations and rules apply to many of the activities that appear in the Project alternatives. It is assumed that the activities would be conducted in compliance with the regulations and rules.

Expected Impact of Alternative A on Air Quality: This alternative would result in reductions in emissions of particulate matter from BLM managed lands, and corresponding declines in PM_{10} concentrations in a number of areas. This would be due to restrictions, reductions or elimination of activities and disturbed areas that have the potential to emit pollutants. Some activities would have the potential to increase emissions. These activities along with their pollutants, relative changes in emissions, time scales and locations are expected to be as described by Table 4-1.

Table 4-1
Air Quality Impacts – Alternative A

ACTIVITY	POLLUTANT(S)	CHANGE DIRECTION	MAGNITUDE	TIME SCALE	LOCATION(S)	NOTES
Paved roads	PM_{10}	Increase	Slight	Short & long term	Within tortoise critical habitat	Could eliminate paving as dust control measure on unsurfaced roads
OHV route designation	PM_{10}	Decrease	Moderate[3]	Short & long term	Most would be within Mojave Desert Nonattainment Area	Wind erosion would cease as route stabilizes in 1-2 years

Notes: 1. MDAQMD inventory of sources showed nearly 8% of PM_{10} emissions from construction and bare ground in 1990.
2. Livestock grazing accounted for .4% of MDAQMD PM_{10} inventory (1990).
3. Wind erosion from unpaved roads accounted for 20% of PM10 emissions in MDAQMD inventory (1990).

Cumulative Impacts on Air Quality: There could be a slight increase in particulate emissions from private lands, and reductions in emissions of particulate matter from public lands. This would result in corresponding declines in PM_{10} concentrations in a number of areas. On an overall basis, there would be a significant reduction in particulate emissions. A goal of Alternative A is to streamline procedures for development on private lands. This could result in an increased development rate in the short term. In the long term, other factors would control development and expected emissions from development would be nearly the same with or without Alternative A. Long term projected growth and emission increases would occur in and around current core population centers such as the Antelope Valley, the Victor Valley area and Barstow. Reductions would occur on BLM lands away from population centers.

Significance: There would be a significant reduction in PM_{10} emissions as a result of Alternative A. These reductions could exceed 1000 tons of PM_{10} per year.

Federal Conformity: A federal conformity analysis is required for any federal action within any federal nonattainment or maintenance area. There are seven areas within the western Mojave Desert that meet these criteria. These are the Owens Valley, Coso Junction, Indian Wells Valley, Trona and Mojave Desert PM_{10} planning areas and the Eastern Kern County and Mojave Desert modified ozone-planning areas. The clean air act and its implementing rules (40 CFR part 93) state that federal agencies must make a determination that proposed actions in federal nonattainment/ maintenance areas conform to the applicable implementation plan before the action is taken. In addition, the action cannot cause or contribute to any new violation of the National Ambient Air Quality Standards, cannot increase the frequency or severity of any existing violation of any NAAQS or delay timely attainment of any standard or any required interim emission reduction or other milestones.

The BLM has developed a ten-step process to comply with the federal conformity requirements. These ten steps are: (1) Determine spatial and jurisdiction applicability, (2) Describe SIP status and content, (3) Develop any necessary background information, (4) Develop air quality impact analysis, (5) Compare activity to applicable SIP provisions and rules, (6) Develop conclusion statement, (7) Prepare a formal determination, (8) Conduct an agency/public review, (9) Submit the determination to appropriate regulatory agencies and (10) Archive the results. Steps 7-10 must be completed only if the project has total emissions of criteria pollutants exceeding deminimus levels established in the regulations (40 CFR 93.153 (b)(1&2)). Most of these steps are carried out in this EIR/S.

Conformity Analysis and Conclusion: Alternative A results in significant reductions of PM_{10} emissions. All of the SIP requirements for the five federal PM_{10} nonattainment/maintenance areas are met by the alternative for PM_{10}. Ozone precursor emissions could increase slightly in the short term under this alternative. Because the precursor emission levels are lower than the budget established the in the regional plans, Alternative A conforms to the SIP. All emission levels are below de minimus levels, so no further conformity analysis is necessary and a formal conformity determination is not required.

4.2.1.2 Soils

Off Highway Vehicle Impacts: OHVs impact soils properties in several ways. OHVs increase soil compaction, which in turn effects infiltration and water erosion, soil moisture, wind erosion, and soil chemistry.

Most desert soils, including many sands, are susceptible to intense compaction if driven across a sufficient number of times. Places heavily used by OHVs such as pit areas, trails, and hillclimbs generally are intensely compacted. Compaction produced in most soils depends on vehicle characteristics, amount of activity, and soil water at the time of impact that on differences

between soil properties. For example, increased OHV activity on wet soils would increase compaction. Some cohesion-less sands such as sand dunes, however, are very resistant to compaction whether wet or dry. Many playa soils would have considerable resistance to compaction if driven on when dry. (BLM, 1980)

Intense OHV use in steep areas (primarily hillclimbs on slopes over 20 percent) yields large increases in water erosion as well as mechanical displacement of soil. Where highly compacted trails run for long distances down gentle slopes, erosion may occur on relatively level terrain with slopes as low as three percent (BLM, 1980).

Most desert soils are much more susceptible to wind erosion after disturbance than in an undisturbed condition (BLM, 1980). Wind erosion occurs whenever bare, loose, dry soil is exposed to wind of sufficient speed to cause soil movement. This process would be accelerated whenever the natural equilibrium of the soil is disturbed. During a dust storm, the bulk of eroding material from soils moves only a foot or two above the soil surface where it is subject to downwind transport. Two basic processes are involved in wind erosion: detachment and transport. Detachment is the initiation of soil movement and occurs when wind force or the impact of moving particles is strong enough to dislodge stationary soil particles. After detachment, soil particles are subject to transport by wind through the air or along the soil surface until eventually deposited when wind velocity decreases (NRCS, 29palms)

Erodibility varies considerable within and among soils as a result of variations in texture, organic matter content and aggregate structure. In general, erodibility increases with increasing sand content and decreases with clay content. (NRCS, 29 Palms.) In addition, biological crusts, microorganisms (lichens, algae, cyanobacteria, microfungi) and non-vascular plants (mosses, lichens) that grow on or just below the soil surface. Soil physical and chemical characteristics, along with seasonal precipitation patterns, largely determined the dominant organisms comprising the crust. These crusts are primarily important as cover and in stabilization soil surfaces. In rangelands, biological soil crusts function as living mulch my retaining soil moisture and discouraging annual weed growth. They also reduce wind and water erosion, fix atmospheric nitrogen, and contribute to soil organic matter (Eldridge and Greene, 1994 in USDI, 2001).

4.2.1.3 Water Quality

The primary surface water quality parameter of concern in the Project area is sediment. There is naturally high levels of sediment in the ephemeral surface water that flows in response to storm events because of ongoing geologic processes.

When the soil is disturbed by anthropogenic activities it is more susceptible to erosion. Erosion increases the sediment available in channels for transport by surface water when it occurs.

Particle size, slope, vegetative cover and distance from the waterway determine the length of time the eroded particles take to enter the waterway for transport either in the water column (suspended sediment) or along the streambed (bedload). Small particles will be transported

more easily, steeper slopes and reduced vegetative cover increase the velocity of the water increasing the waters capacity to transport more and larger particles, particles in or close to a waterway will be transported first. The alluvial fans complicate these general rules because of the tendency for channels to migrate across the fan.

The suspended sediment water quality objective of the Lahontan Regional Water Quality Board is "the suspended sediment load and suspended sediment discharge rate to surface waters shall not be altered in such a manner as to cause nuisance or adversely affect the water for beneficial uses."

Eroded sediment and other earthen materials that reach surface waters as a result of human activities are considered waste discharges under the Porter-Cologne Water Quality Control Act.

In the Mojave Desert it is difficult to quantify an increase in human caused sediment that reaches surface waters because sediment transport is part of the natural processes. Storm events that produce sufficient water to transport the sediment are infrequent and episodic so sampling the water cannot be scheduled and is inherently difficult. Equipment can be designed to take samples, but is subject to vandalism and being washed out if the flow is large.

It is easier to measure either the sediment or observe the effects of the sediment. Sediment can reduce the hydraulic capacity of stream channels, causing an increase in flood crests and flood damage. It can fill drainage channels, especially along roads, plug culverts and storm drainage systems, and increase the frequency and cost of maintenance.

Even when measuring the sediment by using sediment basins it is a challenging exercise to determine how much is anthropogenic.

A semi-quantitative determination of human caused sediment can be made by using a model to compare alternatives with each other or with existing conditions by determining directly related factors such as vegetative cover, amount of disturbed soil and soil characteristics directly related to erosion potential. Then use one of the standard soil erosion models. Because we have limited soils information in the study area this is not possible at the present time.

For this analysis water quality (suspended sediment) impacts are assumed to be proportionate to the soil erosion impacts although they may disjunct in time and place.

4.2.2 Biological Resources

4.2.2.1 Natural Communities

The proposed action affects the desert's natural communities in different ways. Most of the recreation areas for off road vehicles are within the creosote bush scrub, desert wash and saltbush scrub communities, though riding on playas is also popular and may impact the adjacent alkali sink scrub vegetation. In mountainous areas, most travel is confined to roads, so that the woodland communities (Joshua tree woodland, scrub oak, pinyon pine woodland, juniper woodland) are not subject to direct vehicle impacts. In mountainous areas with a large number of routes, habitat fragmentation is an issue, depending to some extent on the frequency of use.

In all areas of public lands containing the rarer and more valuable (to wildlife) riparian communities, BLM has already designated routes, primarily through the ACEC Plan process. These roads, as in the canyons of the east Sierras, Jawbone-Butterbredt ACEC, Big Morongo Canyon ACEC, Whitewater Canyon ACEC and Afton Canyon are designated to avoid major impacts to riparian dependent wildlife, such as migratory birds. Isolated springs and seeps, however, are accessible and not entirely free of route proliferation, cleared camping areas and excessive disturbance. In some cases, such as the springs in the Argus Mountains and Great Falls Basin ACEC, BLM has initiated improvements such as barriers and designated parking areas that protect the wetland communities from vehicle damage.

Additional work to define site-specific solutions for access to springs may be needed to protect important sites. The El Paso Mountains and Ridgecrest subarea will provide this analysis through the Collaborative Access Planning Area process. In other areas, such as the Juniper subregion, monitoring of the vehicle disturbance at springs (if any) is the best way to determine if adverse impacts from the route designation are taking place.

Kane Springs in the Ord-Rodman subregion is an important spring that clearly benefits from the designation of Alternative A, compared with the No Action Alternative (Alternative D). The same is true for Kane Wash, which contains a desert willow community, because the designated routes utilize the parallel utility route out of the streambed.

In the Bighorn subregion, adoption of the 1985-1987 routes presents no change from the No Action Alternative. Routes near Vaughn Spring, Mound Spring and Viscera Spring (on adjacent Forest Service lands) will need continued monitoring to determine if the relatively dense network in this location is detrimental to the riparian communities at these springs. The Forest Service review of these routes, which cross jurisdictional boundaries, could result in a more cohesive network for the area.

4.2.2.2 Desert Tortoise

Alternative A does not directly address the threat of either short- or long-term drought. However, some prescriptions would enhance tortoise conservation during drought periods. Prescriptions that would result in beneficial and adverse impacts are summarized in Table 4-2

Table 4-2

Beneficial and Adverse Impacts of Measures to Counteract Drought

BENEFICIAL IMPACTS	ADVERSE IMPACTS
Motorized Vehicle Access ? The single most effective measure to alleviate human impacts during time of drought is to minimize vehicle use within washes, which would be accomplished by closing 117 of 177 linear miles (66%) of routes identified as occurring within washes in the Desert Wildlife Management Areas (DWMA) being recommended by the West Mojave Plan, which generally correspond to tortoise critical habitat. There are certainly more than 177 linear miles of washes in DWMAs, however, since route use would be restricted to only those routes that are designated as open, washes that are not included would not be available for vehicle use, which would be a very significant beneficial impact. ? Route reductions in higher density tortoise areas in DWMAs would serve to alleviate human-induced stresses during drought periods	Motorized Vehicle Access ? Alternative would fail to close 60 linear miles (34%) of roads in DWMAs that coincide with washes ? Alternative fails to identify specific measures that would be implemented in higher density tortoise areas, which are most likely to benefit from additional protection than would be implemented during periods of prolonged drought.

The alternative to allow vehicle use in only those washes designated as open is a significant beneficial impact, as it replaces a policy that allows vehicle use wherever there is evidence of prior use. In the Ord Mountain Pilot Study, about 25% of the potential routes were actually washes, with and without vehicle tracks (LaRue 1997). The current route network identifies 177 linear miles of wash routes, 117 miles of which (66%) have been identified for closure. It is very likely that the digitized routes within washes underestimate the actual number of washes that are being used for vehicle travel (i.e., compared to the hydrological features identified by the Mojave Desert Ecosystem Program, for example). However, the alternative would allow for vehicle use in only those washes that are designated as open, so the non-digitized wash routes would not be available for vehicle use.

Tortoises concentrate their foraging activities around washes (Jennings 1993), often burrow in wash banks or on adjacent slopes (Baxter 1988), and may occupy burrows closer to washes during periods of drought (Circle Mountain Biological Consultants 2002). Where OHV use in washes is common, tortoises are more at risk. They are already physiologically stressed by lack of both food and water. Since they are less active during drought but often lay at least one clutch of eggs, both animals and nests are in harm's way where heavy vehicle use occurs. Shrubs often take on a dull appearance and desiccate (dry out) during a single year of low rainfall. Because wash-side growth is denser than growth in adjacent open lands, there is increased risk of fire in washes where camping, shooting, and vehicle use is more common. Minimizing these and numerous other impacts (see Chapter 3) is perhaps the only practical thing that can be done to minimize impacts associated with drought, and is a beneficial impact.

Motorized Vehicle Access: The new route network would be adopted by CDCA Plan amendment upon issuance of the BLM's Record of Decision. Effective implementation of the network would require signing open and limited use routes, physically obstructing roads identified for closure, and other actions. An aggressive, focused education program that targets all vehicle

user groups would facilitate the success of the program. The assumptions inherent to this analysis are given in Table 4-3.

Table 4-3
Assumptions Regarding Motorized Vehicle Access Analysis

CATEGORY	ASSUMPTIONS
General	Unless otherwise noted, all discussion pertains to: ? Alternative A ? Desert tortoises (i.e., habitat, densities, mortality, conservation, etc. of tortoises) ? Public lands
Desired Results	? The goal is to designate and implement a route network that would provide for public access, authorized uses, and the following desired results: ? Fewer losses of tortoises to crushing, poaching, pet collection, intentional vandalism, and similar activities requiring vehicle access ? Less degradation and loss of occupied habitat (first priority) and suitable habitat (second priority) ? Larger blocks of unfragmented habitat, which would be achieved if vehicle use is prevented on designated closed routes, does not result in increased cross-country travel in adjacent areas, and promotes recovery of suitable habitats more quickly than would naturally occur ? Route closure in higher density tortoise areas is likely to provide the most benefit in terms of avoiding mortalities and other losses ? Route closure in lower density tortoise areas would alleviate losses of animals that are critically important to natural repatriation
Impacts to Tortoises and Habitat	? Tortoises are more likely to be adversely impacted (i.e., crushed, collected, poached, etc.) in regions supporting higher densities than in areas of lower densities ? Vehicle-based impacts are proportionate to the number of existing roads in an area. Both permitted (i.e., vehicle use that remains on existing roads) and un-permitted uses (i.e., cross-country travel outside BLM Open Areas, dumping, vandalism, collection, etc.) are more likely to occur where roads are relatively more common ? Tortoises and habitat are more likely to be impacted by vehicular activities in areas below about 20% slope than in steeper areas ? If left unchecked, vehicle use in areas of above-average human disturbances would continue to result in loss of tortoises, degradation of habitat, and seriously undermine conservation and recovery efforts

Given the assumptions identified above, there are likely to be both adverse and beneficial impacts associated with the BLM's motorized vehicle access network, as summarized in Table 4-4.

Table 4-4
Beneficial and Adverse Impacts of BLM's Motorized Vehicle Access Network

BENEFICIAL IMPACTS	ADVERSE IMPACTS

Overall Importance ? Designating and implementing a motorized vehicle access network that is supported by land use laws and compatible with tortoise recovery is the single most important management action that could be implemented to minimize the widest variety of known human impacts.	Overall Importance
For Animals and Habitat ? Implementing this alternative would reduce the following impacts, and would be proportionate to the linear miles of routes closed: ? Tortoises would be less susceptible to: pet collection; animals, burrows, and eggs crushed; gunshot impacts; handling that results in bladder voiding; harassment or mortality by pet dogs; poaching for ceremonial purposes; releasing pet tortoises into wild populations, which may spread disease; translocation, where tortoises are moved outside their home range into other habitats; and vandalism. ? Habitats would be less susceptible to soil compaction, displacement through wind and water erosion, petroleum contamination; spread of exotic weeds, which supports spread and intensity of fire; damage and complete removal of shrubs, which reduces protective cover and burrowing opportunities; dumping (which leads to more dumping), resulting in soil contamination, food sources for predators, focal areas for illegal target shooting; increased litter and garbage used as a food source by ravens; and increased noise levels (though effects are not well known).	For Animals and Habitat ? There is no clear way to assess the current or future impacts specifically associated with roads, which would be necessary to adaptively manage public lands to provide a balance between human use and tortoise conservation.
Route Reductions in Specified Regions ? Within *higher density areas*, the network would result in the closure of 577 of the 1,146 total linear miles of routes in such areas, which is a 50% reduction of routes in this area. This would have immediate and long-term benefits where tortoises are most abundant ? Within *lower density areas*, the network would result in the closure of 1,278 of the 3,079 total linear miles of routes in such areas, which is a 42% reduction of routes in this area. This would have immediate benefits to habitat and long-term benefits to overall conservation ? Within *above average vehicle disturbance areas*, a total of 435 of the 829 linear miles of routes would be closed, comprising about 53% of the existing routes in above average vehicle impact areas.	Route Reductions in Specified Regions ? The remaining 569 linear miles of open routes (50% in area) in *higher density areas* would continue to result in impacts ? The remaining 1,801 linear miles of open routes (58% in area) in *lower density areas* would continue to result in impacts to the few remaining animals, which are critical for re-establishing reduced or extirpated populations ? The remaining 394 linear miles of open routes (47%) in *above average vehicle disturbance areas* would continue to adversely affect tortoises

Given the assumptions, closure of any routes would be of some benefit to tortoise conservation. However, the effectiveness of the closures to achieve desired results is dependent on where the routes are located relative to higher and lower density tortoise areas, how soon the routes would be closed, and how well law enforcement would function to ensure traffic remains on approved routes of travel. Successful implementation must consider these and other variables, which cumulatively would provide the most substantial means of minimizing this known form of impact. If implemented as envisioned, the motorized vehicle access network would constitute a

significant beneficial impact.

There are potential problems associated with route closures that could undermine the conservation value of the reduced route network. For example, the conservation value would be adversely affected if closure results in increased illegal cross-country vehicle travel outside designated open areas, which in turn could lead to more crushed tortoises and habitat degradation. It is also possible (though not likely) that fewer routes may result in increased vehicle congestion on the remaining routes and concomitantly higher impacts in adjacent areas. These and many other impacts could be effectively avoided if BLM rangers begin to apply focused regulatory enforcement in conservation areas, which would require a major philosophical change in current enforcement practices.

4.2.2.3 Mohave Ground Squirrel

Table 4-5 reports only those beneficial and adverse impacts as they relate to MGS conservation that are different from the impacts identified under Alternative A for the tortoise.

Table 4-5
Mohave Ground Squirrel Impacts of Alternative A

BENEFICIAL IMPACTS	ADVDERSE IMPACTS
Recreation Competitive Events ? (HCA-40) Prohibition of vehicle speed events within the MGS Conservation Area would serve to minimize the amount of habitat degradation that is typically associated with this type of activity. This is likely to be more of a benefit to MGS habitat (important) than to actual squirrels, which are less likely to be crushed than tortoises, for example.	Recreation Competitive Events

4.2.2.4 Bats

The primary need for conservation of bats is protection of maternity and hibernation roosts, and secondarily, protection of transitory roosts used during migration. These roosts are most often mine shafts and adits possessing specific conditions of temperature, humidity, and light. They must be free from human disturbance. Roosts are less often found in rock crevices, abandoned buildings, under highway bridges, and in water tunnels.

Access is maintained in the Pinto subregion to one location with an important roost. Other routes of travel allow vehicles to come within one-half mile of a known roost. Until the adit entrances are gated, these roosts are somewhat at risk of human disturbance. The routes provide access to existing mining claims at the sites or in the immediate vicinity. Several desert washes in the area used for foraging by California leaf-nosed bats are undisturbed by vehicles.

Foraging habitat for these two species would be protected and routes of travel would be

eliminated from riparian areas and desert washes near significant roosts. Evaluation of potential vehicle impacts on the foraging habitat would be done on a case-by-case basis.

4.2.2.5 Other Mammals

Bighorn Sheep: Bighorn sheep in the West Mojave are found in only a few discrete mountain ranges away from the military bases. Route designation in the Ord and Newberry-Rodman subregions would reduce the occasional disturbance from vehicle traffic.

Mojave River Vole: This species is not affected by route designation on public lands. All known areas of occurrence are on private lands.

Yellow-eared Pocket Mouse: The status of the yellow-eared pocket mouse would remain relatively unchanged by provisions of Alternative A. Threats to this species are few, though its precise range and habitat requirements are poorly known. Route designation within the limited range is governed by ACEC management plans (Sand Canyon, Short Canyon, the Kelso Valley portion of Jawbone-Butterbredt, which are compatible with minimal surface disturbance on the mixed woody scrub of the hillsides. Designated wilderness in the est Sierras, which prohibits vehicle travel, also protects habitat for this species.

4.2.2.6 Birds

Bendire's Thrasher: Three areas of public land management would benefit Bendire's thrasher. In the Coolgardie Mesa area, reducing routes of travel through the Joshua tree habitat would decrease disturbance to this vehicle-sensitive bird during the spring nesting season. Little change would be evident in the Kelso Valley and Jawbone-Butterbredt ACEC, where existing management appears to support a small population. In north Lucerne Valley, management of BLM lands as open space with defined routes of travel would benefit the species in the long term by reducing disturbance.

Burrowing Owl: Although most recent burrowing owl nest locations within the West Mojave have been reported from private lands, often within urban areas, Alternative A would improve the habitat for this raptor by reducing vehicle disturbance at nest locations in more remote desert habitats. Reductions in route density, compared to the 2001 inventory, in the Coyote, El Mirage, Fremont, Kramer, Newberry Rodman, Ord, Red Mountain and Superior subregions are significant. Elimination of travel on single track trails and dirt roads in these areas will create larger blocks of disturbance-free habitat for the burrowing owl. This is a beneficial impact of Alternative A.

Golden Eagle: Most golden eagle nests are within designated wilderness, and nest disturbance is not a major factor. For those nests that are accessible, the provisions of Alternative A regarding the designation of a route network that mostly avoids nest sites based on line-of-sight and distance standards would be a beneficial aspect of the plan that minimizes impacts.

Inyo California Towhee: Designation of routes on public lands does not affect this species. The Ridgecrest Field Office has created barriers at accessible springs in the Argus Mountains (North Ruth Spring, Austin Spring, Benko Spring), so that the habitat for the Inyo California towhee is protected from vehicle intrusion. Open routes are not designated for access to Bainter Spring. These springs are designated as critical habitat by USFWS. No aspect of the Alternative A route designations will adversely modify the critical habitat.

LeConte's Thrasher: Alternative A would improve the habitat for this vehicle-sensitive bird by reducing motion and noise disturbance at nest locations in its desert wash and creosote bush scrub habitats. Reductions in route density, compared to the 2001 inventory, in the Coyote, El Mirage, Fremont, Kramer, Newberry Rodman, Ord, Red Mountain and Superior subregions are significant. Elimination of travel on single-track trails and dirt roads in these areas will create larger blocks of disturbance-free habitat for the LeConte's thrasher. This is a beneficial impact of Alternative A.

Prairie Falcon: Although many of the prairie falcon nest sites are within Wilderness, the remaining sites are often subject to human disturbance during the nesting season. Route designation in mountainous terrain would improve conservation for the prairie falcon. The provisions of Alternative A providing a route network that mostly avoids nest sites based on line-of-sight and distance standards would be a beneficial aspect of the plan that minimizes impacts.

Western Snowy Plover: Western snowy plovers are extremely sensitive to vehicle intrusion at the margins of playas during the nesting season. Alternative A does not affect the known nest sites at Searles Lake and potential nest sites at Dale Lake, which are located on private land. The probable nest location at Harper Dry Lake is managed by BLM within the existing ACEC, and vehicles (and pedestrians) are prevented from disturbing the birds during the nesting season.

4.2.2.7 Reptiles

Mojave Fringe-toed Lizard: Each distinct known habitat onpublic lands for the Mojave fringe-toed lizard is discussed separately below.

Along the Mojave River, public lands are in scattered parcels west of the Manix ACEC. Most, but not all, provide suitable blowsand habitat for the fringe-toed lizard. No routes of travel are designated for these lands (Map 47). From Manix east, the Mojave Road is designated as open from Manix Wash through Afton Canyon and beyond. Additional open roads traverse blowsand habitat between Fourmile Waterhole and Ninemile Waterhole (Map 48). These existing open roads do not appear to be impacting this species because of the very light use, but are not appropriate for conservation of the habitat for ths vehicle-sensitive species. The Designation Project would have a minor adverse affect on this population.

In the Sheephole Valley, the 1985-1987 route designations allow travel on three primary routes across fringe-toed lizard habitat on BLM lands outside wilderness and Joshua Tree

National Park. The light travel on these routes, which cover about one-fourth of the occupied habitat, does not appear to be impacting this species. These routes provide access to mining claims and are part of a recreational loop. The Mojave fringe-toed lizard population in this area should remain secure for the indefinite future.

At Pisgah Crater, vehicle intrusion onto occupied habitat would be restricted compared to the present. Alternative A proposes closure of some, but not all, of the routes crossing suitable habitat, which would be a beneficial improvement. Additional closures of spur routes and redundant routes in sandy habitat west of Pisgah Crater are necessary to insure adequate protection of the lizards and their habitat from vehicle damage.

Alternative A would consolidate routes accessing the west slope of Alvord Mountain (Map 41), closing several in the sandy washes. Access is maintained for the private land in this area, which is in a checkerboard pattern. This reduction in routes is beneficial to the Mojave fringe-toed lizard because it closes routes traversing occupied and potential habitat.

The population at Cronese Lakes would be conserved by adoption of the ACEC route designations, which are compatible with protection of the blowsand habitat.

Impacts to habitat of the Mojave fringe-toed lizard at El Mirage and east of Harper Lake cannot be determined until the occupied habitat is better defined. The historical records of occurrence for this lizard in these two areas are not precise, an no recent sightings have been made.

Panamint Alligator Lizard: Designation of routes on public lands does not affect this species. The Ridgecrest Field Office has created barriers at accessible springs in the Argus Mountains, so that the habitat for the Panamint alligator lizard is protected.

San Diego Horned Lizard: Between Cajon Pass and Joshua Tree National Park, route designation in the Juniper and Bighorn subregions would benefit the San Diego horned lizard. The habitat west of Cajon Pass extending to Palmdale, is almost entirely on private land and Alternative A would have no affect on this lizard in that region.

4.2.2.8 Plants

Barstow Woolly Sunflower: Barstow woolly sunflower is found within the Fremont, Kramer and Superior subregions. It grows on bare patches where soils are shallow, often underlain by a caliche layer. It is therefore susceptible to off-road vehicle travel, but is not damaged by travel on established roads. Proliferation of routes within the range fragments the habitat to an unknown extent, but its powers of dispersal are probably rather limited because of its small size and tiny seeds.

Route designation in the three subregions would benefit the Barstow woolly sunflower over the existing situation because larger blocks of undisturbed habitat would be created. Route

designation, especially for through motorcycle routes, would restrict potential damage from off-road travel

Carbonate Endemic Plants: The four listed carbonate endemic plant species on the north slope of the San Bernardino Mountains are mostly within the Bighorn subregion (Maps 70, 73 and 74). The routes within the habitat of the carbonate endemic plants are limited to those designated in 1985 and 1987. The terrain generally prevents off-road travel. Use of these roads is infrequent. Some routes have been used for dual sport events in the past. Past vehicle use has not been detrimental to the listed plant species, and the designations in Alternative A would not adversely impact the plants or further modify the critical habitat. Additional monitoring and review of the routes designated as open in the habitat of the carbonate endemic plants may be warranted.

Occurrences of Parish's daisy in the Bighorn subregion near Vaughn Spring (Map 74) are avoided by the adoption of the 1985-1987 designations proposed in Alternative A. No routes traverse critical habitat in Section 22 (T 2N, R 3E).

Critical habitat for Cushenbury milkvetch is crossed by routes within Sections 7 and 8 (T 3N, R 2E), though the routes appear to avoid occupied habitat. No adverse modification to critical habitat is anticipated from these existing routes, which are the same for all alternatives, because travel off the road is prevented by the terrain. These routes access existing mining claims on the Blackhawk Slide (Map 70).

The easternmost route through Section 1 (T 3N, R 2E) crosses critical habitat for Cushenbury milkvetch and Parish's daisy and is within the proposed Carbonate Endemic Plants Research Natural Area ACEC of the West Mojave Plan. The western route in this section forms the boundary of the ACEC. These routes access existing claims for limestone deposits. Elimination of the eastern route would be beneficial to the carbonate plants, but might prohibit access to a claim further south.

Within important habitat east of Highway 18 (Map 73) are two major areas where concentrations of the carbonate endemic plants are found. These areas also have overlapping critical habitat designations for 1, 2, 3, or all 4 species. These areas are North of Monarch Flats (Sections 11 and 12 of T 3N, R 1E) and West of Terrace Springs (known locally as the Partin Mine; Section 16 of T 3N, R 2E). Open routes extend across critical habitat to varying degrees in both areas. These routes access existing claims, are in poor condition, and are seldom used. In the North of Monarch Flats area, one open route enters public land from adjacent private land for less than 0.2 miles then deadends. In the West of Terrace Springs area, four route links cross into the National Forest. Because of their long prior existence as mining roads, these routes cause no new adverse modification of critical habitat. In a few cases near the Partin Mine, Parish's daisy is growing on the road surface or edge.

West of Highway 18 (which is outside the Bighorn subregion boundaries) one limited and one open route cross critical habitat for Parish's daisy in Section 10, T 3N, R 1E). All other

routes designated open west of the highway are outside known occupied habitat for all four carbonate species and outside designated critical habitat.

Existing fragmentation of the carbonate plants, a result of natural occurrence patterns and historical mining impacts, prevents conservation of a completely unified block of undisturbed habitat for these species. It is unlikely that routes through the habitat contribute in an important way to fragmentation or isolation of populations from each other.

The complex configuration of designated critical habitat within the Bighorn subregion, combined with the extensive series of claims in this area, both for limestone deposits and metallic minerals on the Blackhawk Slide, make route designation problematical. The western part of the Bighorn subregion is within the interagency Carbonate Habitat Management Strategy planning area. This BLM and Forest Service document analyzes the mining and conservation conflicts in detail and proposes resolutions based on BLM and Forest Service establishment of conservation areas and compensation to the landowners and claimholders. A more site-specific route designation could be provided through the ACEC process in the West Mojave Plan. Access roads to claims within critical habitat may require the limited designation.

Charlotte's Phacelia: Charlotte's phacelia faces few threats at present, being protected in the Owens Peak Wilderness, Red Rock Canyon State Park and in ACECs of the east Sierra canyons. No alternative would alter the existing protections. This species is found within the East Sierra and El Paso Mountains subregions, which would retain the 1985-1987 route designations. Designation of routes in the El Paso Mountains via the Collaborative Access Planning Area process would result in additional safeguards against habitat becoming disturbed by hill climbs, parallel routes, and dead-end routes, assuming that these routes are closed.

No adverse impacts are expected to Charlotte's phacelia from Alternative A.

Crucifixion Thorn: Very few threats now exist to the isolated occurrences of crucifixion thorn, which are found within the Coyote and Newberry-Rodman subregions. Reduction in the route network for both areas would benefit the species by establishing larger undisturbed habitat blocks, particularly near the crucifixion thorn "woodland" south of Fort Irwin. The existing maintained road near the "woodland" would remain open under Alternative A.

Potential disturbance by the Johnson Valley to Parker race on routes designated as open in the Pisgah area may impact the habitat of crucifixion thorn. This race is held on routes designated as open, and stipulations attached to the event at the time would prevent damage to the rare plants.

Desert Cymopterus: Alternative A would achieve a substantial improvement in conservation for desert cymopterus. Reduction of the route network in the Superior subregion will achieve better protection of the sandy habitat. Very few occurrences on public land are known for this species, although more are likely to be detected in the future. Maintenance of larger blocks of habitat is the best protection until specific localities are identified. Alternative A

would achieve this by closing 251 miles of routes within the Superior subregion.

Kelso Creek Monkeyflower: Kelso Creek monkeyflower is found only within the Jawbone-Butterbredt ACEC, where the existing route designations specified in the 1982 ACEC Management Plan will remain. That network, which would be adopted as a CDCA Plan Amendment for Alternative A, reduced the routes and trails within the occupied and potential habitat to a minimum. Access to private lands provides the main justification for the open routes, which are infrequently used. None appear to be impacting the known occupied habitat. No impact to this species will result from Alternative A.

As additional botanical surveys of the potential habitat better define the distribution of Kelso Creek monkeyflower on public lands, some adjustments may be necessary in the route designation. These would probably all fall within the definition of minor realignment.

Kern Buckwheat: Conservation of Kern buckwheat requires proactive management of the few known locations on public land. This management consists of providing barriers to exclude vehicles and restoration of widened routes and a parking and turnaround area in one location. Hence, conservation measures of the Route Designation Project for this species involve implementation rather than route designation. No routes are designated as open within the occupied habitat for Kern buckwheat, and Alternative A would beneficially impact this very rare plant species.

Lane Mountain Milkvetch: Route designation is very important to Lane Mountain milkvetch, an endangered West Mojave endemic species. Although direct impacts from vehicles to the plants and their habitat are not documented, indirect impacts from casual use mining and off-road travel could be significant. In addition, the potential operations planned on the Fort Irwin expansion may result in the loss of substantial numbers of plants and acres of habitat, so that the remaining habitat on public lands on Coolgardie Mesa (Map 33) and the west side of the Paradise Range (Map 40) must be managed on a reserve-level basis. Mitigation provided by the Army for potential impacts could include acquisition of occupied habitat on private lands and restoration and obliteration of roads on public lands. Implementation of the Route Designation Project would be aided by this mitigation.

The existing patchwork of private and public lands on the Coolgardie Mesa and the West Paradise Range where Lane Mountain milkvetch is found results in an incomplete network of access routes. If and when private land is acquired, additional routes may be designated as open or closed.

Alternative A closes many of the open routes on public lands in and near occupied habitat for this species, but is constrained by the necessity to provide access to the private lands. Access to mining claims is also provided. The West Mojave Plan proposes a mineral withdrawal for the occupied habitat. At the time claims are acquired or relinquished, certain routes within the habitat could be closed. The open designations consolidate access routes to popular destinations to the extent possible. However, Alternative A does not achieve the level of habitat conservation

necessary to avoid indirect adverse impacts to this species.

Little San Bernardino Mountains Gilia: Off-road travel is a known threat to Little San Bernardino Mountains gilia, but this threat is confined to washes on private land. Very few occurrences are known on public lands managed by BLM, though several occurrences are within Joshua Tree National Park. Alternative A would have no impact, either beneficial or adverse, on this species.

Mojave Monkeyflower: The Mojave monkeyflower is affected by route designation in the Ord subregion (Map 53) and in the Brisbane Valley (Maps 52, 58 and 59), which is not within a subregion.

In the Ord subregion, 390 miles of routes would be closed under Alternative A. Those roads within washes west of Camp Rock Road and near the transmission line that are closed would beneficially impact Mojave monkeyflower habitat by excluding vehicles from occupied habitat and by consolidating the potential habitat into large, disturbance-free blocks. Consolidation of the network near the Azucar Mine by closure of redundant roads is a positive impact to this species.

In the Brisbane Valley, travel on roads is not a threat, but off-road travel is extensive in places. The enforcement provisions of the implementing plan for the Designation Project would beneficially impact the Mojave monkeyflower in this region.

Mojave Tarplant: Existing occurrences of Mojave tarplant are protected within wilderness and BLM ACECs. Alternative A would have no affect on known populations of Mojave tarplant.

The historical occurrence near Mojave Forks dam has probably been extirpated. If the species were re-discovered in this area in the future, as in Grass Valley or other parts of Las Flores Ranch, adaptive management would be required to conserve plants in this area. This could include route designation on the few scattered BLM parcels in the area.

Parish's Phacelia: Route designation in Alternative A would have no affect on Parish's phacelia because travel on the small playas where it is found is not currently allowed. The enforcement and signing provisions of the implementing plan would be beneficial for this species. The Manix tank trail, which passes adjacent to the occupied habitat, would remain open under Alternative A.

Red Rock Poppy: Conservation provisions of Alternative A would represent no change from the existing situation for Red Rock poppy. Three quarters of the population is protected within Red Rock Canyon State Park, with the remainder occurring in the public lands of the El Paso Mountains. Threats are not apparent, but vehicle traffic off established roads could damage plants or their habitat.

The Collaborative Access Planning Area process for the El Paso Mountains would consider the range and local distribution of the Red Rock poppy. The resulting network of open roads and trails may eliminate parallel routes, hill climbs, and straying off established paths, especially in Mesquite Canyon. This would improve conservation for the Red Rock poppy by creating larger areas of undisturbed habitat for it to grow.

Red Rock Tarplant: Conservation provisions of Alternative A would represent no change from the existing situation for Red Rock tarplant.

The Collaborative Access Planning Area process for the El Paso Mountains would consider the range and local distribution of the Red Rock tarplant, now limited to Red Rock Canyon and Last Chance Canyon within the State Park. The resulting network of open roads and trails may eliminate parallel routes, hill climbs, and straying off established paths that pass near seeps and springs. This could improve conservation for the Red Rock tarplant by creating larger undisturbed areas at potential habitat near alkali springs.

Shockley's Rock Cress: Impacts to Shockley's rock-cress from Alternative A are as described for the carbonate endemic plants, except for the routes in the Vaughn and Mound Springs areas, where this species does not occur.

Short-joint Beavertail Cactus: Designation of routes on public lands would have no affect on short-joint beavertail cactus, which is found entirely on private land within the West Mojave.

Triple-ribbed Milkvetch: Although vehicle travel has a high potential to impact the endangered triple-ribbed milkvetch, no specific conflicts with routes of travel are known. Alternative A would have no affect on this species.

Future surveys in the Little San Bernardino Mountains area may result in newly detected occurrences. Potential impacts of access routes to newly detected populations may result in minor changes to the network in the future. These changes would probably fit the definition of minor realignments.

White-margined Beardtongue: The only apparent threat to white-margined beardtongue from recreation is off-road travel within the occupied habitat in washes draining the Cady Mountains. Alternative A addresses these threats by adopting the 1985-87 route designations for this area, which are compatible with conservation of this species. Access routes crossing occupied habitat are legal easements for utilities that must remain open. These specific crossings can be signed as part of the project implementation. Routes of travel that may impair wilderness suitability cannot be designated within the Cady Mountains Wilderness Study Area.

Closure of spur routes crossing washes northeast of Pisgah Crater (Map 55) will beneficially impact the white-margined beardtongue.

4.2.2.9 Cumulative Biological Resource Impacts

When placed in context of other developments within the West Mojave, including increased land development, mining and increased recreational use of habitat lands, the reduction in surface disturbance by the elimination of unnecessary and parallel routes and those impacting certain species would be beneficial and an improvement over the existing situation (the No Action Alternative). This is because larger blocks of relatively undisturbed habitat would be available, creating a lesser chance of vehicle collision, a reduced disturbance factor, and less fragmentation.

4.2.3 Recreation

A substantial increase in demand for access and related services would occur primarily because of increased population growth in Southern California. Other factors include:

- ?? An emerging awareness of desert resources and values
- ?? Saturation of other outdoor recreation areas in Southern California
- ?? Energy shortages and economic stresses that would cause more people to come to the relatively nearby Desert and stay longer
- ?? Technological innovation in recreational equipment that would influence user trends and consequently the demand for various resources

All of this suggests that the demand for access into the California Desert's public lands is on the increase, and that the need for the conscientious designation of routes into these large areas is high.

Under Alternative A, the western Mojave Desert will continue to offer a variety of areas and types of routes that will meet the needs of recreational users. While some activities such as competitive OHV racing have been curtailed and moved to areas specifically designated for that purpose due to environmental reasons (e.g., Stoddard Valley and Ord Mountain open area), the regional recreational needs of the public were carefully taken into account as they were weighed against other resource concerns. As a result the proposed route network largely meets public recreational and commercial motorized access needs. The Tables 4-6 reviews some of the effects of the proposed route network upon recreation opportunities within several of the more popular West Mojave subregions.

Table 4-6
Effects on Specific Types of Recreation

SUB REGION NAME	MC	4WD	EQUES-TRIAN	HUNTING	ROCK HOUNDING	HISTORIC EXPLOR-ATION	NOTES

Coyote	Moderate recreational opportunity for M/C. Greater closures in flat areas such as Coyote Lake	Moderate 4WD opportunity. Impacts on checker-board ownership low.	Staging opportunities continue to exists in spite of moderate closures.	Moderate bird hunting opportunities – closure is low impact	Moderate Rock hounding & mining - closure has low impact	Touring for interest in a few old mines, such as the Alvord Mines.	B to V started at Alvord Rd north of I-15 and continued east on utility easement.
El Mirage	Route closures in the flats will impact touring opportunity. Technical riding opportunity in mountains maintained.	High route closures in flats will have minimal impact. Technical routes maintained in Shadow Mountains. Larger OHV interest in El Mirage Dry Lake	Low Equestrian demand Potential equestrian opportunities maintained in Shadow Mtns	Low Hunting Demand Route closures will little impact to hunting opportunity.	No high level interest in rock hounding. Access routes in Shadow mountains remain for exploration.	No high level interest in historical exploration. Access routes in the Silver Peaks and Shadow mountains remain for exploration.	There is some recreation interest in area of Shadow Mts. and Rabbit Hole Mine
Fremont	Loss of touring opportunity in southern section	Loss of touring opportunity south of Harper Dry Lake.	No loss of technical opportunity; some loss of touring	No loss	Minimal loss in the mountains.	Minimal loss in the mountains.	Exploring through traveling of old routes such as Cuddeback - Fremont Road, Lockhart Road, and Harper Lake Road.

Juniper	Popular MC opportunity due to relative proximity to the Apple Valley and Victorville. Leaves intact the viable route network with minimal impact.	Moderate to heavy level of route closures but viable route network left intact.	Equestrian access to San Bernardino National Forest through primary routes such as the Pack Trail and trails along Grapevine Canyon. Just north of the Pacific Crest Trail. Minimal impact on equestrians.	Moderate size of subregion does not offer a high level of hunting opportunities, however the proposed route network accommodates hunting.	Subregion does not offer a high level of rock hounding opportunity.	Allows trail access to early historic sites in San Bernardino Mountains relating to late 1800s and early 1900s time period.	Relatively small subregion located at the north base of the San Bernardino Mountains and on the north edge of the San Bernardino National Forest. Access still provided to most popular routes and staging areas.
Kramer	This is a moderate use sub region. High levels of closures have a moderate impact.	Moderate use sub region. High levels of closures have a moderate impact on 4WD recreation, travel on Kramer Rd, Buckhorn Wash and Iron Mtn Rd in east Kramer.	Low equestrian interest. High levels of closures have little impact. Opportunity maintained in Iron Mtns.	Low draw for hunting High level of closures will have little impact on opportunity.	Historic high interest in Kramer Hills. Access opportunity in that area maintained.	Low historical interest Hi closures Low impact	Activity level of this sub - occurs because of Proximity to Highways 395 & 58
Middle Knob	Moderate MC opportunity.	Significant interest in 4WD activity related to mining and maintaining facilities such as the Los Angeles Aqueduct.	Moderate level of 4WD routes offer access for equestrians; this access is maintained since there is a low amount of closure.	The existing 4WD network provides good access to the Middle Knob area for hunting.	There is a minimum of rock hounding interest in this area; trail network provides some opportunity.	Historic exploration can be enjoyed through visitation of old mines, such as the Amalia Mine and Skyline Mine.	There are recreation opportunities through traveling on maintenance routes to the Los Angeles Aqueduct.

Newberry - Rodman	Relatively low demand for MC recreation; much of the central portion of the subregion is within Rodman Mtn and Newberry Mtn Wilderness.	Some 4WD opportunity, but relatively small network of routes.	Low level of equestrian recreational opportunity due to low number of appropriate trails.	Low level of hunting opportunity.	Relatively high interest in rock hounding, due to presence of several mines such as the Bell Mine, Silver Cliffs Mine, Camp Rock Mine, and the National Mine.	Good access off of Interstate 40 and Fort Cady Road to mining areas and primary 4WD routes for circulation, such as Troy Road and Fort Cady Road.	Network provides access to the Newberry Mountains and Rodman Mountains Wilderness, and also the Johnson Valley OHV Area to the south.
Red Mountain	High recreational opportunity maintained by selective site-specific moderate closures. Route closure plan will reduce recreation opportunity at Cuddeback Lake.	High 4WD interest will be moderately impacted by closures. Route closure will reduce recreation opportunity at Cuddeback Lake.	Moderate equestrian opportunity. Moderate closures will lead to moderate impacts.	High interest. Moderate closures will impact opportunity moderately.	Very high levels of historic and present day mining activity. Moderate closures may result in only moderate impact due to minimal access needs being met by network.	Historic interest in mining. Opportunity maintained by selective closures.	Mountainous terrain in north offers interest in OHV activities, north of Twenty Mule Team Road and Cuddeback Lake.
Superior	Moderate recreation opportunity. Moderate to high route closure. Moderate impact.	Moderate recreational opportunity. Moderate to high route closure. Recreational impact generally low.	Moderate to high equestrian demand. Moderate to high closures done selectively; impact low.	Low to moderate hunting demand. Good route network, low recreational impact.	High rock hounding demand. Network maintained, little impact.	Moderate interest. Low impact to recreational opportunity.	Region has high tortoise numbers so many routes closed. Those routes retained still offer a complete network.

Note: MC = Motorcycle; 4WD = Four Wheel Drive Vehicles

Recreationists who cannot participate in their desired activity in one location may seek an alternate site elsewhere. The result may be "spillover" into areas adjoining or nearby the location where the visitor originally went to recreate. This increases the chances of random travel, perhaps by using closed routes or no cross-country, in search of a new site. In order to minimize travel on closed routes or the creation of "volunteer routes", additional signs and other informative media can be used to direct recreationists to other locations, via designated routes, where the desired type of recreation exists. This would, however, increase workload demands on BLM staff to maintain signs along designated routes. Examples of this may occur in the Kramer sub region in the areas adjoining the community of Silver Lakes in areas north of Barstow in the Superior sub region.

Competitive Events: With the exception of the Barstow to Vegas and Johnson Valley to Parker races, and the use of "C routes" all competitive events have occurred in the OHV open areas since the CDCA Plan was adopted in 1980. The Barstow to Vegas and Johnson Valley to Parker races have not been run for nearly 15 years, so with the exception of the events that have used the "C Routes" near the Spangler OHV area, all competitive racing has been located within the OHV areas. Alternative A does not reduce the size of the OHV areas; therefore, the amount of land available for competitive events since the late 1980s would not be changed.

Both the 29 Palms Wild West Grand Prix and Adelanto Grand Prix are held entirely on private property that has previously been approved for sports activities such as this. As such, no effect is anticipated

Table 4-7 discusses the general effects of the proposed motorized vehicle access network on public access to each of the route subregions.

Table 4-7
General Impacts of Route Designations
On Motorized Vehicle Access

SUB REGION	DIRECT IMPACTS OF ROUTE DESIGNATIONS ON ACCESS OPPORTUNITY	INDIRECT IMPACTS OF ROUTE DESIGNATIONS ON ACCESS OPPORTUNITY:	NOTES
Coyote	Relatively more routes were closed in the area of Coyote Dry Lake and Superior Valley, providing less access in this area.	The general touring opportunities lost due to closures will shift such activities to other similar areas where such opportunities still exist, such as the northern portions of the Superior sub region.	Closures of routes in this sub region are moderate and primarily aimed at duplicity. The eastern legs of Coyote that surround the Soda Mountains WSA had moderate closures of routes and thus, less access to the WSA.
El Mirage	A proportionately higher number of route closures occurred in those areas characterized by "bajada" topography, limiting travel in this type of landscape. A proportionately higher number of routes were kept open in the more mountainous terrain. A proportionately higher number of routes were kept open in the more mountainous terrain, such as in the Shadow Mountains near Rabbit Hole Mine.	Route closures in the flatter topography will afford more buffer protection to the private properties that checkerboard the area, thereby reducing conflicts between different uses.	The network largely addresses recreational and environmental needs. Route closures in the flatter topography will shift some of that use to other areas where the concerns related to tortoise protection are not as high, e.g. to the El Mirage OHV Area, in particular the El Mirage Dry Lakebed.
El Paso	No change from the currently designated route system.	No change from the currently designated route system.	

Fremont	A proportionately higher number of route closures occurred in those areas characterized by "bajada" topography, limiting travel in this type of landscape. A proportionately higher number of routes were kept open in the more mountainous terrain of the northern portions of this sub region, including Gravel Hills, Hamburger Mill, and Fremont Peak Area.	Proportionately higher rates of route closures in high tortoise density areas in El Mirage, Kramer, and Superior sub regions should shift more activity to the more mountainous, historically popular northern portions of this sub region, e.g. Gravel Hills, Hamburger Mill.	Route designations considered historic recreation patterns and sensitive species concerns (particularly desert tortoise). The route system designated under this alternative both more accurately reflects and addresses both the access needs and environmental concerns of the entire planning area.
Juniper	Subregion is relatively small, with a viable route network serving recreational opportunity.	Subregion serves as a staging area for visitors from the Apple Valley wanting to recreate in the San Bernardino Mountains. One route of access would be through the Grapevine Canyon Area of this subregion into the Coyote Flat area of the San Bernardino National Forest, while another would be from the Juniper Flats area in the subregion into the Deep Creek area of the San Bernardino National Forest via the Pack Trail.	Good equestrian access from the Apple Valley to the San Bernardino National Forest through the Grapevine Canyon area, as well as into the Deep Creek area via the Pack Trail.
Kramer	A proportionately higher number of routes were closed in the flatter areas of Kramer where tortoise concerns were greatest, whereas in the historically more actively visited areas (e.g. Kramer Hills for rock-hounding and Iron Mountains for family camping) a proportionately higher number of routes were left open.	The large closure rate in southern Kramer will reduce the impacts from the Silver Lakes urban area and should allow for the continued existence of high tortoise densities in this area. In a like manner, the high route closure rate in the central and center-north portions of this sub region should facilitate the continued existence of healthy tortoise populations in this area.	Many of the routes crossing this sub region were created by race events in the 60's and 70's. Those events have since been shifted to the "Open Areas" designated for that purpose. Those routes and the Kramer subregion as a whole are not as popular as other areas for motorcycle use. Also because most of the sub region is comparative flat relative to other sub regions, it offers less interest for vehicle recreation. These factors make it conducive to emphasizing route designation that is more focused toward tortoise protection.
Middle Knob	The low-density route network in this sub region is planned for low closure and therefore a viable route network will continue and will provide access to mines, and for the servicing of utility corridors.	Low to moderate indirect impacts because of low level of route closure.	This area could have a special recreation demand because it offers recreational opportunity at higher elevations, such as in the Chuckwalla Mountains, which is over 5,000 feet, and Middle Knob peak at 6,000 feet.
Newberry – Rodman	Benefits from direct access from Interstate 40, which provides access to Newberry Mountains Wilderness, Rodman Mountains Wilderness, and the Johnson Valley OHV Area to the south.	Subregion is an access point to other areas of interest either within the subregion or surrounding it. Access would continue to be provided for touring, rock hounding, and visiting mining sites (such as Silver Cliffs Mine, Bell Mine, and Camp Rock Mine).	The subregion is bordered on the southeast by the Marine Corps Air Ground Combat Center.

Red Mountain	The rugged northern portions this sub region near 395 have a very high density of mine claims. In order to maintain this access need, relatively more routes were designated open in this area. In the flatter southern and eastern portions of this sub region tortoise concerns led to proportionately more route closures.	The greater closures in the eastern and southern portions of Red Mountain also will afford greater protections to the tortoise, but will hinder recreational opportunities. Recreational activity will therefore shift to the more mountainous areas of this and the Fremont sub regions where more recreational opportunity was maintained.	Route designation in this sub region like others that were located within desert tortoise critical habitat emphasized encouraging recreational opportunities in the more mountainous regions north of Twenty Mule Team Road by opening a more extensive network in those areas. On the other hand tortoise protection was facilitated by leaving relatively fewer routes open in the flatter bajadas terrain.
Superior	The relatively high number of route closures in those areas known for high tortoise concerns will reduce a variety of recreational opportunities in those areas. Many routes are closed in areas of low recreation interest and where sensitive areas occur such as the Rainbow Basin ACEC. Fewer closures in high value recreation areas.	The high level of route closures in those areas known for desert tortoise or Lane Mountain milk vetch should afford these species additional protection from a variety of vehicle-related impacts. The closures associated will also shift recreational use away from these generally flatter areas to areas where more recreational opportunities are facilitated by a denser open route network.	This largest of sub regions had both a diversity of recreational interests, as well as environmental concerns. The Superior Sub Region has a lot of flat area offering lower recreation value and greater habitat value for the tortoise. Therefore a high level of closures help the tortoise without significant impact to access opportunity

Most of the recreational needs and opportunities identified by the public take place in the more mountainous terrain of the planning area, such as the Gravel Hills in the Fremont subregion and the more mountainous areas of the Red Mountain subregion, while many of the more sensitive desert tortoise areas are located on the bajadas and in washes. The proposed network would take account of this by leaving relatively more routes open in rougher terrain (e.g. Kramer Hills, Gravel Hills, Hamburger Mill, Red Mountain, the Superior sub region hills north and east of Rainbow Basin), and impose relatively more closure in the flatter surrounding areas (e.g. in portions of the El Mirage, Kramer, Fremont, Red Mountain, and Superior subregions). The network would address other sensitive species concerns (which included many immobile plants) by avoidance.

Because the designated open route system is less than the entire inventoried network (including non-designated "volunteer or legacy" routes), visitor use on the designated routes would increase. Visitors would still be able to experience solitude in a number of natural areas due to the size of the area and the extensive open route network that would be provided. Examples of where this solitude can still be experienced occur in the wide open expanses of the Superior sub region.

The proposed network provides for relatively undiminished camping opportunities throughout the planning area. Campsites in the Iron Mountains, Kramer Hills, Gravel Hills, Hamburger Mill, the Pinnacles, and around Rainbow Basin, as well as a number of other areas would still be largely accessible to the public. The staging areas and trailheads associated with many of these campsites would remain available for equestrian endurance rides, rock hounding,

hiking, birding and hunting.

Abundant opportunities for both dual-sport motorcycle and 4WD touring still exist throughout the planning region. The network provides connectivity of routes by route type, such as single-track or two-track, enabling long touring routes to be created that would allow enabling visitors to travel over large areas. These recreational routes opportunities traverse a variety of landscapes. Thus, a visitor, whether on a dual sport motorcycle or SUV, may engage in multi-hour (e.g. through the Kramer Hills or up Mesquite Canyon through the Bonanza Gulch of the El Pasos) to multi-day tours (e.g. dual sport motorcycle rides starting in the El Mirage sub region and ending in the Ridgecrest sub region or SUV tours traveling along the many old historic roads that lace the planning area, such as the Mojave Road, the Spanish Trail, and Isham Road. Many of these historic roads are noteworthy for the distance and variety of terrain that they allow the experienced desert visitor to travel.

More challenging or more technical routes were also left in place wherever possible. Generally these were located in the more mountainous terrain, such as the Gravel Hills of the Fremont sub region or the Iron Mountains of the Kramer sub region. A greater number of routes tended to be left open in the more mountainous terrain, while more were closed in the bajadas and washes.

The needs of specific recreational interest groups would be met. These include:

?? *Rock hounds and gem collectors.* Access to a number of sites and destination areas identified as important during the planning process was retained. Some of these sites included spots in the Newberry-Rodman sub region, the Kramer Hills and a number of dispersed sites in the Superior sub region.

?? *Equestrians, including endurance race riders.* Access to staging areas is provided, and motorized routes that parallel equestrian endurance courses were, in many cases, retained as open routes. For example routes paralleling the Grass Valley and Golden Wilderness Areas often serve equestrians entering these wildernesses. This factor weighed prominently in keeping some of these routes open.

?? *Upland game hunters.* Routes that would enable volunteers (such as Quail Unlimited) and CDFG to maintain guzzlers were retained, as were other routes that served to access hunting areas that are only utilized during the fall hunting season. In particular a number of specific sites and their associated routes were identified in the Red Mountain sub regions.

?? *Informal and formal historic sightseeing societies.* Access to many old routes, mining sites, and homesteads that are of special interest to these organizations was retained. This is important because guidebooks, maps and magazine articles publicize these sites, making them popular destinations.

The route network would also meet commercial access needs, including access to the following:

?? Utility easements such as electrical transmission lines, communication towers (both public and military) and underground communication lines, pipeline corridors, support facilities, support and maintenance roads;

?? Ranching facilities including outbuildings, corrals, water tanks, wells, and service roads; and,

?? Mining facilities including tunnels, pits, buildings, claim stakes, and service roads.

Private property access would be provided to each known privately held parcel. Factors that were taken into consideration in determining the appropriate access route were the size and remoteness of the parcel, proximity to other areas of development and/or occupancy, topographic features (e.g. canyons or ridgelines) that might bisect the property and thereby necessitate two or points of access and safety issues. In one area, Homewood Canyon, known occupied parcels were afforded more than one point of access due to the risk of flash floods.

The proposed route network would have few unmet access needs. Although some areas, particularly those identified as having higher than average tortoise densities, may have substantially fewer routes than other areas, those routes that do remain open would provide access to meet inventoried needs. In some areas, however, access needs (primarily recreational) would be constrained due to resource needs. These would include portions of the following subregions:

?? The El Mirage subregion may lack motorcycle and vehicular touring opportunities in the bajadas north of the Shadow Mountain complex.

?? The Kramer subregion, both west and northwest of Silver Lakes, may not meet demands for general motorcycle recreation and touring.

?? The Red Mountain subregion west of Cuddeback Lake, where demands for general motorcycle, vehicle touring and camping opportunities would not be fully provided.

These shortfalls in recreational access would be compensated by available access for similar forms of recreation elsewhere. Vehicular and motorcycle touring opportunities would be abundant in many other sub regions where the resource issues are not such a major concern. Off highway vehicle open areas, moreover, would help absorb displaced demand for general motorcycle use.

Most of the Backcountry Discovery Trail System would be designated open. In those cases where certain BDTS routes were recommended for closure due to resource concerns, alternative open routes are available to maintain the continuity of BDTS.

The proposed network generally avoids dry lakebeds (such as Harper Dry Lake in south Fremont, Superior Dry Lake and Coyote Dry Lake). Routes would remain open on or around each dry lakebed only where necessary for efficient travel management, where necessary to meet a specific need of the area such as resource protection or public safety. No change is anticipated in the management of the Sunfair Dry Lake area. BLM manages only three-fourths of a section in this area. The vast majority of the area currently used for OHV use is held either privately or by San Bernardino County. San Bernardino County once planned on an OHV recreation facility at this area, but eventually abandoned these plans because of the cost associated with the management of such a site. Although recreational OHV visitor use has continued, there have not been any serious issues identified by either the county or BLM.

4.2.4 Cultural Resources

4.2.4.1 Activities That Would Affect Cultural Resources

Activities proposed in Alternative A that may affect cultural resources include the following listed actions.

?? Implementing actions such as construction of fences or culverts, placement of signs and kiosks, rehabilitation and restoration of routes or larger areas;

?? Designation of routes of travel as open to vehicle use if those routes occur on or near cultural resources; and

?? Decisions to continue use of existing designated routes that are located inside, near, or in the vicinity of cultural resources.

For many of these activities, significance of effect would be evaluated when specific actions are proposed and their locations are known. Specific actions would be subject to full compliance with cultural resource statues and regulations, and managers must not approve proposed activities until compliance with Section 106 of the National Historic Preservation Act has been completed and documented, including consultation with the State Historic Preservation Officer and federally recognized Indian tribes.

The effect of routes of travel on cultural resources has not been fully determined because information needed to assess effect is incomplete at the present time; however, records and observation indicate the effect on some sites is significant. Route designation would be reviewed under the Section 106 process, and a programmatic approach to Section 106 compliance for routes of travel within this planning area is being discussed with the California State Office of Historic Preservation.

4.2.4.2 Regional Analysis: Potential Areas of Conflict

Christmas Canyon ACEC: The 1985-87 route designations would be adopted for the portion of this ACEC outside the Spangler Hills Open Area. The effects of this designation process have not been determined and have not been subject to Section 106 consultation. Under Section 106 of the National Historic Preservation Act, effects of an action and proposed mitigation must be subject to consultation with the State Office of Historic Preservation prior to making a decision. Current on-going inventory within this ACEC has resulted in recordation of approximately 100 previously unknown archaeological sites and has identified the presence of an extremely significant complex of sites in the ACEC and in adjacent areas. Analysis of materials from these sites places them amongst the oldest known sites in the California Desert and throughout the United States. Route designation decisions here should fully consider impacts to or opportunities to protect these very important and very fragile cultural resources.

J**awbone/Butterbredt ACEC:** Routes within this ACEC have only recently been subject to partial Section 106 consultation. Inventory occurring now has resulted in recordation of more than 100 previously unknown sites within the ACEC and open areas contained within the ACEC. This data, still being processed, is likely to affect any existing designated route system. Sites within the ACEC are currently being affected by the designated route system, including the Dove Spring site (2.5 feet of artifact-bearing midden soil at the junction of three open routes). Several other significant sites are known to be suffering adverse impacts from designated routes.

Last Chance Canyon ACEC: The effects of the 1985-87 designated route system on cultural resources have not been determined because route inventories for cultural resources have not yet been carried out. This area has extremely high site densities and is part of the Last Chance Canyon National Register District. The decision to adopt this route system has not been subject to Section 106 requirements. The decision to retain existing route designation in this area would continue existing adverse effects for an unidentified length of time. Alternative A would implement by a Plan Amendment the ACEC decision to close the east access to Mesa Spring, which is a beneficial impact. Of greater importance at this site is a physical barrier to vehicle travel.

Wildlife Water Sources: A decision to leave existing artificial water sources in place and to continue to allow access to these facilities for maintenance would result in continuing impacts to some prehistoric sites. A number of guzzlers within the planning area have been built into significant prehistoric sites, including sites in the Last Chance Canyon National Register District and Red Mountain Spring National Register District. Recognition of on-going impacts to significant sites requires that efforts be made to reduce or eliminate the impacts under Section 110 of the National Historic Preservation Act. A decision to leave them there and continue their use and maintenance, rather than moving the activity elsewhere, would require mitigation of effects to the cultural properties being affected.

4.2.4.3 Off Road Vehicle Route Designation

Route designation has the greatest potential to both impact and protect significant cultural resources, depending upon the criteria used to designate routes as open or closed. A study of

impacts to cultural resources in the California Desert that was done in concert with preparation of the CDCA Plan identified the combined effects of vehicle routes and activities in and on archaeological sites and vandalism resulting from increased levels of access as OHV use became more popular as the greatest impact and greatest threat to cultural resources in the California Desert (Lyneis *et al.* 1980). This study referenced similar studies in other states that reached the same conclusions. Vehicle routes across or near archaeological sites affect those sites in various ways, depending upon the nature of the archaeological materials, the nature of the soils at the site and in the immediate vicinity, and the topography of the immediate area. Softer soils, and especially "midden" soils[1], are easily displaced by vehicle tires along with artifacts or other cultural materials that may be in the route. Artifacts and the soil matrix in which they exist may be displaced both horizontally and vertically as vehicle tires move through the soil. Artifacts such as projectile points, flakes, beads, pottery and other thin items of stone, bone, shell, etc. may be broken or crushed by the weight of vehicles passing over them. Under some conditions, larger stone objects such as manos and metates may be cracked and broken by vehicles. Subsurface features such as hearths or burials may be exposed either directly by vehicle use on the road, or indirectly by erosion channels created by vehicle use. Erosion of routes may affect sites that are off the route but downstream in the erosion channel. Vehicles passing each other or going wide to avoid ruts may gradually widen a route so that it cuts deeper into the portions of sites along the sides of routes. Routes through historic sites may also displace or damage artifacts in the road or immediately adjacent to the route. Effects may occur from the actions, both deliberate and inadvertent, of the occupants or operators of the vehicles, such as collection of artifacts or erosion as a result of the use of the route. Similar effects can also occur to cultural resources that fall within the 600-foot wide (300 feet on either side of the centerline) corridor along routes in which parking, camping, pulling off, etc. are allowed.

4.2.4.3.1 Effects Of Networks: Ridgecrest Field Office

Assumptions and Methods: Within the Ridgecrest Field Office Area, no cultural resources field inventory has been carried out on the proposed 2002 route designation updates. Assessment of effects is based upon data available in a GIS database system. This data includes the 1985-87 route designation system for all of the sub-regions subject to route designation and 2002 updates for Middle Knob and Red Mountain sub-regions. The database also includes static data from the California Historical Resources Information System generated over a year ago. New inventory and archaeological site data are not included in the database. Information in the database includes recorded prehistoric and historic site locations and areas that have been subject to cultural resources inventory. The accuracy of the following analysis is directly proportional to the accuracy of the digitized data available. Since this data has been collected over time from various sources and no field checking has been done, the accuracy is unknown. For purposes of analysis it is assumed that data in the GIS database accurately represents the locations of cultural resources and the locations of vehicle routes under consideration. The actual degree of accuracy/error is unknown. Since levels of archaeological inventory for the planning area in general are very low, 1% to 2% in most areas, the predictive value of the archaeological data is

1 "Midden" is a term used for the highly organic soils that form on some prehistoric habitation sites as a result of long-term or intense occupation of the site location.

low as well. For purposes of analysis, the width of routes was arbitrarily set at 10 feet on either side of the centerline, the centerline being the line in the GIS database that represented each particular route. This would, of course, be too narrow in some instances and too wide in others. Also for purposes of analysis, effects or potential effects of the 600-foot corridor (300 feet on each side) were analyzed. In some areas this corridor would be narrowed under actions proposed in this alternative. Finally, time constraints did not allow for determining whether or not all of the sites in the database are still in place. Some may have been subject to mitigation as a result of actions that have occurred since the sites were first recorded; however, it is unlikely that the bulk of the sites have been evaluated for significance or subject to any data recovery.

The impact to cultural resources within the Barstow Field Office Area by the route network proposed in Alternative A was evaluated using 7.5 minute quadrangle maps and overlays. GIS route data was not available; therefore, due to time constraints, analysis was restricted to proposed open routes.

Sub-regions selected for route designation updates in the Ridgecrest Field Office area include Red Mountain, Middle Knob, Fremont, Ridgecrest and El Paso. Updated route networks were available for analysis of Red Mountain and Middle Knob. The other sub-regions would continue with the 1985-87 or other previous route designations, either permanently or (in the case of Ridgecrest and El Paso) until the completion of the El Paso Collaborative Access Planning Area process.

Red Mountain Subregion: In the Red Mountain sub-region three recorded sites are directly bisected by routes contained within the 2002 digitized route system. One of these routes, RM-1184, would be closed under the proposed 2002 route designation system. The site on this route was recorded in 1976 as a small milling station, with no more recent data available. Although this particular route is proposed for closure, use of the route may have already affected the site.

Three routes proposed for open designation intersect inside the Blackwater Well National Register District and inside the boundaries of the primary prehistoric habitation site (first recorded in the 1930s) that is the focal point of the National Register district. Use of the sites within the district "extended from about 1200 B.C or earlier to possibly as late as A.D. 1820. The main village itself, designated CA-SBR-2322, has been described as 'one of the richest archaeological sites in the California desert' (Hickson 1978:7)" (Blackwater Well National Register Nomination Form). The site is about three acres in size and about one meter deep. The three routes, which intersect on top of the village site, have caused considerable damage to the site; continued use of the routes would result in continued deterioration of the site. Since the primary goal in National Register districts is preservation of significant cultural resources, avoidance of impacts by closing the routes would be the most appropriate option. If the routes were designated open, mitigation of effects in the form of scientific data recovery and analysis would be required under Section 106 of the National Historic Preservation Act. Continued degradation of the site and scientific data recovery may both have impacts on Native American values attached to the site. Loss of the site would preclude on-site public interpretation/education opportunities. One of the same three

routes intersects a second site inside the National Register district, SBr-10278, a milling station described as in fair condition when recorded in 1978. The artifacts recorded on the surface are all small and lightweight enough to be easily damaged or scattered by vehicle use of the road through the site. Sites within the district may well also fall within "existing disturbed areas" along routes in which camping and parking would be allowed under Alternative A. Field inventory would be required to determine how many sites within the district would be subject to impact under Alternative A. Almost all of the known sites within the district have fallen within the existing 600-foot corridor along routes for camping, stopping and parking, so all of the sites within the district have already been impacted to some degree by the existing route network. Because effects to cultural resources from vehicle access can occur beyond established vehicle corridors, route designation within the National Register district should be re-evaluated, taking into consideration the effects of travel, vehicle use, and related activities on archaeological properties inside the district.

The GIS database indicates an additional 22 archaeological sites that fall within the existing 600-foot corridor allowed for camping, parking and stoping. These sites include temporary campsites, roasting pits, milling (food processing) sites, petroglyphs, and habitation sites. Some are within the Red Mountain Spring ACEC and the partially over-lapping National Register district. These sites have already been impacted by vehicle activity along the routes. Seventeen of these sites are along routes proposed for open designation under the current plan, including RM2018, RM2001, RM2036, RM2034 (three sites along this route), RM2051, RM4001, RM3021, RM2017, RM2020, RM2018, RM2051, and RM2129. Reduction of the corridor width to 100 feet (50 feet on either side of the centerline) may decrease the number of known sites within corridors of vehicle use but even sites that are no longer within the corridors would have already suffered some degree of damage. Time constraints did not allow for full analysis of how changing the corridor width would affect impacts to cultural resources. The actual number of sites that have been affected and would be affected by the route network system is unknown due to the very low level of inventory in the area and due to the fact that impacts from vehicle access can extend beyond the allowed vehicle corridor.

In the absence of valid levels of inventory a certain amount of prediction regarding archaeological site densities in the Red Mountain sub-region and consequent levels of impact to cultural resources within vehicle corridors can be made using cultural resource sensitivity polygons based upon inventory for the CDCA Plan. These sensitivity polygons identify areas in which the potential for significant cultural resources is considered to be high or very high in relationship to surrounding areas. Documentation justifying a determination of high or very high sensitivity was based upon such factors as number of recorded sites, types of sites, diversity of sites within an area, uniqueness/rarity of known sites, scientific value, aesthetic value, integrity of known sites and their surroundings, socio-cultural and Native American concerns, and similar values. Predictive site densities for the Red Mountain planning unit run around 4.5 sites per square mile. Inside the sensitivity polygons site densities are expected to be higher than this average. Approximately 270 miles of route and 10,118 acres of route corridor fall inside the high/very high sensitivity polygons. It is expected that some degree of impact has occurred to cultural resources within these areas. Of these routes, 162 miles would be designated as open

under this alternative. The 600-foot route corridor would amount to 7,791 acres. This alternative would reduce levels of impact to resources on approximately 3,000 acres if the route corridors stayed at 600 feet. Currently available data does not allow for finer definition of impact over the sub-region as a whole.

Middle Knob Subregion: Five routes proposed for open designation, MK0010, MK0013, MK0014, MK0016, and MK0019, intersect recorded archaeological sites. MK0010 intersects 12 recorded sites, MK0013 two recorded sites, and the other three routes intersect one recorded site each. Site types intersected by these routes include a series of prehistoric lithic scatters at which stone was quarried and worked into tools. Some of these sites are very large and were observed to contain formed tools as well as scatters of flakes and cores that are the detritus of making stone tools. One stretches for 400 meters along a route. Some contain evidence of use as temporary campsites for collection of resources other than tool stone. One site is a historic site containing segments of historic routes, structures, and debris scatters that date from 1848 to the present. Many of the site records note vehicle damage. An additional 5 sites are recorded within 600-foot corridors along proposed open routes. A short route segment that is proposed for closure bisects one additional site, a lithic scatter that covers over 5000 square meters. The site record indicates some damage has already occurred to the site.

For predictive purposes, approximately 15 miles of route (approximately 3,000 acres of route corridor) that is proposed for open designation fall within areas that have been determined to be of high or very high sensitivity for cultural resources as a result of the CDCA Plan inventory. Given the number of known sites in the sub-region and the low level of inventory it is likely that many more sites would be found along existing routes.

East Sierra, Fremont, North Searles and South Searles Subregions: These four sub-regions would retain existing route designations. A number of open routes within these sub-regions cross significant archaeological sites and are causing damage, sometimes severe, to the resources. The GIS database shows 15 sites that are bisected by open routes. These sites include eight large permanent or semi-permanent prehistoric occupation sites (villages) that are characterized by the presence of flaked stone tools, milling tools, fire-affected rock, hearths, and in some cases, house depressions and pottery sherds, and midden to a depth of more than 100 centimeters. Although none of these sites have been formally evaluated it is likely that all would be found eligible for listing in the National Register of Historic Places. Some of these sites are crossed by several routes and all of the site records indicate damage, usually severe. These sites occur in Ninemile Canyon, Grapevine Canyon, Sand Canyon, Indian Wells Canyon, Freeman Canyon, and the Little Lake area. It is highly likely that other such sites exist in these same canyons or other canyons on the Eastern Sierra front. Recent inventory of the Los Angeles Aqueduct and transmission line (in process) resulted in recordation of over 300 sites that have not yet been entered into the currently available database.

Recent inventory in the Searles Lake area has resulted in location of approximately 100 previously recorded sites, all prehistoric, but the data is still in preparation and is not available for current analysis. It does indicate the potential for very high site densities around Searles Lake.

Thirty-four sites fall within the 600-foot corridor open to parking and camping. This number includes those already listed as bisected by the routes. Many of the routes in use today follow historic routes and the impact to the historic routes has not often been formally assessed. In many cases the historic routes have been obliterated by later use. About 100 miles of linear cultural resources (out of a total of 571 miles of linear cultural resources within the sub-region) match currently open routes.

Within the sub-regions, 36,013 acres within the four sub-regions have been identified as having high or very high sensitivity for cultural resources. Within these areas there are 284.3 miles of open route and 8908.54 acres of route corridor. Most of these routes have not been inventoried for cultural resources. Site densities from the California Desert Conservation Area Plan inventory averaged around 4.5 sites per square mile but are higher in some areas.

California Back Country Discovery Trail: Although routes identified for inclusion in the CBCDT have been incorporated into the West Mojave Plan, cultural resources inventory has not been carried out on the CBCDT as a whole within the Ridgecrest Field Office Area. Impacts from this trail cannot be assessed until the inventory has been conducted.

El Paso and Ridgecrest Subregions: Retention of the existing 1985-87 designations until completion of the El Paso Collaborative Access Planning Area process would continue existing impacts, in some cases severe, to properties listed in the National Register of Historic Places. The El Paso Mountains contain a 110-square-mile National Register district, the first listed National Register district in the California Desert, and a cultural resource ACEC.

The currently available GIS data shows five recorded National Register properties in the El Paso Mountains that are bisected by existing open routes of travel. These sites occur on routes EP-0155, 7101, 5146, 5151, 6231, 0238, 0421, 0471, and 0469. Some of the sites are bisected by or adjacent to more than one route. The five sites include a stone workshop/quarry with flakes, formed tools and groundstone; a temporary habitation/quarry/workshop with flakes, formed tools, millingstones, hearths, and a rock ring which is a possible dwelling foundation; a "large temporary campsite with pockets of midden exposed in the road", fire-affected rock (hearths), lithic scatter, and groundstone that is over 5000 meters square; and a temporary campsite with bedrock milling slicks, lithic scatter, and petroglyphs. One of these sites also contains historic mining materials. Most of the records for these sites indicate that presence of the route has caused damage to the site. Two additional sites containing midden, flake scatters, groundstone, and rock rings have recently been recorded inside the boundaries of the National Register district but have not been added to the GIS database. Existing open routes bisect both of these sites. At one of these sites erosion from vehicle tracks in the road is causing loss of soil and artifacts from the site. Routes, including EP-0226, 2143, and 4144, bisect several recorded sites in the vicinity of Sheep Spring, including two habitation sites with midden soils. The combination of high site densities and low inventory levels indicates that there are probably many more unrecorded sites that are bisected by routes.

GIS analysis identified 43 recorded archaeological sites that lie within the 600-foot corridor along open routes in which vehicle parking, camping, etc. are allowed. Nearly all of these sites are within the boundaries of the National Register district. Site densities from the CDCA Plan inventory averaged around four sites per square mile but are probably much higher in some areas and may be much higher in general throughout the El Paso Mountains. One sensitivity polygon contains 143 recorded sites. One hundred eighty-six open routes fall partially or completely inside high and very high sensitivity polygons, which are primarily within the National Register district. Most of these routes have not been inventoried for cultural resources. There are 247.6 miles of open route and 10,808 acres of open route corridor inside high/very high cultural resource sensitivity polygons, almost all of which are inside the National Register district. There are 440.8 miles of open route in the El Paso sub-region. This means that of the 31,156.98 total acres within the El Paso sub-region, 24,157.1 acres fall within 300 feet of an open route and are therefore subject to impacts from use of open routes and adjacent areas. These figures make it highly probable that a great deal more damage is occurring to National Register properties than has been formally identified. The above analysis does not include effects to archaeological resources from vandalism, artifact theft, and other types of activities that tend to occur along vehicle access corridors but these activities have been a continual problem in the El Paso Mountains for decades.

4.2.4.3.2 Effects Of Networks: Barstow Field Office

The Barstow Field Office area includes nine subregions for route designation. The following discussion summarizes those effects.

Afton Subregion: In the Afton Sub-region, nine routes intersect with several habitation sites, a village site, and the Mojave Road (SBR3033H/CHL963) a historic landmark.

Coyote Subregion: Approximately 84 routes intersect historic and prehistoric resources in this sub-region. Multiple lithic scatters, lithic reduction sites, stone alignments, road, lithic quarries, rock shelters (SBR7185, SBR2167), and habitation/cremations sites are present. There are also four significant sites, either historic landmarks or eligible for the National Register of Historic Places. These include the Mormon Trail (CHL577/SBR4411H), Boulder Transmission line (NRHP-E-SBR7694H), Borate-Calico Hills (CPHI-SBR54), and the Hoover Dam to Los Angeles transmission lines (NRHP-E-PSBR38H).

Bighorn Subregion: Three springs, rock art, pottery, habitation sites, and lithics characterize the cultural resources in this sub-region. Terrace Springs (SBR4038), Rattlesnake Spring (SBR4039), and a village near Old Woman Spring (SBR25) have open routes leading directly to them, and disturbance of cultural remains has occurred. Further degradation is likely should these route remain open. Sixteen routes intersect cultural resources in this region.

Granite Subregion: This sub-region contains various lithic scatters, lithic reduction sites, and trails. The most currently significant trail is the Mormon Trail (CHL577/SBR4411H). Additionally, the Boulder Dam to Los Angeles Power lines (NRHP-E-SBR7694H), a National

Register eligible property, are found in this area. Twelve open routes intersect, or run parallel to, cultural resources in the sub-region.

Juniper Subregion: Bureau of Land Management records indicate that no known cultural resources are directly impacted by open routes of Alternative A.

Newberry-Rodman Subregion: Twenty-two routes were found to intersect or parallel a variety of cultural resources. Impacted sites include the Boulder Transmission lines 1, 2, 3 (SBR7694H), rock shelters, rock art, lithic quarries, mining sites, and historic graffiti.

Ord Subregion: There are rock art sites, lithic scatters, habitation sites, and historic graffiti located within this sub-region. Alternative A route maps show seven routes that intersect these cultural resources.

Sleeping Beauty Subregion: Three National Register eligible properties are found in the Sleeping Beauty sub-region, the Mojave Road (SBR3033H/CHL963), the Hoover Dam to Los Angeles transmission lines (NRHP-E-PSBR38H), and the ATS&F Railroad (NRHP-E-SBR6693H). Other cultural resources in this area include village sites, road, railroad grades, lithic quarries, and rock shelters. Thirty-one routes intersect these prehistoric and historic resources.

Superior Subregion: Approximately sixty-six Alternative A routes intersect a variety of rock art sites, lithic reduction, scatter, and quarry sites, historic mining sites, camps, and an airplane crash site (SBR800H). Several National Register eligible properties are located here, including the Goldstone Historic Mining District (NRHP-E-[80-5]), a lithic scatter/town site (NRHP-E-SBR4347/H), and a historic power transmission line (NRHP-E-PSBR39H).

Implementation of Route Network: Rehabilitation/reclamation of routes that are designated closed and maintenance of routes that are designated open would affect archaeological resources along those routes and should not be undertaken until cultural resources inventories and evaluations have taken place

Cumulative Impacts: Cumulative impacts to cultural resources would be significant if there are adverse effects that cannot be resolved through consultation between the BLM, California State Historic Preservation Officer, other consulting parties, and Advisory Council on Historic Preservation, if the latter joins the consultation. Resolution of adverse effect may include measures that would avoid, minimize, or mitigate adversity. Mitigation may include archaeological data recovery and architectural recordation.

The total number of prehistoric/historic sites that are being affected by the open route network is unknown but certainly number in the hundreds, perhaps thousands, of sites. Most of these sites are being affected by routes designated during the 1985-87 route designation process, so the impacts have been occurring for a very long period of time. Since these routes would remain as open routes over much of planning area the impacts would occur under West Mojave

Plan implementation. Cultural resources are a finite and non-renewable resource. The loss is irrevocable. Opportunities for the public to view these sites in their natural surroundings and to experience the sense of exploration, adventure, and understanding that comes with observing them *in situ* are permanently lost. Our ability to provide educational and interpretive opportunities is decreased with the loss of each site or portion thereof. Prehistoric sites are repositories of cultural information about people who lived here into the far distant past and are of very great value and concern to Native American people today. Continued destruction removes pieces of our past on a daily basis.

4.3 ALTERNATIVE B: ENHANCED ECOSYSTEM PROTECTION

4.3.1 Air Quality, Soils and Water

Impacts would be as described for Alternative A, except as specifically noted below, for air quality in Table 4-8.

Table 4-8
Air Quality Impacts – Alternative B

ACTIVITY	POLLUTANT(S)	CHANGE DIRECTION	MAGNITUDE	TIME SCALE	LOCATION(S)	NOTES
Vehicle routes	PM_{10}	Decrease	Slight	Short & long term	Johnson to Stoddard Valley area	Due to elimination of vehicle corridor
Vehicle restrictions	PM_{10}	Decrease	Slight	Short & long term	Within biologically sensitive areas	Due to requirement for street legal vehicles.

4.3.2 Biological Resources

4.3.2.1 Natural Communities

The restriction within Alternative B of certain MAZ areas to street-legal vehicles would probably beneficially impact the most common creosote bush scrub and saltbush communities in those areas by preventing degradation of the surface by off-road travel.

4.3.2.2 Desert Tortoise

Excepting minor differences, Alternative B shares the same beneficial and adverse impacts associated with Alternative A, which for the most part, are not reiterated in Table 4-9.

Table 4-9

Tortoise Impacts of Alternative B (Enhanced Ecosystem Protection)

BENEFICIAL IMPACTS	ADVERSE IMPACTS
DROUGHT	
Motorized Vehicle Access ? Establishing vehicle use, quarantine areas in higher density tortoise areas during drought would serve to alleviate additional impacts to tortoises that are already physiologically stressed due to lack of water and poor nutrition	Motorized Vehicle Access
MOTORIZED VEHICLE ACCESS NETWORK	
? See Multiple Use Class and Drought sections above ? (AD-33) The closure of identified MAZs (see chapter 2) to all but street-legal vehicles would have a significant beneficial impact of prohibiting the types of vehicles most likely to drive cross-country (e.g., dirt bikes, dune buggies, etc.) from tortoise conservation areas. This would likely minimize impacts to tortoises, but be particularly important to habitats, which are less likely to be degraded if vehicles remain on roads.	? (AD-33) The intended function of restricting vehicle travel to street-legal vehicles would only be viable if increased law enforcement is present to enforce the new rule. Street-legal vehicles, including 4-wheel drive trucks

Alternative B necessarily places tortoise conservation and recovery as the highest priorities for land management. In comparing this alternative to Alternative A, Alternative B has both major advantages and neutral advantages. Establishing vehicle quarantine areas in higher concentration areas during drought would be substantially more protective, and significantly augment the limited number of things that can be done relative to drought. Restricting vehicle use to "street legal" vehicles in important habitat areas would also provide a major advantage over Alternative A.

4.3.2.3 Mohave Ground Squirrel

Alternative B would implement protective measures identified similar to those of Alternative A for both the tortoise and MGS, and is intended to provide for enhanced MGS conservation on both public and private lands. The analysis is meaningful, as most of the measures were identified for the tortoise, and this is an opportunity to see if enhanced tortoise protection would extend to the MGS. Table 4-10 reports only those beneficial and adverse impacts as they relate to MGS conservation that are different from the impacts identified under Alternatives A and C for the tortoise and MGS. As such, the programs listed above are not reiterated in the table.

Table 4-10
Mohave Ground Squirrel Impacts of Alternative B

BENEFICIAL IMPACTS	ADVERSE IMPACTS

Motorized Vehicle Access ? The motorized vehicle access network proposed for Alternative A would be implemented under Alternative D and have the same beneficial impacts identified above. ? (AD-33) Based on available data, requiring additional motorized vehicle access restrictions in the following MAZ's would predictably benefit MGS conservation: (a) Little Dixie Wash area: El Paso SS2, and the non-MAZ area north of the El Paso Mountains Wilderness Area, between Ridgecrest SS1 and El Paso SS2. (b) Cuddeback Dry Lake/Pilot Knob area: Red Mountain SS3 and SS4. And (c) Coolgardie Mesa/Superior Valley area: Superior SS3 and SS5. ? (AD-35) During periods of prolonged drought (lasting three or more years), the BLM would consider emergency route closures (generally referred to as "quarantine areas") in the following potential MGS concentration areas (would apply to the MAZs given above): (a) Little Dixie Wash area, between the Sierra Nevada and Ridgecrest/Inyokern; (b) Cuddeback Dry Lake/Pilot Knob area; (c) Coolgardie Mesa/Superior Valley area. ? Such quarantines would be lifted immediately following break of the drought, which would be identified by the Implementation Team in coordination with BLM, USFWS, and CDFG.	Motorized Vehicle Access ? (AD-33, AD-35) Closure of other areas would likely benefit MGS conservation, but there are insufficient data to determine where such areas may be located.

4.3.2.4 Bats

Impacts to bats under Alternative B would be as described for Alternative A.

4.3.2.5 Other Mammals

Impacts to the Mojave River vole and yellow-eared pocket mouse would be as described for Alternative A.

Impacts to bighorn under Alternative B would be essentially as described for Alternative A. Restriction on travel in the Newberry-Rodman MAZ area to street legal vehicles may have a small additional beneficial impact to bighorn.

4.3.2.6 Birds

For the following birds, impacts would be the same as described for Alternative A: Inyo California towhee, western snowy plover (nesting season only).

The following birds would receive a small additional benefit from Alternative B because of the restrictions within certain MAZ areas to street-legal vehicles only: golden eagle, prairie falcon.

The following birds would receive a substantial additional benefit from Alternative B because of the restrictions within certain MAZ areas to street-legal vehicles only: Bendire's thrasher, burrowing owl, LeConte's thrasher.

4.3.2.7 Reptiles

Impacts would be as described for Alternative A for the Panamint alligator lizard and San Diego horned lizard. Alternative B would be substantially more beneficial than Alternative A to the Mojave fringe-toed lizard because of the restrictions in certain MAZ areas to street-legal vehicles.

4.3.2.8 Plants

For the following plants, impacts would be the same as described for Alternative A: carbonate endemic plants, Charlotte's phacelia, Kelso Creek monkeyflower, Kern buckwheat, Little San Bernardino Mountains gilia, Mojave monkeyflower, Mojave tarplant, Red Rock poppy, Red Rock tarplant, Shockley's rock-cress, short-jointbeavertail cactus, triple-ribbed milkvetch, and white-margined beardtongue.

For the following plants, Alternative B would be substantially more beneficial than Alternative A because of the restrictions in certain MAZ areas to street-legal vehicles: Barstow woolly sunflower, crucifixion thorn, desert cymopterus, Lane Mountain milkvetch, Parish's phacelia.

4.3.2.9 Cumulative Biological Impacts

Alternative B would have fewer cumulative impacts to biological resources because of the restrictions on green sticker vehicles and the emergency closures in response to drought. These measures would reduce degradation of the habitat from off-road travel both during normal years and drought years.

When placed in context of other developments within the West Mojave, including increased land development, mining and increased recreational use of habitat lands that may cumulatively impact the habitat, the reduction in surface disturbance by the additional restrictions on vehicle use would be more beneficial than measures of Alternative A.

4.3.3 Recreation

Alternative B shares many of the same beneficial and adverse impacts on the motorized route network as Alternative A. Alternative B does have a number of unique management prescriptions that cause it to differ substantially from Alternative A. Some of these management prescriptions will affect the designated open motorized route network and various recreational and commercial opportunities that are dependent upon motorized access.

During periods of drought vehicle use quarantine areas would be established. These quarantine areas would be established with the intent of alleviating additional impacts to tortoises that are already physiologically stressed due to lack of water and poor nutrition. The precise impact of these quarantines upon vehicular use of the motorized route network and recreational and commercial activities is unpredictable, but is likely to be very profound. Both the length and geographical extent of the quarantine would be defined at the time the quarantine is imposed, which would be dictated by the severity and extent of the drought. The direct effects of this quarantine would be the lack of vehicular access to potentially vast areas. The indirect effects of quarantine are also likely to be profound, as major shifts in recreational activity would occur, resulting in a much more intensive and concentrated use of non-quarantine areas. This in turn could lead to increased visitor conflicts, route proliferation in these "spill over" areas and increased resource damage.

Under this alternative non-street legal or "Green Sticker" vehicles would be restricted from entering several Motorized Access Zones, due to the presence of sensitive tortoise populations or habitat. This would immediately reduce the number of recreational opportunities currently available to dune buggies, rails, quads, ATCs, and dirt bikes. As a result these vehicles would increasingly use areas outside of these restricted MAZs. This shift would tend to be from landscapes characterized by "bajadas and washes" to more mountainous terrains (i.e. with slopes greater than 20% slope and/or with elevations in excess of approximately 3500 feet). In addition, there is likely to be much more intensive and concentrated use of such "spill-over" areas as the Open Areas, the El Pasos, and portions of the Red Mountain and Fremont sub regions. This in turn could lead to increased visitor conflicts and route proliferation "spill over" areas.

4.3.4 Cultural Resources

Since the motorized vehicle access network would be the same as Alternative A, impacts would be the same as those identified in Alternative A.

4.4 ALTERNATIVE C: ENHANCED RECREATION OPPORTUNITIES

4.4.1 Air Quality, Soils and Water

Impacts would be as described for Alternative A, except as specifically described below.

4.4.1.1 Air Quality

The expanded motorized vehicle recreation proposed in Alternative E would result in increased emissions of particulate mater including PM_{10}. Estimates of emissions from this type of activity requires inputs on the number of additional miles traveled on unpaved roads, the type of vehicle and the speed of the vehicle in addition to the amount surface area exposed to wind

erosion. Estimates for most of these factors are not available. A rough estimate of the wind erosion emissions from the proposed Fremont Recreation Area can be derived from MDAQMD inventory data. They show the Spangler Hills Open Area has approximately 300 miles of roads. Using the MDAQMD average widths and emission factors, the Spangler Hills area could emit around 900 tons of PM_{10} per year as a result of wind erosion. As the Fremont Recreation Area's size is similar, comparable wind erosion figures could be expected. Additional emissions could be expected from vehicle travel on the additional open vehicle routes proposed.

Cumulative Impacts: Most of the proposed increased OHV activity and disturbed ground would occur within the Mojave Desert PM_{10} Federal Nonattainment Area. The activity would result in increased concentrations of PM_{10} in the atmosphere. The increased concentrations combined with the existing PM_{10} emissions in the Mojave Desert PM_{10} Plan Area could result in violations of NAAQS.

Significance: Alternative E would result in significant negative impacts on air quality. It could cause or contribute to new violations of the National Ambient Air Quality Standards, increase the frequency or severity of existing violations of NAAQS and/or delay timely attainment of the NAAQS. The activity does not conform to the applicable implementation plan (federal conformity). In addition, the MDAQMD significant thresholds for particulate Matter (PM_{10}) of 15 tons per year would be exceeded. It is unlikely that the expected impacts could be mitigated to less than significant.

Conformity Analysis and Conclusions: Federal conformity rules require that federal managers make a determination that a proposed activity conforms to the implementation plan and not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of NAAQS and/or delay timely attainment of the NAAQS. Alternative E as proposed could not be approved because it does not conform and the impacts cannot be mitigated to conform or be reduced to less than significant.

4.4.2 Biological Resources

4.4.2.1 Natural Communities

Impacts to natural communities under Alternative C would be as described for Alternative A, except as follows:

?? A greater level of degradation to creosote bush scrub, saltbush scrub, desert wash scrub and Mojave mixed woody scrub would result from creation of the Fremont Recreation Area.

4.4.2.2 Desert Tortoise

Alternative C's impacts, insofar as they differ from Alternative A, are described by Table 4-11.

Table 4-11
Tortoise Impacts of Alternative C (Enhanced Recreation)

BENEFICIAL IMPACTS	ADVERSE IMPACTS
MOTORIZED VEHICLE ACCESS NETWORK	
Overall Importance ? Designating and implementing a motorized vehicle access network that is supported by land use laws and compatible with tortoise recovery would be substantially more important if this alternative is to function to minimize and mitigate impacts	Overall Importance
Route Reductions in Specified Regions ? Within *higher density areas*, the network would result in the closure of 313 linear miles of routes (out of 727 linear miles), which is a 43% reduction of routes in this area. This would have immediate and long-term benefits where tortoises are most abundant ? Within *lower density areas*, the network would result in the overall reduction of 488 linear miles of routes (out of 1,332 linear miles), which is a 37% reduction of routes in this area. This would have immediate benefits to habitat and long-term benefits to overall conservation ? Within *above-average vehicle disturbance areas*, there are a total of 353 linear miles of existing routes, 156 linear miles (44%) of which would be closed.	Route Reductions in Specified Regions ? The remaining 414 linear miles of open routes (57% in area) in *higher density areas* would continue to result in impacts, and put tortoises in harm's way in the places where they are most likely to be adversely affected ? The remaining 844 linear miles of open routes (63%) in *lower density areas* would continue to result in impacts to the few remaining animals, which are critical for re-establishing reduced or extirpated populations ? The remaining 197 linear miles within *above-average vehicle disturbance areas* (56%) would remain open and continue to put tortoises in harm's way where traditional vehicle impacts are shown to be most prevalent
RECREATION ACTIVITIES	
Competitive "C" Routes in Spangler Hills	Competitive "C" Routes in Spangler Hills ? "C" Routes are associated with the Spangler Hills Open Area, were used for competitive events originating and ending in the open area but extending into adjacent areas, and became no longer available as a result of the recent settlement between the BLM and Center for Biological Diversity. Reopening these routes will result in impacts both inside and outside the open area

Creation of New Fremont Recreation Area ? 53 mi^2 of Class L lands would be converted to Class M, which would result in relatively more impacts, but not as severe as would occur if the area was newly designated as Class I (the status of official BLM open areas) ? Although establishing the new recreation area would constitute a significant impact (see right column), impacts would be relatively less significant than if the area were being designated as an Open Area	Creation of New Fremont Recreation Area ? Creating the new Fremont Recreation Area on 53 mi^2, all of which is critical habitat, would constitute a significant adverse impact, more so to essential habitat than to resident tortoises, which are largely extirpated from the region; although no higher density tortoise areas would be affected, there are also no higher density human use areas (excepting areas around the south part of Cuddeback Lake, east of Fremont Peak), so much of the habitat is relatively undegraded ? The new recreation area designation would result in concentrated and elevated vehicle use that would not be compatible with tortoise recovery, and would result in degradation of critical habitat ? Severity of impacts would be dependent on authorized and restricted uses given in the recreation area management plan to be prepared for the area. If the management plan allows for off-road travel adjacent to the route instead of restricting vehicles to the racecourse route, for example, the impacts would be relatively more severe. In either case, the new recreation area would receive more vehicle use and result in more cross-country travel, litter and garbage (with a likely increase of ravens), camping, and other activities that would adversely affect tortoises and habitat ? Relatively more approved routes would have a concomitant level of impact to tortoises and habitat than if fewer routes were designated as open

4.4.2.3 Mohave Ground Squirrel

Similar beneficial and adverse impacts given for the tortoise and/or MGS in Alternative A would affect motorized vehicle access. Table 4-12 reports only those beneficial and adverse impacts as they relate to MGS conservation that are different from the impacts identified under previous alternatives for the MGS and tortoise.

Table 4-12
Mohave Ground Squirrel Impacts of Alternative C

ALTERNATIVE E – ENHANCED RECREATIONAL OPPORTUNITIES	
BENEFICIAL IMPACTS	ADVERSE IMPACTS
Recreation *Existing Open Areas and New Recreational Areas* ? (AE-6) Although establishing the Fremont Recreation Area would constitute a significant adverse impact (see right), the impacts would be concomitantly more severe if the recreation area were being designated as an open area.	Recreation *Existing Open Areas and New Recreational Areas* ? (AE-6) The newly established Fremont Recreation Area would occur fully within the MGS range and promote cross-country travel and OHV impacts over 53 mi^2 and adjacent areas. ? (AE-6) Changing class L to class M, allowing for competitive events, increased camping, and emphasizing vehicle access by allowing for a denser network of trails, etc. would all promote uses that result in habitat degradation (likely) and loss of animals (less likely).

4.4.2.4 Bats

Impacts from Alternative C would be as described for Alternative A.

4.4.2.5 Other Mammals

Impacts on bighorn sheep, the Mojave River vole and the yellow-eared pocket mouse would be as described for Alternative A.

4.4.2.6 Birds

Burrowing owls would be vulnerable to a potential for increased impacts from recreation. The magnitude of these impacts is unknown. Le Conte's thrashers would experience increased disturbance to occupied habitat.

Impacts on all other birds would be as described for Alternative A.

4.4.2.7 Reptiles

Impacts on unlisted reptiles would be as described for Alternative A.

4.4.2.8 Plants

Impacts would be as described for Alternative A for the all covered plants species except those discussed below.

Barstow Woolly Sunflower: One primary motorcycle route would pass through the center of the Barstow woolly sunflower conservation area. Location of this enduro corridor here would increase the risk of damage to plants, in the event riders strayed from the route.

Desert Cymopterus: A known population of the desert cymopterus is located to the northeast of Cuddeback Lake. This is overlaps the proposed Fremont Recreation Area, a region proposed for higher-density motorized vehicle access. Although this would not be a new open area, a higher risk of damage exists from inadvertent straying off of designated routes by off-road vehicles.

4.4.3 Recreation

Alternative C shares many of the same beneficial and adverse impacts on the motorized route network as Alternative A. Alternative B does have a number of unique management prescriptions that cause it to differ from Alternative A. Some of these management prescriptions will affect the designated open motorized route network and various recreational and commercial opportunities that are dependent upon motorized access.

Competitive "C" routes would be re-established in the Spangler Hills. This would expand opportunities for those forms of competitive motorcycle recreation afforded by these routes. A Fremont Recreation Area would also be established. The net impact on the designated open motorized route system would be negligible in that the same open route system designated in Alternative A would be utilized in this area. The net impact on recreational opportunity would probably be negligible in the short term, but more substantial in the long term in that the designation of the area as a Recreation Area would give some surety into the future that this area would be managed primarily for the recreational opportunities and resources. Recreational use of the area could increase as this fact became more widely known due to the Recreation Area designation.

4.4.4 Cultural Resources

Expansion of the Spangler Hills Open Area would expose archaeological resources on these acres to uncontrolled vehicle use. The CDCA Plan inventory data indicated that site densities in this area average around 4.5 sites per square mile. A decision to open this area would require inventory of the expansion area and mitigation of impacts to affected cultural resources. It would result in loss of any significant resources in the area. Lack of inventory precludes more detailed description at this time. Similar impacts and requirements for inventory and mitigation would apply to the establishment of a Fremont Recreation Area near Cuddeback Lake. Establishment of a corridor for enduro events would impact cultural resources in the corridor but without a specifically identified route the nature and extent of such impacts cannot be predicted. Since this alternative would use the motorized vehicle access network described in Alternative A those impacts would be the same.

4.5 ALTERNATIVE D: NO ACTION

4.5.1 Air Quality, Soils and Water

Air Quality: The No Action alternative would not result in any changes in current air quality or future trends. Future management actions would be guided by existing management plans, rules and policy that are restrictive on most of the activities that have the potential to emit pollutants on BLM lands. Future activities would be subject to the current air quality rules and emission control requirements. The SIPs all are required to show attainment of the NAAQS. All of the PM_{10} nonattainment areas except for Owens Valley have met requirements to be reclassified by the USEPA to a Maintenance status. Owens Valley is projected to achieve attainment by 2006.

4.5.2 Biological Resources

4.5.2.1 Natural Communities

Adverse impacts of the No Action Alternative to natural communities within the West Mojave Plan fall into three categories:

1. Fragmentation
2. Degradation
3. Substantial loss or modification of rare community types.

The existing large blocks of creosote bush scrub and saltbush communities would be subject to fragmentation over time, although the magnitude of these impacts from use of dirt paths and roads is unknown.. The mountain foothill vegetation consisting of relatively large blocks of pinyon pine woodland, juniper woodland, Mojave mixed woody scrub and chaparral communities would not be affected by Alternative C ecause of the private land ownership.

Degradation of the natural communities by recreational use is a predicted consequence of the No Action Alternative. Without route designation on public lands, gradual degradation of natural communities would proceed without restraint.

The rare and unique communities like native grassland, mesquite bosque, montane meadow and some Joshua tree woodlands are the most at risk. Their small size makes the proportional impacts of fragmentation and degradation larger. Existing designations would probably adequately protect valuable and limited natural communities like riparian woodland, riparian scrub, alkali seeps and springs and fan palm oases.

Certain smaller communities without major threats, such as playas, desert holly scrub, some dune communities, blackbush scrub and blue oak woodland would continue in a productive state.

4.5.2.2 Desert Tortoise

Alternative D, the No Action alternative, would result in no changes to current management. There are still new data and information that could be used by the BLM, USFWS, CDFG, and private jurisdictions that could help fine-tune current management, and some of these are suggested, but for the most part, there would be no changes. Beneficial and adverse impacts associated with the No Action alternative are addressed in Table 4-13.

Table 4-13
Tortoise Impacts of Alternative D (No Action)

BENEFICIAL IMPACTS	ADVERSE IMPACTS
DROUGHT	
Motorized Vehicle Access ? BLM would still be obligated to implement a designated route network, which is the single most effective measure to alleviate human impacts during time of drought, particularly to minimize vehicle use in and alongside washes. As such, there would still be the closure of 117 of 177 linear miles (66%) of routes identified as occurring within washes in areas recommended by the West Mojave Plan as Desert Wildlife Management Areas, which generally correspond to tortoise critical habitat. There are certainly more than 177 linear miles of washes, however, since route use would be restricted to only those routes that are designated as open, washes that are not included would not be available for vehicle use, which would be a very significant beneficial impact. ? Route reductions in higher density tortoise areas would serve to alleviate human-induced stresses during drought periods	Motorized Vehicle Access ? Alternative would fail to close 60 linear miles (34%) of roads that coincide with washes
MOTORIZED VEHICLE ACCESS NETWORK	
Overall Importance ? Designating and implementing a motorized vehicle access network that is supported by land use laws and compatible with tortoise recovery is the single most important management action that could be implemented to minimize the widest variety of known human impacts. The BLM is obligated by the CDCA Plan to identify and implement this network in the absence of the WMP, which is significant beneficial impact ? See Alternative A and B for beneficial impacts	Overall Importance ? See Alternative A and B for adverse impacts
TRANSPORTATION	

4.5.2.3 Mohave Ground Squirrel

Impacts of Alternative D would be as described for Alternative A.

4.5.2.4 Bats

The known significant roosts on public lands (BLM and NPS) would probably remain

intact, but would be at risk from human disturbance. The extreme sensitivity of these sites during the maternity or hibernation periods makes this risk biologically unacceptable.

4.5.2.5 Other Mammals

Bighorn Sheep: Because bighorn are primarily a wilderness species within the West Mojave, impacts are not anticipated to be adverse or significant, especially in the short term.

Mojave River Vole: Alternative D would have no affect on this species, which is found entirely on private land.

Yellow-eared Pocket Mouse: Threats to yellow-eared pocket mouse are few, and information about its numbers and precise distribution is inadequate to accurately predict the future. Most known sites within the known range are protected as public land Wilderness or ACECs. Even with no action, few adverse impacts are expected to this species overall.

4.5.2.6 Birds

Bendire's Thrasher: The No Action Alternative would have an adverse effect on this vehicle-sensitive bird, especially in the Coolgardie Mesa occupied habitat.

Burrowing Owl: Alternative D would provide no benefit to the burrowing owl, which can be easily disturbed by vehicles near nest sites, where it reacts to the loud noises or excessive motion. Single passes from one car, 4WD or truck normally have little, if any affect on the birds. Taking no action would perpetuate the risk of nest site loss due to disturbance at nest sites throughout the lower elevations of the West Mojave.

Golden Eagle: A few golden eagle nest sites would remain vulnerable to vehicle disturbance during the nesting season with the No Action Alternative. Future increased recreational use of remote mountainous areas might increase the potential for disturbance to nest sites. This would constitute a small adverse impact to this raptor

Inyo California Towhee: Impacts detected in the past to Inyo California towhee from vehicle traffic and access to sensitive habitat for camping and riding, including hill climbs adjacent to Austin Spring, have been corrected by the BLM and volunteers who have constructed barriers and delineated parking and camping locations. No effect, either beneficial or adverse to this threatened bird would result from adoption of Alternative D.

LeConte's Thrasher: The range and occupied habitat for LeConte's thrasher would continue to become fragmented without positive steps to establish large, contiguous habitat blocks. Without a route network for public lands, disturbance to LeConte's thrasher in the nesting season would continue, and probably increase. The No Action Alternative would be adverse to this species.

Prairie Falcon: The No Action Alternative would probably have no adverse affect on the overall number of prairie falcons in the West Mojave. Loss of a few occupied territories is expected. Most nest sites are in rugged terrain, often in designated Wilderness, and existing threats to the prairie falcon from recreation disturbance are minimal.

Western Snowy Plover: The Western snowy plover is very site-specific in nesting habitat requirements. Ongoing efforts at conservation, including strict control of access duting the nesting season, would continue at Searles Lake and Harper Dry Lake. However, the No Action Alternative would most likely result in increased recreation on and adjacent to playas supporting potential or undetected nest sites, resulting in a moderate adverse impact to the species.

4.5.2.7 Reptiles

Impacts would be as described for Alternative A, except as noted below.

Mojave Fringe-toed Lizard: Vehicle disturbance on occupied habitat of the Mojave fringe-toed lizard is detrimental to this species because of direct mortality, spread of weeds onto the habitat, and damage to the soils and perennial plants. The No Action Alternative would continue the trend of gradual habitat degradation at several sites, detailed below.

Habitat at Pisgah Crater would become more degraded by surface disturbance in the long term. Route proliferation is evident in this area within the occupied and suitable habitat.

Fringe-toed lizards along the Mojave River east of Barstow, including the Manix ACEC would continue to be conserved in an acceptable, though not beneficial, manner.

The population at the Cronese Lakes ACEC would not be affected by the No Action Alternative.

The population on the west slope of Alvord Mountain would continue to receive adverse impacts from the proliferation of existing routes within the occupied and potential habitat.

Suitable habitat at El Mirage and northest of Harper Lake would continue to receive a moderate level of adverse impacts from vehicle disturbance. The effect on the fringe-toed lizards (if any) at these locations is unknown.

The Mojave fringe-toed lizard is not seriously threatened throughout its range. Outside the West Mojave thirteen additional locations support this species, and threats at these sites are minimal. Some are protected within the Mojave National Preserve and Death Valley National Park. Taking no action on route designation would not adversely impact the species as a whole, but might reduce the numbers or degrade the habitat of distinct isolated populations. Some evidence exists for genetic differentiation among the populations at Alvord Mountain, Dale Lake and Pisgah Crater, so loss of any one of these populations could represent a substantial loss of

genetic diversity within the species.

Panamint Alligator Lizard: Impacts of the No Action Alternative on the Panamint alligator lizard would be negligible, as described for the Inyo California towhee.

San Diego Horned Lizard: The eastern and western habitat blocks for this species are very different within the West Mojave. From Cajon Pass to Palmdale, no substantial adverse impacts to San Diego horned lizard would result from adoption of the No Action Alternative because this species is found primarily on private land and its habitat is entirely outside any route designation polygons. The scattered BLM parcels within suitable habitat of the San Gabriel Mountains foothills may support this species, but are not in areas where route designation is likely. Because the policy of minor realignment would not necessarily be in place, a slight negative impact compared to Alternatives A, B and C would result if this lizard were found in the future on these parcels.

Between Cajon Pass and Joshua Tree National Park, failure to perform route designation in the Juniper and Bighorn subregions would be adverse to the horned lizard compared to Alternative A

4.5.2.8 Plants

Barstow Woolly Sunflower: Although specific threats to the Barstow woolly sunflower are few, the fragmentation and degradation of its habitat by widespread off-highway travel is a long-term problem. The No Action Alternative would preclude addressing the vehicle-based impact within the entire range of this West Mojave endemic. Alternative D is adverse both from the occasional direct vehicle impacts and from the long term indirect impacts of weed invasion, disruption of the specific soil conditions necessary for growth, and fragmentation of populations and habitat.

Carbonate Endemic Plants: Completion of the Carbonate Habitat Management Strategy (CHMS) is assumed to be part of the No Action Alternative. This document would become agency guidance for federal actions on these four listed species and receive a separate Biological Opinion. The CHMS does not address route designation within the carbonate habitat. Without management of travel on the existing routes that traverse critical habitat adverse modification to the critical habitat is more likely. This is because the very small range of the carbonate endemic plants, combined with the mining impacts already present, requires that all disturbances to remaining occupied habitat be carefully controlled. The No Action Alternative is not a viable option for the carbonate endemic species, even assuming increased attention from the CHMS. Affects of the No Action Alternative would be at least moderately adverse to these species.

Charlotte's Phacelia: Lack of threats to Charlotte's phacelia make impacts of the No Action Alternative the same as Alternative A.

Crucifixion Thorn: Because threats to crucifixion thorn from vehicle recreation are few, the numbers and habitat for this species are expected to remain stable under the No Action Alternative. Compared to Alternative A, adverse impacts would be worse, due to the retention of unnecessary routes crossing habitat near Pisgah Crater.

Desert Cymopterus: Positive conservation action is needed to prevent declines of desert cymopterus on public and private land within the West Mojave outside Edwards AFB. Without consolidation of existing routes into a network based on avoidance of this species, habitat and numbers of desert cymopterus would be impacted in the future. The No Action Alternative would not provide the benefits of route reduction in the Fremont, and Superior subregions, and would have an overall adverse impact on the species.

Kelso Creek Monkeyflower: Threats are not apparent to Kelso Creek monkeyflower on public lands, but this narrow-range plant is vulnerable to even small land-use changes, such as increased off road travel. No adverse impacts to the species are expected from the No Action Alternative, but continued surveys of the identified suitable habitat on public land and monitoring of occupied habitat are necessary to insure the known populations remain stable.

Kern Buckwheat: Small areas of existing populations of Kern buckwheat are being impacted by vehicle and trail use near Sweet Ridge in the Middle Knob area. Without restoration efforts, the numbers of this extremely restricted West Mojave endemic plant would continue to decline. In addition, off-road intrusion onto the clay soil habitat has damaged one significant population and this could continue without placement of rock or bollard barriers at the edge of the open route. The No Action Alternative would lead to eventual loss of numbers and area of habitat for this species. This species currently meets the definition of rare under state law. Without positive conservation measures, Kern buckwheat could become listed as threatened or endangered in the future. The No Action Alternative would have adverse impacts on the species.

Lane Mountain Milkvetch: Threats from vehicle recreation to Lane Mountain milkvetch are mostly indirect, but cumulative impacts to the occupied habitat require that implementing measure of the Designation Project be undertaken. These include signing, obliteration of certain routes, designation on acquired lands and potentially fencing along routes to prevent off road travel. The No Action Alternative would provide no habitat protection and would have substantial adverse impacts to this species.

Little San Bernardino Mountains Gilia: No adverse impacts to Little San Bernardino Muntains gilia would result from adoption of the No Action Alternative because this species is not known from federal lands and its habitat is mostly outside any route designation polygons. The scattered BLM parcels within suitable habitat north of Joshua Tree National Park may support this species, but are not in areas where route designation is likely. Because the policy of minor realignment would not necessarily be in place, a slight negative impact compared to Alternatives A, B and C would result if occurrences of this plant were found in the future on these parcels.

A small likelihood of negative impact to potential habitat would occur without the

designation in the Copper Mountain MAZ.

Mojave Monkeyflower: The No Action Alternative would be adverse compared to Alternative A in the Dagget Ridge and Azucar mine areas, where the existing network of redundant routes and routes in washes would continue to place small harmful impacts to existing populations and suitable habitat. Without an education and enforcement program, route proliferation and off road travel would be more likely in the Brisbane Valley as well, potentially damaging occupied habitat on publilc lands.

Mojave Tarplant: Lack of threats to Mojave tarplant make impacts of the No Action Alternative the same as Alternative A, except that the policy of minor realignment probably could not be applied in the future to newly detected populations.

Parish's Phacelia: Unregulated travel on the small playas is a potential threat of fairly high risk. Such travel would lead to degradation of the habitat, and substantial loss of plants if it occurred in the growing season. Alternative D would have an adverse affect on this species in the long term, because some implementing measures, such as signing and enforcement, are necessary to provide minimal protection.

Red Rock Poppy: Protection of this species relies on management of Red Rock Canyon State Park. No adverse impacts are expected to the species as a whole from Alternative D. Without route designation in the El Paso Mountains, the occurrences outside the state park boundaries could be negatively impacted. This is relatively unlikely because travel within Mesquite Canyon does not normally stray onto occupied habitat.

Red Rock Tarplant: Protection of this species relies on management of Red Rock Canyon State Park. No adverse impacts are expected to the species as a whole from Alternative D. Without route designation in the El Paso Mountains, the occurrences outside the state park boundaries could be negatively impacted. This is relatively unlikely because travel within Last Chance Canyon does not normally stray onto occupied habitat.

Shockley's Rock Cress: Impacts to Shockley's rock-cress would be similar to those of the No Action Alternative for the carbonate endemic plants.

Short-joint Beavertail Cactus: No adverse impacts to short-joint beavertail cactus would result from adoption of the No Action Alternative because this species is not known from federal lands and its habitat is entirely outside any route designation polygons. The scattered BLM parcels within suitable habitat of the San Gabriel Mountains foothills may support this species, but are not in areas where route designation is likely. Because the policy of minor realignment would not necessarily be in place, a slight negative impact compared to Alternatives A, B and C would result if occurrences of this plant were found in the future on these parcels.

Triple-ribbed Milkvetch: No identifiable impacts to triple-ribbed milkvetch would result from adoption of the No Action Alternative. However, the risk of damage to undetected

populations in washes of the San Bernardino Mountains would increase without route designation. The policy of minor realignment could not necessarily be implemented if occurrences of this endangered plant were found in the future adjacent to open routes.

White-margined Beardtongue: No substantial adverse impacts to the disjunct populations of white margined beardtongue are expected from the No Action Alternative because threats to this species from vehicle recreation are few. Compared to Alternative A, adverse impacts would be worse, due to the retention of routes crossing wash habitat near Pisgah Crater and to the increased potential for off road travel in the large washes south of the Cady Mountains.

4.5.2.9 Cumulative Biological Impacts

The No Action Alternative would continue the pattern of off road travel on redundant and parallel roads, roads in washes, and roads passing through rare plant communities, occupied habitat for sensitive species, and designated critical habitat for listed species. Cumulatively, an excess of routes through habitat leads to slow degradation of the plant communities and overall ecosystem. Weedy species invasion is one aspect of habitat degradation that can be attributed to routes of travel. As new linear corridors are created, weeds invade further into natural blocks of habitat. Certain plant species, including Barstow woolly sunflower and Little San Bernardino Mountains gilia, are intolerant of weeds and may show declines in numbers and local range. Other animal species, including the desert tortoise, cannot receive the high nutritional value present in native annuals when the only available forage is weeds.

Another aspect of degradation is the potential for increased off road travel. Without an education and enforcement program, and signing of open routes, the public will continue under the impression that off road travel is allowable anywhere it is possible (outside wilderness and established ACECs). Desert washes and desert playas in particular are likely to receive increased use and consequent degradation, given the demand for increased recreation in the West Mojave.

Excessive routes and trails may also cause fragmentation of habitat, though the magnitude of this impact is not well documented for dirt roads and single-track routes. Nearly all animal species can easily cross dirt routes of travel. Some plant species may encounter barriers to seed dispersal of segmentation of populations because of dirt roads and tracks. One aspect of fragmentation is the disturbance factors that reach farther into the interior of habitat blocks, which can affect vehicle-sensitive animals such as the burrowing owl, and LeConte's thrasher.

Considering these aspects of degradation and fragmentation, the No Action Alternative has a moderate cumulative adverse impact on biological resources.

4.5.3 Recreation

Alternative D, which would not result in any changes to current management, is substantially different from Alternative A. It would maintain the existing 1985-87 motorized vehicle access network in all areas, including the nine subregions that were revised for Alternative

A. While the existing network meets most access needs in more remote, less heavily used areas such as Inyo County and the Cady Mountains, the design of the network does not necessarily meet public needs in the more heavily used public in the southwestern portion of the western Mojave Desert.

The 1985-87 network is, by and large, utilitarian. It tends to be composed of long, straight routes connecting destinations, such as powerline roads. The network provides relatively little opportunity for OHV touring, that is, routes that are designed to enhance the enjoyment of the ride and the recreation experience. Touring routes tend to follow more rugged terrain, provide loops, and have serpentine rather than straight alignments. The routes often do not deviate to popular destinations, such as camping areas, overlooks and historic sites. Many of the 1985-87 routes lead to dead ends. And the network provides little in the way of challenging, technical four wheel drive routes.

The existing network entirely ignores motorcycle routes and recreation. In fact, few single-track routes were either inventoried or designated. It provides fewer opportunities for popular motorcycle tours, camping areas and other traditional activities than Alternative A.

The current network is not seamless; rather, it is composed of different components designed years apart, and the routes in any given two components (such as an ACEC network and a portion of the 1985-87 network) do not necessarily match at the boundaries. This problem is especially pronounced around the Black Mountain ACEC, where many routes simply do not connect with routes in the adjacent Fremont subregion. Other problem areas included the northern boundary of the Black Mountain ACEC and the Superior subregion, and the southern and eastern boundaries of the Rainbow Basin ACEC. Many minor “clean-up” problems exist elsewhere.

Finally, the 1985-87 inventory was, by the standards of the 2002 inventory, relatively crude. Routes were not recorded using GPS equipment (which didn’t exist at that time), motorcycle trails were not accounted for, and the resources and time available to field staff were comparatively limited. As a result, the network was designed with less knowledge of the nature of the routes and the destinations access was to serve.

The following is a brief discussion of the effectiveness of the existing network in each of the nine subregions for which new designations are proposed by Alternative A. The discussion addresses these areas because they are the public lands that receive some of the highest levels of visitor use and have significant resource conflicts.

?? **Coyote:** This is a lightly used area, with little motorcycle use. Most routes designated by the current network serve mining and commercial needs and utility maintenance. The network was not designed to serve recreational demands, so it is not particularly effective in providing access to popular rock hounding sites in Alvord Mountains. Its many long, linear routes provide limited opportunity for general touring, and tend to be destination oriented or lead to dead ends.

?? **El Mirage:** The existing network offers very little in way of web of routes, in an area where a lack of a defined network has encouraged trespass riding on private property. Little general touring or connectivity is designed into the existing system, particularly in the Shadow Mountains, where the network is utilitarian but does not encourage, for example, enjoyable jeep touring.

.

?? **Fremont:** The current network is particularly flawed in that it ignores what is considered to be one of most popular off highway vehicle areas, the region just north of Fremont Peak and the Gravel Hills. A location known as Hamburger Mill, just north of Fremont Peak, has traditionally been a very popular area for motorcycle groups to camp and tour. It is very popular with families, for it offers a wide variety of topography and trails demanding a broad spectrum of skills, from novice to highly technical. Large groups tend to congregate here. The current network doesn't provide any access in this area other than broad, four-wheel drive routes; few if any of the popular motorcycle touring routes in this area and through the Gravel Hills are open. Campsites northeast of Fremont Peak, long used by OHV groups, are particularly affected. Finally, the existing network provides poor access in the Black Mountain area.

?? **Juniper:** The current network suffers from many redundant routes. While it addresses most recreation needs, it does not meet current demands for a seamless interface with United States Forest Service route networks.

?? **Kramer:** This region has many old motorcycle trails dating from many decades ago. The failure to leave some of these open is particularly important in the Iron Mountains, where the current network provides utilitarian access to mines and other facilities via well-graded routes but does not provide opportunities for OHV touring. The Iron Mountains are a popular area for rockhounding, exploring historic mines, and camping, and a demand for recreation-focused routes exists and is not satisfied by the existing network. Similarly, the Kramer Hills are historically popular with rockhounders, target shooters and motorcylists. The current network provides many two-track routes but no single-track routes. Finally the region as a whole lacks long range touring routes and single-track connectivity.

?? **Middle Knob:** Since the existing network was designated, considerable windfarm development has occurred in the surrounding area. The design of the network does not take these developments into account, insofar as providing a recreation experience in this environment is concerned. The current network was not designed with the needs of private property owners in mind (that is, ensuring a minimum of conflicts between recreationists and property owners).

?? **Newberry-Rodman:** This area known for rockhounding. The existing network does not ensure nearly as much access to these popular rockhounding areas as the demand warrants; rather, the network tends to be utilitarian rather than recreational in focus. There is a lack of short loops, and no provision for motorcycles (although motorcycle use

of this subregion is not nearly as common as elsewhere). The current network is not as effective as it could be in preventing conflicts between recreationists and livestock grazing.

?? **Red Mountain:** This is a very important motorcycle recreation area. The current network is particularly lacking in providing for this, in part because the 1985-87 inventory did not address single-track routes. The 1985-87 effectively curtails quality motorcycle recreation experience, since the network is composed primarily of two-track and graded routes. The network lacks routes in rougher terrain around Red Mountain itself, other than in the form of utilitarian access to commercial mines and facilities. The network tends to be valley and bajada – focused, and directs visitors towards areas they can't access, such as the Grass Valley wilderness.

?? **Superior:** 85 deficient in 2 track terrain opportunities, particularly in northwest quadrant of superior subregion. This is a very dispersed area, unlike hamberger mill – camping down by Rainbow Basin, Opal Mtn, a few other areas. And some routes just disappear into Fort Irwin expansion area. Draws people into Superior Valley, the expansion area, and the Water Valley (tortoise hotbead) rather than sending them elsewhere

4.5.4 Cultural Resources

On-going impacts to cultural resources from the existing route network would continue at existing levels, much of which is described in Alternative A. In some areas, impacts from existing routes are severe and significant resources are being degraded or completely lost.

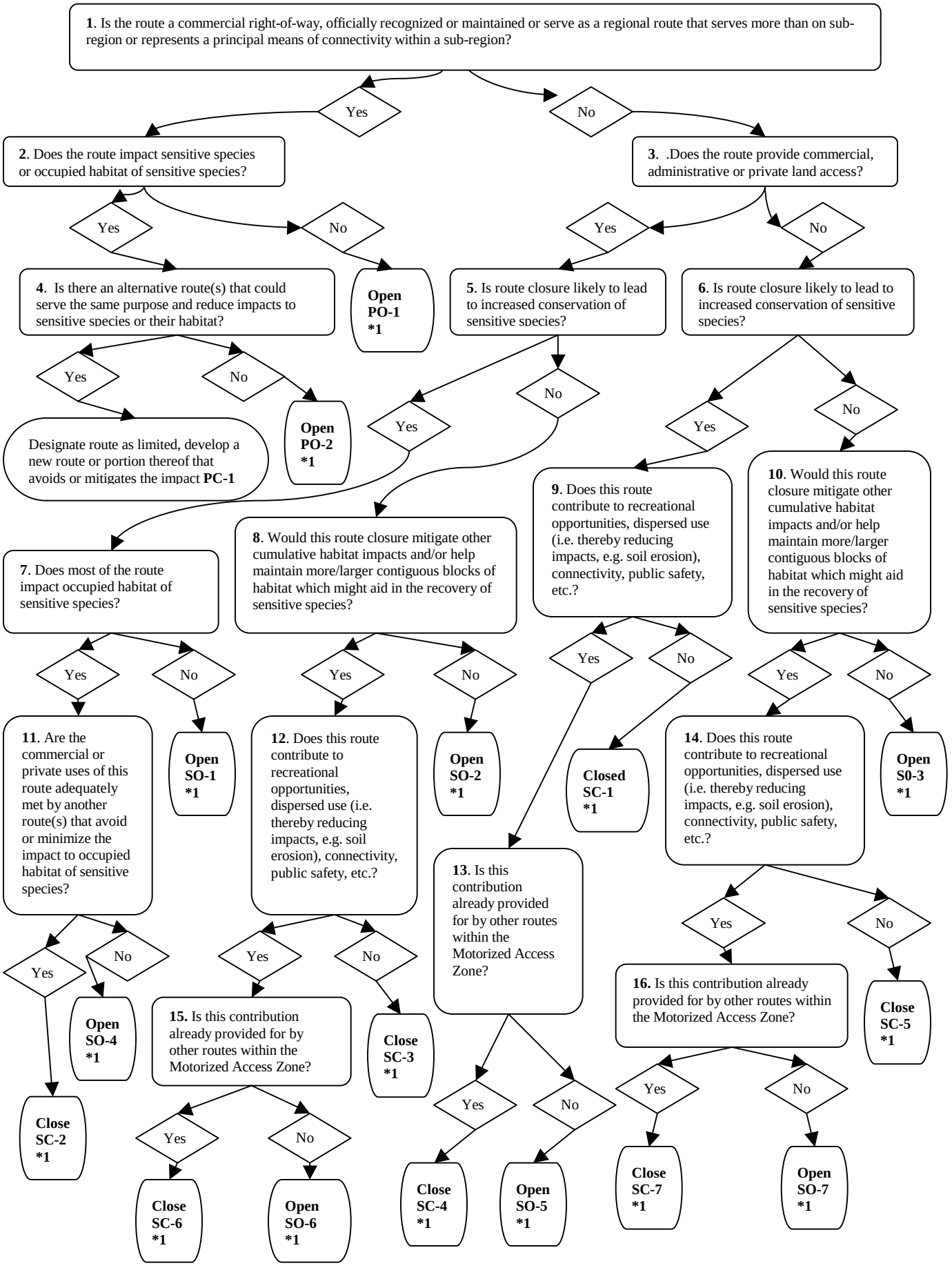
APPENDICES

List of Appendices

Appendix A	Decision Tree
Appendix B	Subregions
Appendix B	Route Designation Maps and Tables

APPENDIX A

DECISION TREE


1. Is the route a commercial right-of-way, officially recognized or maintained or serve as a regional route that serves more than on sub-region or represents a principal means of connectivity within a sub-region?
Yes
No
2. Does the route impact sensitive species or occupied habitat of sensitive species?
3. .Does the route provide commercial, administrative or private land access?
Yes
No
Yes
No
4. Is there an alternative route(s) that could serve the same purpose and reduce impacts to sensitive species or their habitat?
Open PO-1 *1
5. Is route closure likely to lead to increased conservation of sensitive species?
6. Is route closure likely to lead to increased conservation of sensitive species?
Yes
No
Yes
No
Yes
No
Designate route as limited, develop a new route or portion thereof that avoids or mitigates the impact PC-1
Open PO-2 *1
7. Does most of the route impact occupied habitat of sensitive species?
8. Would this route closure mitigate other cumulative habitat impacts and/or help maintain more/larger contiguous blocks of habitat which might aid in the recovery of sensitive species?
9. Does this route contribute to recreational opportunities, dispersed use (i.e. thereby reducing impacts, e.g. soil erosion), connectivity, public safety, etc.?
10. Would this route closure mitigate other cumulative habitat impacts and/or help maintain more/larger contiguous blocks of habitat which might aid in the recovery of sensitive species?
Yes
No
Yes
No
Yes
No
Yes
No
11. Are the commercial or private uses of this route adequately met by another route(s) that avoid or minimize the impact to occupied habitat of sensitive species?
Open SO-1 *1
12. Does this route contribute to recreational opportunities, dispersed use (i.e. thereby reducing impacts, e.g. soil erosion), connectivity, public safety, etc.?
Open SO-2 *1
Closed SC-1 *1
13. Is this contribution already provided for by other routes within the Motorized Access Zone?
14. Does this route contribute to recreational opportunities, dispersed use (i.e. thereby reducing impacts, e.g. soil erosion), connectivity, public safety, etc.?
Open S0-3 *1
Yes
No
Yes
No
Yes
No
Yes
No
Open SO-4 *1
15. Is this contribution already provided for by other routes within the Motorized Access Zone?
Close SC-3 *1
16. Is this contribution already provided for by other routes within the Motorized Access Zone?
Close SC-5 *1
Close SC-2 *1
Yes
No
Yes
No
Yes
No
Yes
No
Close SC-6 *1
Open SO-6 *1
Close SC-4 *1
Open SO-5 *1
Close SC-7 *1
Open SO-7 *1

West Mojave Route Designation Tree Footnotes

1. **Question 2**: Evaluate and take into account:

?? both season and intensity of use as it relates to impacts to sensitive species or their habitat;

?? the number of sensitive species and/or the amount of sensitive habitat potentially impacted;

?? Other areas already designated or set aside or other measures that may be already contributing to the conservation of these species (e.g. Wilderness Areas and raptor nests, bat grates, etc.)

2. **Question 3**: E.g. utility, military, mining, ranching facilities; monitoring sites; guzzlers).
3. **Questions 8, 10**: I.e. Would this route closure likely lead to a reduction of those indirect impacts suspected of leading to a significant decline in habitat quality (e.g. litter, poaching, harassment, plinking, etc.) or lead to a decline in impacts that directly negatively impact sensitive species?
4. **Questions 11, 13, 15, 16**: When evaluating the duplicity of this route take into consideration the quality of this route, particularly as it relates to public safety.
5. ***1**:

    ?? Are there any other special circumstances that would warrant reconsideration? (e.g. unusual public safety issues, Section 106 considerations, current or future community growth/zoning issues, current or reasonably foreseeable land acquisitions or trades (e.g. for mitigation as part of this planning effort or by other resource organizations/agencies), special permits (e.g. Mining Plan of Operations), environmental benefits of a route (e.g. facilitating the maintenance of a guzzler), legal easements, user conflicts, neighboring uses, etc.).

    ?? Should a limited designation be used in lieu of either an open or closed designation in order to mitigate for impacts?

APPENDIX B

SUBREGIONS

APPENDIX B
SUBREGIONS

One of the first steps in the off road vehicle designation process for the West Mojave was the identification of 20 "subregions" (see also Tables 2-20 and 2-21), which were geographic subdivisions of lands outside of wilderness areas, open areas and ACECs. With the exception of certain BLM Class M lands in Inyo County and in and around the Cady Mountains, and scattered parcels elsewhere, all public lands for which route designations have been recommended are within one of the subregions. The subregions, therefore, constitute the "building block" of the motorized vehicle access network. The following discussion provides a general overview of each subregion, and describes the recreational values present in each.

B.1 Bighorn Subregion

General description: The Bighorn subregion consists of public and private lands found to the southwest of State Highway 247 as it makes a wide arc roughly between its intersection with Camp Rock Road and the community of Yucca Valley, California. The subregion is composed mainly of BLM-managed public lands, with private lands and the San Bernardino National Forest to the west, and primarily private lands to the south. The Bighorn Mountains Wilderness is located within and to the west of the subregion.

The rugged Bighorn Mountains are the eastern foothills of the San Bernardino Mountains. Visitors can experience the rare ecological transition that occurs here, going from yucca and Joshua trees on the desert floor to stands of Jeffrey pine at higher elevations. Mule deer, mountain lions, bobcats, and golden eagles are prominent wildlife of the area. Resident and migratory birds rest along Rattlesnake Canyon Creek, which flows through the wilderness and northward to Johnson Valley. Elevations within the Bighorn subregion range from 3,100 to 6,600 feet.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the subregion are cattle grazing, powerline and pipeline rights-of-way, communication sites, wildlife habitat, mining and recreational mining, hunting, and off-highway vehicle use restricted to open routes of travel. The area is a popular destination for National Forest-related recreation to the west, and has been an historical off-highway vehicle destination on the south side.

The designated routes provide for vehicle access to the following subregion features: Rattlesnake Canyon and the San Bernardino National Forest, to the south and east. In addition, the designated routes provide for access to the boundary of the Bighorn Mountains wilderness. Vehicles are not permitted in wilderness, but hiking, camping, and horseback riding are encouraged.

B.2 Coyote Subregion

General Description: The Coyote subregion, located approximately 20 miles northeast of Barstow, California, is defined by the Fort Irwin Military Reservation (National Training Center) on the north, Interstate-15 on the south, the Calico Mountains on the southwest, and the Soda Mountains Wilderness Study Area (WSA) on the east. The extensions of this subregion consist primarily of public lands on either side of the Soda Mountains WSA.

Coyote Dry Lake, Alvord Mountain, and a portion of the Calico Mountains are found within the subregion. Elevations range from 1,700 to 3,600 feet.

The Calico Early Man Site is found at the south end of the subregion. This National Register Property was designated as an ACEC by the 1980 CDCA Plan. A management plan was prepared in 1984. The plan designated a network of vehicle access routes, a network designed to protect the evidence of ancient human occupation. This ACEC is located within the Superior-Cronese tortoise DWMA

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are powerline and pipeline rights-of-way, wildlife habitat, cattle grazing, recreational mining, rockhounding, hiking, upland gamebird hunting, and off-highway vehicle use restricted to open routes of travel. The recommended route network provides vehicle access for all of these, as well as for access to each block of non-federal land within the area.

B.3 East Sierra Subregion

General Description: The East Sierra subregion, located approximately 10 miles west of Ridgecrest, is defined by Highway 14 on the east; Highway 178 on the south; the Bakersfield BLM Field Office and Sequoia National Forest boundaries on the west; and the Class L and Class M boundary in the Coso Junction and Rose Valley area on the north. The Owens Peak and Sacatar Trail wilderness areas (49,009 and 33,132 acres) are located within this sub-region.

All or parts of three ACECs are found within the East Sierra subregion: Fossil Falls, Sand Canyon and Last Chance Canyon. Route designation for Fossil Falls and Sand Canyon was designated by their management plans and is not changed by the Designation Project or the West Mojave Plan. For the Last Chance Canyon ACEC, Alternative A would adopt the 1985-87 route designations, except for the east access to Mesa Springs, which was recommended for closure by the 1982 ACEC management plan. This network would be effective on an interim basis, until the completion of a collaborative and community-based program to develop a revised motorized vehicle access network for the El Paso Mountains, including all of the Last Chance Canyon ACEC outside wilderness. Participants in this effort would include the City of Ridgecrest, Kern County, BLM and interested stakeholders. When it is completed, the revised network for the El Paso Mountains would be incorporated into the CDCA and West Mojave Plans through plan

amendment.

The region consists primarily of the eastern face of the southern Sierra Nevada. Elevations range from 2,400 feet along Highway 14 to 8,453 feet above sea level on top of Owens Peak. The mountainous terrain has deep, winding, open and expansive canyons, many of which contain springs with extensive riparian vegetation. This area is a transition zone between the Great Basin, Mojave Desert and Sierra Nevada ecoregions. Vegetation varies considerably with a creosote bush scrub and Joshua tree woodland community on the bajadas, and cottonwood and willow riparian vegetation in the canyons at lower elevations. Above 5,000 feet, the canyons and ridges are dominated by pinyon-juniper woodland with sagebrush and grey pine.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are: domestic sheep and cattle grazing, mineral exploration, utility and aqueduct corridor maintenance, communication site maintenance, recreational vehicle touring/sightseeing, dispersed hiking and camping, rock climbing, upland gamebird and deer hunting, bird watching, wildflower viewing, rock hounding, mountain biking and equestrian use. Much of this sub-region is designated as wilderness.

Biological values of special concern include habitat for desert tortoises, bats, Mohave ground squirrels, special status plants, and raptors (both nesting and foraging areas). The area has a number of special habitats (extensive riparian corridors and desert washes and springs). Cultural resources are significant in the area, especially in the canyon bottoms.

The proposed route designations provide for vehicle access to the following features: Owens Peak Wilderness, Sacatar Trail Wilderness, Short Canyon, Sand Canyon, Ninemile Canyon, the LADWP Aqueduct, No Name Canyon, and Indian Wells Canyon. They also provide for vehicle access to dispersed camping throughout the Eastern Sierra. The designations provide access to hiking trailhead opportunities along the boundary of the Owens Peak and Sacatar Trail Wildernesses, Short Canyon, Sand Canyon and No Name Canyon. The designations provide access to staging areas for mountain bike and equestrian recreation throughout the subregion.

The proposed designations provide for vehicle access to and through the subregion's prime chukar, Gambel's quail, and deer hunting areas. Vehicle access to popular rock hounding sites and historic Depression-Era mining sites in Indian Wells Canyon are provided. Also, vehicle access for livestock operations is provided.

The proposed designations provide for vehicle access to every known active mineral exploration area, and provide access along each authorized utility and aqueduct corridor within the area. Vehicle access to all authorized communication sites are also provided for.

B.4 El Mirage Subregion

General Description: The El Mirage subregion, located northwest of the community of

Adelanto and due north of BLM's El Mirage Off-Highway Vehicle Area is defined by Edwards Air Force Base to the north and west, State Highway 395 to the east, and the El Mirage Off-Highway Vehicle Area immediately to the south. The western boundary is not well defined, consisting of private and Federal lands. The subregion is located in both Los Angeles and San Bernardino Counties.

The Shadow Mountains, in the southwestern corner, trend northwest-to-southeasterly, and have a maximum elevation of 3,996 feet. The greater area is characterized by bajadas, dry lakebeds, washes, rugged hills, and desert mountains. Vegetation consists of three basic types, creosote bush scrub, saltbush scrub and alkali sink scrub, all of which are typical of the western Mojave Desert. Creosote bush scrub is by far the dominant vegetative type.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are powerline and pipeline rights-of-way, rockhounding, cattle grazing, recreational mining, upland gamebird hunting, hiking and camping, wildlife habitat, and off-highway vehicle use restricted to open routes of travel.

Particular designated routes provide access to various blocks of non-federal land within the area.

B.5 El Paso Subregion

General Description: The El Paso subregion, located approximately 10 miles southwest of Ridgecrest, is defined by the El Paso Mountains wilderness area and "old" U. S. 395 to Inyokern on the north, U.S. Highway 395 on the east, the Garlock Road and Red Rock Canyon State Park on the south, and Highway 14 on the west. The subregion is 83,474 acres in size, with 92% federal land (76,998 acres) managed by the BLM and 8% private and state land (6,475 acres). Numerous landowners own the private lands. The El Paso Mountains wilderness is surrounded by this subregion on three sides.

The region consists of prominent volcanic peaks (El Paso Mountains), broad valleys, rolling foothills, badlands, sloping bajadas, braided washes, and narrow canyons. Elevations range from 2,000 feet on the southern boundary to 5,244 feet above sea level on top of Black Mountain. Creosote bush scrub and saltbush acrub are the predominant plant communities in the lowlands, with numerous desert washes, remnant stands of native perennial bunchgrasses on the mountain tops, scattered Joshua tree woodland, and small riparian plant communities at a few of the widely spaced springs.

The El Paso Mountains contain three West Mojave endemic plants: Red Rock poppy, Red Rock tarplant and Charlotte's phacelia. They are well known as a raptor nesting area and support abundant populations of upland game birds.

Recreation Activities/Resource Uses Overview: Primary resource uses occurring in this

subregion are: domestic sheep grazing, mineral exploration, utility corridor maintenance, communication site maintenance, and various recreational activities. The BLM's CDCA Plan identified four sites within the subregion with excellent potential for interpretation and education: Burro Schmidt's Tunnel; the El Paso Mountains; the Garlock Fault; and the Goler Grabben.

In particular, the El Paso Mountains are heavily used for a variety of recreational activities. The area contains excellent opportunities for upland game bird hunting (chukar and Gambel's quail) and rock and mineral collecting. Other activities include recreational vehicle touring/sightseeing, dispersed hiking and camping, mountain biking, and equestrian recreation. The subregion is also used for commercial 4-wheel drive and dual sport motorcycle tours and competitive equestrian endurance rides.

B.6 Fremont Subregion

General Description: The Fremont subregion is located approximately 30 miles northwest of Barstow, California. U.S. Highway 395 provides access to the Fremont subregion from the west, and State Highway 58 from the south. Several public roads are located within the subregion including Harper Lake Road, Santa Fe Avenue, and Lockhart Road. The Grass Valley Wilderness and the Red Mountain subregion (within BLM's Ridgecrest Resource Area) bound the subregion to the north, State Highway 58 to the south, the Black Mountain Wilderness and Superior subregion to the east, and U.S. Highway 395 to the west. The Fremont subregion encompasses a total of approximately 222,750 acres, which includes 52% (116,274 acres) Federal land managed by the BLM, and 47% (105,494 acres) private and State land.

The southern portion of the Fremont subregion includes Water Valley, a relatively large, open and flat area with scattered low rolling hills. This area also includes about half of Harper Dry Lake, which is the lowest point of the subregion at 2,018 feet. A portion of Harper Lake is within a BLM Area of Critical Environmental Concern (ACEC), in support of the birds and wildlife in that area. Vegetation in the Water Valley consists mainly of creosote bush scrub and saltbush scrub, and some scattered Joshua trees. A large number of unimproved roads cross the valley along with public infrastructure facilities that include high voltage transmission lines, wood pole power lines, and telephone lines. In addition, the valley includes intermixed grazing and ranching lands with associated fences and structures.

The northwest portion of the subregion includes primarily flat terrain, undulating slightly with some prominent rocky buttes. Vegetation is limited to creosote bush scrub, typical of that found throughout the Western Mojave. U.S. Highway 395 bounds this area to the west, and Fremont Peak to the east. Fremont Peak is located within the northern portion of the subregion, and rises abruptly to 4,584 feet above the flat valley surrounding it. The creosote bush scrub community in this area is limited to the bajada and foothills, extending only about one-third of the way to the top of Fremont Peak. The higher elevations of Fremont Peak are rocky hillsides with widely scattered plants of the Mojave mixed woody scrub community. Old mines and OHV tracks are located throughout the Fremont Peak area.

East of Fremont Peak, the northern portion of the subregion includes the Gravel Hills. This topographically varied area consists of low rolling mountains with vegetation limited to typical low desert shrubs found throughout the West Mojave. The far northeast portion of the subregion borders the Black Mountain Wilderness Area, and includes a portion of the Black Mountain ACEC, established for the protection of sensitive cultural resources. The foothills surrounding Black Mountain provide varying topography and areas of sharp relief.

The Barstow woolly sunflower ACEC is located within the Fremont subregion. This ACEC protects a rare West Mojave endemic plant which is found on shallow soils throughout the subregion.

Recreation Activities/Resource Uses Overview: Primary resource uses occurring in the subregion include cattle grazing, power line and pipeline rights-of-way, wildlife habitat, mining and recreational mining, hunting, and off-highway vehicle use restricted to open routes of travel.

The Fremont subregion includes all or portions of four grazing allotments. These include the following:

- Gravel Hills Allotment (ephemeral designation)
- Harper Dry Lake Allotment (ephemeral/perennial designation)
- Superior Valley Allotment (ephemeral designation)
- Monolith Cantil Allotment (ephemeral designation)

Mineral resources in the subregion include leaseable economic mineral resources (energy, geothermal, oil and gas), primarily at the southeast portion. Small areas in the northern portion of the subregion have the potential for locatable energy and other strategic mineral resources.

Limited areas of known high and very high cultural resource sensitivity occur within the western portion of the subregion. These mostly represent the remains of mining activity and historic travel. The prehistoric remains include a wide range of site types. Areas within the eastern portion of the subregion include known locations of high and very high cultural resource sensitivity/significance, located primarily within the Black Mountain ACEC (established for the protection of prehistoric and Native American resources). The extremely high diversity of site types in this area range from complex to simple, as well as a number of sites listed within a National Register District. Many of the sensitive resources in this area represent historic activities, mostly mining and travel. The prehistoric resources represent habitation, extractive activities, and lakeside adaptations.

The suggested vehicle route network provides recreational OHV enthusiasts access to popular OHV areas at Cuddeback Lake and the Fremont Valley, and also maintains a substantial portion of the dual-sport network that runs throughout the subregion. The suggested routes also provide motorized access for rockhounding, recreational mining, equestrian recreation, recreational vehicle touring/sightseeing, and game bird hunting.

B.7 Granite Subregion

General Description: The Granite subregion, is defined by State Highway 247 on the east, the Stoddard Valley Off-Highway Vehicle Area on the north, private lands on the west, and private lands on the south. The Granite Mountains, Sidewinder Mountain, North Lucerne Valley, and Stoddard Ridge are all found within this subregion. Elevations range from 3,000 feet to 4,900 feet.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are cattle and sheep grazing, powerline and pipeline rights-of-way, rockhounding, communication sites, hiking, camping, wildlife habitat, mining and recreational mining, hunting, and off-highway vehicle use restricted to open routes of travel.

Some designated routes provide access to many blocks of non-federal land within the area.

B.8 Juniper Subregion

General Description: The Juniper subregion, located east of Hesperia and south of Apple Valley, is defined by a large block of BLM-managed public lands with the San Bernardino National Forest on the south and private lands on the east, west, and the north. Juniper Flats is a diverse landscape of mountains, canyons, impressive boulder fields and washes. Elevations range from 3,000 feet to 6,000 feet.

Within the subregion is an ACEC for the Juniper Flats Cultural Area. The ACEC contains springs and riparian habitat in a dense stand of junipers and was an important Native American habitation and special use site.

The Willow fire in 2000 burned over the entire region, leading to a temporary closure of the ACEC until vegetative recovery had begun.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are cattle grazing, powerline and pipeline rights-of-way, equestrian riding, wildlife habitat, recreational mining, hiking, hunting, and off-highway vehicle use restricted to open routes of travel. Within Juniper Flats ACEC, open recreational travel routes are posted with markers installed at intervals. Off-Highway Vehicle touring is appropriate here. Several routes in Juniper Flats have been closed to vehicle travel to protect riparian habitat and cultural sites.

There are equestrian riding opportunities in the subregion as well as hiking opportunities. Equestrian use is extensive, though staging areas and parking areas for horse trailers are limited. The washes provide good hiking trails for experiencing natural conditions and for bird watching. A BLM-contracted bird survey in 2001 detected 61 species in Grapevine Canyon and 73 species

in Arrastre Canyon. Mountain and California quail were abundant breeding gamebirds, and the canyons were used extensively by neotropical migrants. Tracks were seen of mountain lions in upper Arrastre Canyon, and badger, deer and bobcat were observed in the two canyons. Several species of reptiles were also observed (Laymon, 2001). The Juniper subregion also provides habitat for the San Diego horned lizard and the gray vireo, two unlisted species proposed for protection in the West Mojave Plan.

Visitors can camp at Bowen Ranch, a private facility, and at locations throughout the National Forest to the south. Many visitors access Deep Creek Hot Springs in the National Forest from the Juniper Flats area. Equestrians access other areas of the National Forest from Grapevine Canyon and utilize a network of trails near Arrastre Canyon and Round Mountain.

Route designation for the Juniper Flats ACEC was prescribed in the 1988 management plan, and will be adopted into the CDCA Plan with this Plan Amendment. The route designations adopted in 1985 and 19087 for the remainder of the Juniper subregion will also be incorporated into the CDCA Plan.

B.9 Kramer Subregion

General Description: The Kramer subregion is located south of State Highway 58, between the cities of Hinkley and Kramer Junction. State Highway 58 and Edwards Air Force Base bound the subregion on the north, State Highway 395 on the west, and private lands to the east and south. The Kramer subregion encompasses a total of approximately 133,129 acres, which consists of 84,020 acres (63 percent) federal land managed by the BLM, and 49,109 acres (37 percent) private and State land.

The Kramer subregion is largely an area of alluvial soils and low rolling hills incised by braided, seasonal washes draining toward the Mojave River. Elevations range from 2,273 feet to 3,021 feet. The Kramer Hills, Iron Mountain, and Buckthorn Wash are found within the subregion. The Kramer Hills provide the most topographically varied portion of the subregion, and consist of low-lying, rolling hills composed of a complex of sedimentary and volcanic rocks. Iron Mountain, located in the northeastern portion of the subregion, also provides prominent areas of topographic relief. Most of the subregion is covered with creosote bush scrub and saltbush scrub plant communities. Joshua trees are scattered throughout the Kramer Hills and upper washes, in association with creosote and cholla.

State Highway 58 on the north and U.S. Highway 395 on the west provide access to the subregion. Several public roads are located within the subregion including Shadow Mountain Road, Harper Lake Road, and Helendale Road.

Recreation Activities/Resource Uses Overview: Current land uses include routes for several power lines and gas pipelines, as well as scattered homesteads. Recreational uses within the subregion include primarily OHV activity, and rockhounding in the Kramer Hills. Primary

recreation activities and other resource uses occurring in the subregion are power line and pipeline rights-of-way, wildlife habitat, mining, hunting, and off-highway vehicle use restricted to open routes of travel.

The Kramer subregion includes portions of two grazing allotments. The majority of the subregion falls within the Stoddard Mountain grazing allotment. The southernmost portion of the subregion includes a small portion of the Buckhorn Canyon Allotment.

Mineral resources within the subregion are located primarily within Iron Mountain and the Kramer Hills. Gold has been produced at the Kramer Hills, which also includes occurrences of uranium, magnesite and feldspar. Considerable exploration of uranium occurred in the Kramer Hills during the 1970s. At Iron Mountain, limestone, marl, quartzite, and asbestos have been produced. In addition, there are occurrences of clay, copper, and mica in this area. The U.S. Geological Survey has classified the subregion as prospectively valuable for sodium, potassium, oil, and gas. Mining and homestead sites established in the late 19th and early 20th century exist in the area, some of which may have historical significance.

The suggested route network provides for vehicle access to the Kramer Hills, Iron Mountain, and other areas located throughout the Kramer subregion; provides access to sites appropriate to recreational target shooting; provides opportunities for general dispersed camping and back country touring; provides access through each of the primary upland gamebird hunting areas; provides access to popular rockhounding locations; provides access to known areas important for recreational mining; provides motorized access facilitating mountain bike recreation throughout the subregion; maintains vehicle access for a variety of terrain, a variety of trip lengths and access to remote areas for the equestrian community; provides the recreational OHV enthusiasts a variety of opportunities from which to choose, and it maintains a substantial portion of the dual-sport network (for on-street/off-street motorcycles) which runs throughout the subregion.

B.10 Middle Knob Subregion

General Description: The Middle Knob Subregion, located approximately 40 miles southwest of Ridgecrest, is defined by Highway 14 on the east; Highway 58 on the south; the CDCA boundary on the west; and the Jawbone Butterbredt ACEC on the north. Numerous landowners own the private lands.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the subregion are recreational vehicle touring/sightseeing (such as in the proposed Middle Knob ACEC), camping and hiking (such as within the proposed Middle Knob ACEC and the Pacific Crest National Scenic Trail), hunting, domestic sheep and cattle grazing, utility corridor maintenance, communication site maintenance, wind energy, and mineral exploration.

In addition, the subregion has a variety of special habitats (pavement plains, vernal pool, springs and grey pine woodland) and artificial waters (small game guzzlers). Biological values of special concern include habitat for desert tortoises, Mohave ground squirrels, raptors (nesting and foraging areas), and special status plants. Further, cultural resources are significant in the subregion.

B.11 Morongo Subregion

General Description: The Morongo Subregion is located east of Highway 62 and west of Joshua Tree National Park. Much of the subregion is located in the Little San Bernardino Mountains. Elevations in the area range from 1700 feet on the canyon floor to 5000 feet at the ridge tops.

The area is noted as a breeding location for many riparian birds, the site of the endangered triple-ribbed milkvetch, and a critical watering area for bighorn sheep and mule deer that live in the region.

The subregion has a desert climate with hot, dry summers and moderate winters. Rainfall is scarce, with an average annual total of only 8 inches. Big Morongo Creek emerges from the mountains northwest of Morongo Valley and flows intermittently on the surface of the creek bed. The water percolates quickly into sandy soils as it crosses the Morongo Basin, but as it enters Big Morongo Canyon it encounters alternating layers of sandy and cemented rock. The harder layers bring the water to the surface in a series of perennial springs, whose waters disappear into the sandy layers farther downstream. Within the Subregion are some of the oldest rocks in the state of California, dated at almost two billion years. They consist of former granitic rocks that have been altered by heat and pressure to form gneisses and schists.

Recreation Activities/Resource Uses Overview: Within the subregion there exists habitat qualities which have earned much of the area both national and international reputation among bird watchers. Big Morongo Canyon is a desert oasis with perennial surface water in springs and streams that support an extensive willow and cottonwood forest.

Big Morongo Canyon ACEC, located within the subregion, is a 28,274 acre wildlife refuge and National Watchable Wildlife Site. Preserve programs and displays seek to provide educational opportunities for children, youth, and adults to further their understanding of desert and marsh ecosystems, and the function and importance of a preserve on local, regional, and global levels. Numerous trails, including boardwalk trails through the marsh and stream habitats, meander through the Preserve, which is managed by the BLM.

B.12 Newberry-Rodman Subregion

General description: The Newberry/Rodman subregion, located just south of Newberry Springs, California, is defined by Interstate-40 on the north, the Twentynine Palms Marine Corps

Base and the Johnson Valley Off-Highway Vehicle Area on the south, and Camp Rock Road on the west. The subregion is 81,585 acres in size, with 73.6% Federal land (60,012 acres) managed by the BLM and 26.3% private and State land (21,481 acres). Catellus Development Corporation is the primary private landowner.

The general region consists of two small rugged mountain ranges and the surrounding foothills, valleys, sloping alluvial fans, washes, lava flows, and canyons. The entire area shows evidence of volcanic geologic activity, which provides for dramatic views. Elevations range from 1,800 feet to 5,100 feet in the Newberry Mountains. Creosote bush scrub is the predominant plant community in the lower elevations, with a desert willow-dominated plant community found in the dry desert washes, and remnant stands of perennial bunchgrasses in the higher elevations. Joshua tree woodland and small, riparian plant communities may also be found here in select locations. Many raptor nesting sites are found in the region. Kane Wash, which runs in a southwesterly to northeasterly direction, bisects the subregion, separating the Newberry Mountains wilderness and the Rodman Mountains wilderness. Access to this subregion is from Interstate-40, a power line road to the southeast, and Camp Rock Road on the west side.

A wide diversity of cultural site types are found here, some of which are associated with a National Register District. The Serrano tribe lived in the region, resulting in rock art and other cultural sites. Parts of the Rodman Mountains are designated as an ACEC to protect cultural resources. Most of this area is within the Rodman Mountains Wilderness. In addition to the desert tortoise, the prairie falcon and the golden eagle are found in the subregion, and the area is a potential reintroduction area for bighorn sheep. The Ord Mountain grazing allotment is located in the subregion. Much of the area is highly scenic in character, and both hiking/backpacking and upland gamebird hunting opportunities are plentiful.

Recreation Activities/Resource Uses Overview: Primary recreation activities and other resource uses occurring in the subregion are cattle grazing, mineral exploration/production, utility corridor maintenance (2 major utility corridors), communication site maintenance, recreational vehicle touring/sightseeing, dispersed hiking and camping, equestrian recreation, upland gamebird hunting, and rockhounding.

The Ord grazing allotment is located within this subregion. This allotment consists of 154,848 acres, of which 14,820 are private.

In regards to mineral values in the subregion, construction materials (crushed rock, sand and gravel) are being produced from the northwest area of the Newberry Mountains (Cal West Quarry). There has been production of placer gold at the Camp Rock mine. Cinders have and are being produced from Pipkin cinder cone (Malpais Crater) in the south-central part of the subregion. Borates (Fort Cady Minerals) and specialty clays (Rheox) are being produced in the eastern part of the subregion. BLM classified the western portion of the subregion as having a moderate to high potential for the occurrence of copper, silver, lead, tungsten and gold based on past exploration and production. The eastern portion of the subregion has a high potential for borate minerals and clay deposits.

A utility corridor runs along the northern boundary of the subregion, while another utility corridor crosses from north to south.

Excellent hiking/backpacking and upland game hunting opportunities exist in the Newberry and Rodman Mountains. There are three highly rated interpretive sites within the subregion, the Newberry Mountain Caves, Pipkin Cinder Cone, and the Rodman Mountain petroglyphs**.** Other federal plans relating to this subregion include the Johnson Valley Off-Highway Vehicle Area Management Plan.

The suggested route network provides for vehicle access for these resource uses and recreational activities. Further, they provide access to each block of non-federal land within the subregion.

B.13 North Searles Subregion

General Description: The North Searles subregion, is located approximately 28 miles northeast of Ridgecrest, immediately north of Pioneer Point and the community of Trona. Slate Range Crossing on the north, the crest of the Slate Range on the east, the Inyo-San Bernardino County line on the south, and the China Lake Naval Air Weapons Station (NAWS) boundary on the west define the subregion. Numerous landowners own the private lands. The Great Falls Basin ACEC, Argus Mountains wilderness and the Great Falls Basin Wilderness Study Area are surrounded by this subregion on three sides.

The general region consists of the upper part of Searles Valley, part of the ancient lakebed above Searles Lake. It is encircled by two prominent mountain ranges on the west, and east and north - the Argus and Slate ranges, respectively. The area is made up almost entirely of gravel, sand, and silt lakebed sediments. Elevations start as low as 1600 feet on the southern Inyo-San Bernardino County boundary, climbing to more than 5300 feet above sea level to the west in the Argus Range and to 4950 feet above sea level in the east along the crest of the Slate Range. Due to its location along the highway to Death Valley National Park (Highway 178) and close proximity to the community of Trona, visitation is generally high throughout the year, especially in the cooler months. Mojave saltbush and creosote bush scrub are the predominant plant communities in the lowlands, with rabbitbrush dominating communities in the washes. Joshua trees are found in sparse stands at a few locations at upper elevations in the Argus and Slate ranges. Small riparian communities exist at isolated seeps and springs throughout the Argus Range. These communities, made up mostly of willow and baccharis, comprise the sole critical habitat for a threatened species, the Inyo California towhee. This is a subspecies of towhee endemic only to the southern Argus Range. The many small seeps and springs also attract upland game hunters, as well as more casual visitors from the surrounding local area.

In the fall of 1999, the BLM initiated a series of yearly cleanups of a popular party place at the base of the falls in Great Falls Basin with volunteers from several Trona community service

organizations and local businesses. Volunteers picked up trash, sifted for glass, dispersed fire rings, sandblasted graffiti, rehabilitated hill climbs, and donated more than $20,000 worth of boulders, heavy equipment and equipment operators to block off further vehicle trespass to Austin Springs, the base of the falls, and to various unauthorized hill climbs in the immediate vicinity. To date, the project has been very successful in implementing the many provisions of the ACEC plan for the area. Vehicle access also has been restricted at several other springs in the area, notably North Ruth, Nadeau, and Christmas to prevent overnight camping within 200 yards of a wildlife watering source per California State Fish and Game regulations (California Administrative Code 730(6)(b)). Fence exclosures have been built around other springs in the area to protect towhee critical habitat from damage by wild burros.

The subregion contains the Indian Joe Canyon Ecological Reserve, a Department of Fish and Game property protecting significant riparian habitat.

Access to this subregion is from Highway 178 and its extension, the Trona-Wildrose road.

Recreation Activities/Resource Uses Overview: Casual OHV recreational use involving dune buggies, quads, and motorcycles takes place within the subregion. The majority of these users are local residents. They come from Trona and the associated communities of West End, Argus, and Pioneer Point, or from Homewood Canyon. Gem and mineral collecting also occurs throughout the Argus and Slate Ranges. In October, the Searles Valley Gem and Mineral Society puts on a Gem and Mineral Show. The subregion is also used for interpretative museum and commercial 4-wheel drive, dual sport motorcycle and equestrian tours, as well as for equestrian competitive endurance rides.

Numerous dispersed camping opportunities exist along the route network. Vehicles are generally permitted to pull off within 300 feet of any route in the area to make camp with one exception. California State Fish and Game Code regulations specifically prohibit overnight camping within 200 yards of a wildlife-watering source. While some staging areas off of Highway 178 exist, most off road vehicle enthusiasts stage from their own homes in the adjacent communities of West End, Argus, Trona, Pioneer Point, and Homewood Canyon. There are many unmaintained dirt roads that directly connect these communities to the route system in the area. For these users, there is no need to go on pavement except to cross the Trona-Wildrose road occasionally to access routes on the opposite (east) side of Highway 178. Virtually all trails in this subregion are full-size 4x4 as opposed to single-track routes. Many of these trails offer challenges requiring strong 4x4 driving skills, particularly in rocky and mountainous stretches of the Slate and Argus Ranges.

Other uses occurring within the subregion are birdwatching, climbing, equestrian rides, hiking, target shooting, hunting, and rockhounding. The Kerncrest Audubon Society participates in regular bird censuses of Indian Joe Canyon and the Great Falls Basin is popular with backpackers, including the Sierra Club and Desert Survivors.

B.14 Ord Subregion

General Description: The Ord subregion, located southeast of Barstow, California, is defined by State Highway 247 on the west, the U.S. Marine Corps Firing Range on the north, Camp Rock Road on the east, and greater Lucerne Valley on the south. The Newberry Mountains Wilderness lies immediately to the northeast, the Johnson Valley and Stoddard Valley Off-Highway Vehicle Areas to the southeast and northwest respectively, and private land of Lucerne Valley to the south.

Apart from the portion north of Power Line Road and a small portion to the south, the subregion consists of the BLM's Ord Mountain Route Designation Pilot Planning Unit. The Planning Unit consists of approximately 126,000 acres, located between the Stoddard Valley and Johnson Valley Off-Highway Vehicle Areas. As such, it is a popular connector between the two. In early 1995, the Ord Mountain Pilot Project was initiated as an opportunity to conduct OHV route planning and vehicle access planning for the West Mojave Plan.

The subregion includes three important desert peaks in close proximity to one another, Ord Mountain, East Ord Mountain, and West Ord Mountain; as well as Daggett Ridge and portions of East Stoddard Valley and North Lucerne Valley. Elevations in the area range from 2,500 feet to 6,309 feet above sea level.

The Ord Mountain area consists of valleys, rolling and jagged hills, sloping bajadas, braided washes, and barren playas.
The creosote brush scrub plant community is the dominant vegetative assemblage found within the subregion. Plant species within this community include creosotebush, burrobush, Mormon tea, allscale saltbush, golden cholla, and beavertail cactus. A BLM sensitive species, the Mojave monkeyflower, is found here.

Reptile fauna found in the area include desert tortoise, desert banded gecko, desert horned lizard, rosy boa, and Mojave rattlesnake. Notable avian species include golden eagle, prairie falcon, roadrunner, burrowing owl, and loggerhead shrike. Mammalian fauna include desert woodrat, antelope ground squirrel, black-tailed jackrabbit, kit fox, and coyote.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are cattle grazing, powerline and pipeline rights-of-way, rockhounding, rock climbing, communication sites, camping, hiking, wildlife habitat, mining and recreational mining, hunting, and off-highway vehicle use restricted to open routes of travel.

The Ord Planning Unit consists of a precise vehicle network, restricting access to only essential routes of travel; all other historical routes are either closed or are limited to access by certain individuals for specific reasons, such as maintenance crews and ranch operators.

The recommended route network provides for vehicle access to the following features.

Stoddard Valley Off-Highway Vehicle Area, to the west, and Johnson Valley Off-Highway Vehicle Area, to the southeast. In addition to these, the historic Ord Mountain Road and the Daggett Wash Road are accessible by four-wheel-drive vehicles and motorcycles. Mining operators used these two historic roads to haul their ore to the railhead in Daggett, California. Hercules Rock, on the south of the subregion, is a popular destination for rock climbers.

In addition, the network provides for access to the boundary of the Newberry Mountains wilderness, to the east; vehicular travel is not permitted within wilderness, but hiking, camping, and horseback riding are encouraged.

Many visitors to this area take advantage of the many hunting opportunities for small game birds found here. Hunting is enhanced in the region by a variety of water sources to be found here, including springs and guzzlers.

The recommended route network also provides access to various blocks of non-federal land within the area.

B.15 Pinto Subregion

General Description: The Pinto Mountain subregion, located immediately southeast of Twentynine Palms and north of Joshua Tree National Park, is defined by State Highway 62 to the north, and Joshua Tree National Park, to the east, west, and south.

The smaller, north-south-trending Twentynine Palms Mountains are located in the western portion of the region and the larger, east-west-trending Pinto Mountains cover its southern half. Historic mines associated with the Old Dale Mining District cover the eastern half of the area. Sand dunes are found to the northeast of the subregion, the greater part of which is within the Sheephole Valley Wilderness. The Bullion Mountains are located directly to the north.

Most of the area is dominated by steep but generally routed hills, vegetated with the creosote bush scrub community. Vegetation becomes more diverse in the washes, consisting of smoke tree, catclaw and desert willow. Stands of Mojave yucca exist within many of the interior valleys. Elevations range from 1,300 to 4,500 feet.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in the area are cattle grazing, powerline and pipeline rights-of-way, wildlife habitat, rockhounding, mining and recreational mining, hunting, and off-highway vehicle use restricted to open routes of travel.

Some of the designated routes provide access to each block of non-federal land within the area.

B.16 Red Mountain Subregion

General Description: The Red Mountain subregion, located approximately 20 miles southeast of Ridgecrest, is defined by U.S. Highway 395 and the Kern County line on the west; the Spangler Hills Off-Highway Vehicle Management Area on the north; the China Lake Naval Air Weapons Station B Range on the east; and the Barstow Field Office management boundary on the south. 120,199 acres in size, the area is 82% (98,043 acres) Federal land managed by the BLM and 18% (22,156 acres) private and State land. Numerous landowners own the private lands. The subregion borders the Golden Valley and Grass Valley wilderness areas.

Elevations in the subregion range from 2,568 feet on the Cuddeback Playa to 5,260 feet on Red Mountain. Creosote bush and Mojave saltbush are the predominant plant communities in the lowlands, with cheesebush-dominated plant communities found in the washes, remnant stands of native perennial bunch grasses on the mountaintops and scattered Joshua tree woodland.

Recreation Activities/Resource Uses Overview: The subregion is used for commercial 4-wheel drive and dual sport motorcycle tours and competitive equestrian endurance rides. Further, additional activities in the subregion include commercial filming, mineral exploration, utility corridor maintenance, recreational vehicle touring/sightseeing, dispersed hiking and camping, and upland game bird hunting.

Superior Valley, Monolith Cantil, Lava Mountains, and Pilot Knob are grazing allotments located within the subregion. The first three are ephemeral sheep allotments, and the Pilot Knob Allotment is an ephemeral cattle allotment, which is currently leased to the Desert Tortoise Preserve Committee. Sheep grazing is not currently allowed in the majority of tortoise critical habitat.

The BLM's mineral resource potential classification shows a moderate potential for the occurrence of placer gold deposits in the Randsburg and Atolia mining districts. A high potential for lode and placer gold occurs immediately outside the south boundary of the subregion. There are no active mining operations in the Red Mountain Subregion based on reports from the California Division of Mines and Geology filed under the California Surface Mining and Reclamation Act of 1975 (SMARA). BLM records show, as of March 2001, there are eight lode-mining claims north and west of Randsburg, and two lode claims located on some older workings on a small hill west of the Black Hills.

There are approximately 246 placer mining claims in the subregion. The placer claims are clustered in the center of the subregion, with dense clusters in the Atolia mining district and at the Summit Diggings area south of the Summit Range. Small clusters of placer claims are also located in the center of the subregion near Blackhawk Well. Most of the placer mining claims are association placers, each aggregating about 160 acres. As of March 2001, there were five plans of operation and eleven notice level operations authorized by BLM in the subregion pursuant to 43 CFR 3809. Most were approved for small placer operations in the Summit Diggings area or assessment work in the remaining area of the subregion.

A utility corridor crosses the western portion of the subregion, running parallel to Highway 395. The corridor contains existing facilities.

Various opportunities for outdoor recreation are present in the subregion. Some of the best upland game bird hunting in the eastern Kern and San Bernardino Counties is available in the Lava Mountains, Red Mountain and Blackwater Well areas. During years when winter rainfall is suitable, seasonal wildflower displays are exceptional in the Golden Valley and Grass Valley areas. Red Mountain Spring (formerly called Squaw Spring) and Steam Well are two cultural heritage sites in the subregion. Both of these sites contain rock art. A route proposed for the California Statewide Discovery Trail crosses from south to north.

Other recreational opportunities and experiences available in the Red Mountain subregion include dispersed camping; four wheel drive and motorcycle touring; target shooting; rock hounding; hiking in the Golden Valley wilderness and climbing Red Mountain; mountain biking and equestrian recreation; and land sailing on Cuddeback Dry Lake. Several outfitters also use the area for recreational activities operated under recreation use permits including equestrian endurance rides, dual sport events and jeep tours.

Commercial filming in the subregion occurs primarily on \Cuddeback Dry Lake where an average of 15 permits a year is issued for advertising and motion picture projects.

B.17 Ridgecrest Subregion

General description: The Ridgecrest subregion, located south and east of the city of Ridgecrest, is defined by U.S. Highway 395 and the boundary of the Spangler Hills Open Area on the south; the city of Ridgecrest and the China Lake Naval Air Weapons Station on the north and west; and BLM Route RM 138 on the east. 22,465 acres in size, the area is 94% (21,115 acres) Federal land managed by the BLM and 6% (1,350 acres) private land. Numerous landowners own the private lands.

The general region consists of the rolling Rademacher and Spangler Hills. Sloping bajadas, braided washes, and narrow canyons characterize the general topography. Elevations range from 1,900 feet at the northeastern point of the subregion, to over 3,400 feet above sea level in the hills directly south of the City of Ridgecrest in the western portion of the subregion. Creosote bush scrub is the predominant plant community in the subregion, with cheesebush-dominated plant communities found in the washes, remnant stands of native perennial bunch grasses on the mountain tops and scattered Joshua trees.

Recreation Activities/Resource Uses Overview: The subregion contains two livestock grazing allotments. The Spangler Hills Allotment is located in the eastern-most portion of the subregion. This allotment is identified by the 1980 Desert Plan as an ephemeral allotment requiring a minimum of 200 pounds of dry vegetation per acre before the livestock are turned out to graze. The Cantil Common Allotment, an ephemeral grazing allotment, covers the remainder

of the subregion. Sheep grazing occurs in the area in the spring when the annual vegetation meets the minimum requirements. The northern portion of the subregion contains a portion of the Centennial Wild Horse and Burro Herd Management Area.

The BLM's Mineral Resource Potential Classification identifies most of the subregion as having a moderate potential for the occurrence of placer and lode gold deposits, with a high potential for placer, principally hydrothermal lode gold deposits, identified in the western area of the subregion (Rademacher Mining District). In addition, there is a high potential for construction aggregates (sand and gravel) in the western portion of the subregion, with aggregates mined at the Bowman and Inyokern pits outside the western boundary. There are no active mining operations in the subregion filed under the California Surface Mining and Reclamation Act of 1975 (SMARA), based on reports from the California Division of Mines and Geology. Some interest has been expressed in the far western portion of the subregion as evidenced through mining claim locations. BLM records show, as of March 2001, that there are six lode-mining claims and six placer mining claims in this portion of the subregion in the Rademacher Hills. There is one plan of operation and one pending (April 2001) notice level operation in the Rademacher Hills area of the subregion filed pursuant to the regulations at 43 CFR 3809. There are no aggregate resources being developed within the subregion, and the subregion is not valuable, prospectively or otherwise, for Leasing Act minerals.

A utility corridor crosses the northern portion of the subregion, in an east/west direction. This corridor contains existing facilities.

The Ridgecrest Subregion supports a wide variety of recreation opportunities and experiences including, but not limited to, four wheel drive and motorcycle touring, hunting and target shooting, paintball, stargazing, photography, exploring mining sites, social gatherings, rockhounding, hiking and running, limited dispersed camping, mountain biking and equestrian recreation.

The most prominent recreation feature in the subregion is the Rademacher Hills, located south of the City of Ridgecrest. The Rademacher Hills offer a 12.5-mile network of trails open to hiking, jogging, horseback riding and mountain biking. This area forms the backdrop for the City of Ridgecrest and provides an urban-public land interface that is fast becoming a popular recreation site for local residents. Motorized trails through the Rademacher Hills provide access from the City of Ridgecrest to the 57,000 acre Spangler Hills OHV Area. A link to the Statewide Motorized Discovery Trail is proposed to connect the trail to the City of Ridgecrest through the Rademacher Hills.

The subregion is also used by a variety of recreation permit holders who use the public lands for mountain bike races, ultra-marathon running events, high school cross country running competitions, equestrian trail rides and endurance events, dual sport motorcycle tours, jeep tours, and other activities.

The area is used for commercial 4-wheel drive and dual sport motorcycle tours and

competitive equestrian endurance and mountain bike events.

B.18 Sleeping Beauty Subregion

General Description: The Sleeping Beauty subregion, located approximately 3 miles west of Ludlow, California, is defined by Interstate-40 on the south by the northern edge of the public land Multiple Use Class L (limited) boundary on the north

The northern half of the subregion includes Sleeping Beauty Mountain, a part of the southern Cady Mountains. The southern half is a large, sweeping bajada sloping southward to Interstate 40. The larger washes draining the southern Cady Mountains support disjunctr occurrences of white-margined beardtongue, a rare plant. Elevations within the subregion range from 1,300 to 3,980 feet.

Access to this subregion is generally from Interstate 40, via Lavic off-ramp.

Recreation Activities/Resource Uses Overview: Primary recreation activities and resource uses occurring in this subregion are cattle grazing, power line and pipeline rights-of-way, wildlife habitat, hiking and camping, recreational prospecting and mining, vehicle touring, utility corridor maintenance, and mineral exploration.

B.19 South Searles Subregion

General Description: The South Searles subregion, is located approximately 8 miles northeast of Ridgecrest, immediately north of Randsburg Wash Road and the Spangler Hills Open Area. Randsburg Wash Road defines the subregion on the south, the China Lake Naval Air Weapons Station (NAWS) boundaries on both its east and west sides, and by the Inyo-Kern County line on the north. Numerous landowners own the private lands. The Trona Pinnacles National Natural Landmark and ACEC is surrounded by the subregion on all four sides.

The general region consists of the lower part of Searles Valley surrounding Searles Lake It is encircled by two prominent mountain ranges, the Argus and Slates, on the west and east, and by the Spangler Hills on the south. The area abuts the upper half of Searles Valley above Searles Lake to the north - an area covered by the North Searles Subregion. The area is made up almost entirely of gravel to sandy to silty lakebed sediments. Elevations within this subregion are generally quite low, keeping to within 1600-2500 feet on the valley floor, to more than 2800 feet at selected high points in the Argus Range. Visitation is generally high, particularly in cooler, winter months, due to the presence of the Trona Pinnacles, and the subregion's general location along a highway to Death Valley National Park (Highway 178) and close proximity to the communities of Trona and Ridgecrest. Mojave saltbush and creosote bush scrub are the predominant plant communities on the valley floor, with rabbitbrush dominating plant communities in upper elevation washes.

Access to this subregion is primarily from Highway 178 and its Trona-Wildrose extension. The subregion can also be accessed from the Randsburg-Wash road, north of the Spangler Hills Open Area.

Recreation Activities/Resource Uses Overview: In general, the area absorbs a lot of casual OHV recreational use involving dune buggies, quads, and motorcycles. Most of these users are local residents. They come from Trona and the associated communities of West End, Argus, and Pioneer Point, or from Homewood Canyon. Some gem and mineral collecting also occurs, primarily in the foothills of the Argus Range on the western edge of the subregion. In October, the Searles Valley Gem and Mineral Society put on a Gem and Mineral Show. The subregion is also used for interpretative museum and commercial 4-wheel drive, dual sport motorcycle and equestrian tours.

Vehicles are permitted to pull off within 300 feet of a route to make camp in the subregion, except in the vicinity of the Pinnacles where visitors are asked to camp only in already impacted sites. Laws and regulations prohibit camping or staying within 200 yards of waters, which includes the natural seeps and springs in the Argus Range. Currently, all access routes on public land in this subregion comply with applicable law.

Most trails in the subregion are full-size 4x4 as opposed to quad or single-track routes, which exist only in the extreme southwestern corner of the subregion. While some staging areas off of Highway 178 exist, most off-road vehicle enthusiasts probably stage from campsites within the Trona Pinnacles or from various campsites within the Spangler Open Area just outside the subregion. Local people most likely enter this area directly from their homes in West End, South Trona, and Argus. For access to good riding areas, they must cross highway 178, traveling approximately 7 miles south of town to reach the Pinnacles or more than 12 miles to reach the Spangler Open Area.

The area offers very few opportunities for backcountry touring and sightseeing outside of the Trona Pinnacles National Natural Landmark. Climbers have not been observed in great numbers within the subregion. Equestrian use is tied to spring sources or in the case of organized, commercial and/or competitive events to regular vehicle routes for staging the necessary water and periodic veterinarian checks. Most people who hike in the area are locals who are simply exploring their own backyards.

Access to hunting areas is limited within the subregion. Hunting thus requires a good deal of hiking in the subregion. Hunters are known to pursue chukar over steep rocky terrain for long distances. Chukar and California quail are the primary targets although jackrabbits and mourning dove are hunted as well.

Non-motorized trails for mountain bikers do not exist in the area. However, mountain biking is popular along Highway 178 and with campers at the Pinnacles.

Rockhounding occurs throughout the area, in specific localities, mostly in the foothills of

the Argus and Slate Ranges. During October's Gem and Mineral Show, the Searles Valley Gem and Mineral Society offers information about and several tours to various collecting and other sites of local interest in the valley.

Target shooting occurs throughout the area and is generally permitted wherever the terrain offers a safe backstop. However, the ACEC Plan for The Trona Pinnacles specifically prohibits target shooting anywhere within the vicinity of the National Landmark.

B.20 Superior Subregion

General Description: The Superior subregion, located north of Barstow, is bounded by Fort Irwin (National Training Center) and China Lake Naval Weapons Center on the north, the Fremont subregion and Black Mountain Wilderness on the west, and private lands and Interstate-15 on the south. The subregion is 271,528 acres in size, with 192,877 acres (72 percent) of Federal land managed by the BLM, and approximately 77,359 acres (28 percent) either private or State owned land. The major private landowner is the Catellus Development Corporation.

The Superior subregion encompasses numerous features that include Mount General, the Waterman Hills, Mud Hills, Fossil Canyon, Owl Canyon, and the Inscription Canyon area, known for its great quantity of rock art. The northern portion of the Superior subregion includes the Superior Valley, an area characterized by low-lying, flat open areas containing two dry lakes: an unnamed, small dry lake at the western edge and the larger Superior Dry Lake at the eastern boundary. The central portion of the subregion includes the Black Mountain Lava Flows, Lane Mountain, and the Paradise Range.

The Rainbow Basin, located in the south-central portion of the subregion, is an ACEC and is not included in the Superior subregion. Access to areas within the Rainbow Basin (which include the Mud Hills, Fossil Canyon, Owl Canyon campground, and the Rainbow Basin National Natural Landmark) is obtained via the Superior subregion. The southern portion of the subregion encompasses Mud-Water Valley, Waterman Hills, and outlying areas of Barstow. Elevations range from approximately 2000 feet in the southeast to 4,522 feet at the peak of Lane Mountain in the central-eastern portion of the subregion.

Vegetation in the northern portion of the subregion is similar to other areas in the West Mojave. In the Lane Mountain area, vegetation consists of creosote/mixed desert scrub association with scattered Joshua Trees and golden cholla. The Paradise Range in the northeast include a series of volcanic, rocky hills that exhibit little vegetation on the slopes, with the exception of scattered creosote. Vegetation is similarly sparse within the Black Mountain Lava Flows at the central portion of the subregion. The vegetative cover in the southern portion of the subregion generally is sparse, and includes occasional Joshua Trees.

The Superior subregion is criss-crossed by a number of roads, mainly unimproved. Access

from population centers to the Superior Valley in the north is provided via Copper City Road, an improved road via Fort Irwin Road, and a paved highway. Due to these access routes, the Superior Valley is easily reached, as demonstrated by the noticeable presence of recreational visitors in this portion of the subregion. Access to the subregion from the south is obtained from Interstate 15, State Route 58, and Irwin Road.

Recreation Activities/Resource Uses Overview: Primary recreation activities and other resource uses occurring in the subregion are rockhounding, camping, picnicking, powerline and pipeline rights-of-way, mining and recreational mining, hunting, and off-highway vehicle use.

Excellent opportunities for both hiking and backpacking exist in the Black Mountains, Opal Mountains, and Calico Mountains. Major activities include camping, rockhounding, hunting, and motorcycle free play. The hard, smooth surfaces of two dry lakes in the Superior Valley provide excellent conditions for land sailing. The OHV community also utilizes this portion of the subregion, although the flat terrain is less than ideal for their activities.

The suggested vehicle route network provides the recreational OHV enthusiast an expansive variety of opportunities from which to choose. Routes vary from long, flat graded utility corridor routes or the flats of Superior Valley; technical jeep routes in the Calico Mountains; technical single-track motorcycle routes in the Mud Hills; lengthy remote touring routes around the Black Mountain wilderness or through the Grass Valley wilderness corridor; short quickly accessible routes into the Mitchell Range or Waterman Hills; and those that provide a loop opportunity to those that are "dead-ends".

Additionally, the suggested route network provides access to a variety of destinations ranging from historic mining sites (e.g. Calico Mountains), prehistoric cultural zones (e.g. Inscription Canyon), upland springs (e.g. Sweet Water Spring), geologically unusual areas (e.g. Rainbow Basin), rock-hounding areas (e.g. Opal Mountain), recreational mining (e.g. Coolgardie area); and mountain bike recreation throughout the subregion.

APPENDIX C

ROUTE DESIGNATION MAPS AND TABLES

C.1 ROUTE DESIGNATION MAPS

Maps of the route network can be found on the attached compact disk (CD Rom). Maps are full color, 1:24,000 scale USGS topographic quads; where applicable, the route number is attached for easy cross-referencing to the tables presented in Section R.4. Maps can be viewed using the Adobe reader on your home or local library computer. You will find that this will enable you to view any section of the route network at a variety of scales, and to print your own maps from the attached files. Please note that an index map is also provided. Subregion and motorized access zone boundaries are indicated on the map.

C.2 ROUTE DESIGNATION TABLES

The tables presented on the following pages address each of the more than 5,200 specifically enumerated motorized vehicle routes that are found within the ten subregions for which a revised network is being proposed to replace the existing 1985/87 motorized vehicle access network. A separate table is presented for each motorized access zone within each subregion. The tables identify, for each route, the following:

- ?? Universal Trans Mercator (UTM) coordinates for the route,
- ?? The route number,
- ?? The decision tree code (when the decision tree process was applied to a particular route, and the decision branch followed to its end, a distinctive code was assigned to that end point, allowing the documentation of the thought process that led to the final recommendation),
- ?? Whether the route is recommended as open or close, and
- ?? Reasons for the open or closed recommendation.

LIST OF REFERENCES

Avery, H.W. 1998. Nutritional ecology of the desert tortoise (*Gopherus agassizii*,) in relation to cattle grazing in the Mojave Desert. Ph.D. dissertation, University of California, Los Angeles.

Barnes, James J. 2002 The Life of Reilly: The Archaeology of an 1880s Silver Mine in Panamint Valley, California. Masters Thesis, Sonoma State University.

Bartholomew, G.A. and J.W. Hudson. 1961. Aestivation in the Mohave ground squirrel (*Citellus mohavensis*). Bull. Mus. Comp. Zool. 124:193-208.

Berry, K. H. 1996a. Draft report. The effects of off-road vehicles on animal populations and habitats: A review of the literature. Unpublished, draft report prepared on behalf of the Bureau of Land Management. Riverside, CA. pp.60.

Berry, K. H. 1996b. Memo from Dr. Kristin Berry to BLM Area Manager, Molly Brady regarding observations on permanent BLM study plots between 1979 and 1996. Riverside, CA.

Best, T. L. 1995. *Spermophilus mohavensis*. Mammalian Species 509:1-7.

Boarman, W.I. 2002. Threats to desert tortoise populations: A critical review of the literature. Unpublished report prepared for the West Mojave Planning Team, Bureau of Land Management. U.S. Geological Survey, Western Ecological Research Center. San Diego, CA.

Brooks, M. 1998. Effects of fire on the desert tortoise (*Gopherus agassizii*). Proceedings of the International Conference on Turtles and Tortoises. pp. 7.

Brooks, M. L. 1999a. Habitat invasibility and dominance by alien annual plants in the western Mojave Desert. Biological Invasions 1:325-337.

Brooks, M. L. 1999b. Alien annual grasses and fire in the Mojave Desert. Madrono 46:13-19.

Brooks, M. L. 2000. Competition between alien annual grasses and native annual plants in the Mojave Desert. American Midland Naturalist 144:92-108.

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites by *Gopherus agassizii* in southern Nevada. Proceedings of the 1978 Symposium, Desert Tortoise Council.

Burge, B.L., and W.G. Bradley. 1976. Population density, structure and feeding habits of the desert tortoise, *Gopherus agassizii*, in a low desert study area in southern Nevada. Proceedings of the 1976 Symposium, Desert Tortoise Council.

Bury, R. B. and R. A. Luckenbach. 1977. Censusing desert tortoise populations using a quadrat and grid location system. Proc. 1977 Desert Tortoise Council Symp. 1977: 169-178.

California Department of Fish and Game. 1980. At the Crossroads. Sacramento, CA.

California Department of Fish and Game. 1992. Annual report on the status of California State-listed threatened and endangered animals and plants. Sacramento, CA.

Circle Mountain Biological Consultants. 2002. Copper Mountain College: General biological survey and focused desert tortoise survey, on +/- 115 acres in the community of Joshua Tree, San Bernardino County, California. Unpublished report prepared on behalf of The Addington Partnership. Wrightwood, CA.

Clark, D. 1993. Goals and objectives of Mohave ground squirrel protection and Zone A monitoring. An unpublished report prepared by Debi Clark on behalf of the Bureau of Land Management and the West Mojave Coordinated Management Plan. Barstow, CA.

Congdon, J.D., A.E. Dunham, and R.C. Van Loben Sels. 1993. Delayed sexual maturity and demographics of Blanding**?**s turtles (Emydoidea blandingii): implications for conservation and management of long-lived organisms. Conservation Biology 7:826-833.

Cunningham, Laura. 2001. Snowy Plover Survey for Warm Sulphur Springs, Post Office Springs, and Koehn Lake. Report prepared for BLM, Ridgecrest Field Office, Ridgecrest, CA.
Dodd, C. K., Jr. 1986. Desert and gopher tortoises: Perspectives on conservation approaches. *In* D. R. Jackson and R. J. Bryant (eds.). The Gopher Tortoise and Its Community. Proceedings of the 5th Annual Meeting of the Gopher Tortoise Council. pp.54-72.

Esque, T. C. 1994. Diet and diet selection of the desert tortoise (Gopherus agassizii) in the northeast Mojave Desert. M.Sc. Thesis, Colorado State Univ. Fort Collins, CO.
Evans, J.R., T.P. Anderson, M.W. Manson, R.L. Maud, W.B. Clark, and D.L. Fife. February 1977. Aggregates in the Greater Los Angeles Area, California, Calif. Div. of Mines and Geology, Open File Report 77-1 LA, pp.9, map.

Frenkel, R. E. 1970. Ruderal vegetation along some California roadsides. Univ. Calif. Press, Berkeley.

Garfinkel, Alan P. 1976. *A Cultural Resource Management Plan for the Fossil Falls/Little Lake Locality.* Bureau of Land Management, Bakersfield District Office. Reprinted 1980, Bureau of Land Management, California Desert District Cultural Resources Publications.

Goodlett, G. O and G. C. Goodlett. 1991. Evidence of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Unpublished report prepared on behalf of the Desert Tortoise Preserve Committee, Inc. Ridgecrest, CA.

Gustafson, J. R. 1993. A status review of the Mohave ground squirrel (*Spermophilus mohavensis*). California Department of Fish and Game (Sacramento), Wildlife Management Division, Nongame Bird and Mammal Section Report 93-9, 104 pp. + appendices. Sacramento, CA.

Hall, E. R. 1981. Mammals of North America. John Wiley & Sons, New York, New York.

Haskell, D. G. 2000. Effects of forest roads on macroinvertebrate soil fauna of the southern Appalachian Mountains. Conservation Biology, Vol. 14, No. 1, February 2000, pp.57-63.

Hourdequin, M. (editor). 2000. Special section: Ecological effects of roads. Introduction by the editor. Conservation Biology, Vol. 14, No. 1, February 2000, pp 16-17.

Hovik, D.C., and D.B. Hardenbrook. 1989. Summer and fall activity and movements of desert tortoises in Pahrump Valley, Nevada. Abstract of paper presented at Fourteenth Annual Meeting and Symposium of the Desert Tortoise Council.

Jennings, W.B. 1993a. Foraging ecology of the desert tortoise (*Gopherus agassizii*) in the western Mojave Desert, California. Proceedings of the Desert Tortoise Council Symposium, Vol. 1993, abstract, pp.14.

Jennings, W. B. 1993b. The importance of washes and washlets to desert tortoises (*Gopherus agassizii*) in the western Mojave Desert. Proceedings of the Desert Tortoise Council Symposium. Vol. 1993. Abstract. pp. 79.

Jennings, W.B. 1997a. Invasions of exotic plants: Implications for the desert tortoise, *Gopherus agassizii*, and its habitat in the western Mojave Desert. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference, pp. 10-12.

Jennings, W. B. 1997b. Habitat use and food preferences of the desert tortoise, *Gopherus agassizii*, in the western Mojave Desert and impacts of off-road vehicles. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference. pp. 42-45.

Laabs, D. 1998. Mohave ground squirrel (*Spermophilus mohavensis*). Unpublished species account prepared on behalf of the West Mojave Plan. Santa Cruz, CA.

LaBerteaux, Denise L. 2001. Snowy Plover Surveys at Searles Lake, San Bernardino County, California. Report prepared for BLM, Ridgecrest Field Office, Ridgecrest, CA.

LaRue, E. L., Jr. 1997. Ord Mountain Pilot Study: Recommendations for route designation. Technical Review Team report prepared for the Desert Tortoise Council, and submitted to the Barstow Resource Area of the Bureau of Land Management. Wrightwood, CA.

LaRue, Jr. E. L. 1998. Unpublished plant survey data collected on behalf of the West Mojave Plan during the spring and summer of 1998. Data maintained by the BLM. Riverside, CA.

Leitner, P. and B. Leitner. 1990. Second year baseline report: Coso grazing exclosure monitoring study: Coso Known Geothermal Resource Area, Inyo County, California. Unpublished report prepared on behalf of McClenahan and Hopkins Associates. Oakland, CA.

Leitner, P. and B. Leitner. 1992. Fourth year baseline report: Coso grazing exclosure monitoring study: Coso Known Geothermal Resource Area, Inyo County, California. Unpublished report prepared on behalf of McClenahan and Hopkins Associates. Oakland, CA.

Leitner, P. and B. Leitner. 1996a. A comparison of the diets of the Mohave ground squirrel and cattle: Results of a long-term study in the Coso Region of Inyo County. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P. and B. Leitner. 1996b. Coso grazing exclosure monitoring study: Mohave ground squirrel study, Coso Known Geothermal Resource Area: Major findings, 1988-1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P. and B. Leitner. 1998. Final Report: Coso grazing exclosure monitoring study: Mohave ground squirrel study, Coso Known Geothermal Resource Area: Major findings, 1988-1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P., B. Leitner and J. H. Harris. 1995. Mohave ground squirrel study in Coso Known Geothermal Resource Area, Inyo County, California, March-June, 1994. Unpublished report prepared on behalf of Jean Hopkins and Associates. Orinda, CA.

Leitner, P., B. Leitner and J. H. Harris. 1997. Mohave ground squirrel study in the Coso Known Geothermal Resource Area, Inyo County, California, 1995 and 1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Lovich, J.E. 1992. Natural recovery rates of desert tortoise habitat from anthropogenic effects. Proceedings of the Desert Tortoise Council Symposium, Vol. 1992, Abstract, 205.

Lovich, J. E. and D. Bainbridge. 1999. Anthropogenic degradation of the southern California desert ecosystem and prospects for natural recovery and restoration. Environmental Management. Vol. 24, No. 3, pp 309-326.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. *In*: R.B. Bury (ed.). North American Tortoises: Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, D.C.

Lyneis, Margaret M., David L. Weide, and Elizabeth vonTill Warren. 1980. *Impacts: Damage to Cultural Resources in the California Desert.* Bureau of Land Management, California Desert District Cultural Resources Publications, Eric W. Ritter, General Editor.

Medica, P.A., R.B. Bury, and R.A. Luckenbach. 1982. A comparison of 1981 populations of desert tortoises, *Gopherus agassizii*, in grazed and ungrazed areas in Ivanpah Valley, California. Proceedings of the 1982 Symposium, Desert Tortoise Council.

Michael Brandman Associates, Inc. 1988. Phase One: China Lake Naval Weapons Center, Mohave ground squirrel survey and management plan. An unpublished report prepared on

behalf of Naval Weapons Center Environmental Resources Management Branch. Santa Ana, CA.

Nagy, K.A. and P.A. Medica. 1986. Physiological ecology of desert tortoises in southern Nevada. Herpetologica 42(1):73-92.

National Ecology Research Center. 1990. Assessment of biological information for listing the desert tortoise as an endangered species in the Mojave Desert. Predecision document prepared by NERC and submitted to U.S. Fish and Wildlife Service, Region One. Fort Collins, CO.

Norris, Frank and Richard L. Carrico. 1978. *A History of Land Use in the California Desert Conservation Area.* Desert Planning Staff, Bureau of Land Management, USDI.

Norwood, Richard H., Charles S. Bull, and Ronald Quinn. 1980. *A Cultural Resource Overview of the Eureka, Saline, Panamint and Darwin Region, East Central, California.* Bureau of Land Management, California Desert District Cultural Resources Publications; Eric Ritter, General Editor.

Nowak, R. M. 1991. Walker's Mammals of the World. 5th ed. The Johns Hopkins University Press. Baltimore, Maryland.

Recht, M. A. 1977. The biology of the Mohave ground squirrel, *Spermophilus mohavensis*; home range, daily activity, foraging and weight gain, and thermoregulatory behavior. PhD dissertation at University of California Los Angeles. Los Angeles, CA.

Schamberger, M., and F.B. Turner. 1986. The application of habitat modeling to the desert tortoise (*Gopherus agassizii*). Herpetologica 42(1):134-138.

Stickel, E. Gary and Lois J. Weinman-Roberts. 1980. *An Overview of the Cultural Resources of the Western Mojave Desert.* Bureau of Land Management, California Desert District Cultural Resources Publications; Eric W. Ritter, General Editor.

Stow, D. 1988. Interpretation of aerial photographs to measure off-road vehicle disturbances in the California Desert District. Part A of an unpublished report prepared on behalf of the Bureau of Land Management. San Diego, CA.

Tracy, C. R. 1995. Patterns of fire incidence and implications for management of Desert Wildlife Management Areas. Proc. 1994 Desert Tort. Counc. Symp. 1995:179.

Trombulak, S. C. and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology, Vol. 14, No. 1, February 2000.

Turner, F.B. and D.E. Brown. 1982. Sonoran desertscrub. In: D.E. Brown (editor). Biotic communities of the American Southwest - United States and Mexico. Desert Plants 4(1-4):181-222.

U.S. Bureau of Land Management. 1980. The California Desert Conservation Area Plan, Riverside District Office.

U.S. Bureau of Land Management. 1989. The California Desert minerals compendium, held at Marriott Hotel, Irvine, California: 38 papers representing the policy of multiple use and research associated with mineral exploration and development in the CDCA. California State Office, Sacramento. Contributions were generated by the scientific community, industry, and the government in response to increasing interest in the California Desert mineral resources, pp. 412.

U.S. Bureau of Land Management. April 1991. Division of Mineral Resources The California Desert, Why mining is important, prepared as a supplement to be presented to Congress for the pending wilderness legislation, pp. 83.

U.S. Bureau of Land Management. 1991b. Western Mojave Land Tenure Adjustment Project, Record of Decision. Unpublished report prepared by the California Desert District. Riverside, CA.

U.S. Bureau of Land Management. 1993.

U.S. Bureau of Land Management. 1999a. Current Management Situation of Special-Status Species in the West Mojave planning area. Emily Cohen, Editor. Unpublished report produced by West Mojave Team to assess current management and gaps in the protection for species covered by the Plan. Barstow, CA.

U.S. Bureau of Land Management. 1999b Desert tortoise biological evaluation: Proposed management prescriptions and management areas identified for the conservation of the desert tortoise (*Gopherus agassizii)* in the West Mojave Desert, California. Unpublished report produced by West Mojave Team to document evaluations completed by the U.S. Fish and Wildlife Service and California Department of Fish and Game. Barstow, CA.

U.S. Bureau of Land Management. 1999c. West Mojave Plan Draft Evaluation Report, Suggested Conservation Strategies. ?Biological Evaluation? prepared by the West Mojave Team.

U.S. Bureau of Land Management. 1999d. Desert Tortoise Biological Evaluation: Proposed Management Prescriptions and Management Areas Identified for the Conservation of the Desert Tortoise (*Gopherus agassizii*) in the West Mojave Desert, California. Unpublished report prepared by the West Mojave Team to document evaluations completed by the U.S. Fish and Wildlife Service and California Department of Fish and Game. Barstow, CA.

U.S. Bureau of Land Management. 1982. M*anagement Plan for Denning Spring, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1982. *Management Plan for Salt Creek Hills, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1984. *Management Plan for Calico Early Man Site, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1985. *Management Plan for Cronese Lakes, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Black Mountain Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Greenwater Canyon Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Juniper Flats Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1991. M*anagement Plan for Rainbow Basin Natural Area, An Area of Critical Environmental Concern.* Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1992. *Management Plan for the Rodman Mountains Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Fish and Wildlife Service. June 1994. Desert Tortoise (Mojave Population) Recovery Plan, pp. 73, appendices.

U.S. Fish and Wildlife Service. 1994a. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. *Federal Register* 55(26):5820-5866. Washington, D.C.

U.S. Fish and Wildlife Service. 1994b. Desert tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. pp. 73, plus appendices.

U.S. Fish and Wildlife Service. March 5, 2002a. Biological Opinion for the California Area Plan [Lane-Mountain Milk-vetch, Ash Meadows Gumplant, and Amargosa Niterwort], pp. 52.

U.S. Fish and Wildlife Service. 2002b. Draft Biological Opinion for the California Desert Conservation Area Plan [Desert Tortoise] (6840(P) CA-063.50) (1-8-01-F-16). Draft memorandum from Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California to State Director, Bureau of Land Management, Sacramento, California.

U.S. Fish and Wildlife Service. 2002c. Biological opinion for the California Desert Conservation Area Plan [Desert Tortoise] (6840(P) CA-063.50) (1-8-01-F-16). Memorandum from Field Supervisor, Ventura Fish and Wildlife Field Office, Ventura, CA, to State Director, Bureau of Land Management, Sacramento, CA.

U. S. Fish and Wildlife Service, 2002d. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Five Carbonate Plants From the San Bernardino Mountains in

Southern California; Final Rule. *Federal Register* 67 (247):78570-78610.

Vollmer, A. T., B. G. Maza, P. A. Medica, F. B. Turner and S. A. Bamberg. 1976. The impact of off-road vehicles on a desert ecosystem. Environmental Management Vol 1, No. 2, pp. 115-129. Springer Verlag, New York.

W & S Consultants. 2002. Archaeological Investigation of the Timbisha Trust Parcels, Inyo County, California. On file, Bureau of Land Management, Ridgecrest Field Office, Ridgecrest, CA.

Warren, Elizabeth von Till and Ralph J. Roske. 1980. *Cultural Resources of the California Desert, 1776 – 1980: Historic Trails and Wagon Roads.* Bureau of Land Management, California Desert District Cultural Resources Publications; Russell L. Kaldenberg, Series Editor.

Webb, R. H., H. G. Wilshire and M. A. Henry. 1983. Natural recovery of soils and vegetation following human disturbance. *In* Webb, R. H. and H. G. Wilshire (Editors). Environmental effects of off-road vehicles: Impacts and management in arid regions. Springer-Verlag, New York.

Wehtje, Walter. 2001. Distribution and Breeding Status of the Western Snowy Plover (*Charadrius alexandrinus nivosus*) at Five Sites within the Bureau of Land Management, California Desert District, Barstow Field Office Resource Area.

Weinstein, M., K.H. Berry, and F.B. Turner. 1987. An analysis of habitat relationships of the desert tortoise in California. A report to Southern California Edison Company. Rosemead, California.

Weinstein, M. N. 1989. Modeling desert tortoise habitat: Can a useful management tool be developed from existing transect data? A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Environmental Science and Engineering. University of California, Los Angeles.

Wessman, E. V. 1977. The distribution and habitat preferences of the Mohave ground squirrel in the southeastern portion of its range. Unpublished report prepared on behalf of the California Department of Fish and Game; Report No.77-5 (1977). 15pp plus appendices.

Whitley, David. 2002. National Register Nomination Form, Ayers Rock. On file, Bureau of Land Management, Ridgecrest Field Office.

LIST OF REFERENCES

Avery, H.W. 1998. Nutritional ecology of the desert tortoise (*Gopherus agassizii*,) in relation to cattle grazing in the Mojave Desert. Ph.D. dissertation, University of California, Los Angeles.

Barnes, James J. 2002 The Life of Reilly: The Archaeology of an 1880s Silver Mine in Panamint Valley, California. Masters Thesis, Sonoma State University.

Bartholomew, G.A. and J.W. Hudson. 1961. Aestivation in the Mohave ground squirrel (*Citellus mohavensis*). Bull. Mus. Comp. Zool. 124:193-208.

Berry, K. H. 1996a. Draft report. The effects of off-road vehicles on animal populations and habitats: A review of the literature. Unpublished, draft report prepared on behalf of the Bureau of Land Management. Riverside, CA. pp.60.

Berry, K. H. 1996b. Memo from Dr. Kristin Berry to BLM Area Manager, Molly Brady regarding observations on permanent BLM study plots between 1979 and 1996. Riverside, CA.

Best, T. L. 1995. *Spermophilus mohavensis*. Mammalian Species 509:1-7.

Boarman, W.I. 2002. Threats to desert tortoise populations: A critical review of the literature. Unpublished report prepared for the West Mojave Planning Team, Bureau of Land Management. U.S. Geological Survey, Western Ecological Research Center. San Diego, CA.

Brooks, M. 1998. Effects of fire on the desert tortoise (*Gopherus agassizii*). Proceedings of the International Conference on Turtles and Tortoises. pp. 7.

Brooks, M. L. 1999a. Habitat invasibility and dominance by alien annual plants in the western Mojave Desert. Biological Invasions 1:325-337.

Brooks, M. L. 1999b. Alien annual grasses and fire in the Mojave Desert. Madrono 46:13-19.

Brooks, M. L. 2000. Competition between alien annual grasses and native annual plants in the Mojave Desert. American Midland Naturalist 144:92-108.

Burge, B.L. 1978. Physical characteristics and patterns of utilization of cover sites by *Gopherus agassizii* in southern Nevada. Proceedings of the 1978 Symposium, Desert Tortoise Council.

Burge, B.L., and W.G. Bradley. 1976. Population density, structure and feeding habits of the desert tortoise, *Gopherus agassizii*, in a low desert study area in southern Nevada. Proceedings of the 1976 Symposium, Desert Tortoise Council.

Bury, R. B. and R. A. Luckenbach. 1977. Censusing desert tortoise populations using a quadrat and grid location system. Proc. 1977 Desert Tortoise Council Symp. 1977: 169-178.

California Department of Fish and Game. 1980. At the Crossroads. Sacramento, CA.

California Department of Fish and Game. 1992. Annual report on the status of California State-listed threatened and endangered animals and plants. Sacramento, CA.

Circle Mountain Biological Consultants. 2002. Copper Mountain College: General biological survey and focused desert tortoise survey, on +/- 115 acres in the community of Joshua Tree, San Bernardino County, California. Unpublished report prepared on behalf of The Addington Partnership. Wrightwood, CA.

Clark, D. 1993. Goals and objectives of Mohave ground squirrel protection and Zone A monitoring. An unpublished report prepared by Debi Clark on behalf of the Bureau of Land Management and the West Mojave Coordinated Management Plan. Barstow, CA.

Congdon, J.D., A.E. Dunham, and R.C. Van Loben Sels. 1993. Delayed sexual maturity and demographics of Blanding**?**s turtles (Emydoidea blandingii): implications for conservation and management of long-lived organisms. Conservation Biology 7:826-833.

Cunningham, Laura. 2001. Snowy Plover Survey for Warm Sulphur Springs, Post Office Springs, and Koehn Lake. Report prepared for BLM, Ridgecrest Field Office, Ridgecrest, CA.
Dodd, C. K., Jr. 1986. Desert and gopher tortoises: Perspectives on conservation approaches. *In* D. R. Jackson and R. J. Bryant (eds.). The Gopher Tortoise and Its Community. Proceedings of the 5th Annual Meeting of the Gopher Tortoise Council. pp.54-72.

Esque, T. C. 1994. Diet and diet selection of the desert tortoise (Gopherus agassizii) in the northeast Mojave Desert. M.Sc. Thesis, Colorado State Univ. Fort Collins, CO.
Evans, J.R., T.P. Anderson, M.W. Manson, R.L. Maud, W.B. Clark, and D.L. Fife. February 1977. Aggregates in the Greater Los Angeles Area, California, Calif. Div. of Mines and Geology, Open File Report 77-1 LA, pp.9, map.

Frenkel, R. E. 1970. Ruderal vegetation along some California roadsides. Univ. Calif. Press, Berkeley.

Garfinkel, Alan P. 1976. *A Cultural Resource Management Plan for the Fossil Falls/Little Lake Locality.* Bureau of Land Management, Bakersfield District Office. Reprinted 1980, Bureau of Land Management, California Desert District Cultural Resources Publications.

Goodlett, G. O and G. C. Goodlett. 1991. Evidence of unauthorized off-highway vehicle activity in the Rand Mountains and Fremont Valley, Kern County, California. Unpublished report prepared on behalf of the Desert Tortoise Preserve Committee, Inc. Ridgecrest, CA.

Gustafson, J. R. 1993. A status review of the Mohave ground squirrel (*Spermophilus mohavensis*). California Department of Fish and Game (Sacramento), Wildlife Management Division, Nongame Bird and Mammal Section Report 93-9, 104 pp. + appendices. Sacramento, CA.

Hall, E. R. 1981. Mammals of North America. John Wiley & Sons, New York, New York.

Haskell, D. G. 2000. Effects of forest roads on macroinvertebrate soil fauna of the southern Appalachian Mountains. Conservation Biology, Vol. 14, No. 1, February 2000, pp.57-63.

Hourdequin, M. (editor). 2000. Special section: Ecological effects of roads. Introduction by the editor. Conservation Biology, Vol. 14, No. 1, February 2000, pp 16-17.

Hovik, D.C., and D.B. Hardenbrook. 1989. Summer and fall activity and movements of desert tortoises in Pahrump Valley, Nevada. Abstract of paper presented at Fourteenth Annual Meeting and Symposium of the Desert Tortoise Council.

Jennings, W.B. 1993a. Foraging ecology of the desert tortoise (*Gopherus agassizii*) in the western Mojave Desert, California. Proceedings of the Desert Tortoise Council Symposium, Vol. 1993, abstract, pp.14.

Jennings, W. B. 1993b. The importance of washes and washlets to desert tortoises (*Gopherus agassizii*) in the western Mojave Desert. Proceedings of the Desert Tortoise Council Symposium. Vol. 1993. Abstract. pp. 79.

Jennings, W.B. 1997a. Invasions of exotic plants: Implications for the desert tortoise, *Gopherus agassizii*, and its habitat in the western Mojave Desert. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference, pp. 10-12.

Jennings, W. B. 1997b. Habitat use and food preferences of the desert tortoise, *Gopherus agassizii*, in the western Mojave Desert and impacts of off-road vehicles. Proceedings: Conservation, Restoration, and Management of Tortoises and Turtles - An International Conference. pp. 42-45.

Laabs, D. 1998. Mohave ground squirrel (*Spermophilus mohavensis*). Unpublished species account prepared on behalf of the West Mojave Plan. Santa Cruz, CA.

LaBerteaux, Denise L. 2001. Snowy Plover Surveys at Searles Lake, San Bernardino County, California. Report prepared for BLM, Ridgecrest Field Office, Ridgecrest, CA.

LaRue, E. L., Jr. 1997. Ord Mountain Pilot Study: Recommendations for route designation. Technical Review Team report prepared for the Desert Tortoise Council, and submitted to the Barstow Resource Area of the Bureau of Land Management. Wrightwood, CA.

LaRue, Jr. E. L. 1998. Unpublished plant survey data collected on behalf of the West Mojave Plan during the spring and summer of 1998. Data maintained by the BLM. Riverside, CA.

Leitner, P. and B. Leitner. 1990. Second year baseline report: Coso grazing exclosure monitoring study: Coso Known Geothermal Resource Area, Inyo County, California. Unpublished report prepared on behalf of McClenahan and Hopkins Associates. Oakland, CA.

Leitner, P. and B. Leitner. 1992. Fourth year baseline report: Coso grazing exclosure monitoring study: Coso Known Geothermal Resource Area, Inyo County, California. Unpublished report prepared on behalf of McClenahan and Hopkins Associates. Oakland, CA.

Leitner, P. and B. Leitner. 1996a. A comparison of the diets of the Mohave ground squirrel and cattle: Results of a long-term study in the Coso Region of Inyo County. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P. and B. Leitner. 1996b. Coso grazing exclosure monitoring study: Mohave ground squirrel study, Coso Known Geothermal Resource Area: Major findings, 1988-1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P. and B. Leitner. 1998. Final Report: Coso grazing exclosure monitoring study: Mohave ground squirrel study, Coso Known Geothermal Resource Area: Major findings, 1988-1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Leitner, P., B. Leitner and J. H. Harris. 1995. Mohave ground squirrel study in Coso Known Geothermal Resource Area, Inyo County, California, March-June, 1994. Unpublished report prepared on behalf of Jean Hopkins and Associates. Orinda, CA.

Leitner, P., B. Leitner and J. H. Harris. 1997. Mohave ground squirrel study in the Coso Known Geothermal Resource Area, Inyo County, California, 1995 and 1996. Unpublished report prepared on behalf of CalEnergy Company, Inc. Orinda, CA.

Lovich, J.E. 1992. Natural recovery rates of desert tortoise habitat from anthropogenic effects. Proceedings of the Desert Tortoise Council Symposium, Vol. 1992, Abstract, 205.

Lovich, J. E. and D. Bainbridge. 1999. Anthropogenic degradation of the southern California desert ecosystem and prospects for natural recovery and restoration. Environmental Management. Vol. 24, No. 3, pp 309-326.

Luckenbach, R.A. 1982. Ecology and management of the desert tortoise (*Gopherus agassizii*) in California. *In*: R.B. Bury (ed.). North American Tortoises: Conservation and Ecology. U.S. Fish and Wildlife Service, Wildlife Research Report 12, Washington, D.C.

Lyneis, Margaret M., David L. Weide, and Elizabeth vonTill Warren. 1980. *Impacts: Damage to Cultural Resources in the California Desert.* Bureau of Land Management, California Desert District Cultural Resources Publications, Eric W. Ritter, General Editor.

Medica, P.A., R.B. Bury, and R.A. Luckenbach. 1982. A comparison of 1981 populations of desert tortoises, *Gopherus agassizii*, in grazed and ungrazed areas in Ivanpah Valley, California. Proceedings of the 1982 Symposium, Desert Tortoise Council.

Michael Brandman Associates, Inc. 1988. Phase One: China Lake Naval Weapons Center, Mohave ground squirrel survey and management plan. An unpublished report prepared on

behalf of Naval Weapons Center Environmental Resources Management Branch. Santa Ana, CA.

Nagy, K.A. and P.A. Medica. 1986. Physiological ecology of desert tortoises in southern Nevada. Herpetologica 42(1):73-92.

National Ecology Research Center. 1990. Assessment of biological information for listing the desert tortoise as an endangered species in the Mojave Desert. Predecision document prepared by NERC and submitted to U.S. Fish and Wildlife Service, Region One. Fort Collins, CO.

Norris, Frank and Richard L. Carrico. 1978. *A History of Land Use in the California Desert Conservation Area.* Desert Planning Staff, Bureau of Land Management, USDI.

Norwood, Richard H., Charles S. Bull, and Ronald Quinn. 1980. *A Cultural Resource Overview of the Eureka, Saline, Panamint and Darwin Region, East Central, California.* Bureau of Land Management, California Desert District Cultural Resources Publications; Eric Ritter, General Editor.

Nowak, R. M. 1991. Walker's Mammals of the World. 5th ed. The Johns Hopkins University Press. Baltimore, Maryland.

Recht, M. A. 1977. The biology of the Mohave ground squirrel, *Spermophilus mohavensis*; home range, daily activity, foraging and weight gain, and thermoregulatory behavior. PhD dissertation at University of California Los Angeles. Los Angeles, CA.

Schamberger, M., and F.B. Turner. 1986. The application of habitat modeling to the desert tortoise (*Gopherus agassizii*). Herpetologica 42(1):134-138.

Stickel, E. Gary and Lois J. Weinman-Roberts. 1980. *An Overview of the Cultural Resources of the Western Mojave Desert.* Bureau of Land Management, California Desert District Cultural Resources Publications; Eric W. Ritter, General Editor.

Stow, D. 1988. Interpretation of aerial photographs to measure off-road vehicle disturbances in the California Desert District. Part A of an unpublished report prepared on behalf of the Bureau of Land Management. San Diego, CA.

Tracy, C. R. 1995. Patterns of fire incidence and implications for management of Desert Wildlife Management Areas. Proc. 1994 Desert Tort. Counc. Symp. 1995:179.

Trombulak, S. C. and C. A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. Conservation Biology, Vol. 14, No. 1, February 2000.

Turner, F.B. and D.E. Brown. 1982. Sonoran desertscrub. In: D.E. Brown (editor). Biotic communities of the American Southwest - United States and Mexico. Desert Plants 4(1-4):181-222.

U.S. Bureau of Land Management. 1980. The California Desert Conservation Area Plan, Riverside District Office.

U.S. Bureau of Land Management. 1989. The California Desert minerals compendium, held at Marriott Hotel, Irvine, California: 38 papers representing the policy of multiple use and research associated with mineral exploration and development in the CDCA. California State Office, Sacramento. Contributions were generated by the scientific community, industry, and the government in response to increasing interest in the California Desert mineral resources, pp. 412.

U.S. Bureau of Land Management. April 1991. Division of Mineral Resources The California Desert, Why mining is important, prepared as a supplement to be presented to Congress for the pending wilderness legislation, pp. 83.

U.S. Bureau of Land Management. 1991b. Western Mojave Land Tenure Adjustment Project, Record of Decision. Unpublished report prepared by the California Desert District. Riverside, CA.

U.S. Bureau of Land Management. 1993.

U.S. Bureau of Land Management. 1999a. Current Management Situation of Special-Status Species in the West Mojave planning area. Emily Cohen, Editor. Unpublished report produced by West Mojave Team to assess current management and gaps in the protection for species covered by the Plan. Barstow, CA.

U.S. Bureau of Land Management. 1999b Desert tortoise biological evaluation: Proposed management prescriptions and management areas identified for the conservation of the desert tortoise (*Gopherus agassizii)* in the West Mojave Desert, California. Unpublished report produced by West Mojave Team to document evaluations completed by the U.S. Fish and Wildlife Service and California Department of Fish and Game. Barstow, CA.

U.S. Bureau of Land Management. 1999c. West Mojave Plan Draft Evaluation Report, Suggested Conservation Strategies. ?Biological Evaluation? prepared by the West Mojave Team.

U.S. Bureau of Land Management. 1999d. Desert Tortoise Biological Evaluation: Proposed Management Prescriptions and Management Areas Identified for the Conservation of the Desert Tortoise (*Gopherus agassizii*) in the West Mojave Desert, California. Unpublished report prepared by the West Mojave Team to document evaluations completed by the U.S. Fish and Wildlife Service and California Department of Fish and Game. Barstow, CA.

U.S. Bureau of Land Management. 1982. M*anagement Plan for Denning Spring, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1982. *Management Plan for Salt Creek Hills, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1984. *Management Plan for Calico Early Man Site, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1985. *Management Plan for Cronese Lakes, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Black Mountain Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Greenwater Canyon Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1988. *Management Plan for Juniper Flats Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1991. M*anagement Plan for Rainbow Basin Natural Area, An Area of Critical Environmental Concern.* Barstow Resource Area. Barstow.

U.S. Bureau of Land Management. 1992. *Management Plan for the Rodman Mountains Cultural Area, An Area of Critical Environmental Concern*. Barstow Resource Area. Barstow.

U.S. Fish and Wildlife Service. June 1994. Desert Tortoise (Mojave Population) Recovery Plan, pp. 73, appendices.

U.S. Fish and Wildlife Service. 1994a. Endangered and threatened wildlife and plants; determination of critical habitat for the Mojave population of the desert tortoise. *Federal Register* 55(26):5820-5866. Washington, D.C.

U.S. Fish and Wildlife Service. 1994b. Desert tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, OR. pp. 73, plus appendices.

U.S. Fish and Wildlife Service. March 5, 2002a. Biological Opinion for the California Area Plan [Lane-Mountain Milk-vetch, Ash Meadows Gumplant, and Amargosa Niterwort], pp. 52.

U.S. Fish and Wildlife Service. 2002b. Draft Biological Opinion for the California Desert Conservation Area Plan [Desert Tortoise] (6840(P) CA-063.50) (1-8-01-F-16). Draft memorandum from Field Supervisor, Ventura Fish and Wildlife Office, Ventura, California to State Director, Bureau of Land Management, Sacramento, California.

U.S. Fish and Wildlife Service. 2002c. Biological opinion for the California Desert Conservation Area Plan [Desert Tortoise] (6840(P) CA-063.50) (1-8-01-F-16). Memorandum from Field Supervisor, Ventura Fish and Wildlife Field Office, Ventura, CA, to State Director, Bureau of Land Management, Sacramento, CA.

U. S. Fish and Wildlife Service, 2002d. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for Five Carbonate Plants From the San Bernardino Mountains in

Southern California; Final Rule. *Federal Register* 67 (247):78570-78610.

Vollmer, A. T., B. G. Maza, P. A. Medica, F. B. Turner and S. A. Bamberg. 1976. The impact of off-road vehicles on a desert ecosystem. Environmental Management Vol 1, No. 2, pp. 115-129. Springer Verlag, New York.

W & S Consultants. 2002. Archaeological Investigation of the Timbisha Trust Parcels, Inyo County, California. On file, Bureau of Land Management, Ridgecrest Field Office, Ridgecrest, CA.

Warren, Elizabeth von Till and Ralph J. Roske. 1980. *Cultural Resources of the California Desert, 1776 – 1980: Historic Trails and Wagon Roads.* Bureau of Land Management, California Desert District Cultural Resources Publications; Russell L. Kaldenberg, Series Editor.

Webb, R. H., H. G. Wilshire and M. A. Henry. 1983. Natural recovery of soils and vegetation following human disturbance. *In* Webb, R. H. and H. G. Wilshire (Editors). Environmental effects of off-road vehicles: Impacts and management in arid regions. Springer-Verlag, New York.

Wehtje, Walter. 2001. Distribution and Breeding Status of the Western Snowy Plover (*Charadrius alexandrinus nivosus*) at Five Sites within the Bureau of Land Management, California Desert District, Barstow Field Office Resource Area.

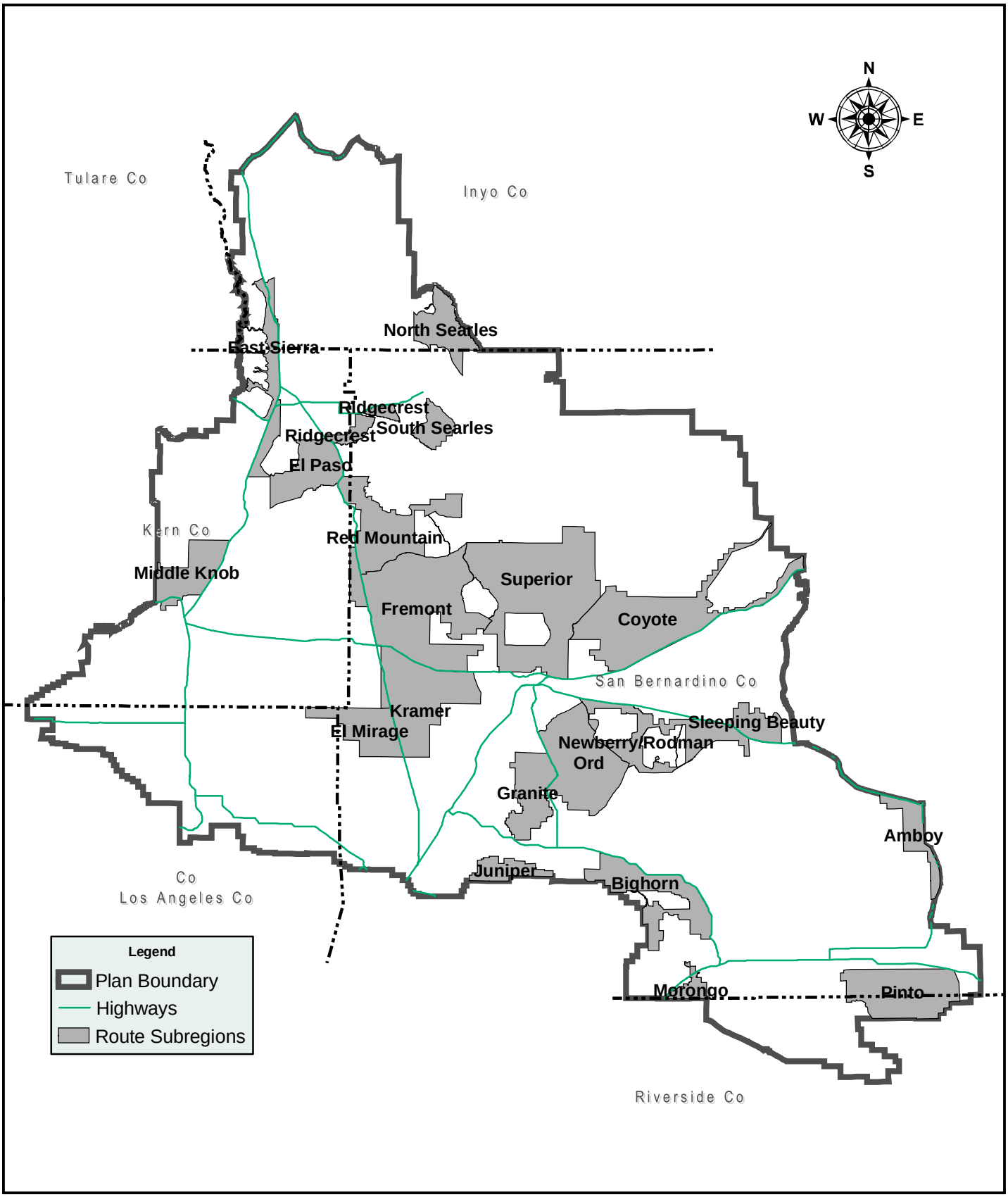
Weinstein, M., K.H. Berry, and F.B. Turner. 1987. An analysis of habitat relationships of the desert tortoise in California. A report to Southern California Edison Company. Rosemead, California.

Weinstein, M. N. 1989. Modeling desert tortoise habitat: Can a useful management tool be developed from existing transect data? A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Environmental Science and Engineering. University of California, Los Angeles.

Wessman, E. V. 1977. The distribution and habitat preferences of the Mohave ground squirrel in the southeastern portion of its range. Unpublished report prepared on behalf of the California Department of Fish and Game; Report No.77-5 (1977). 15pp plus appendices.

Whitley, David. 2002. National Register Nomination Form, Ayers Rock. On file, Bureau of Land Management, Ridgecrest Field Office.

West Mojave Off Road Vehicle Designation Project



Designation Project EA

Map 1

Scale: 1 : 1,600,000

0 5 10 20 30 Km

0 5 10 20 30 Miles

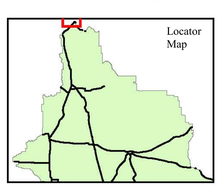
N. Pratini, 3/6/03

No Action - West Mojave Route Designation Program

Map 1 - Owens Lake, Keeler

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 28, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

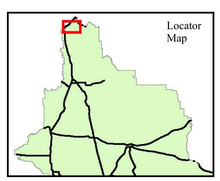
No Action - West Mojave Route Designation Program

Map 2 - Vermillion Canyon, Centennial Canyon

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

Locator Map



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

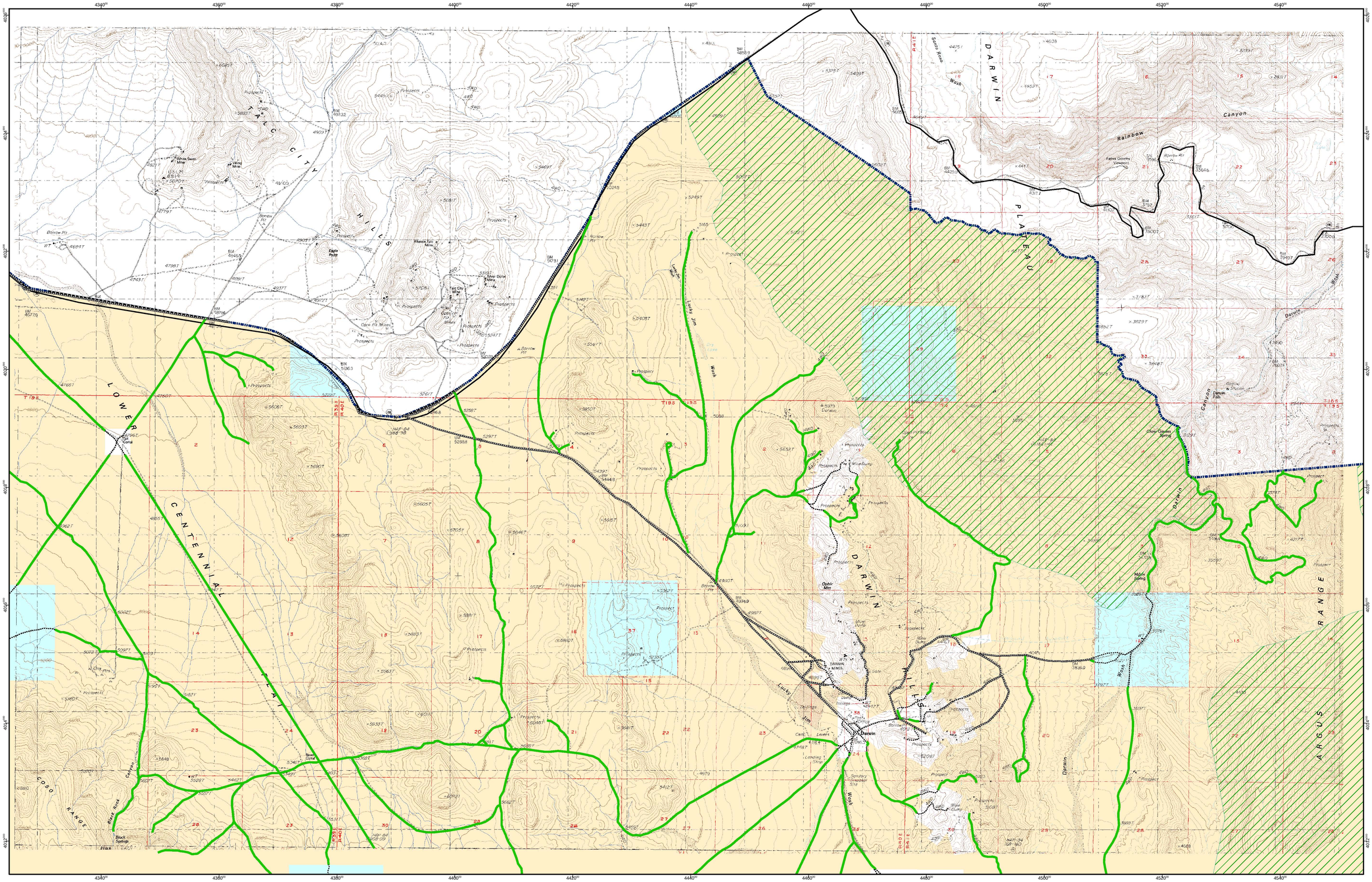
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

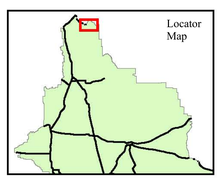
No Action - West Mojave Route Designation Program

Map 3 - Talc City Hills, Darwin



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

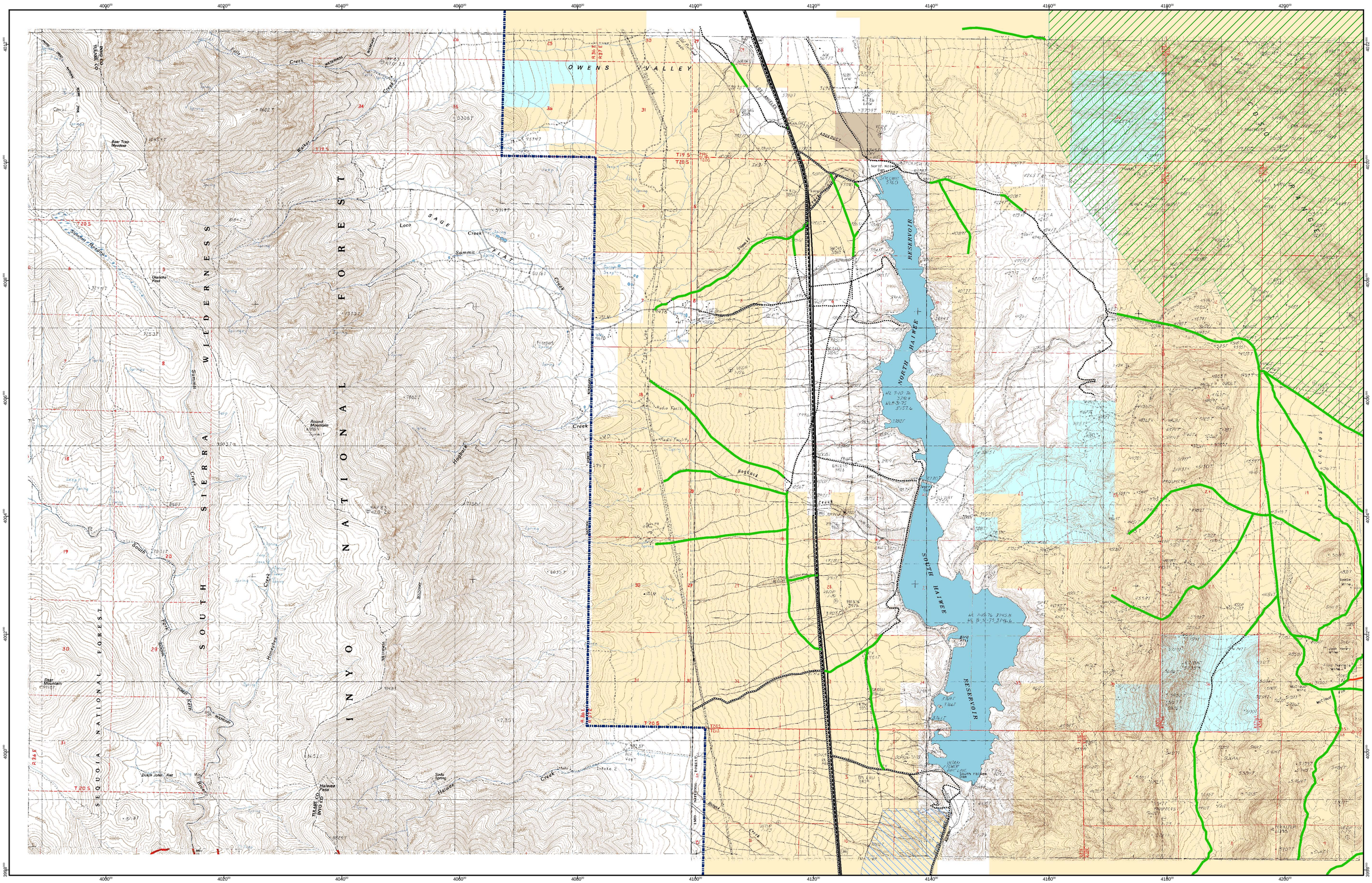
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

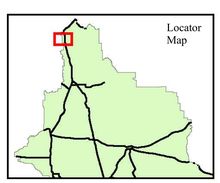
No Action - West Mojave Route Designation Program

Map 4 - Haiwee Pass, Haiwee Reservoirs



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

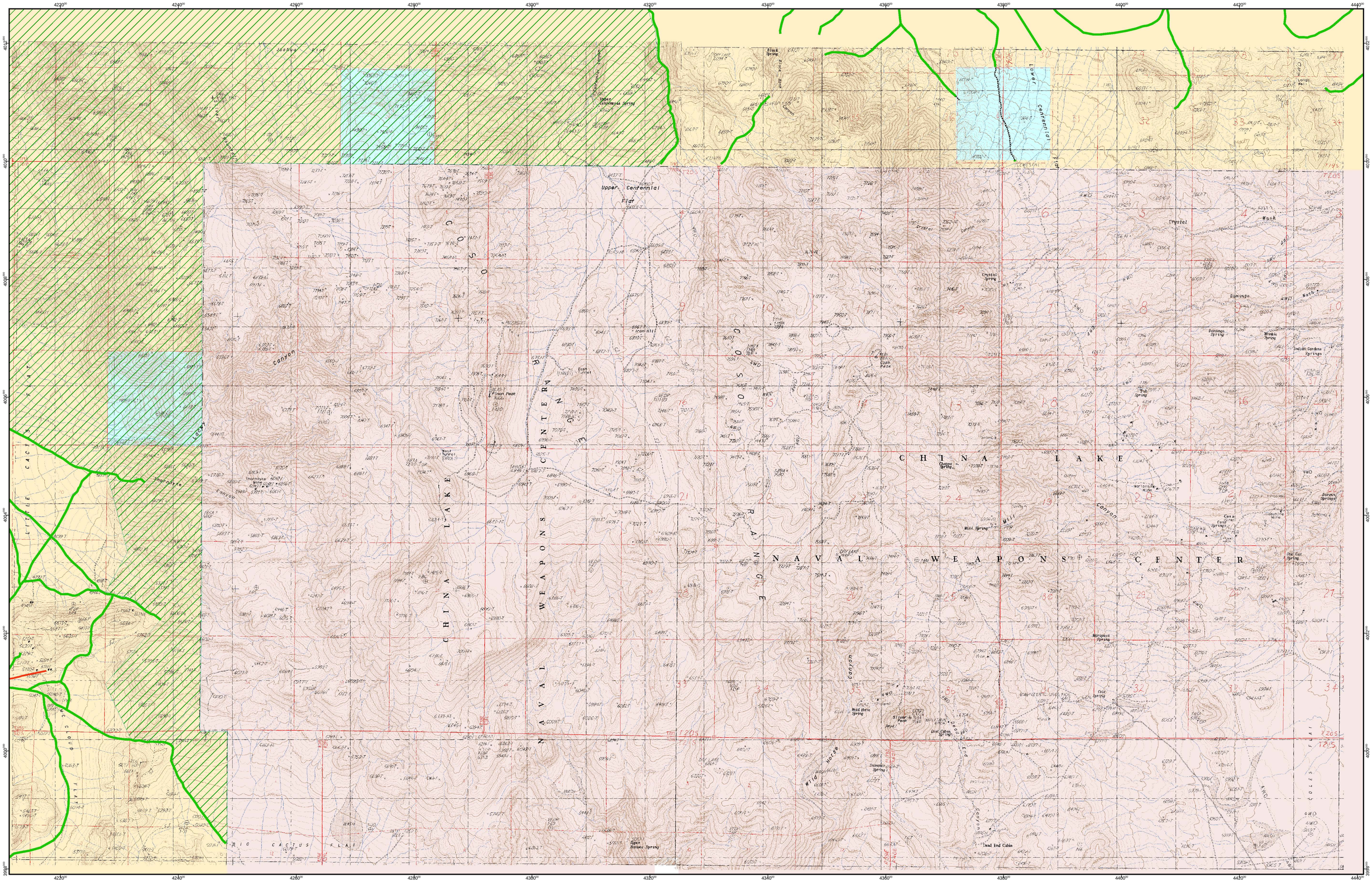
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

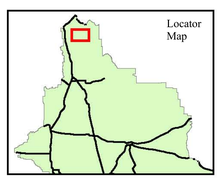
No Action - West Mojave Route Designation Program

Map 5 - Upper Centennial Flat, Coso Peak



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

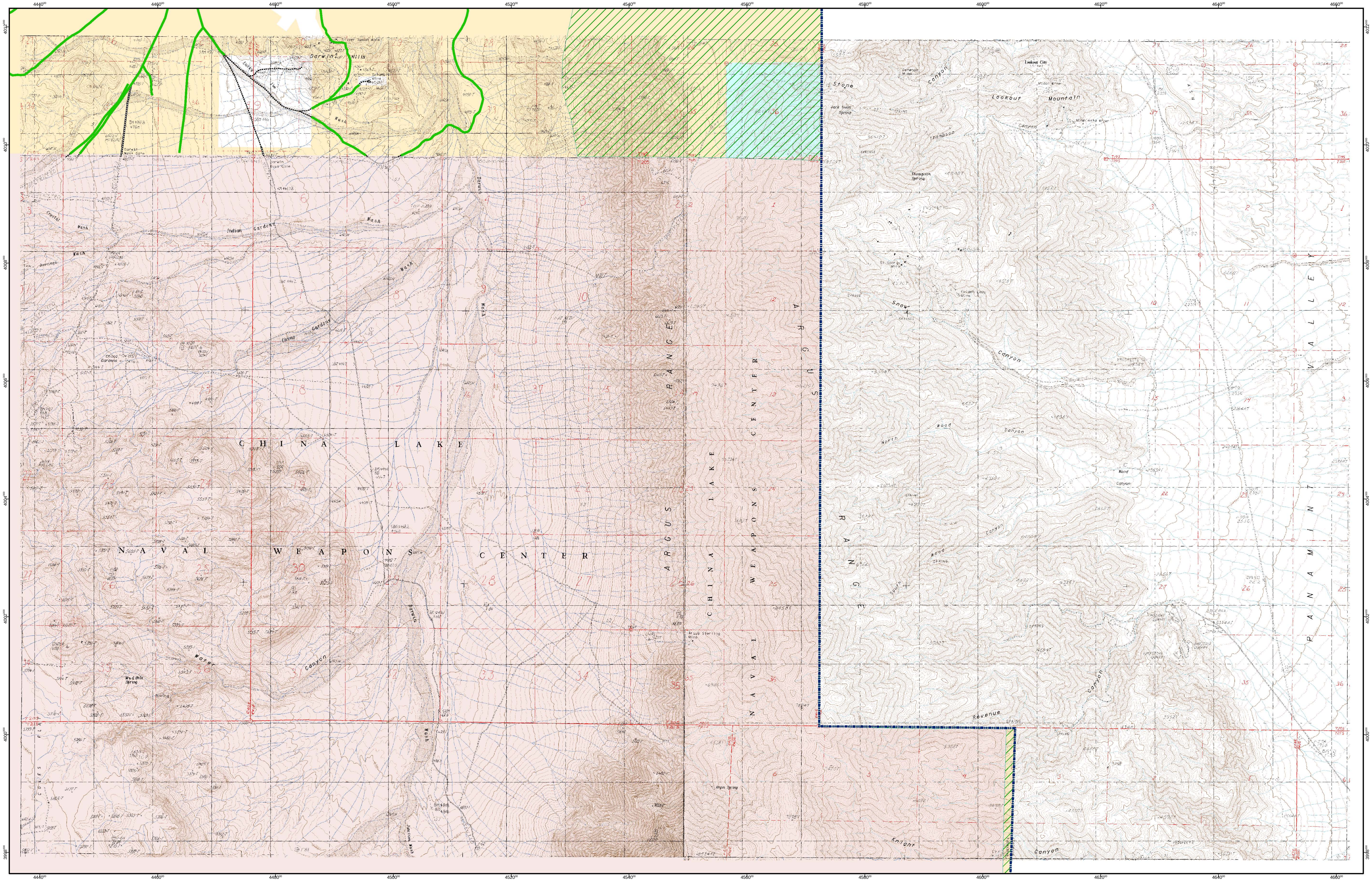
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

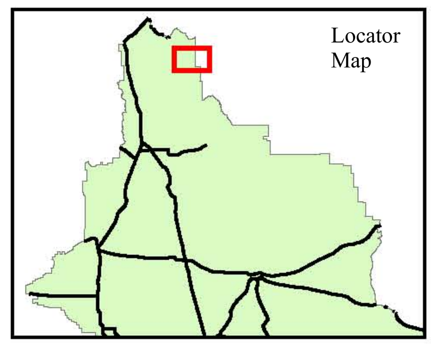
No Action - West Mojave Route Designation Program

Map 6 - China Gardens, Revenue Canyon



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 3, 2003



SCALE 1 : 24,000

Miles: 0 0.5 1 2
Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

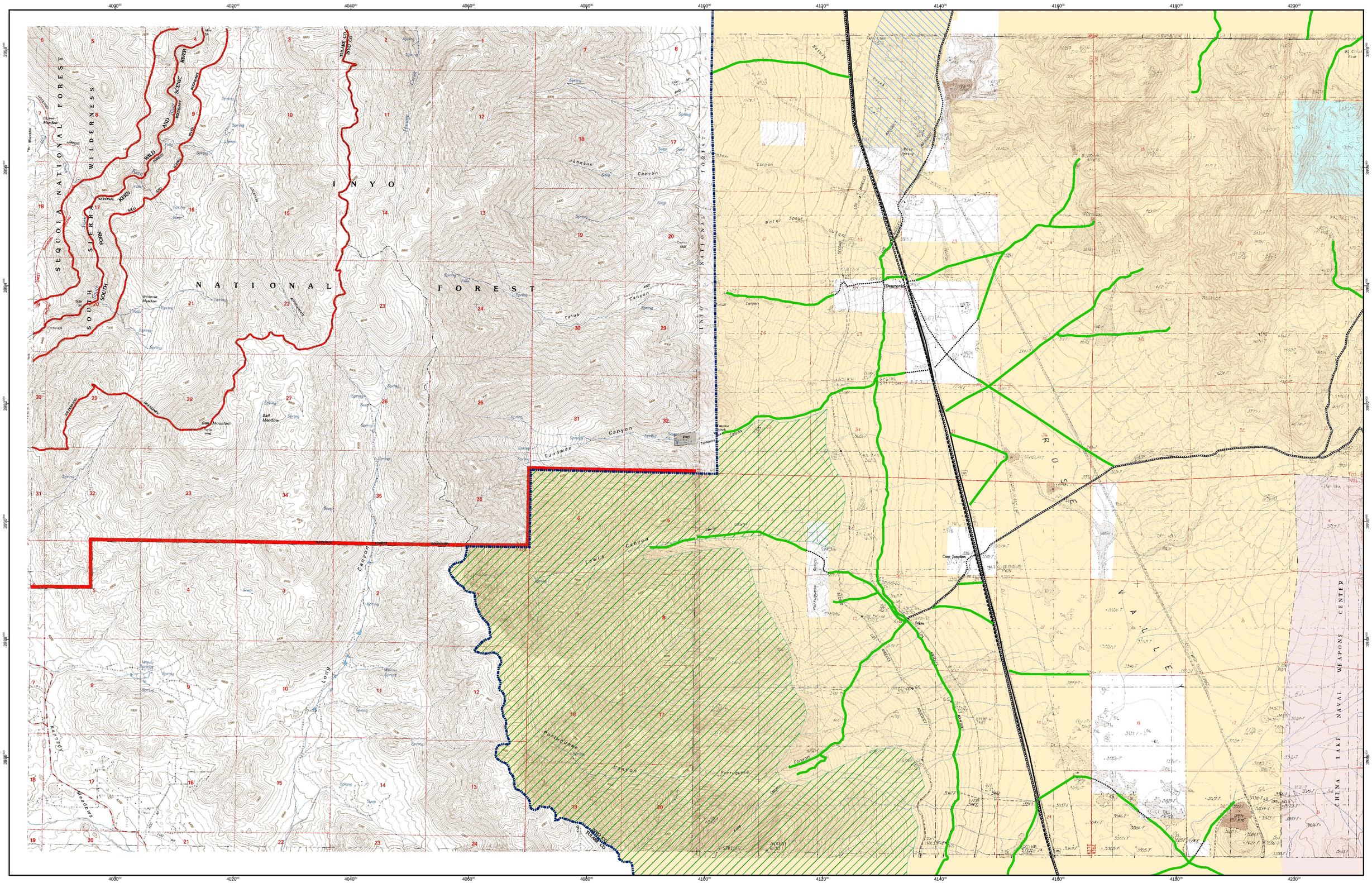
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

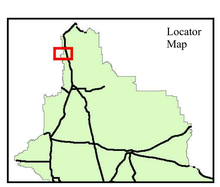
No Action - West Mojave Route Designation Program

Map 7 - Long Canyon, Coso Junction



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

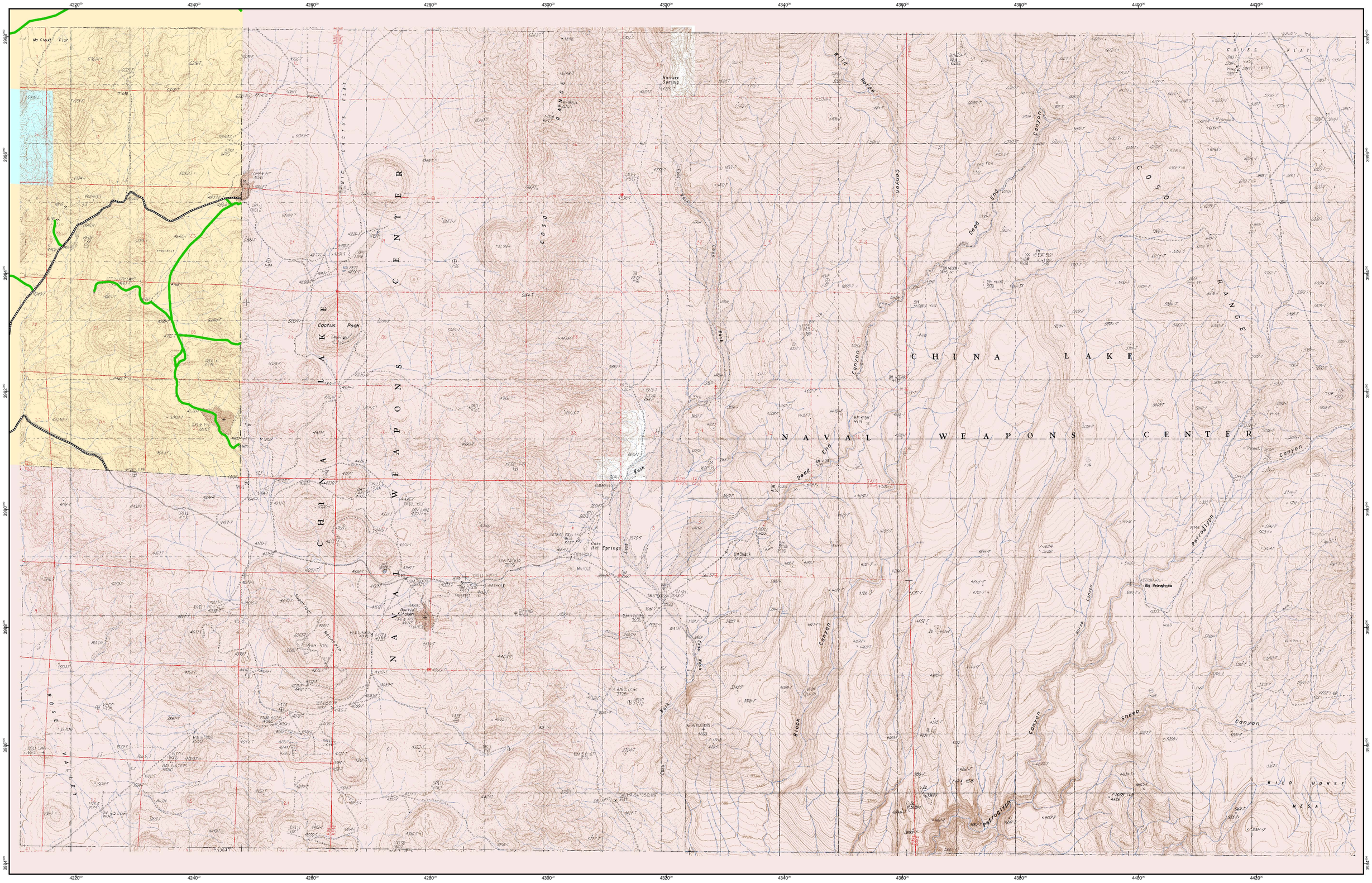
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

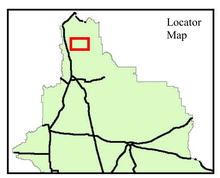
No Action - West Mojave Route Designation Program

Map 8 - Cactus Peak, Petroglyph Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 28, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

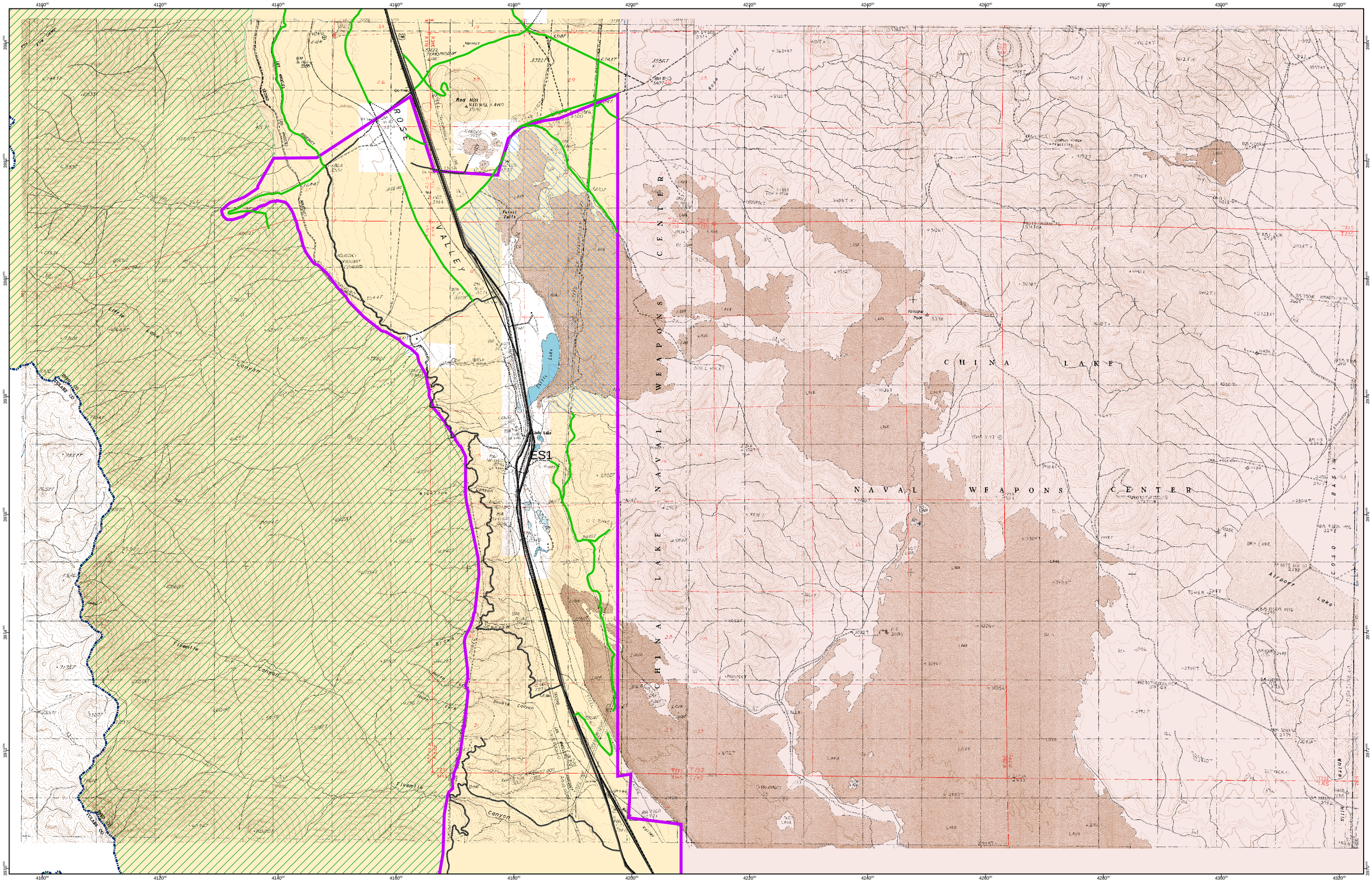
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
Major Roads
Highways

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 9 - Little Lake, Volcano Peak



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 10 - Homewood Canyon, Slate Range Crossing

NS1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

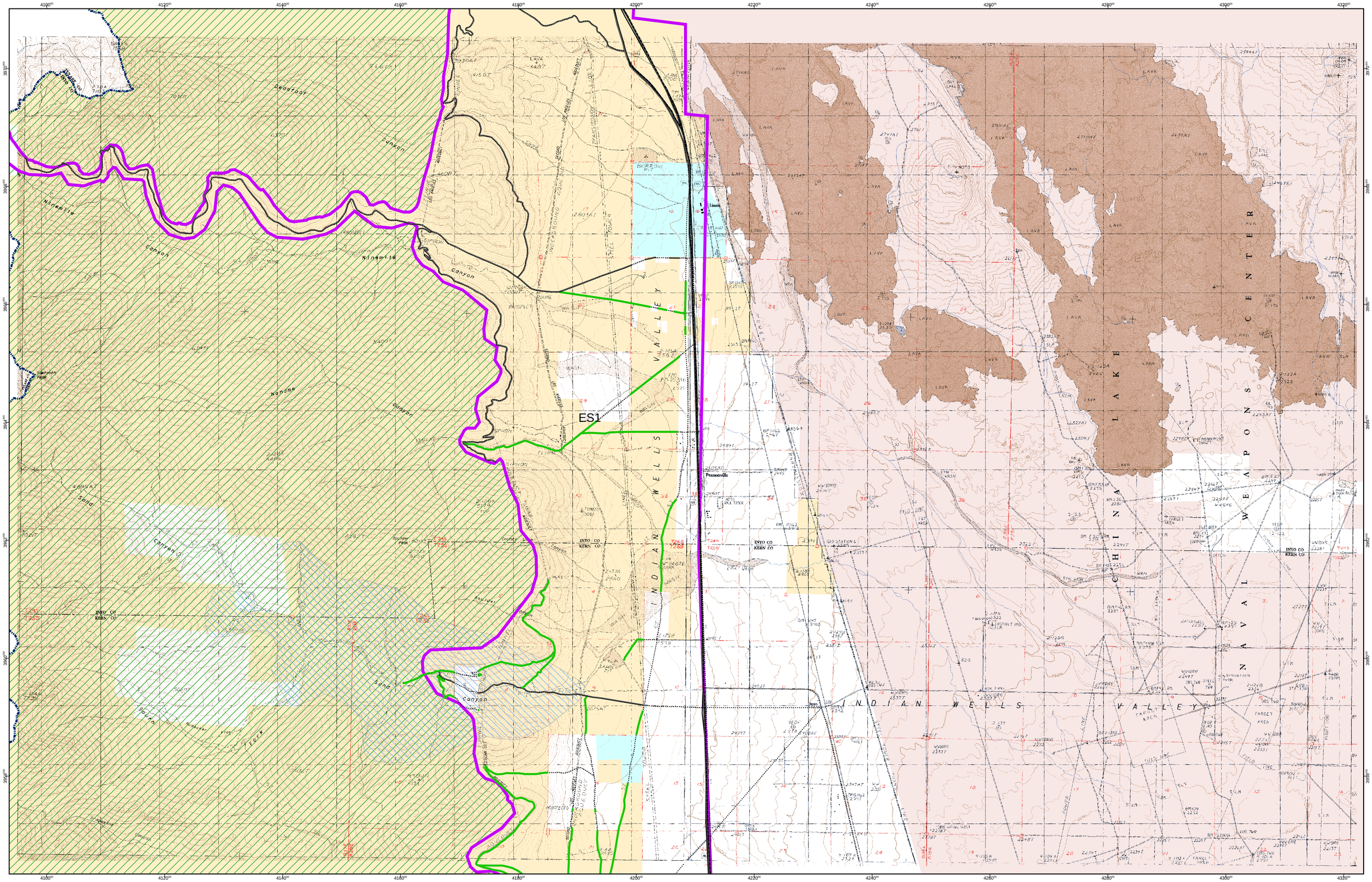
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

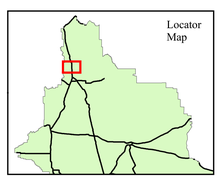
No Action - West Mojave Route Designation Program

Map 11 - Ninemile Canyon, Pearsonville



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 12 - Trona West, Trona East

NS1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

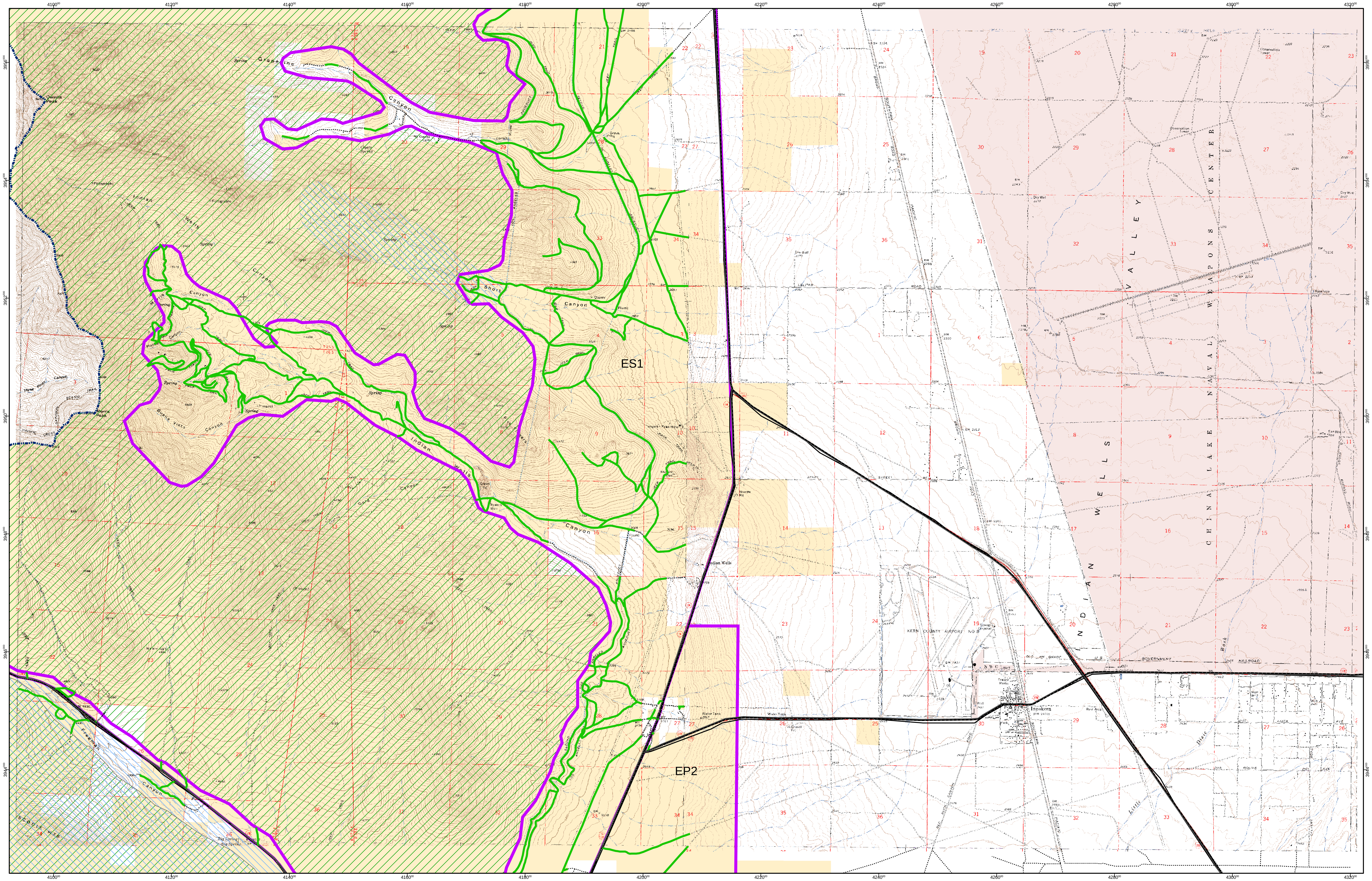
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 13 - Owens Peak, Inyokern



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 3, 2003

Locator Map

SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

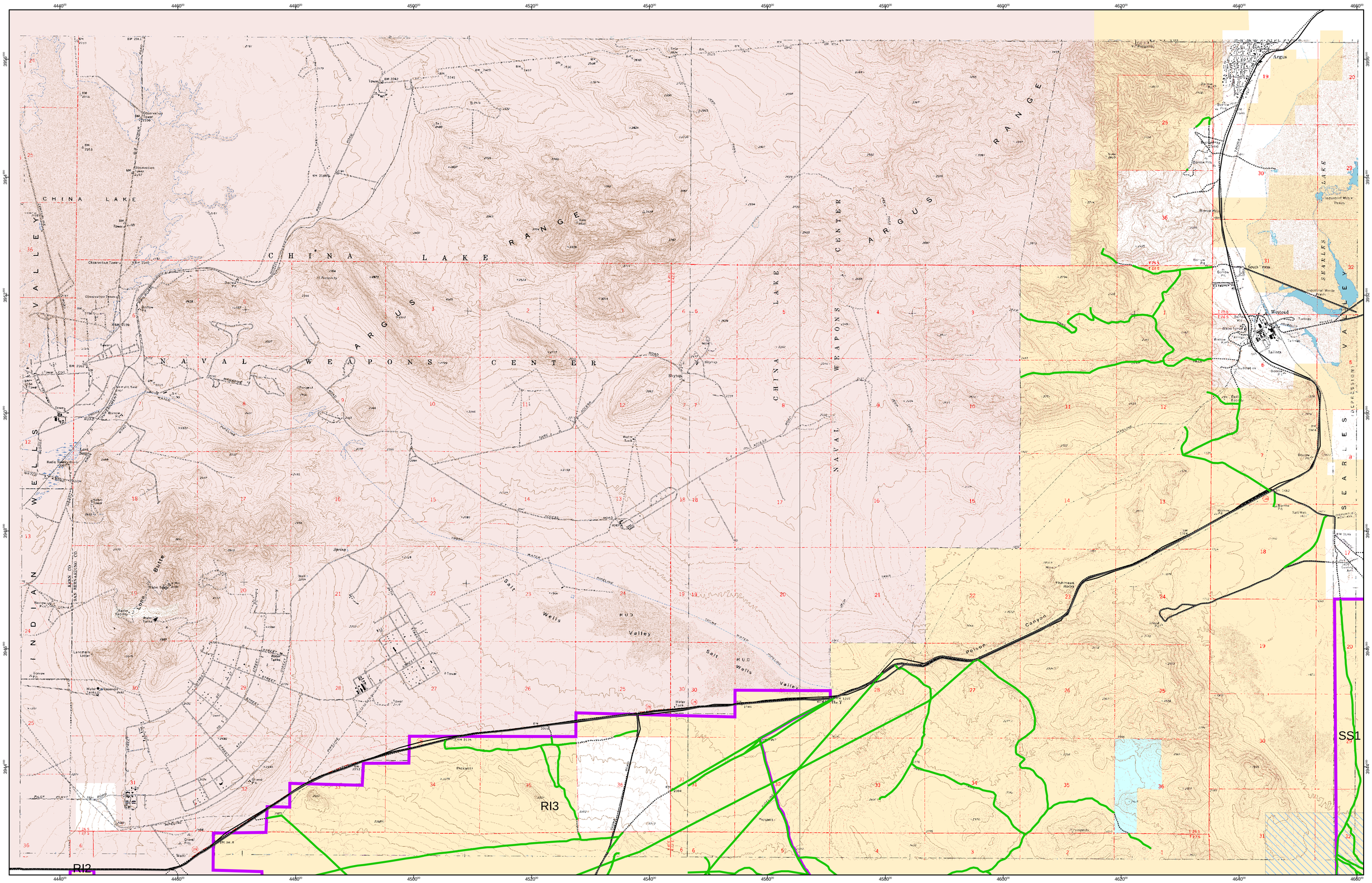
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 14 - Lone Butte, Westend



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

N W E S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
Major Roads
Highways

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 15 - Searles Lake, Layton Spring

NS1

SS1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

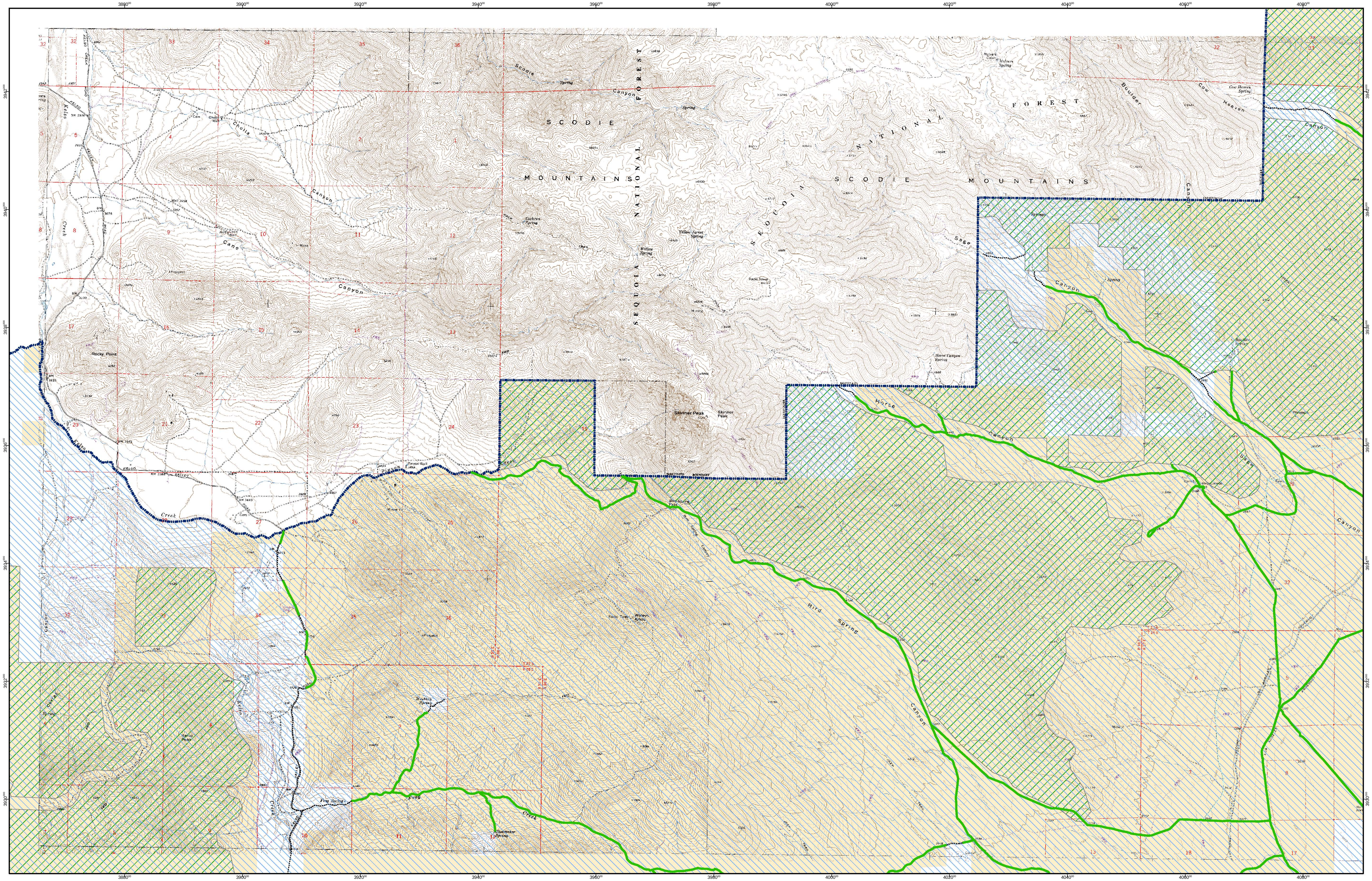
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

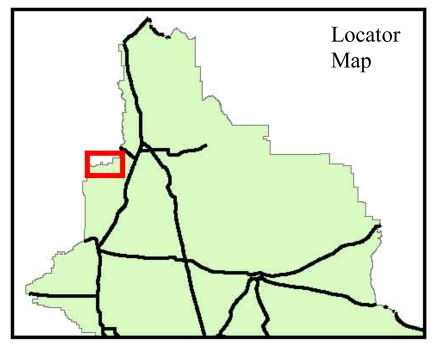
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 16 - Cane Canyon, Horse Canyon





SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 4, 2003

Legend

MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
Major Roads
Highways

Proposed Designations

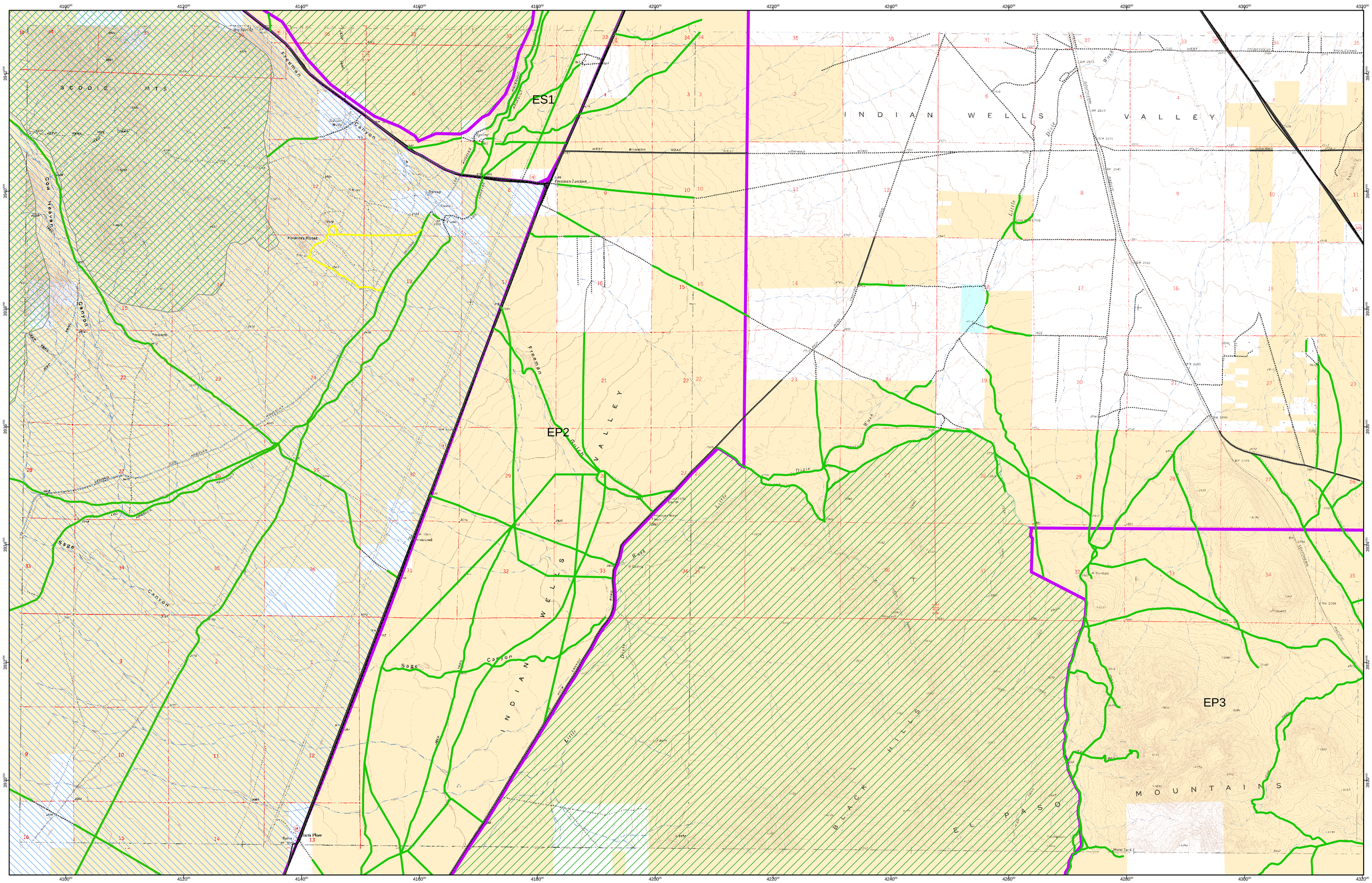
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

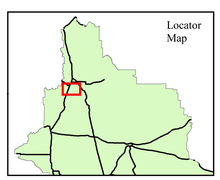
No Action - West Mojave Route Designation Program

Map 17 - Freeman Junction, Inyokern SE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

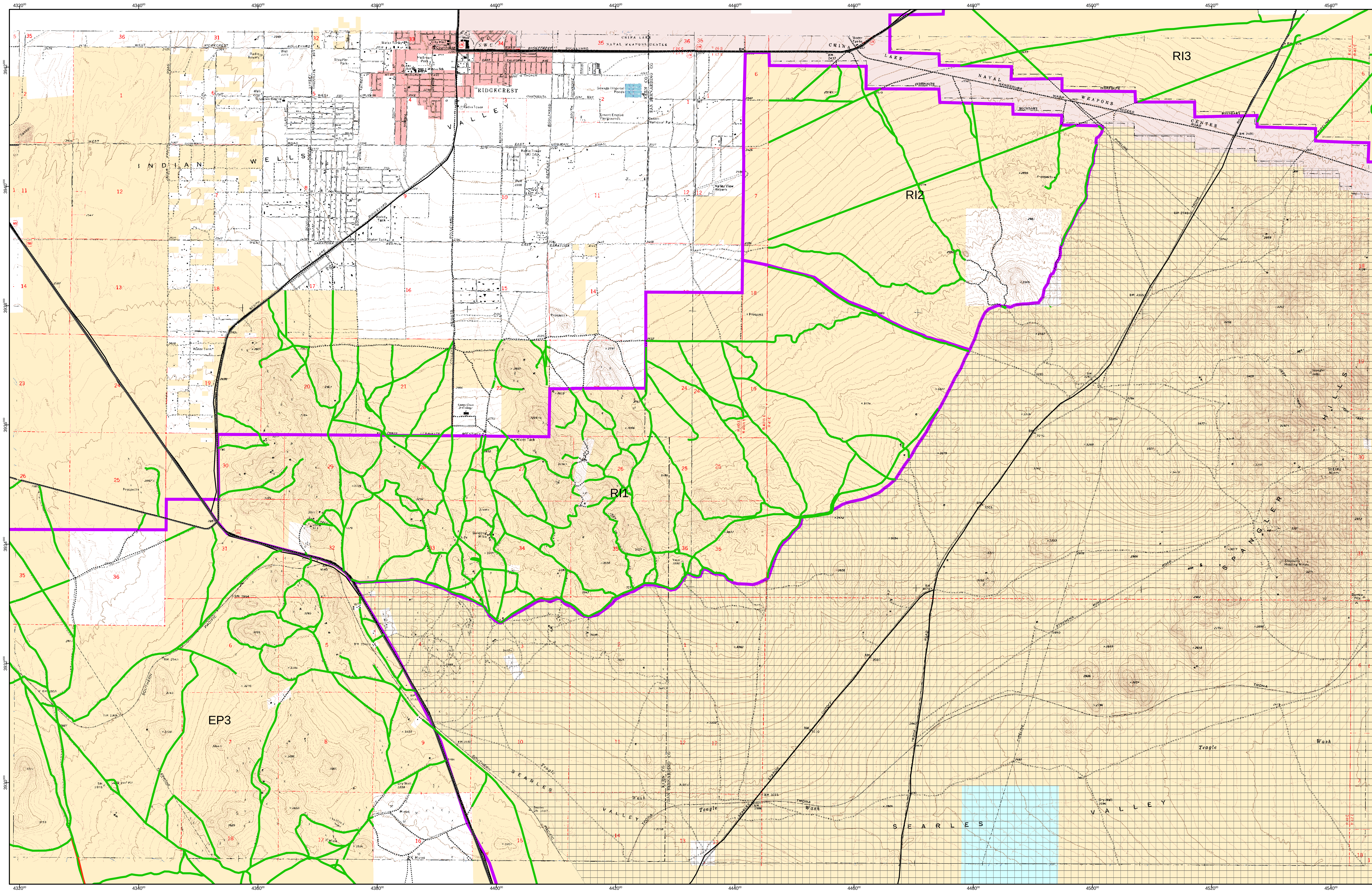
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

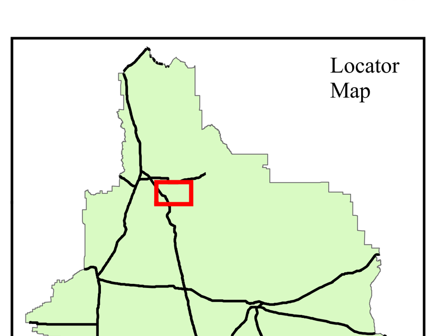
No Action - West Mojave Route Designation Program

Map 18 - Ridgecrest South, Spangler Hills West



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 3, 2003



SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 19 - Spangler Hills East, Christmas Canyon

RI3

SS1

S P A N G L E R H I L L S

S E A R L E S V A L L E Y (DEPRESSION)

C H I N A L A K E W E A P O N S R A N G E

C H I N A L A K E

N A V A L W E A P O N S C E N T E R

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 28, 2003

Locator Map

N W E S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

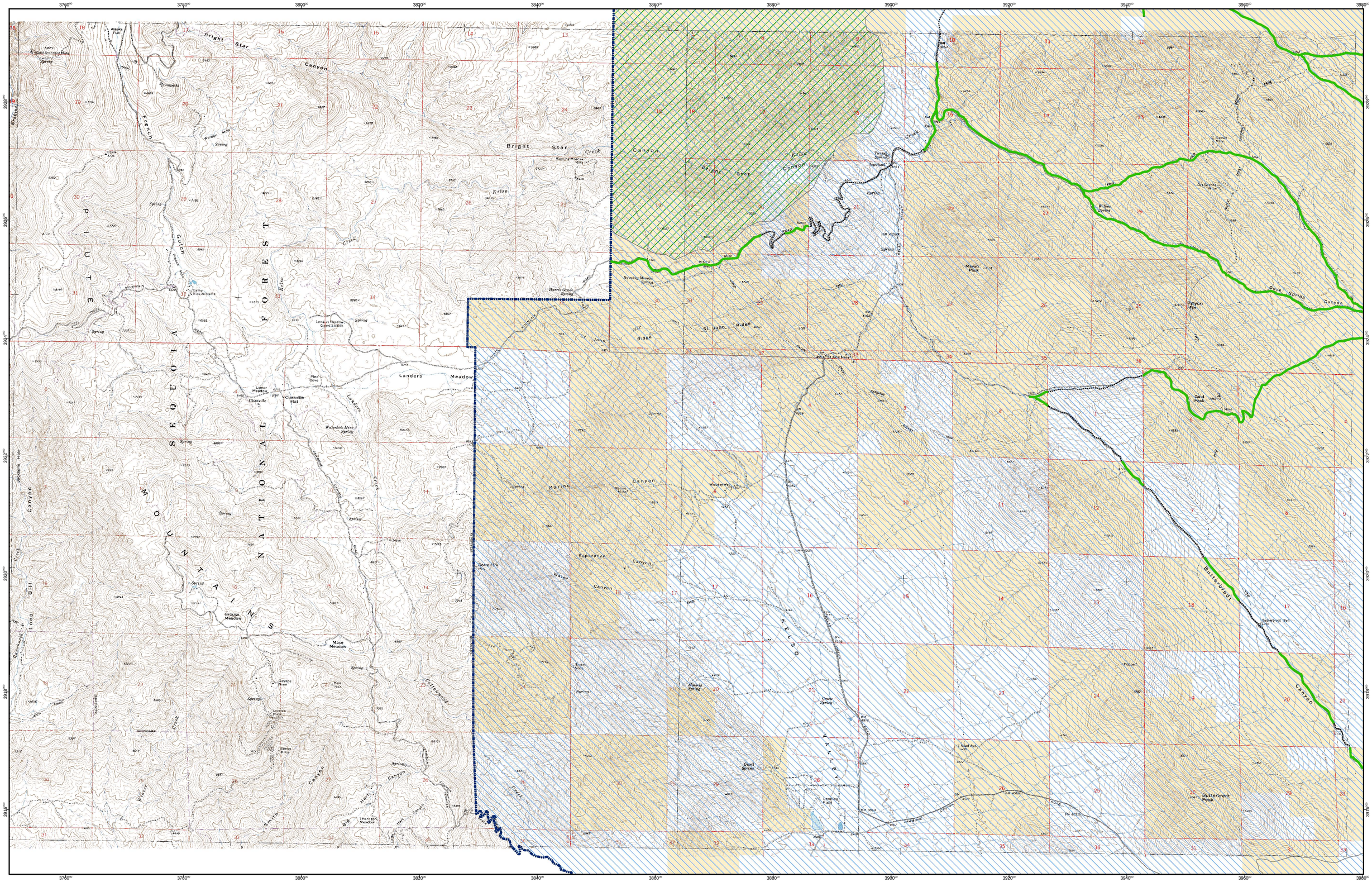
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

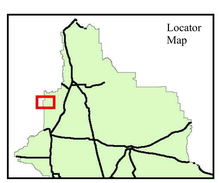
No Action - West Mojave Route Designation Program

Map 20 - Claraville, Pinyon Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

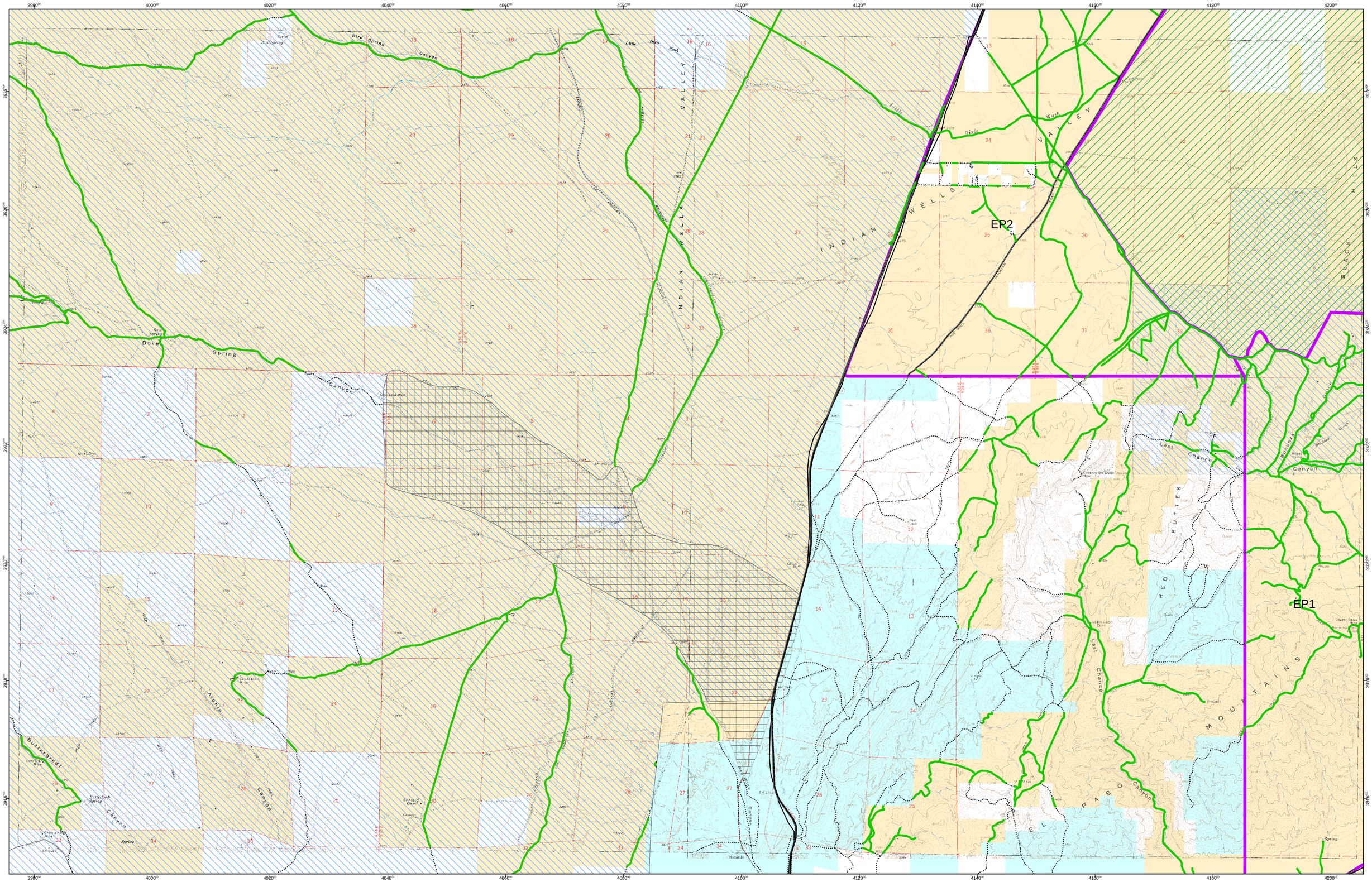
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 21 - Dove Spring, Saltdale NW



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

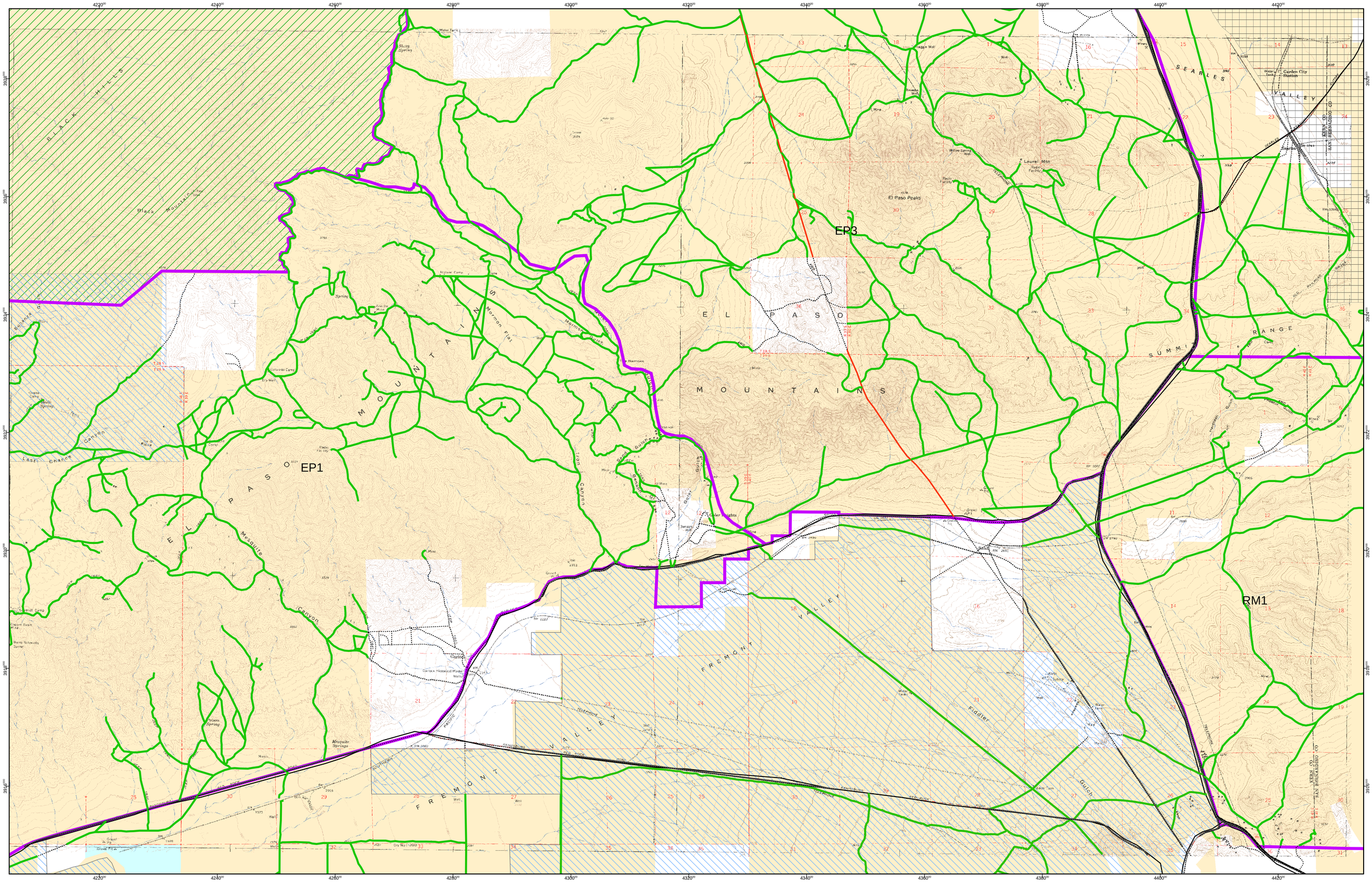
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

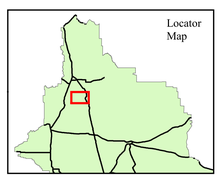
No Action - West Mojave Route Designation Program

Map 22 - Garlock, El Paso Peaks



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

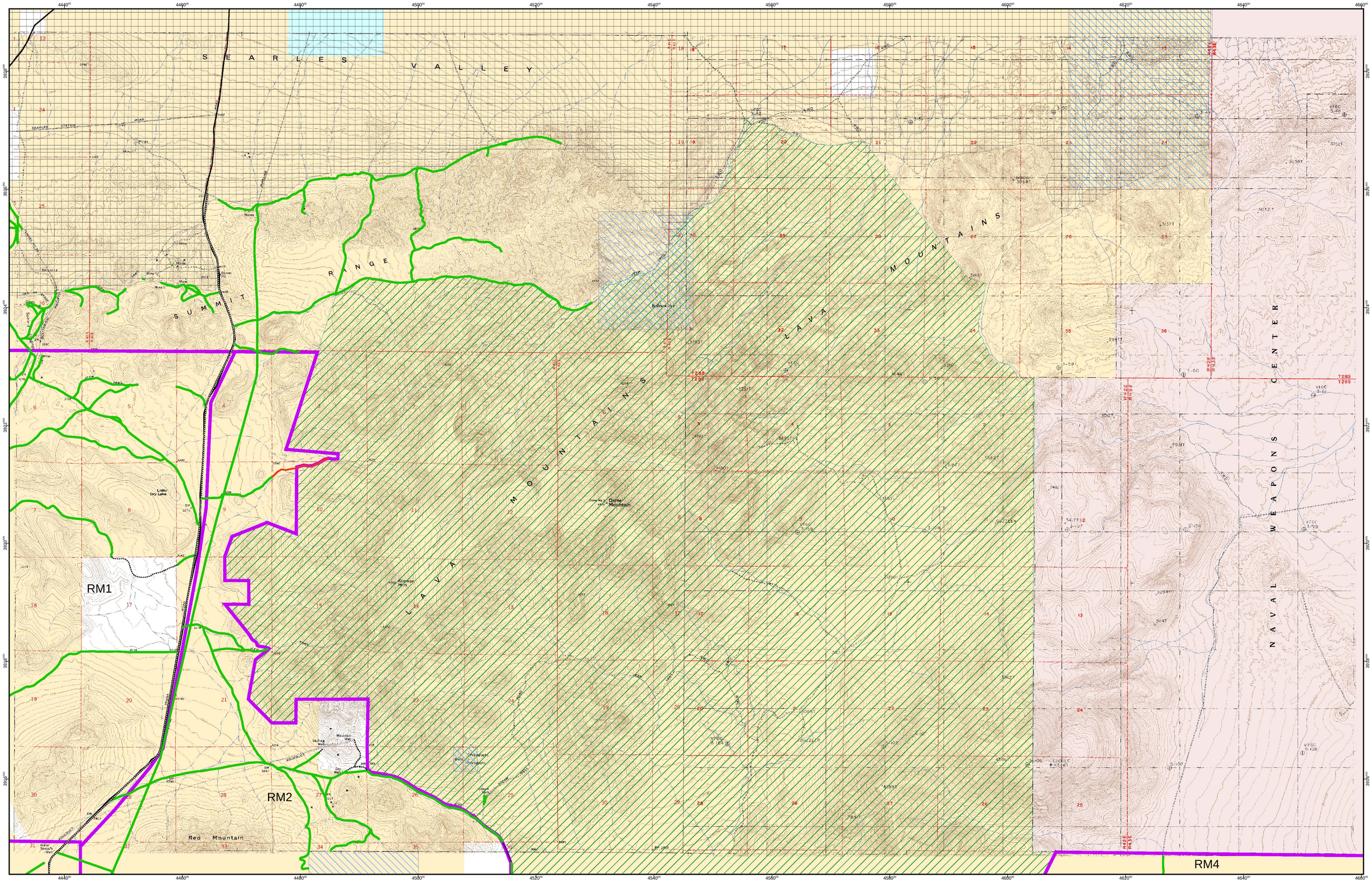
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

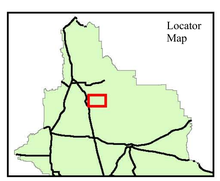
No Action - West Mojave Route Designation Program

Map 23 - Klinker Mountain, West of Black Hills



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 24 - Cinco, Cantil

EP1

MK1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 25 - Saltdale SE, Johannesburg

EP1

RM1

RM3

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 26 - Red Mountain, Cuddeback Lake

RM1

RM2

RM3

RM4

RED MOUNTAIN

ALMOND COVE

CUDDEBACK LAKE

CUDDEBACK LAKE AIR FORCE RANGE

Red Mountain

Atolia

Almond Mountain

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 3, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 27 - Blackwater Well, Slocum Mountain

RM4

FR3

SU2

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

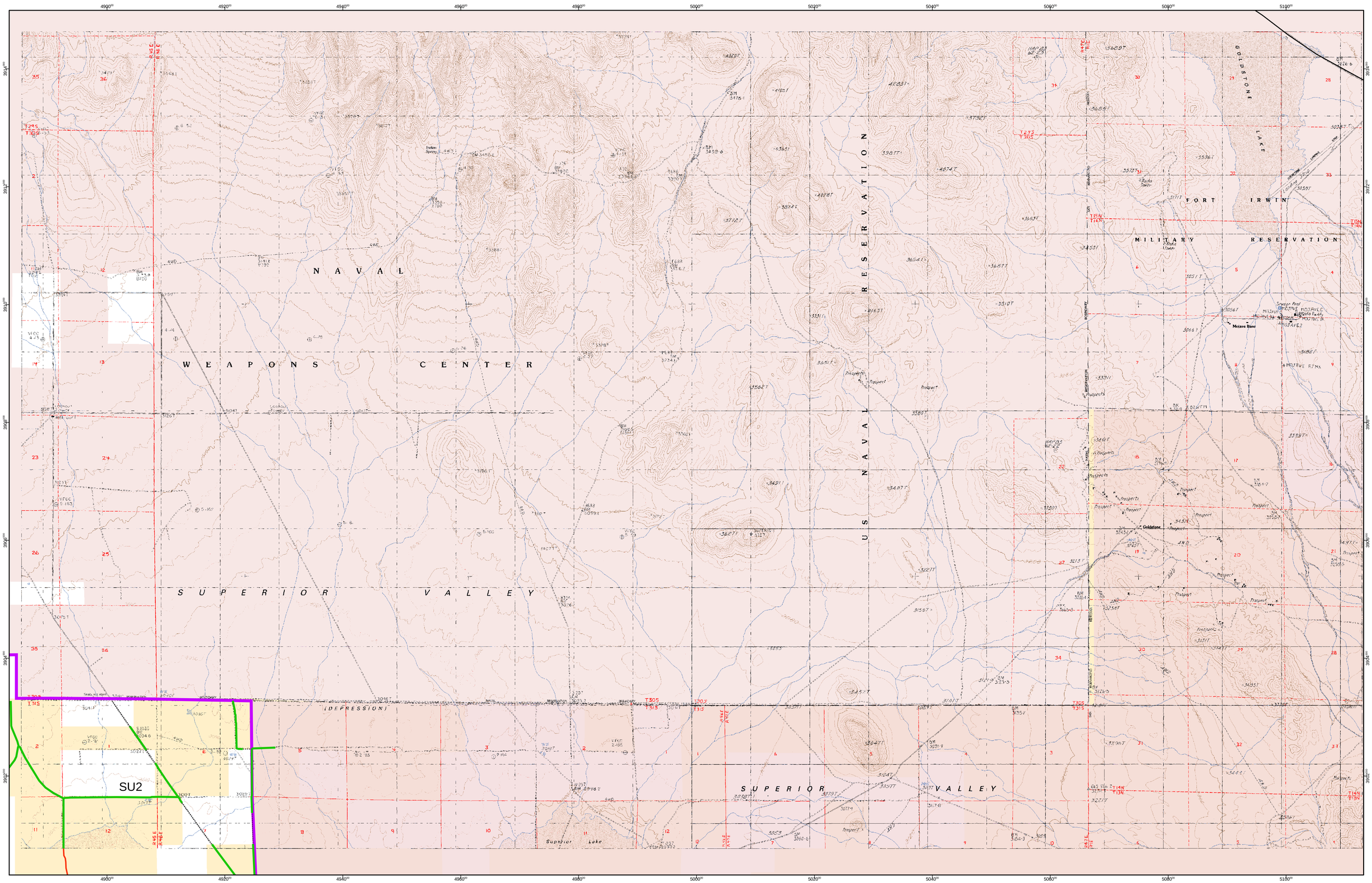
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

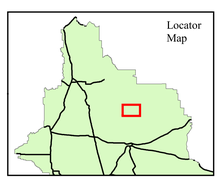
No Action - West Mojave Route Designation Program

Map 28 - Superior Valley, Goldstone



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

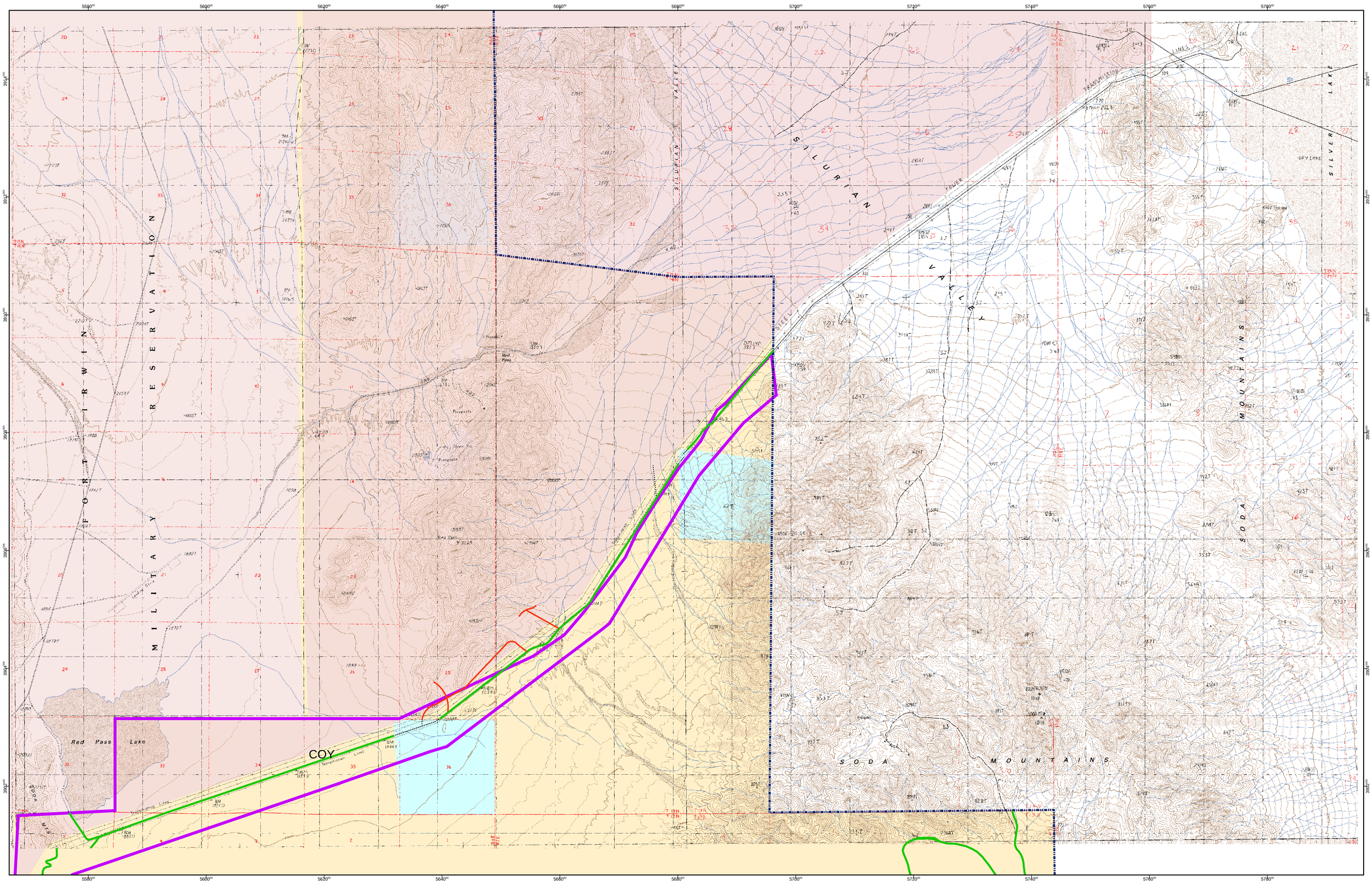
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

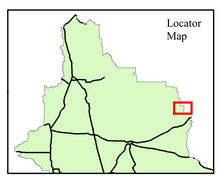
No Action - West Mojave Route Designation Program

Map 29 - Red Pass Lake, West of Baker



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

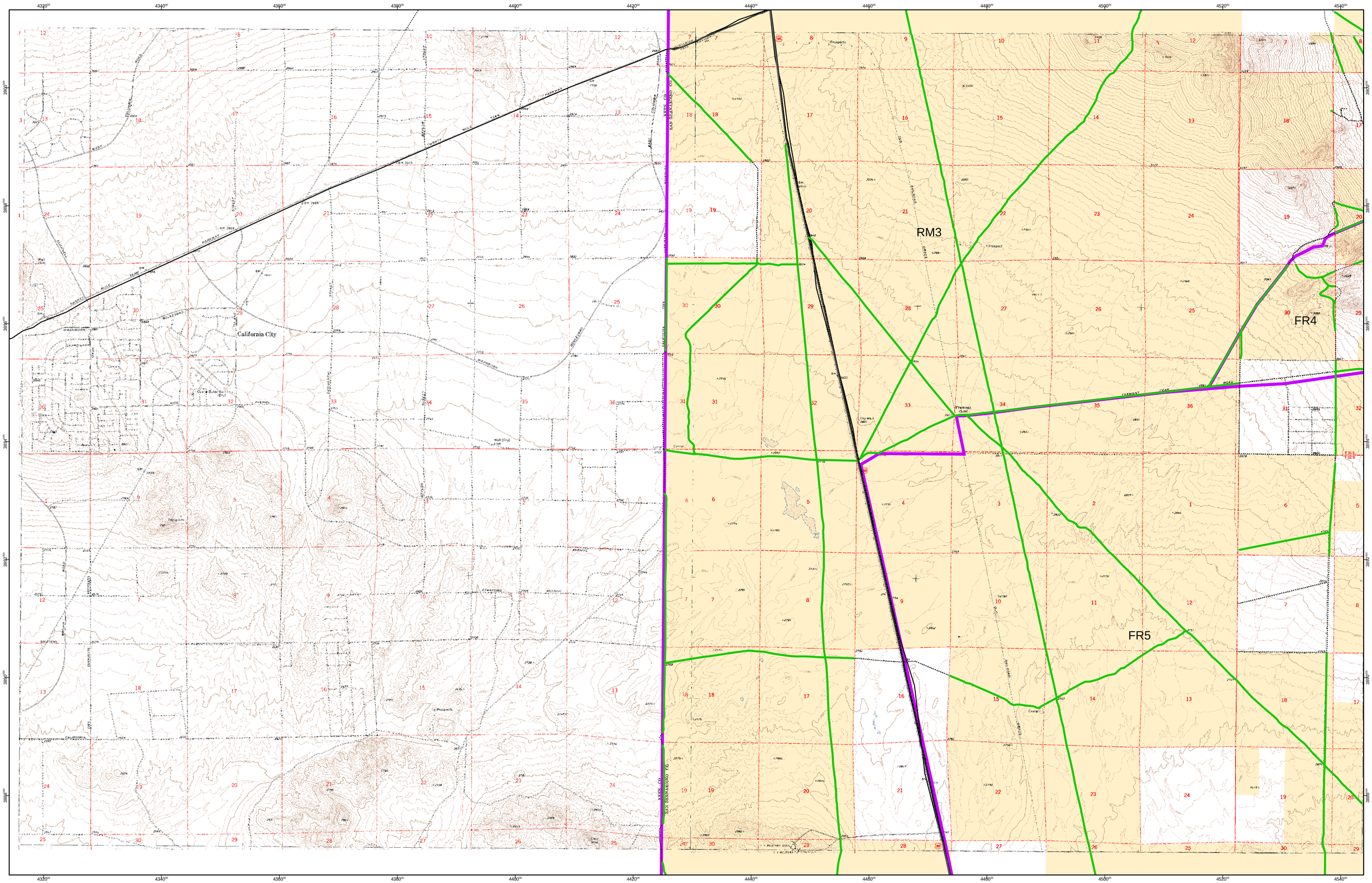
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

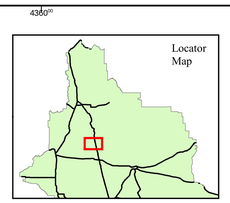
No Action - West Mojave Route Designation Program

Map 30 - Boron NW, Boron NE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 31 - Fremont Peak, Bird Spring

RM3

RM4

RM4

SU2

FR4

FR5

FR3

GRAVEL HILLS

GRAVEL

HILLS

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

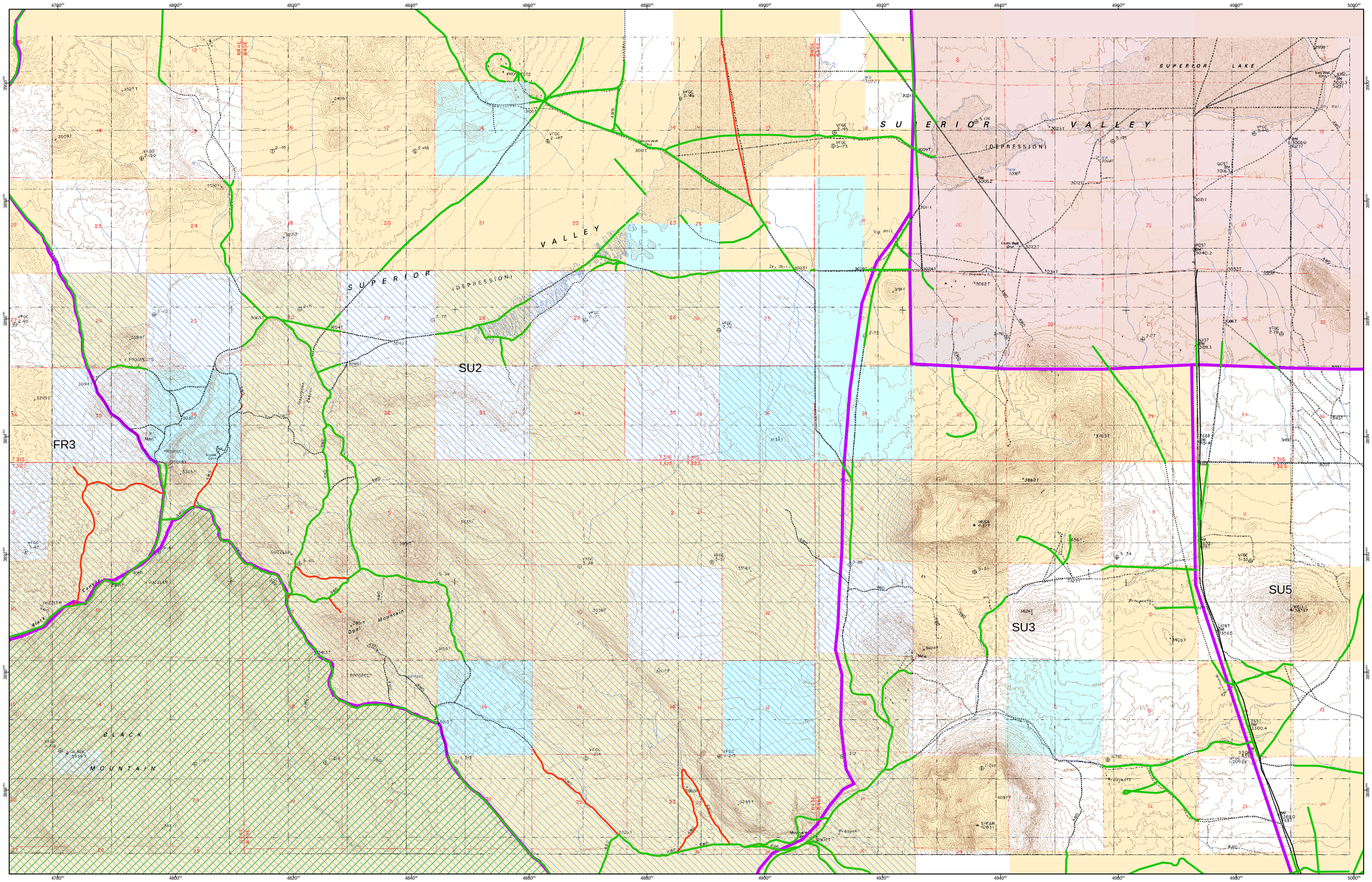
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 32 - Opal Mountain, Superior Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 33 - Williams Well, Paradise Range

SUPERIOR VALLEY

FORT IRWIN MILITARY RESERVATION

PARADISE RANGE

SU5

SU4

COY

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 34 - Langford Well, East of Langford Well

FORT IRWIN

MILITARY RESERVATION

Langford Well

Lake

COY

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

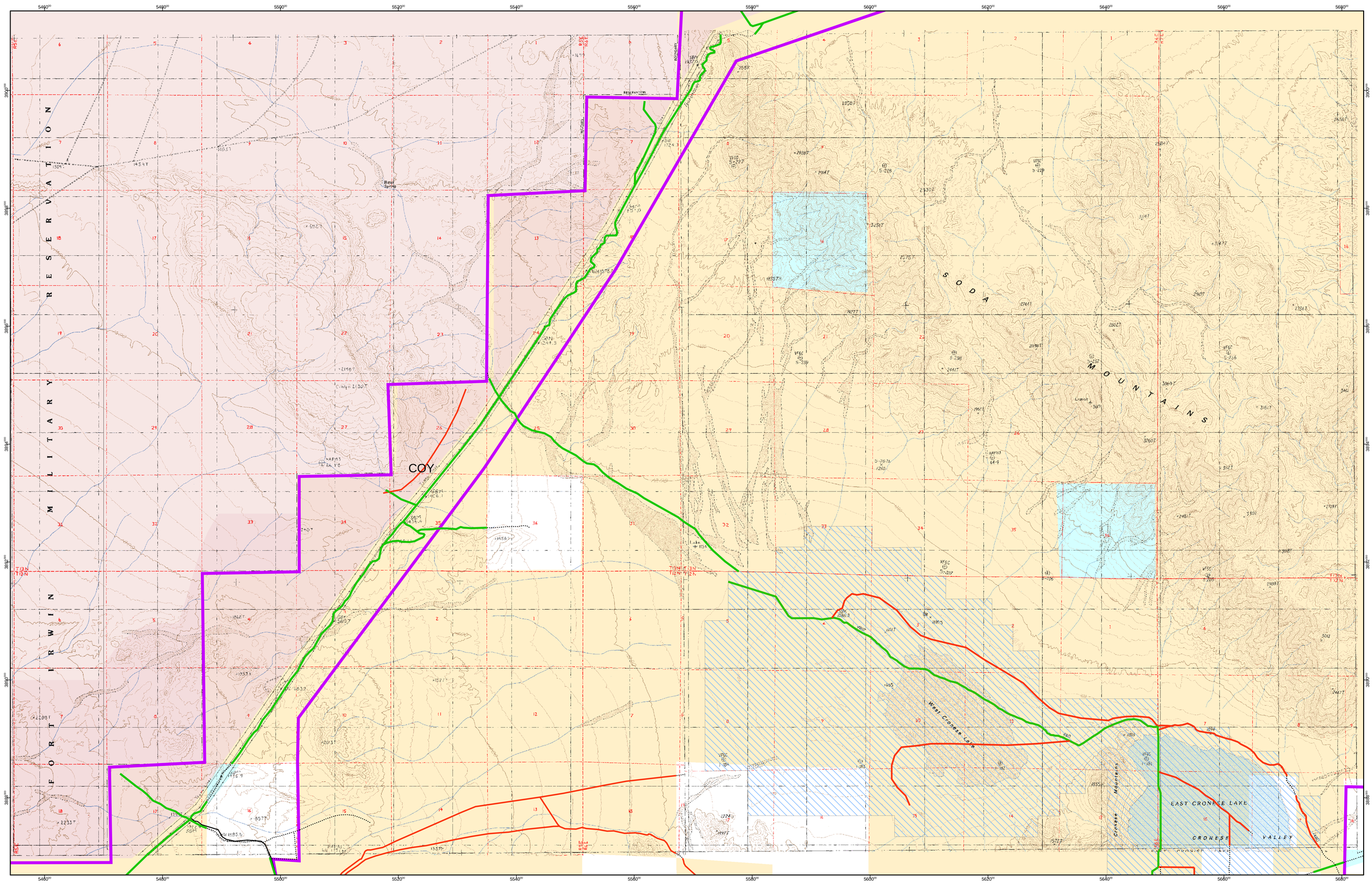
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 35 - Bitter Spring, Cronese Lakes



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

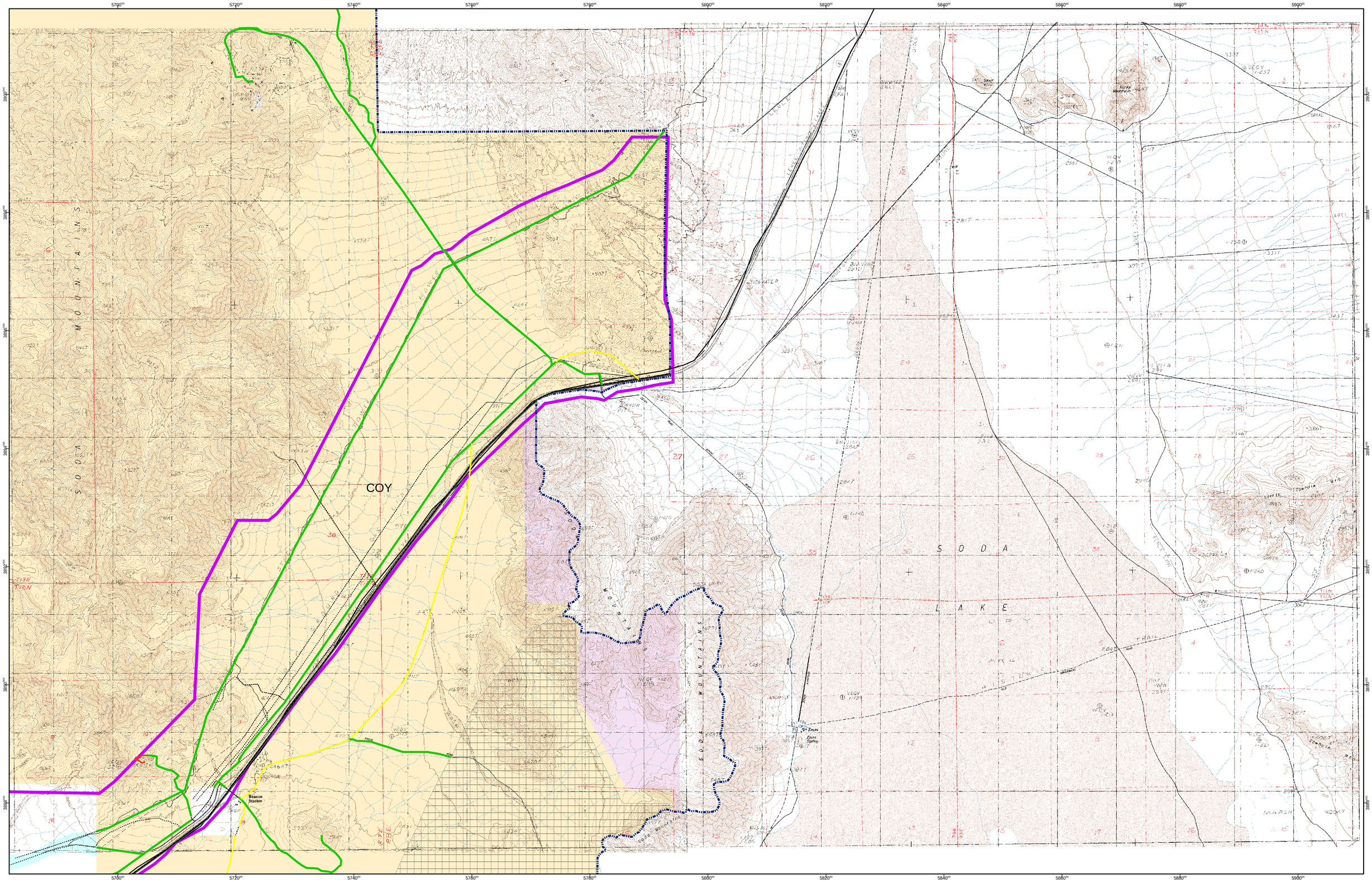
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 36 - West of Soda Lake, Soda Lake North



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 37 - Boron, Saddleback Mountain

RM3

FR5

FR2

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

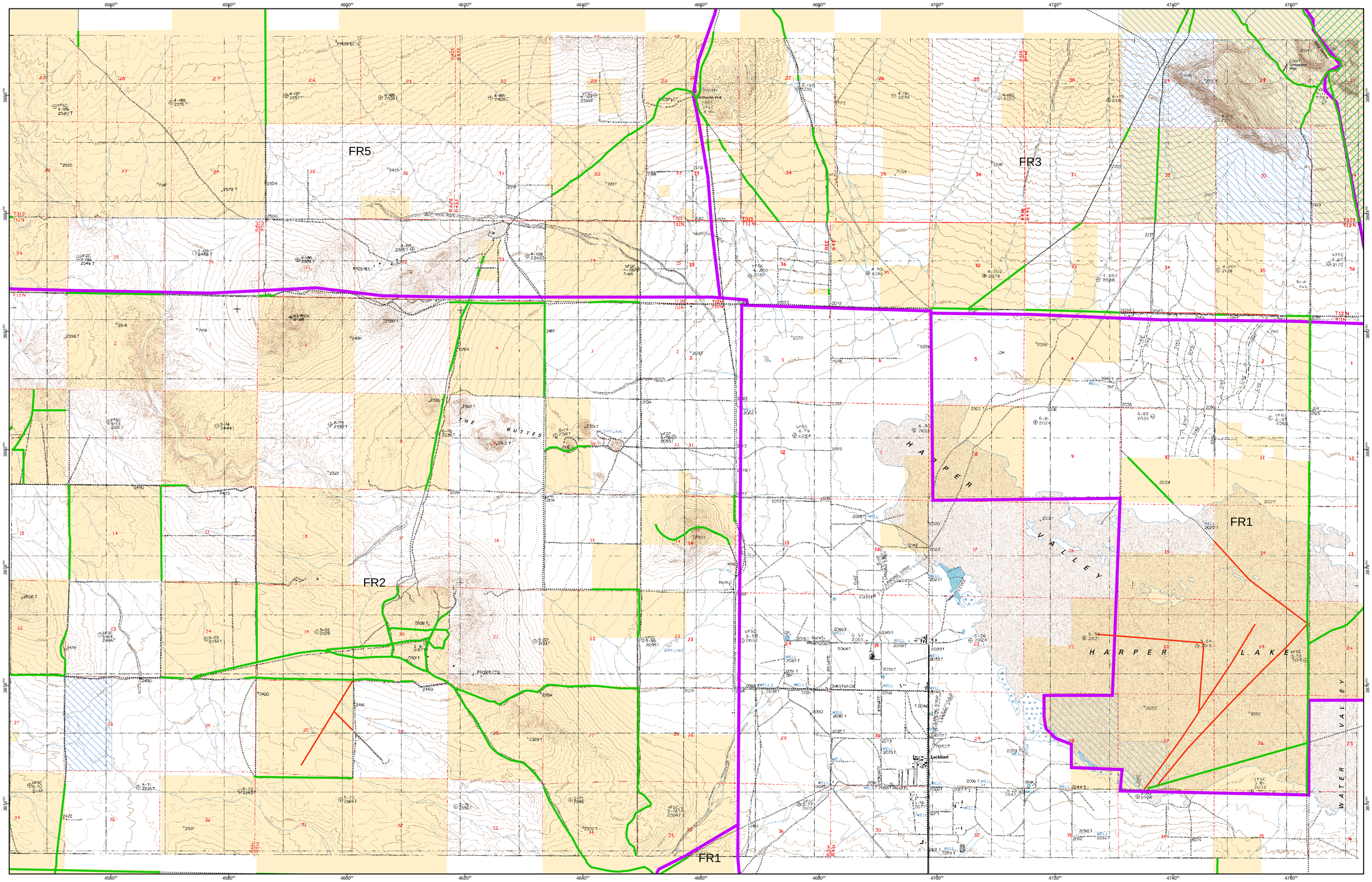
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
Major Roads
Highways

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 38 - The Buttes, Lockhart



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 39 - Water Valley, Mud Hills

SU1

SU2

SU3

SU5

FR1

FR3

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 40 - Lane Mountain, Coyote Lake

SU3

SU5

SU4

COY

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

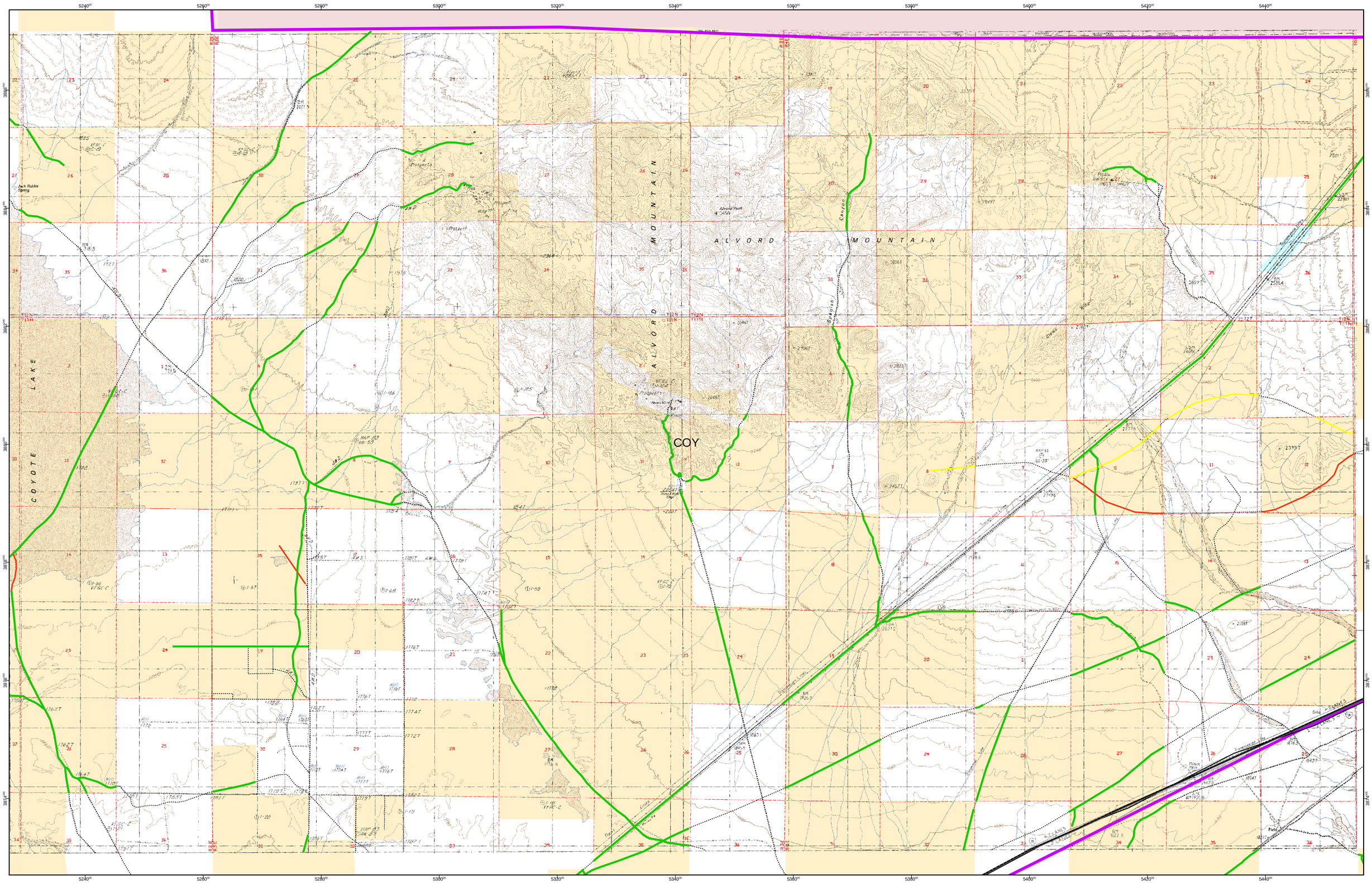
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 41 - Alvord Mountain West, Alvord Mountain East



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

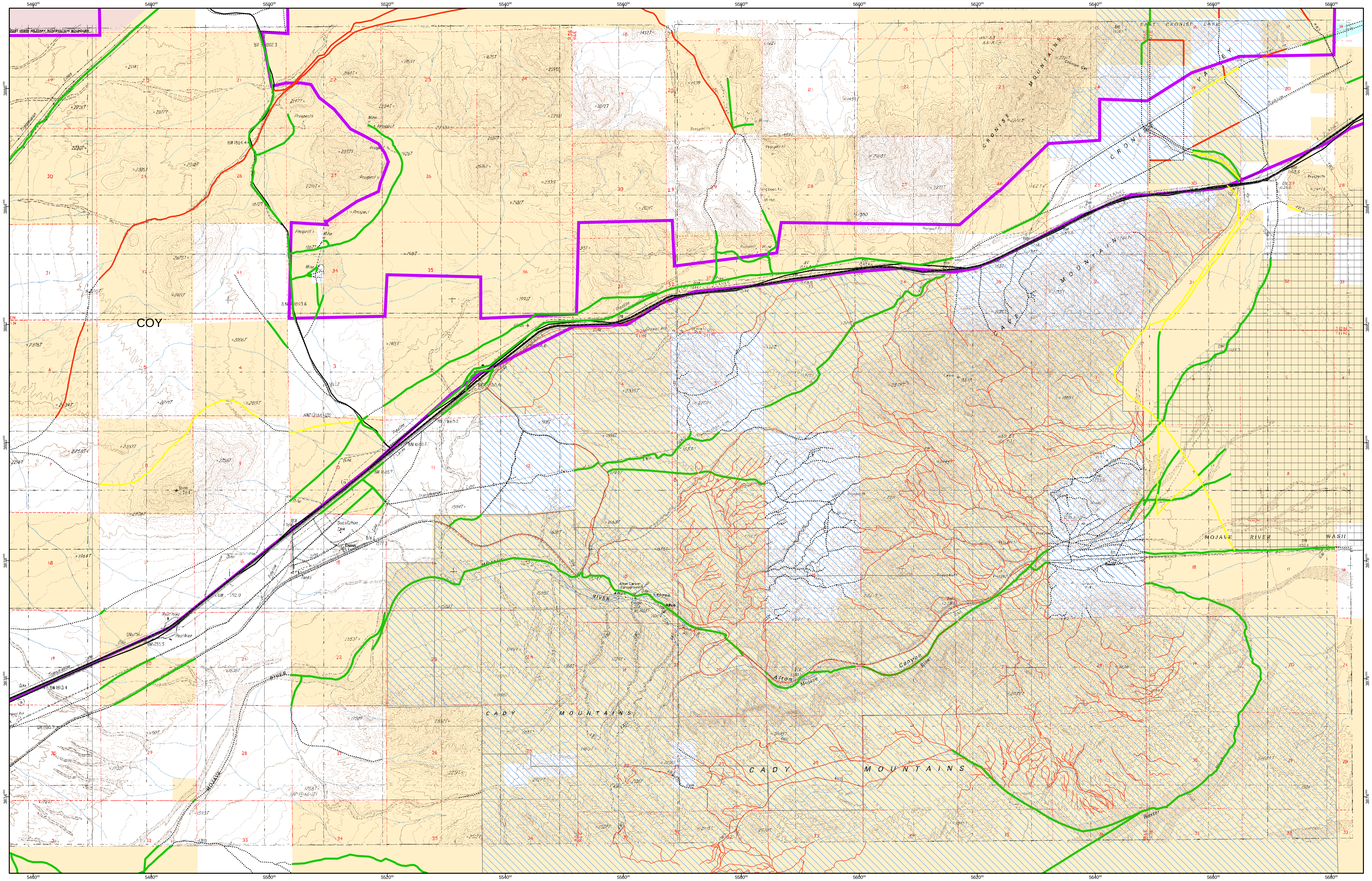
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

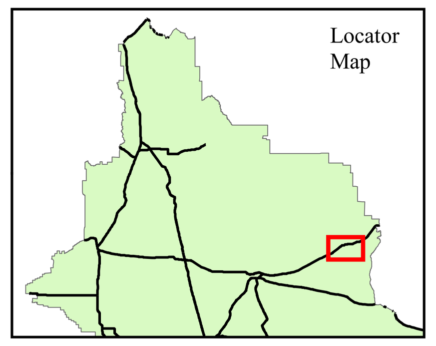
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 42 - Dunn, Cave Mountain





Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 4, 2003

SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2
Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- Major Roads
- Highways

Proposed Designations

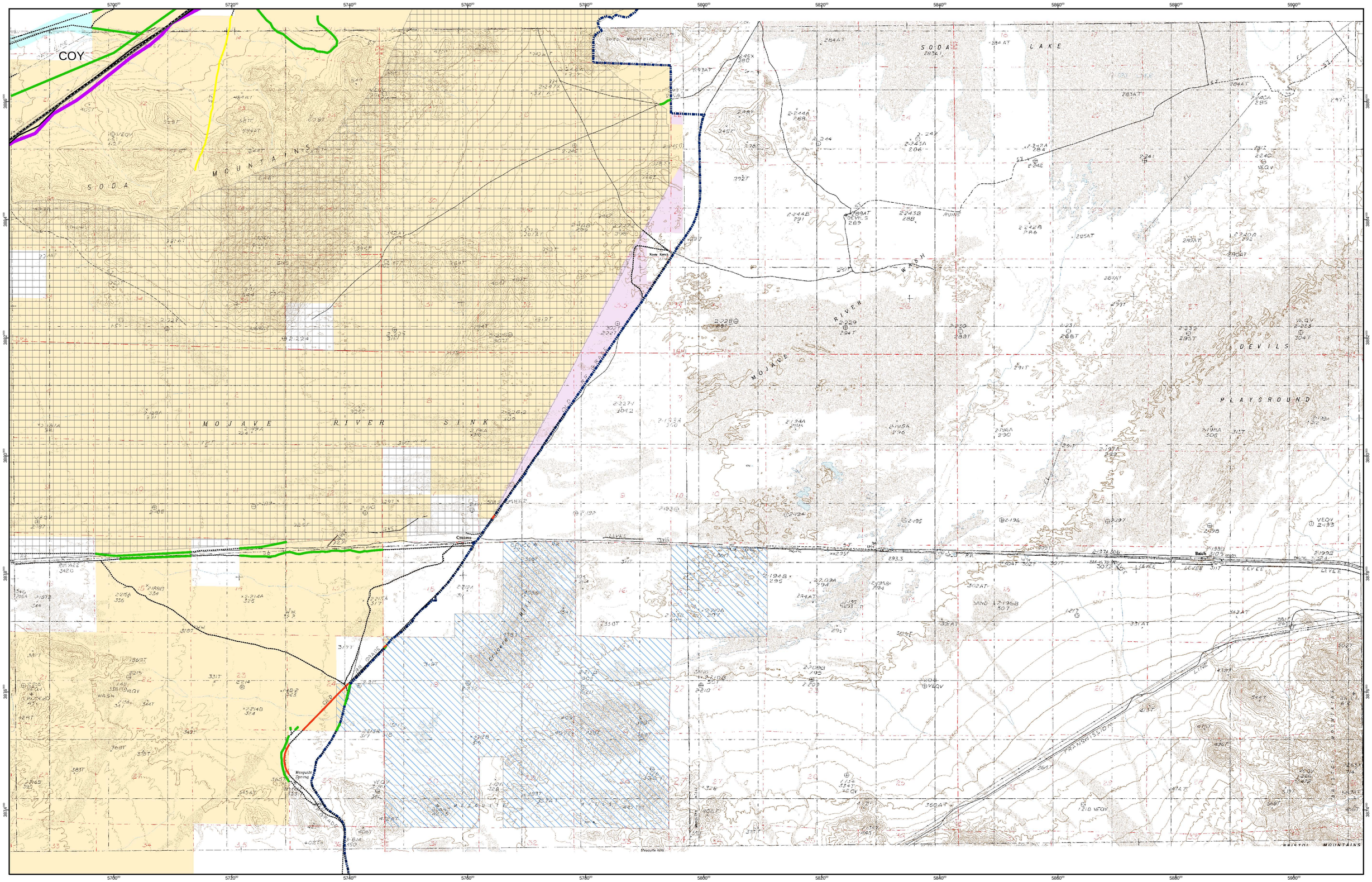
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

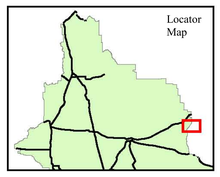
No Action - West Mojave Route Designation Program

Map 43 - Crucero Hill, Soda Lake South



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

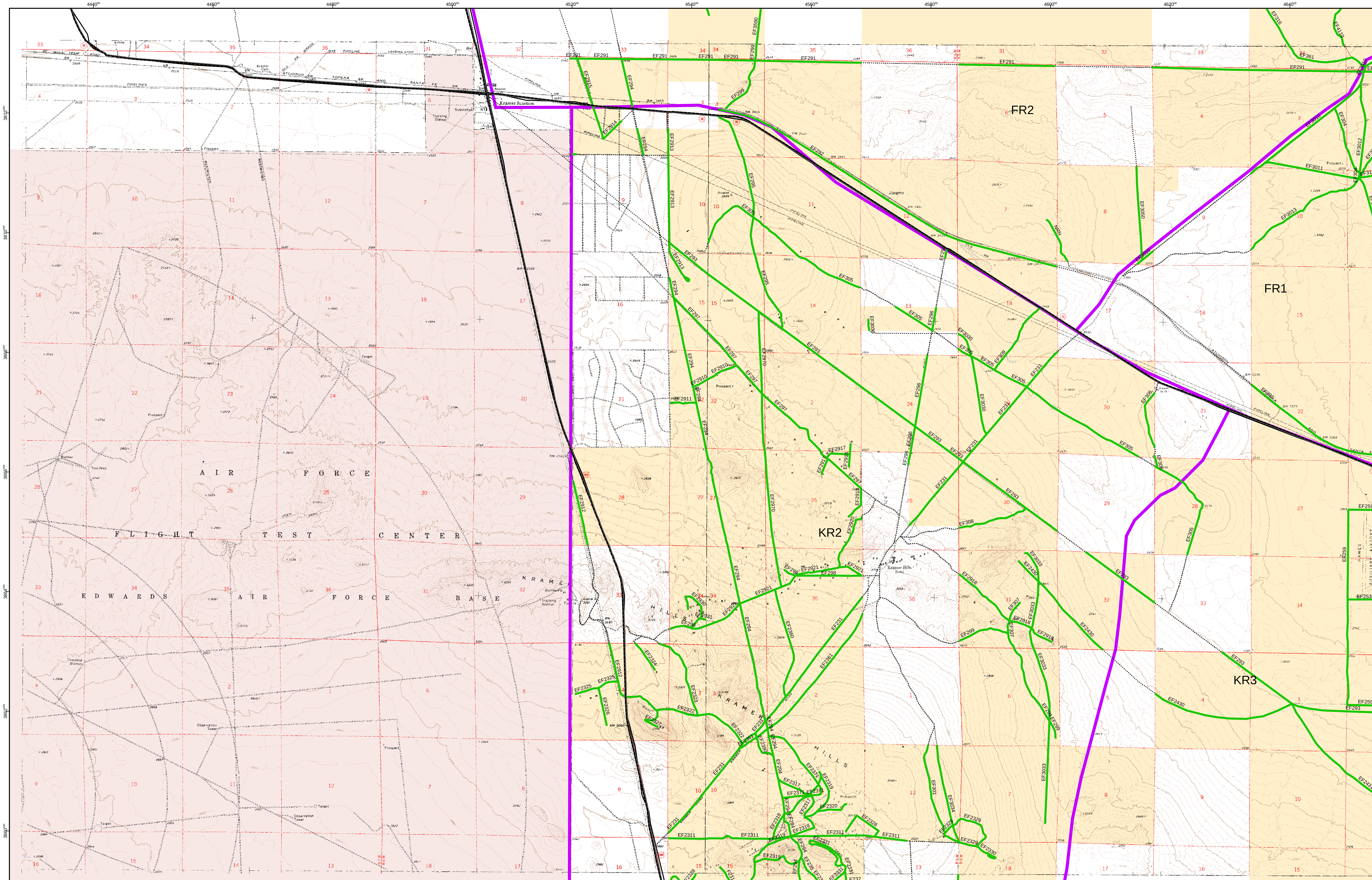
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
Major Roads
Highways

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

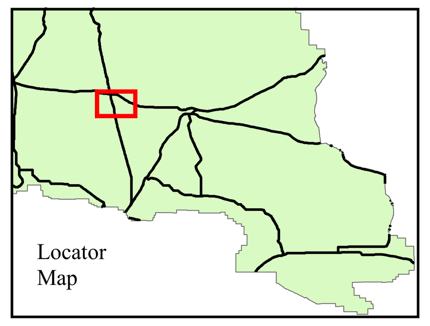
No Action - West Mojave Route Designation Program

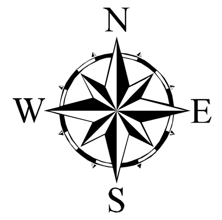
Map 44 - Kramer Junction, Kramer Hills



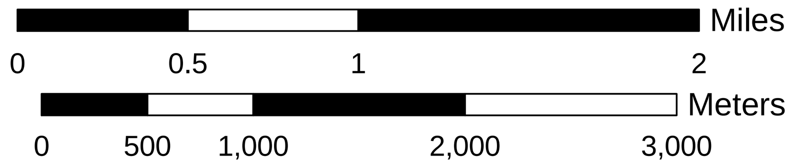
Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003





SCALE 1 : 24,000



Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

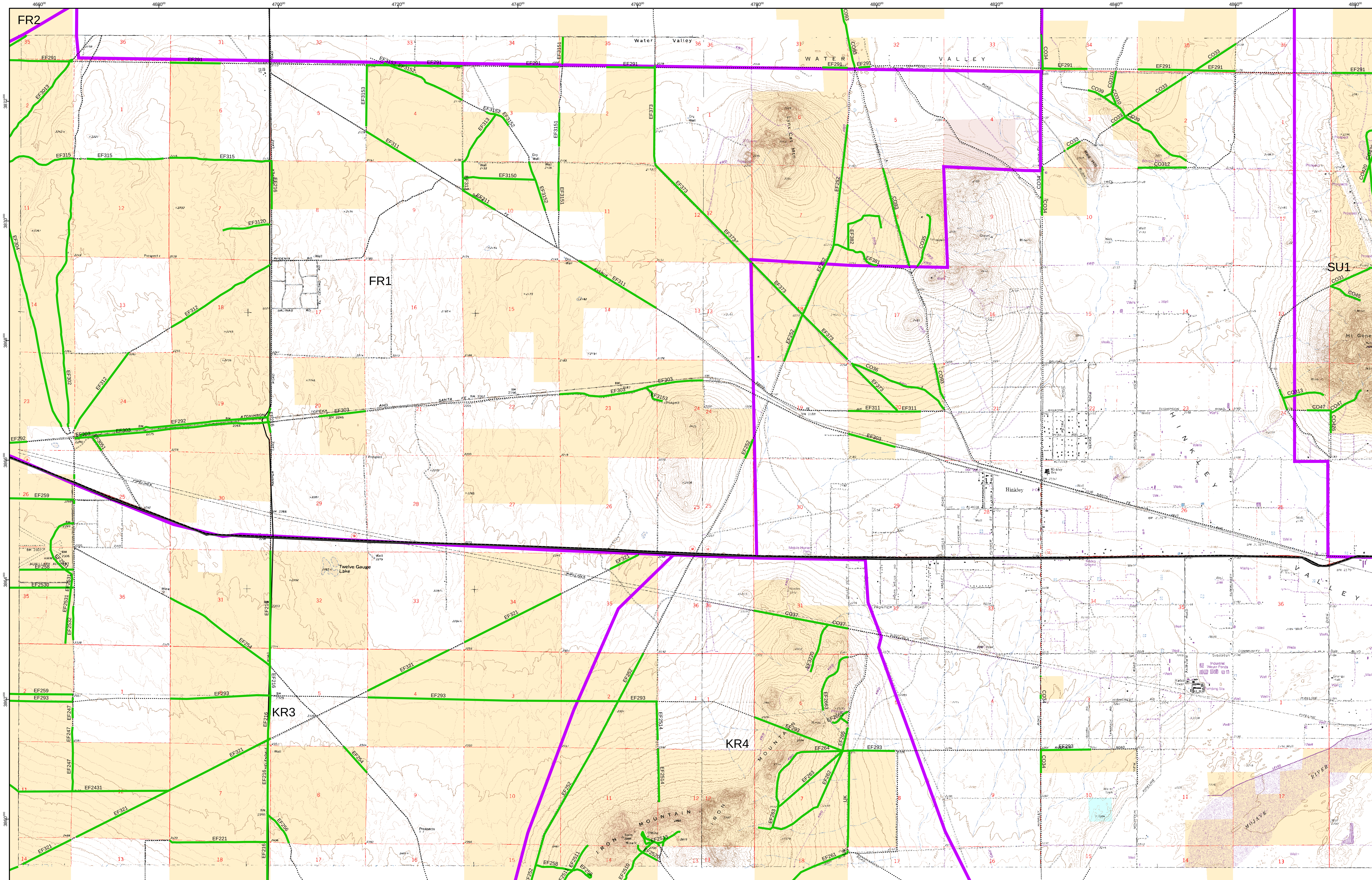
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

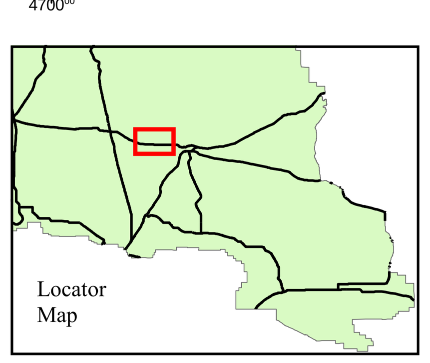
No Action - West Mojave Route Designation Program

Map 45 - Twelve Gauge Lake, Hinkley



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2
Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

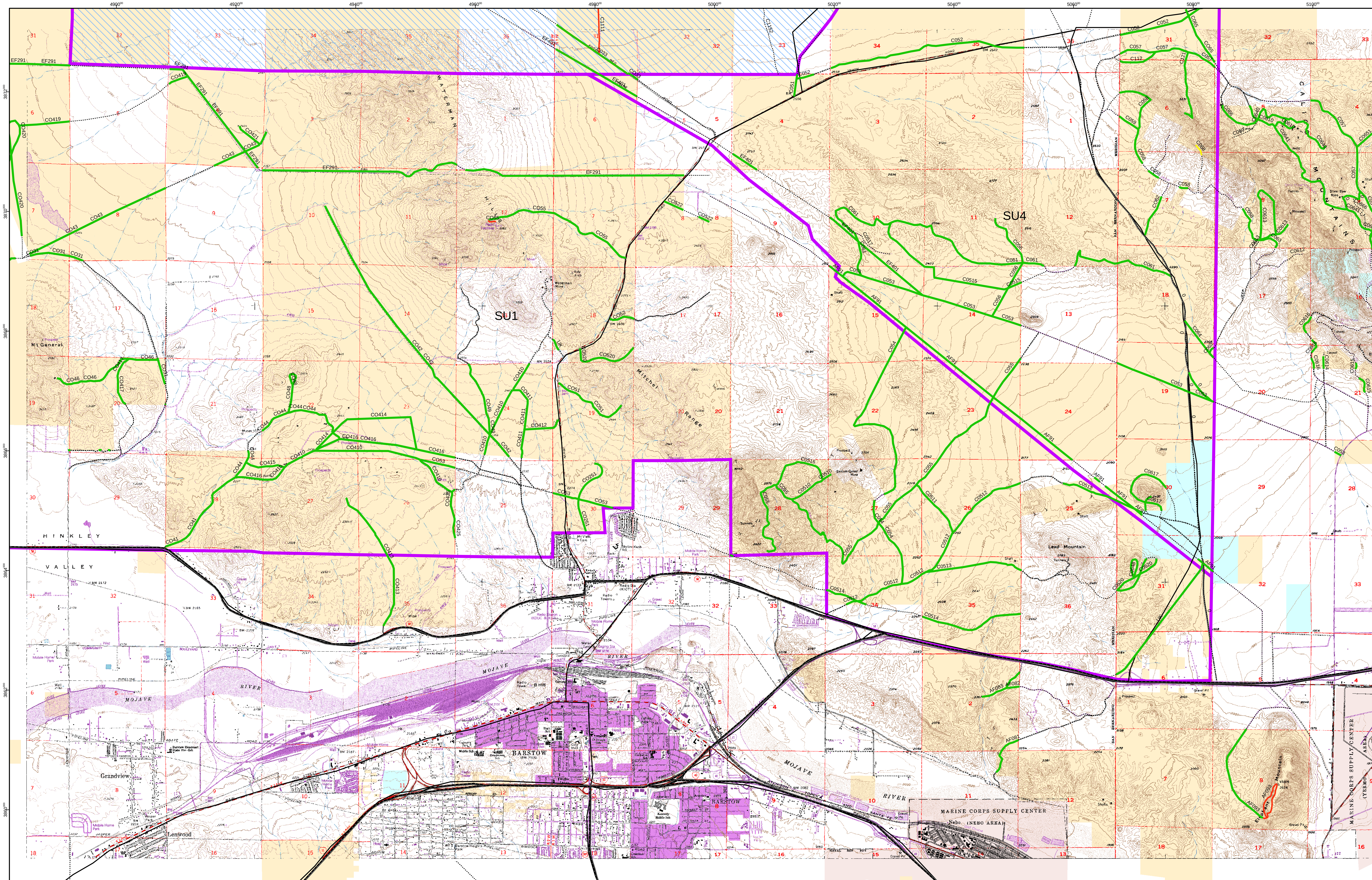
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

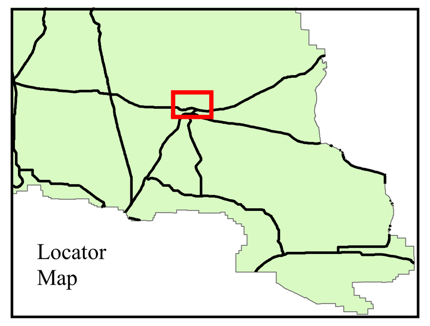
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 46 - Barstow, Nebo





SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

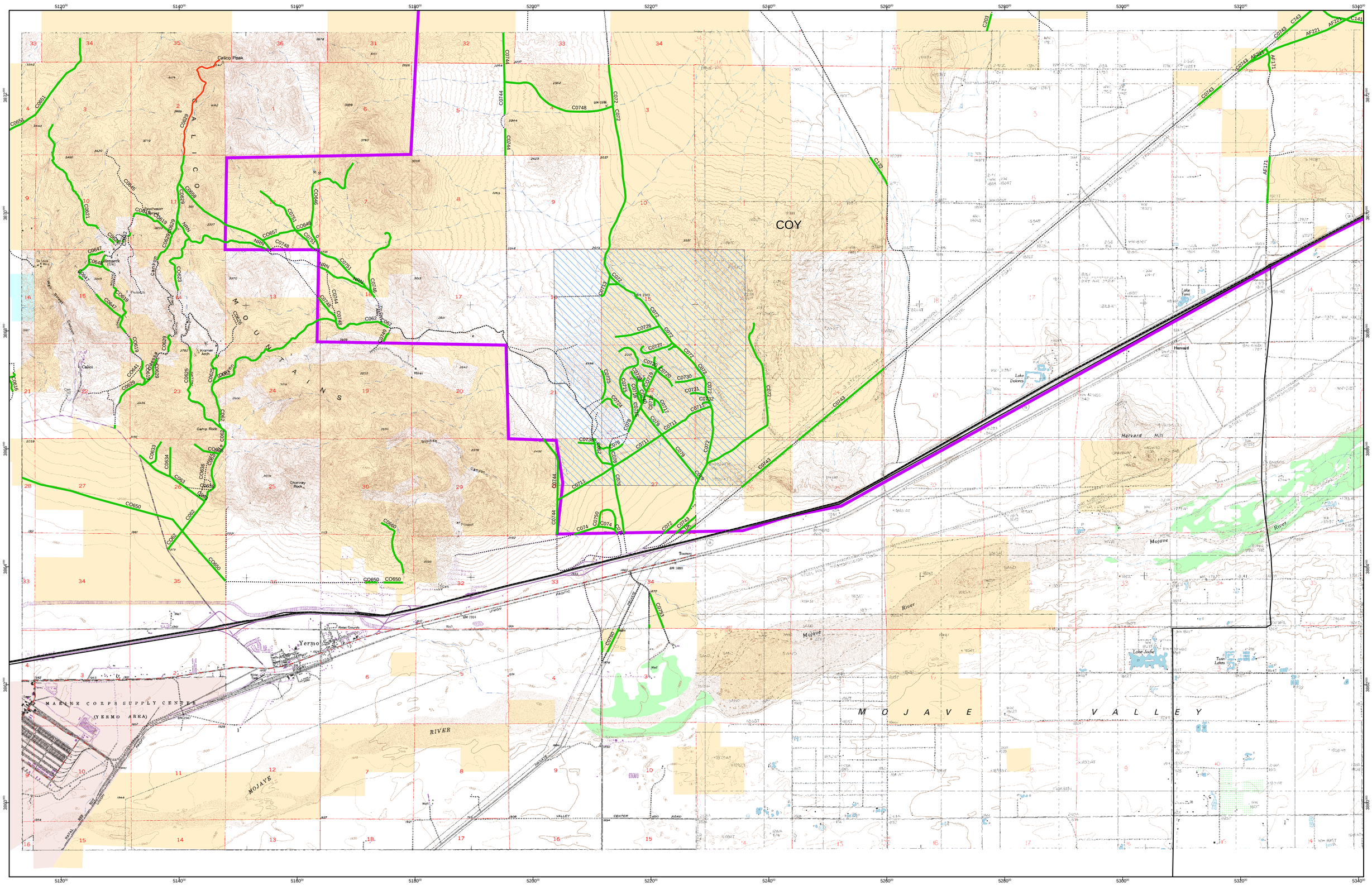
- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003

No Action - West Mojave Route Designation Program

Map 47 - Yermo, Harvard Hill



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

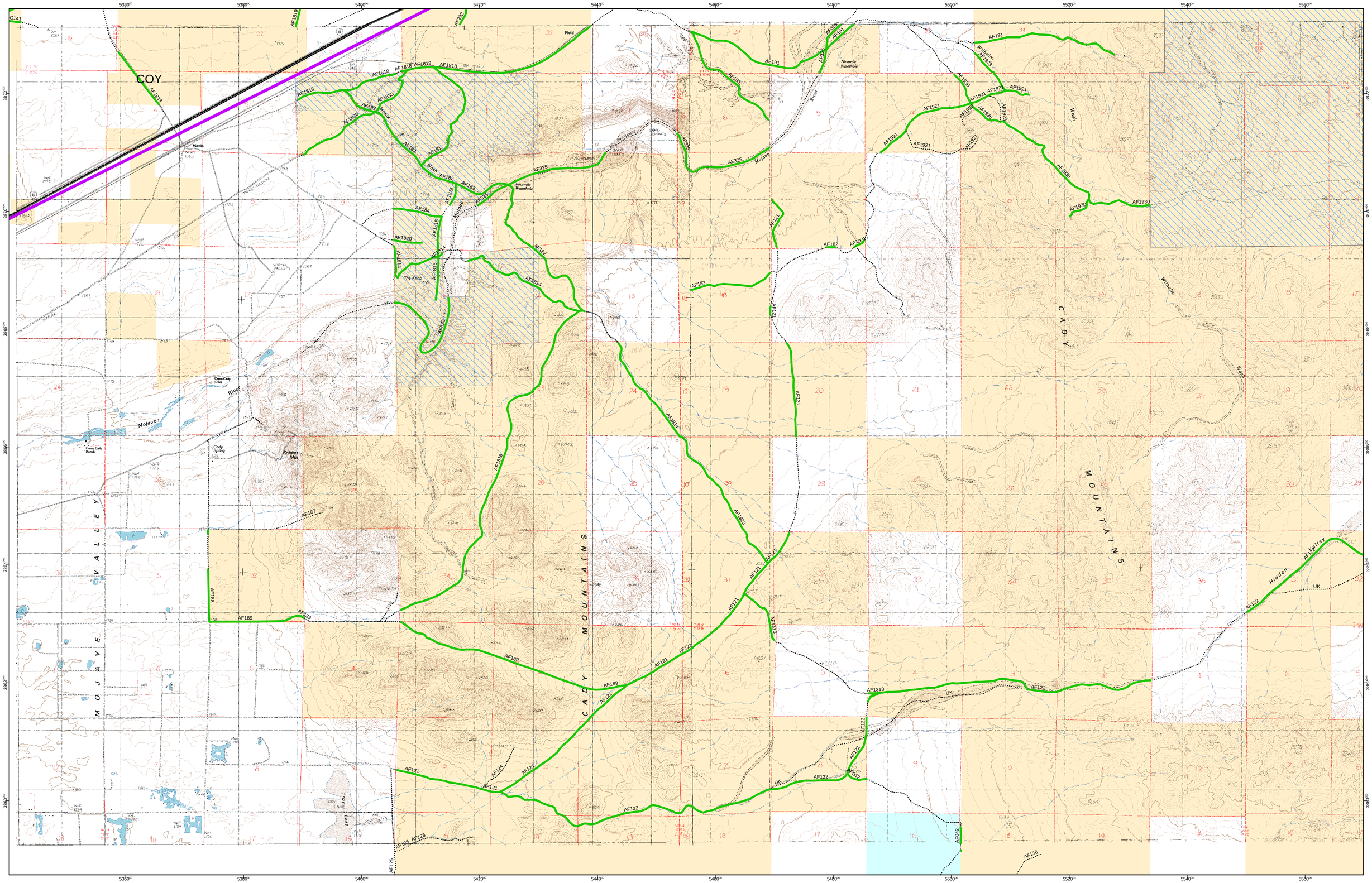
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 48 - Manix, Hidden Valley West



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

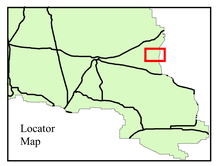
- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 49 - Hidden Valley East, West of Broadwell Mesa

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

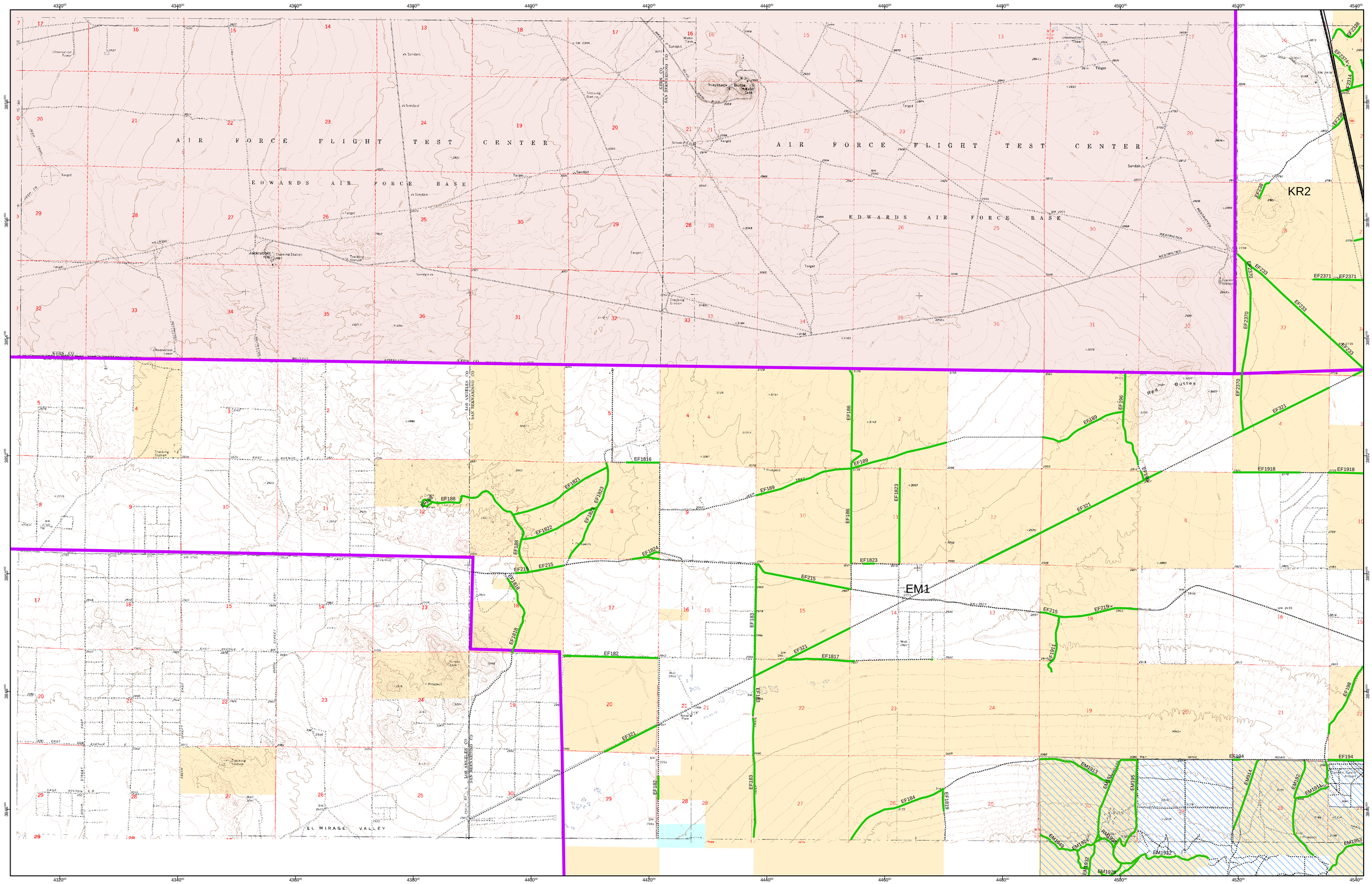
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 50 - Jackrabbit Hill, Red Buttes



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

Miles: 0 — 0.5 — 1 — 2

Meters: 0 — 500 — 1,000 — 2,000 — 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 51 - Astley Rancho, Wild Crossing

KR2 KR3 KR4 KR1 EM1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N W E S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

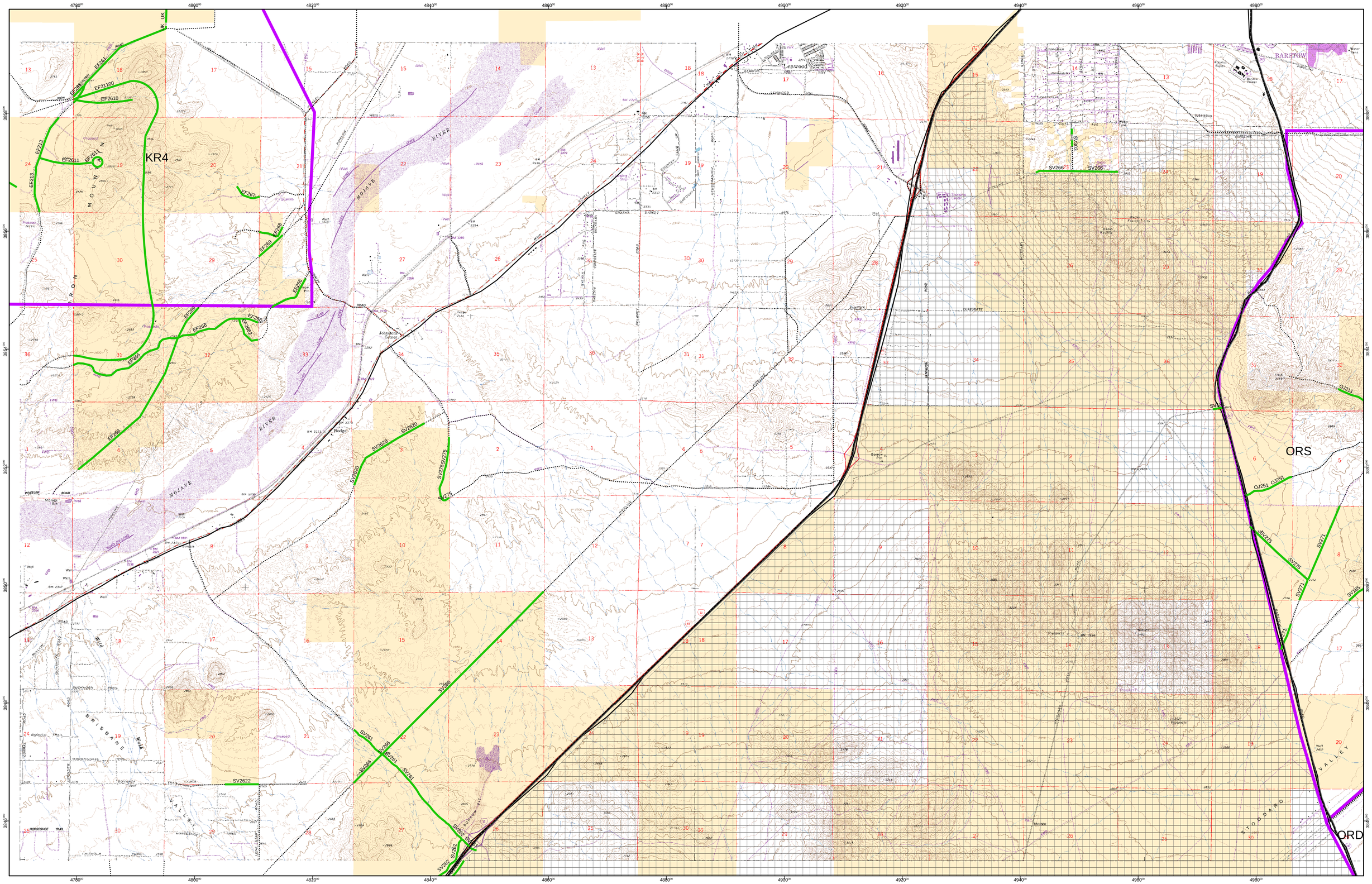
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

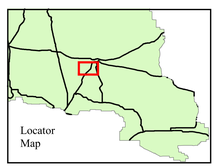
No Action - West Mojave Route Designation Program

Map 52 - Hodge, Barstow SE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

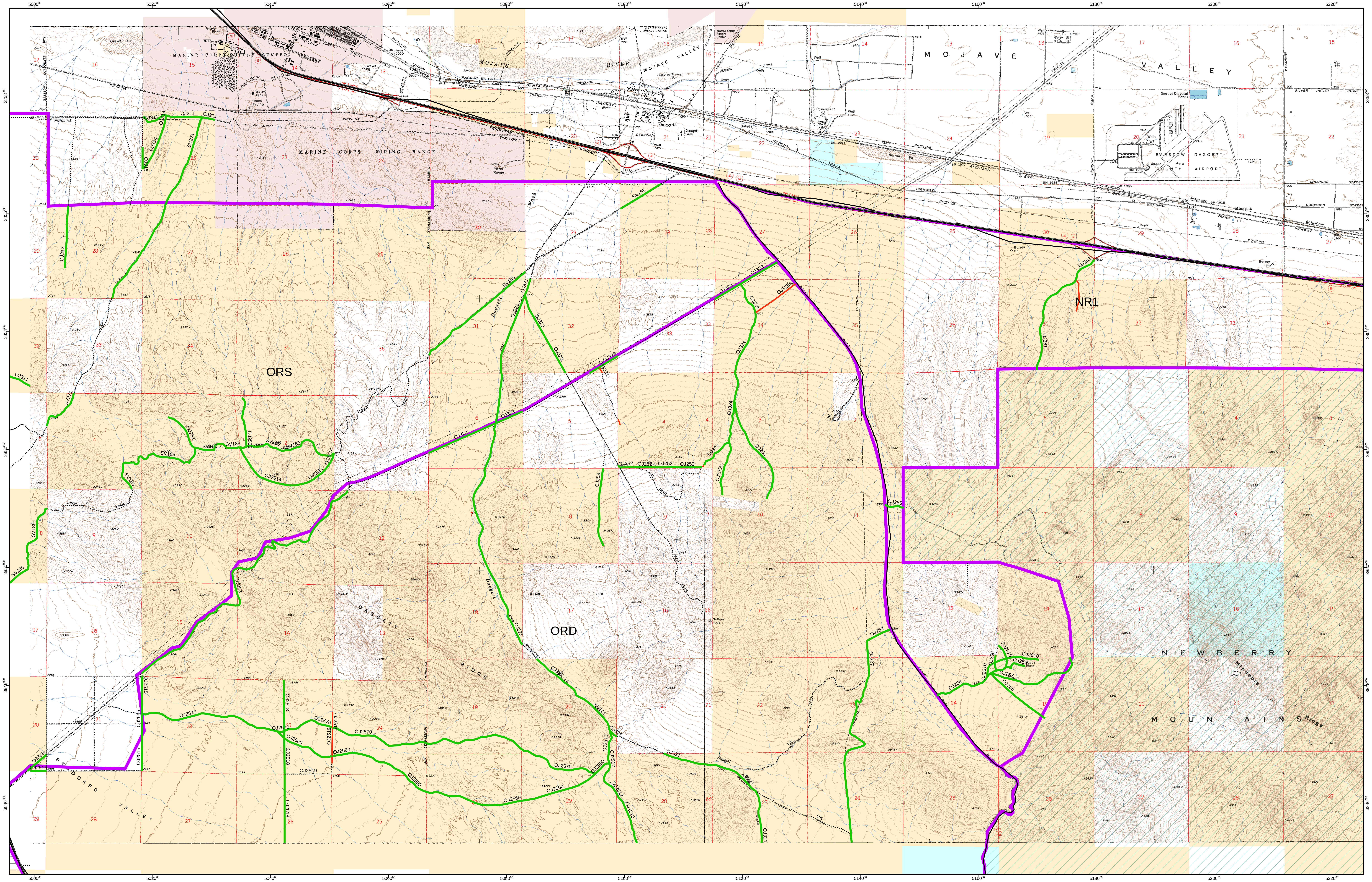
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

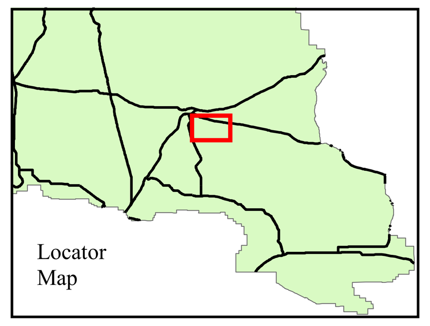
No Action - West Mojave Route Designation Program

Map 53 - Dagget, Minneola



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

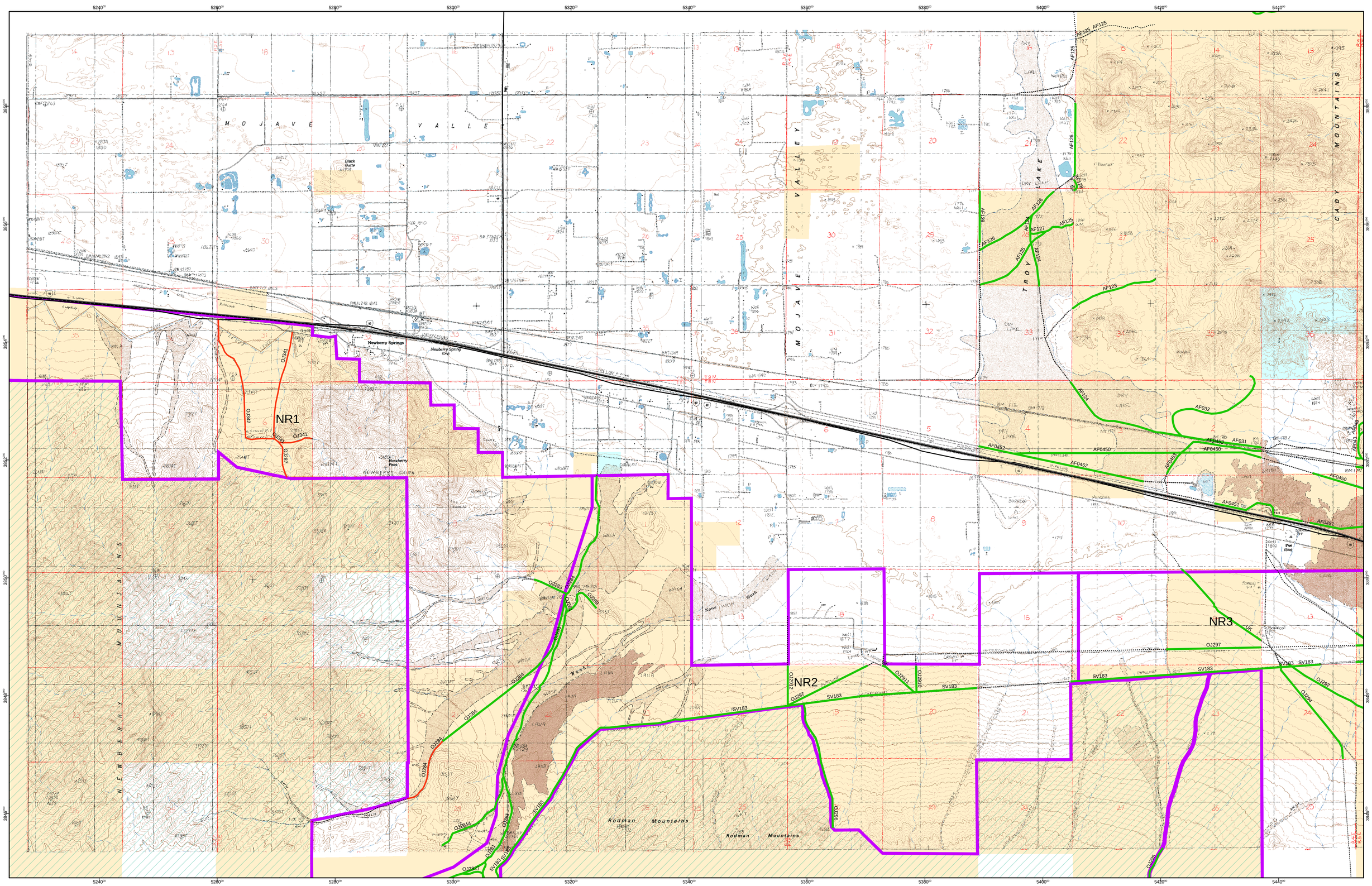
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 54 - Newberry Springs, Troy Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

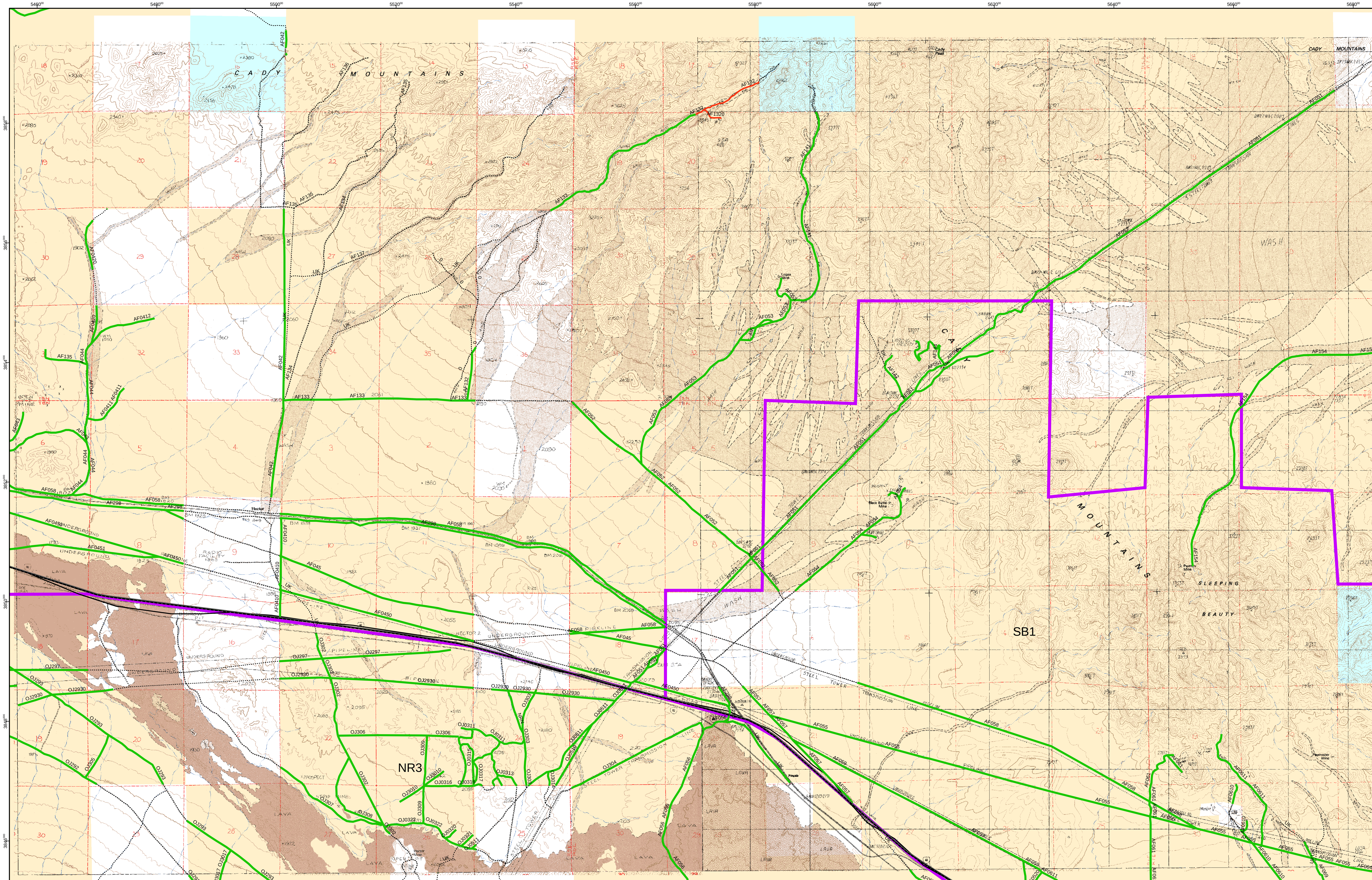
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

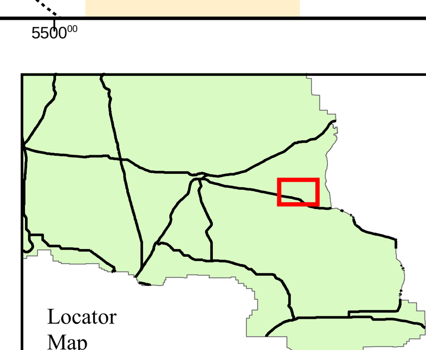
No Action - West Mojave Route Designation Program

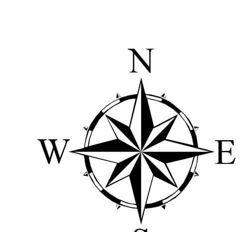
Map 55 - Hector, Sleeping Beauty



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003





SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

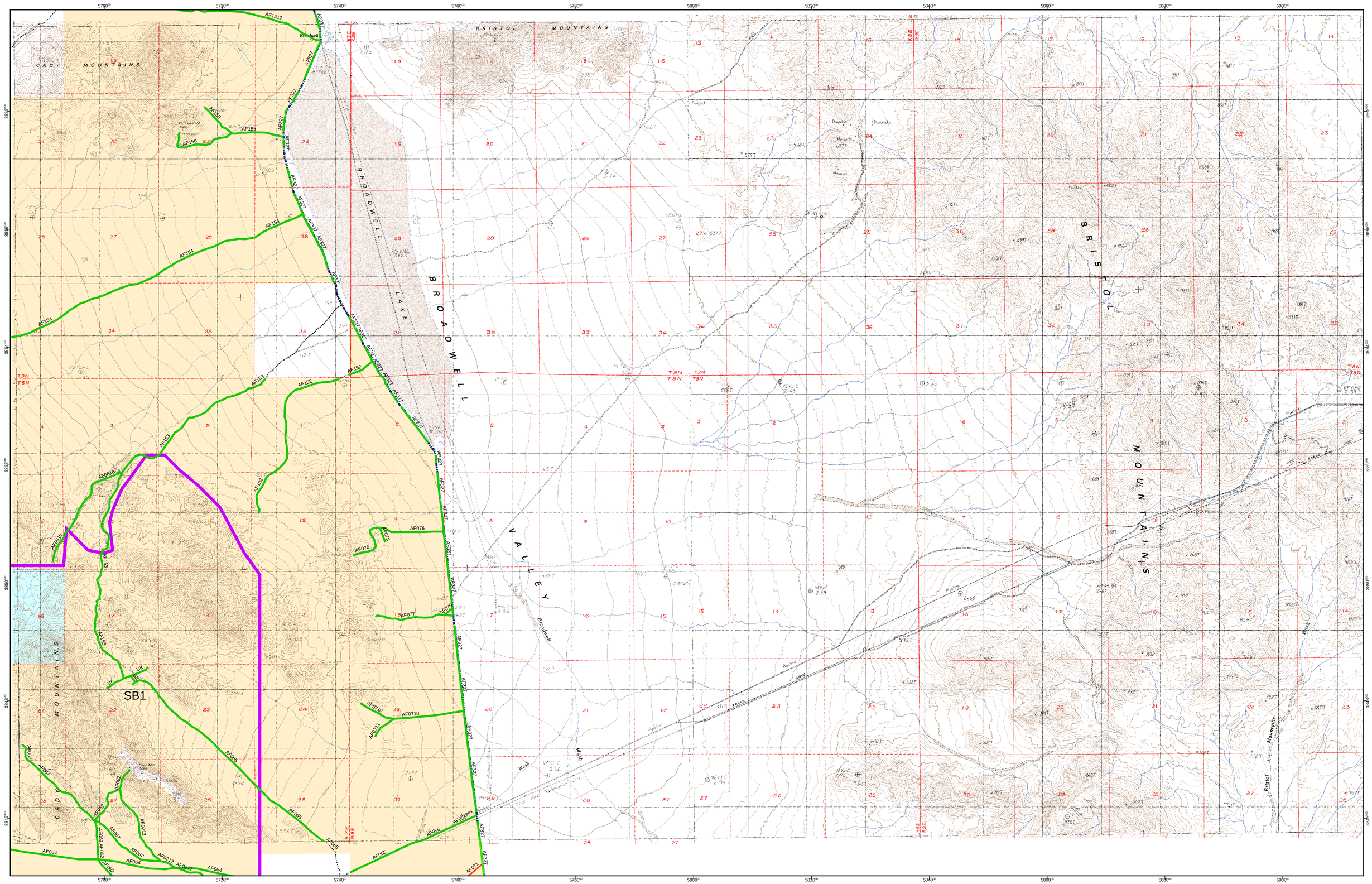
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 56 - Broadwell Lake, East of Broadwell Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

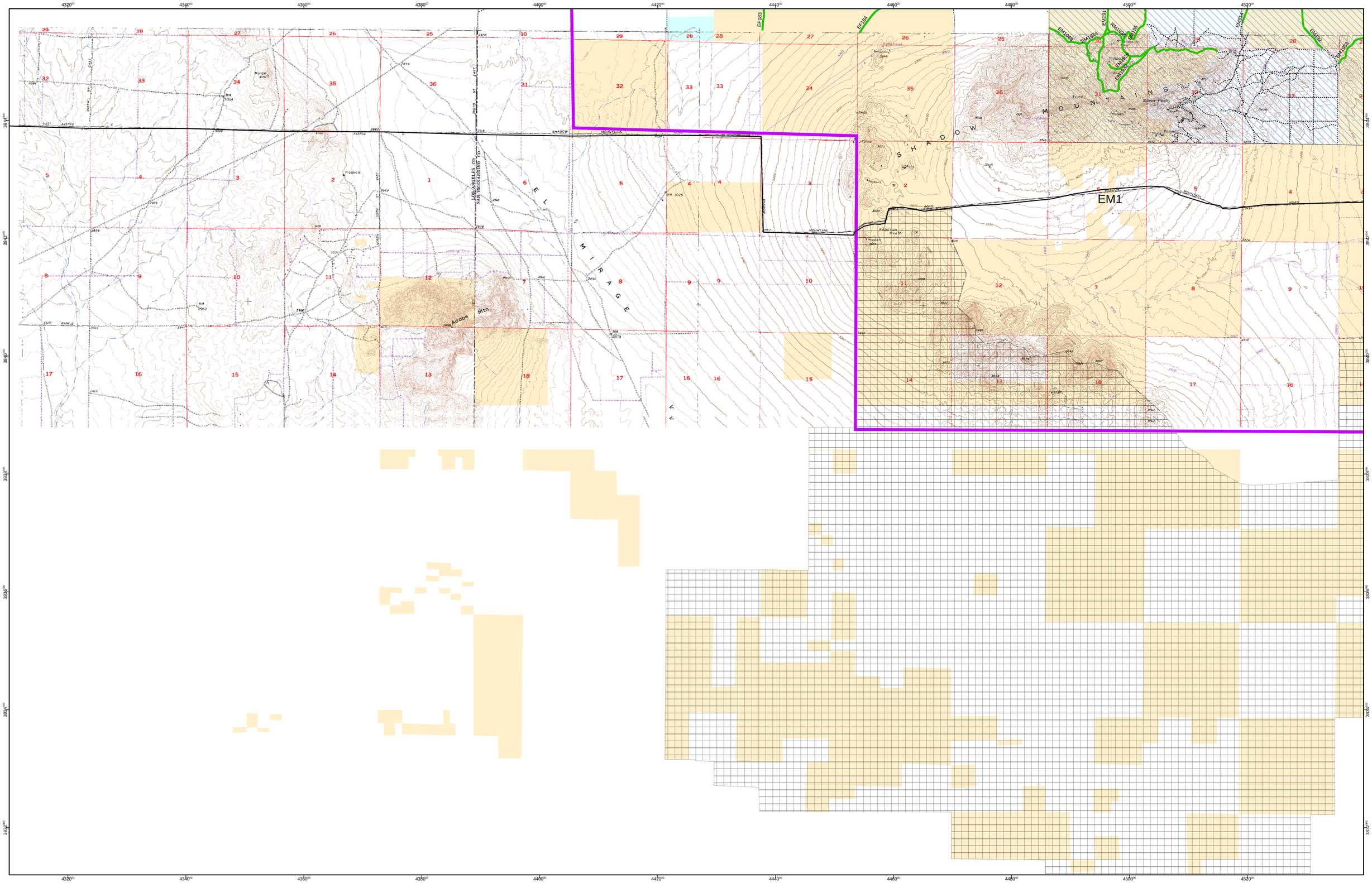
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

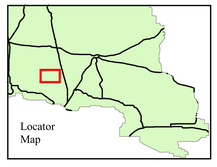
No Action - West Mojave Route Designation Program

Map 57 - Adobe Mountain, Shadow Mountains



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

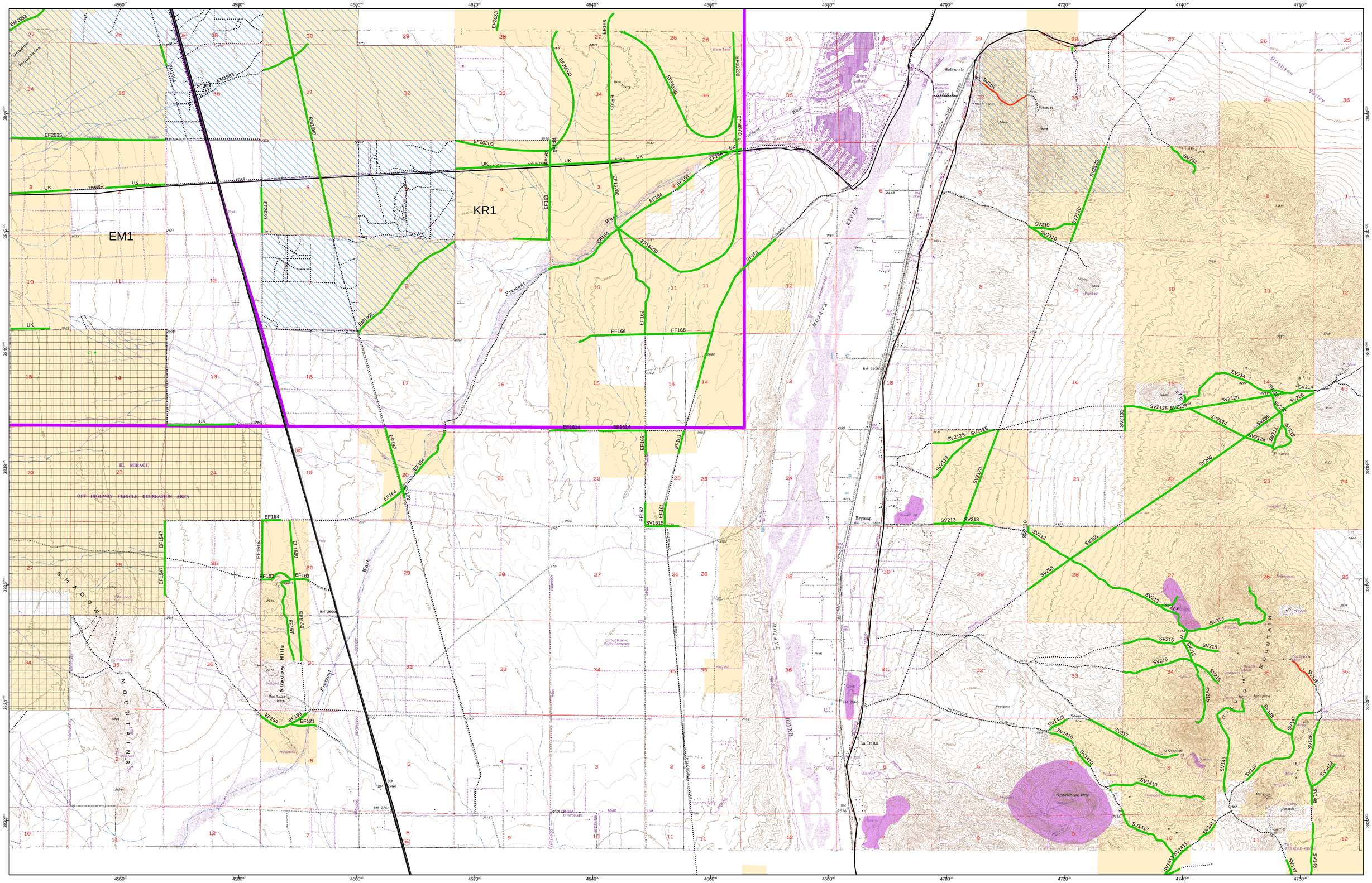
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 58 - Victorville NW, Helendale



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

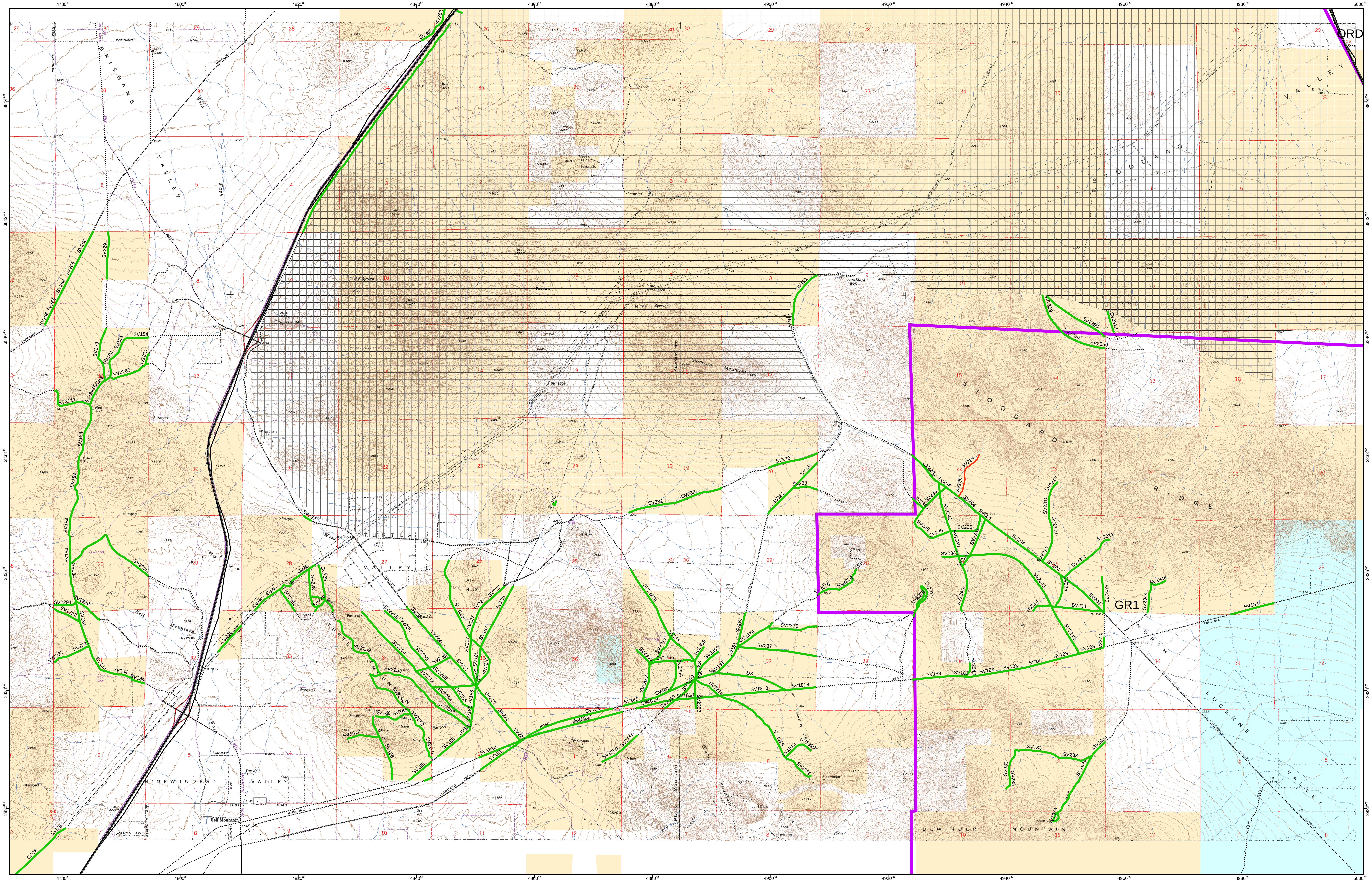
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

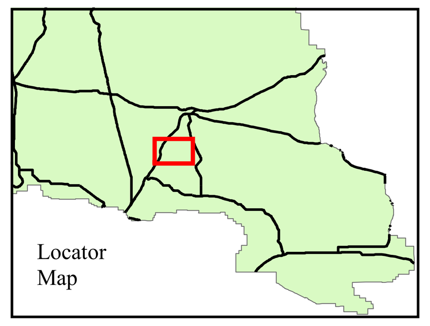
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 59 - Turtle Valley, Stoddard Well





Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

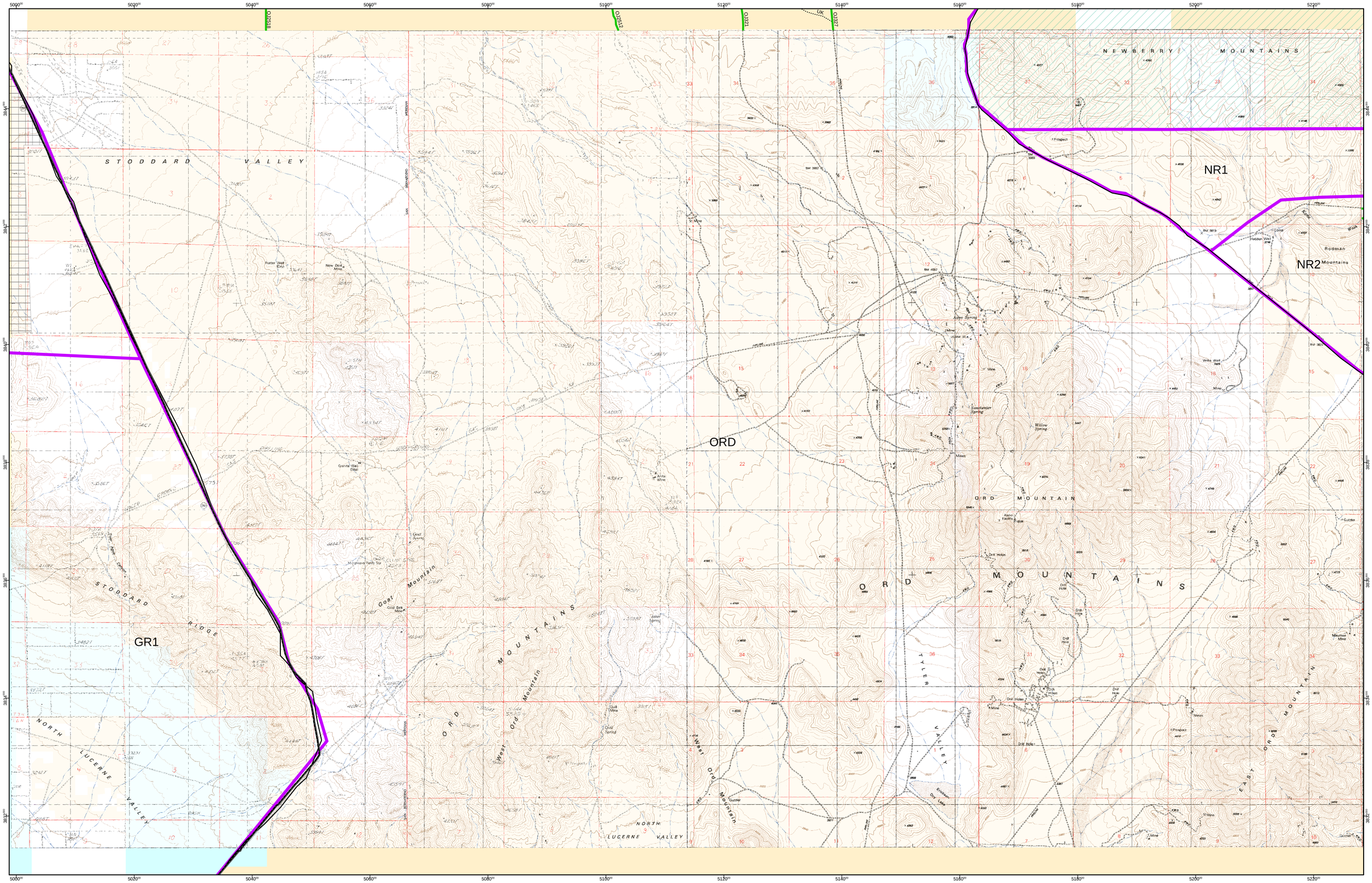
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 60 - West Ord Mountain, Ord Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

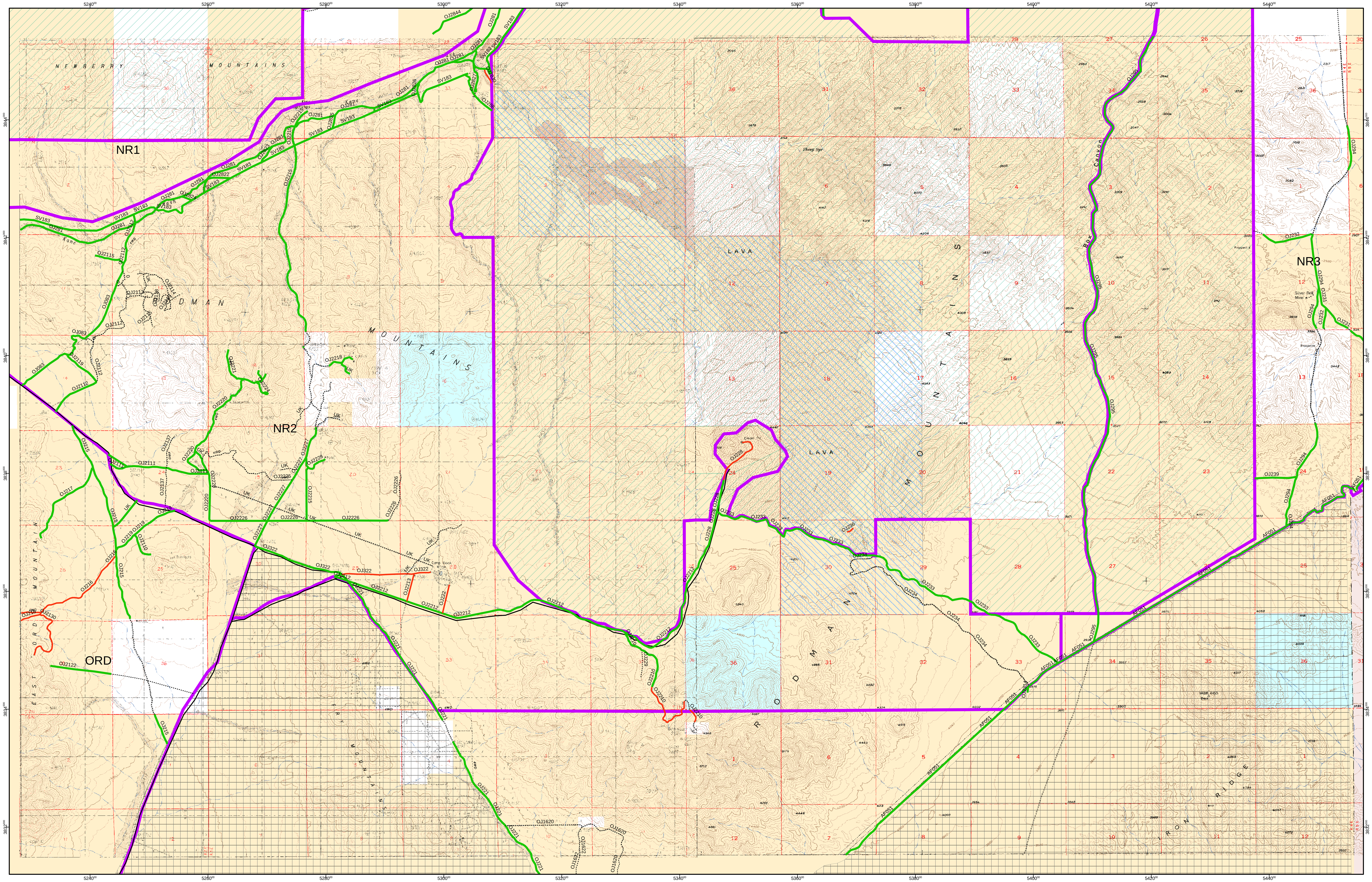
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

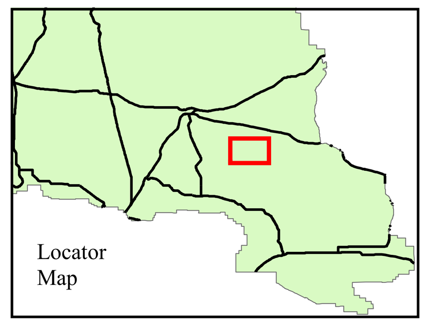
No Action - West Mojave Route Designation Program

Map 61- Camp Rock Mine, Silver Bell Mine



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

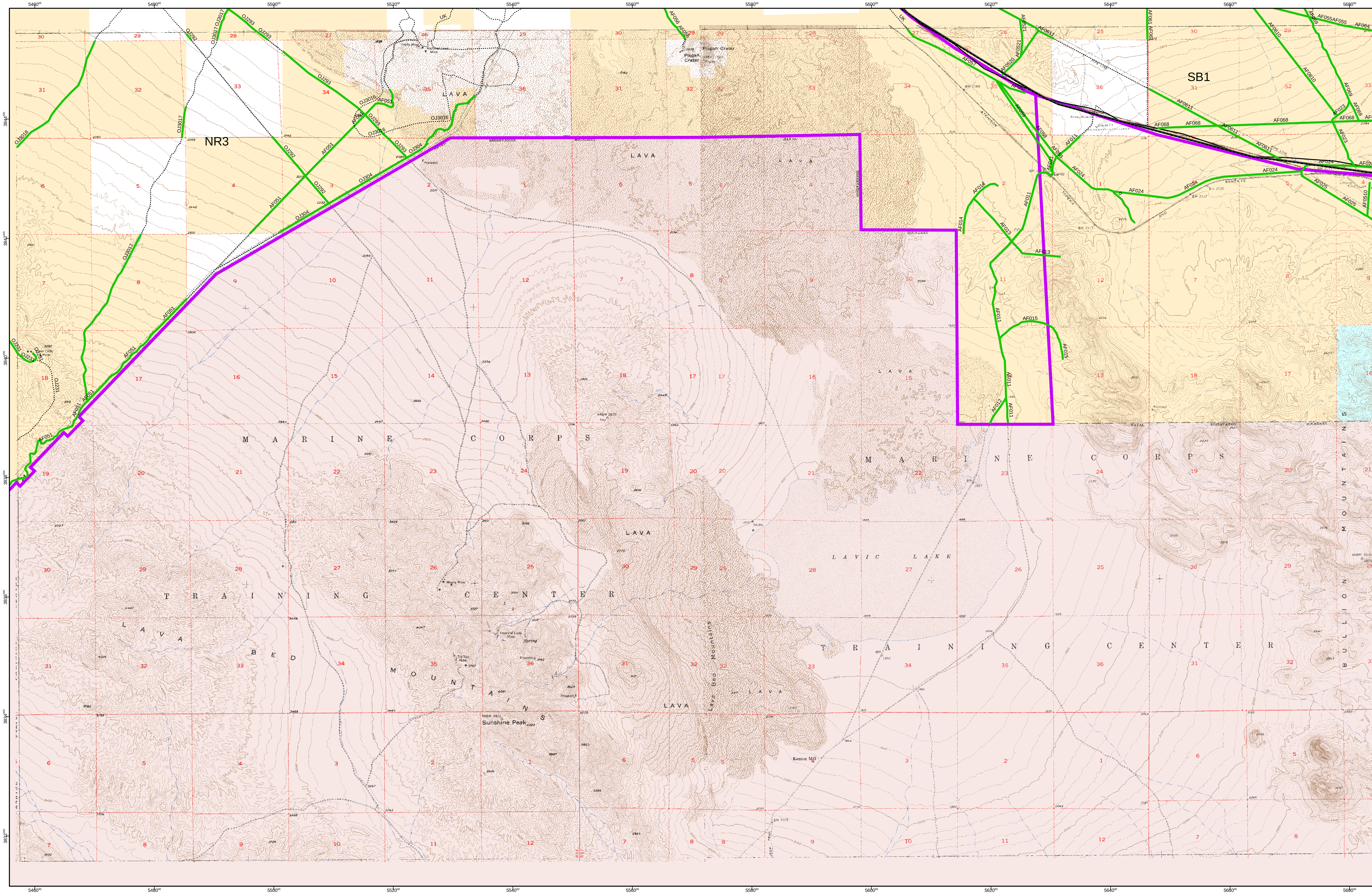
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

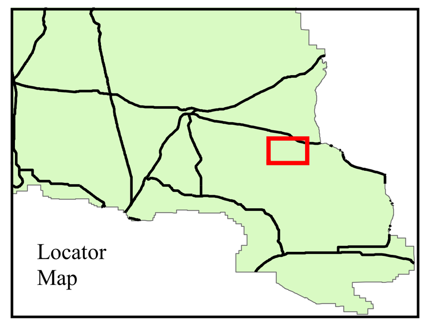
No Action - West Mojave Route Designation Program

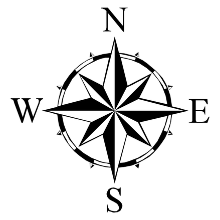
Map 62- Sunshine Peak, Lavic Lake



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003





SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

Highways
Major Roads
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACECs
Open Areas

Proposed Designations

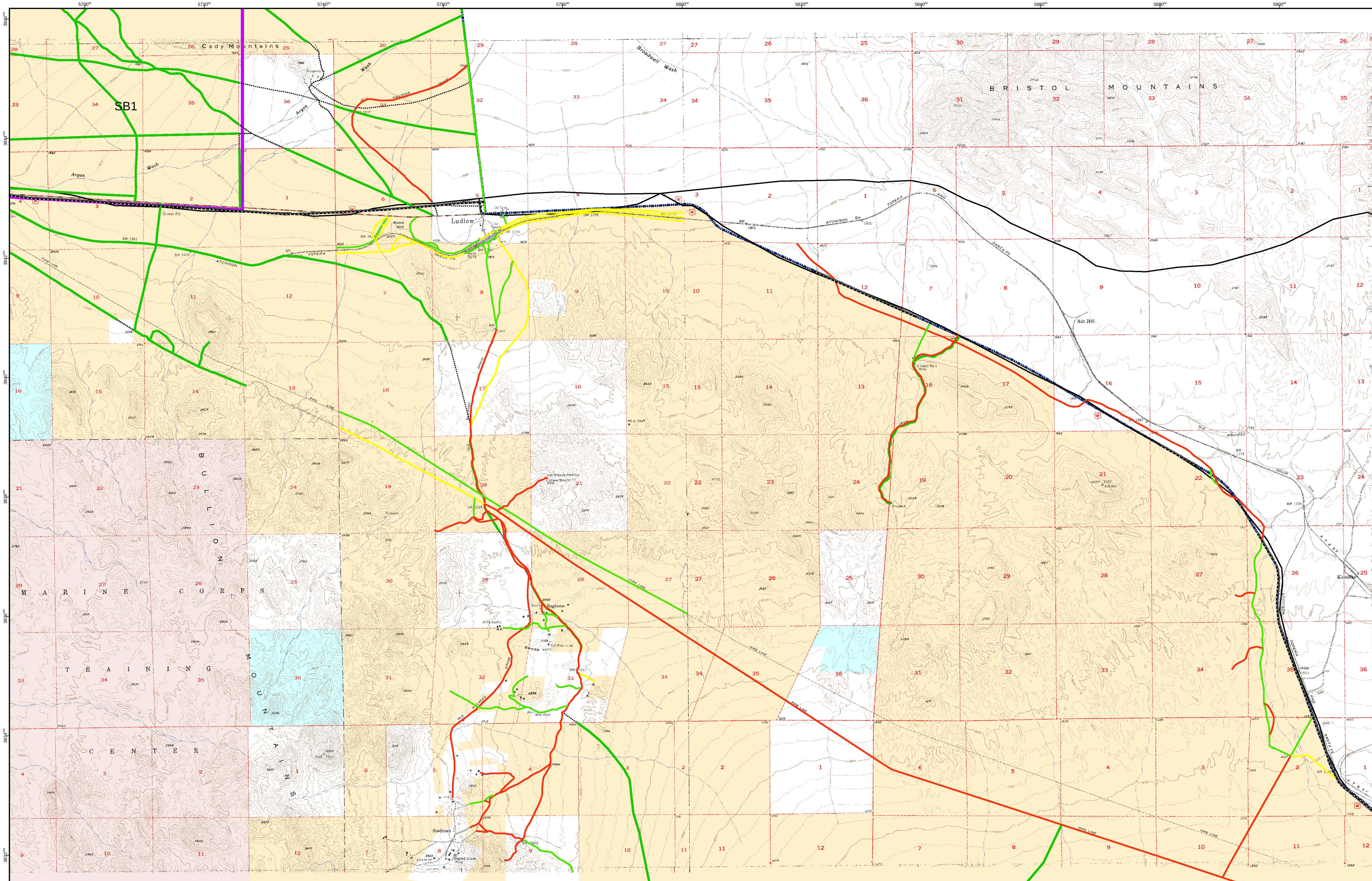
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 63 - Ludlow, Ash Hill



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 4, 2003

Locator Map

SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

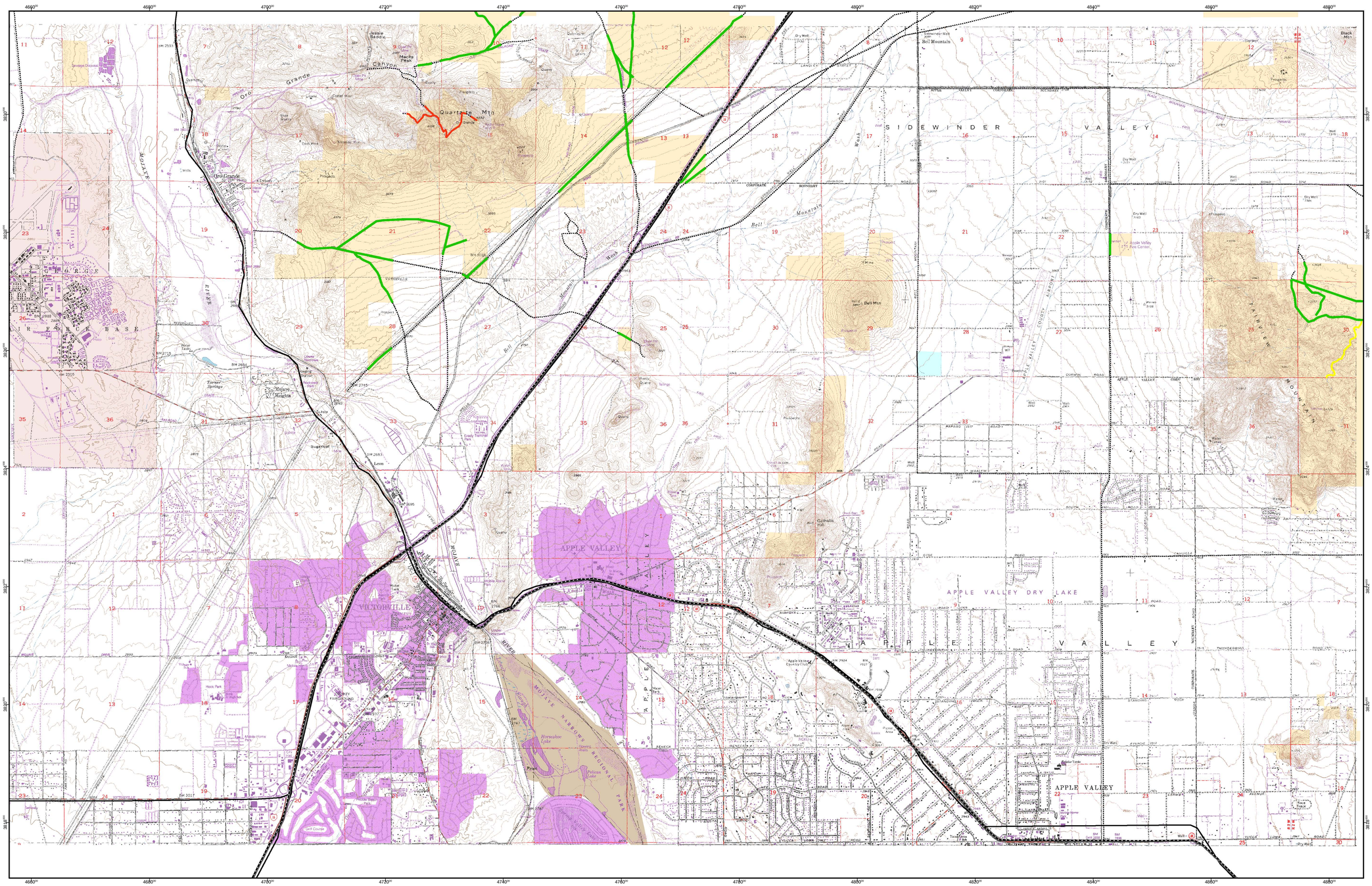
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 64 - Victorville, Apple Valley North



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

No Action - West Mojave Route Designation Program

Map 65 - Fairview Valley, White Horse Mountain

ORD

GR1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

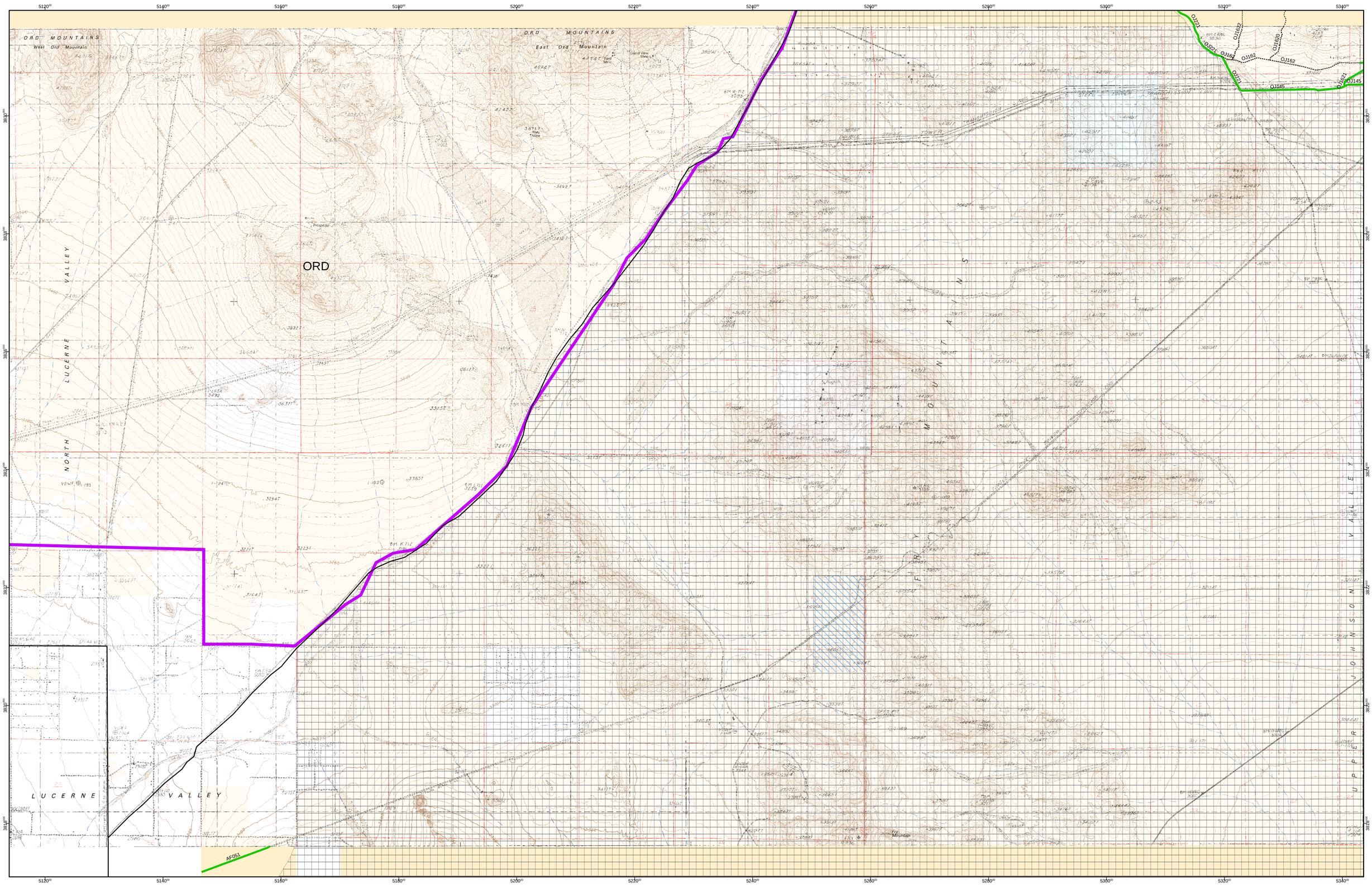
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 66- Grand View Mine, Fry Mountains



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

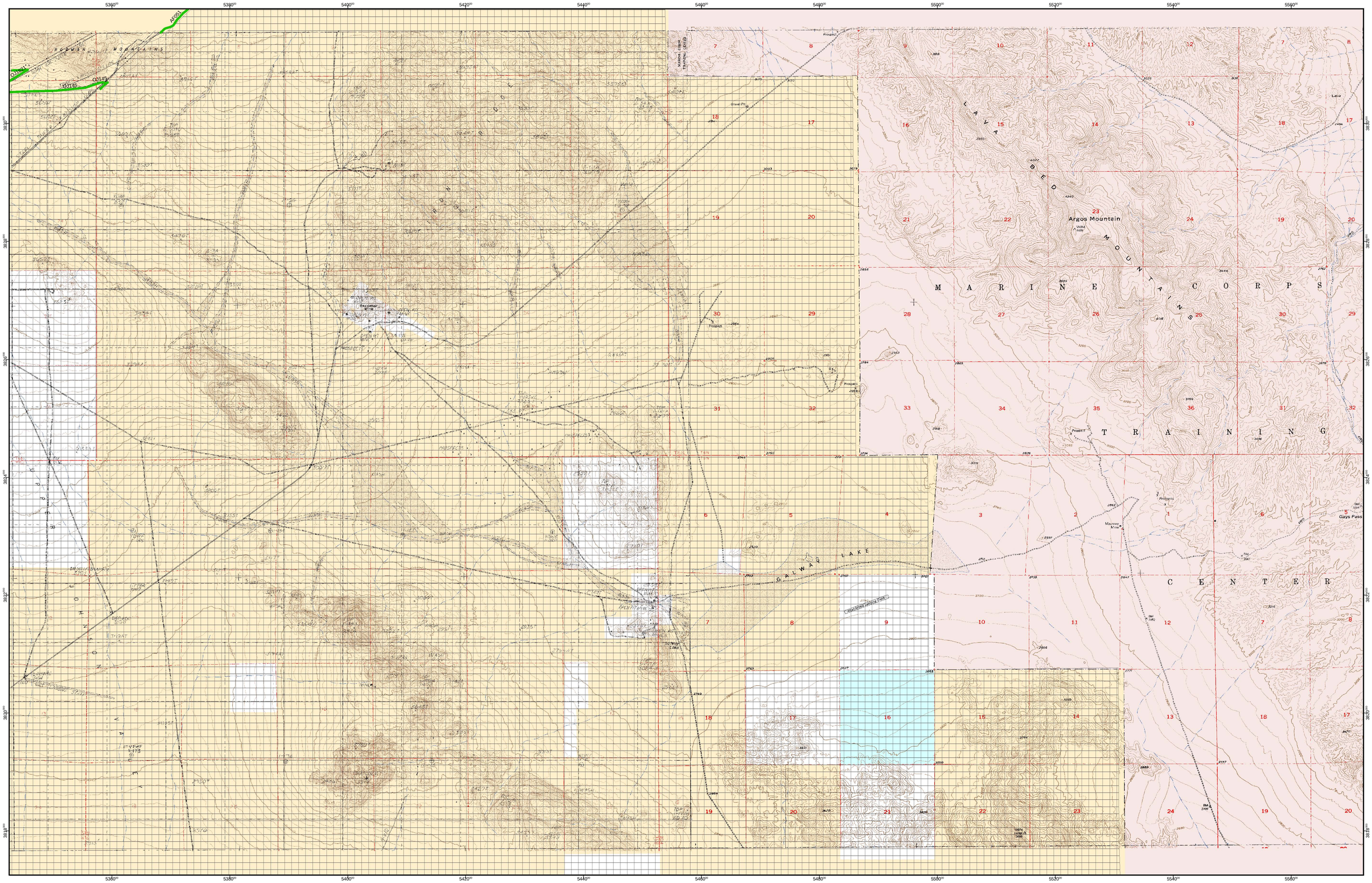
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 67- Iron Ridge, Galway Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

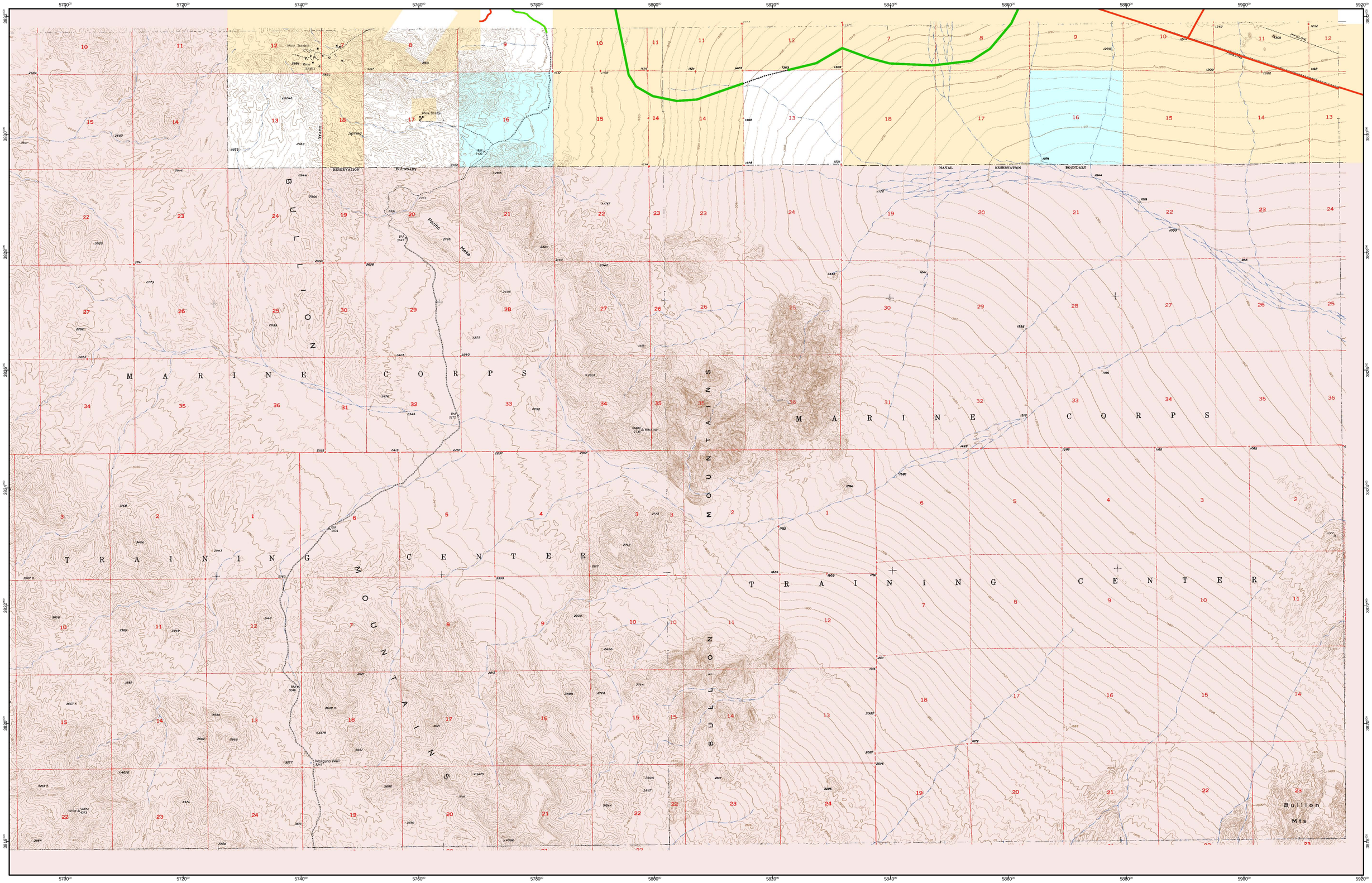
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 68a - Morgans Well, Ludlow South East



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003

N W E S

SCALE 1 : 24,000

Miles: 0 0.5 1 2
Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

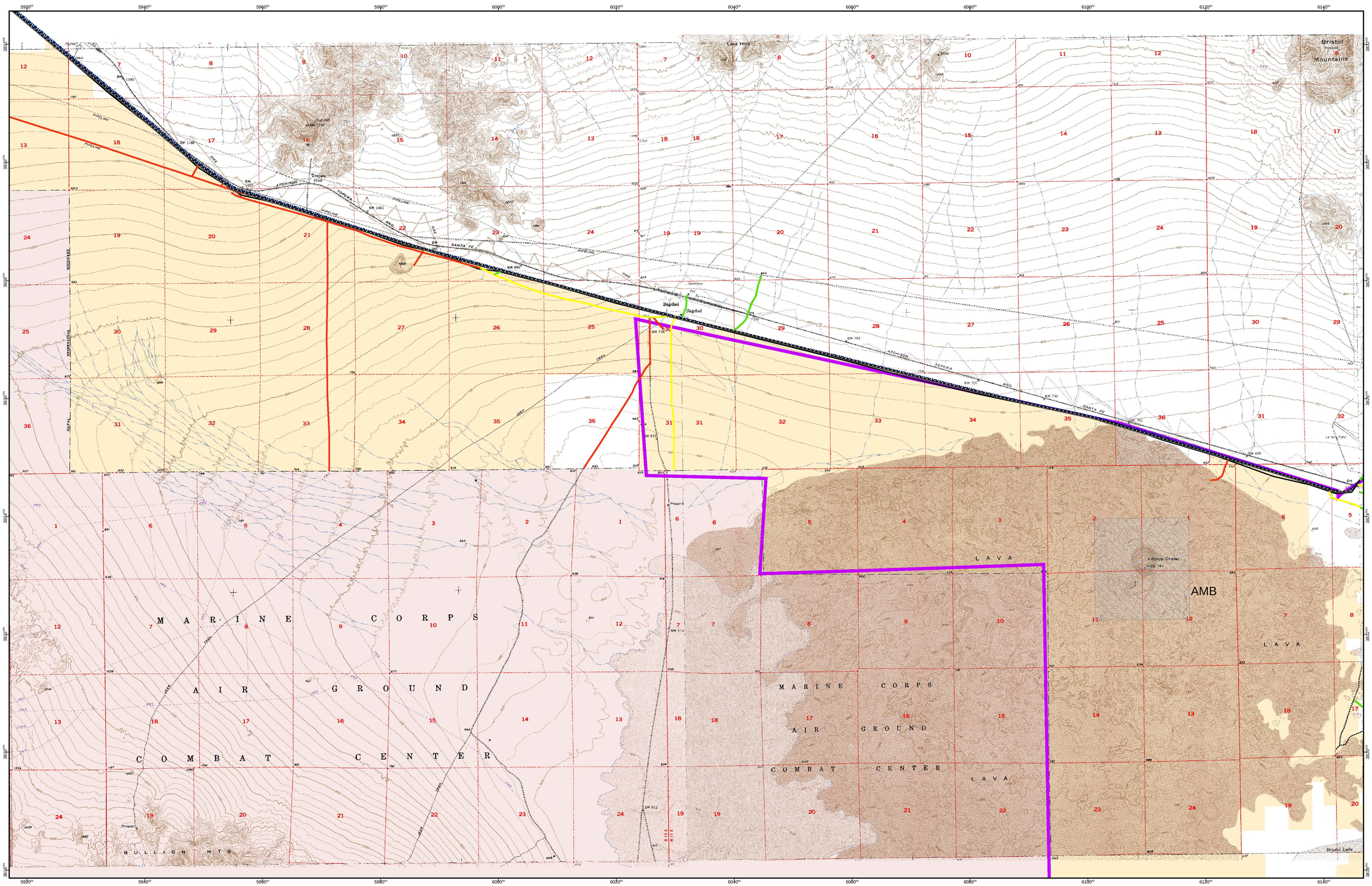
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

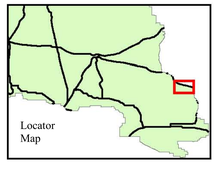
No Action - West Mojave Route Designation Program

Map 68b - Bagdad South West, Amboy Crater



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 4, 2003



N W E S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

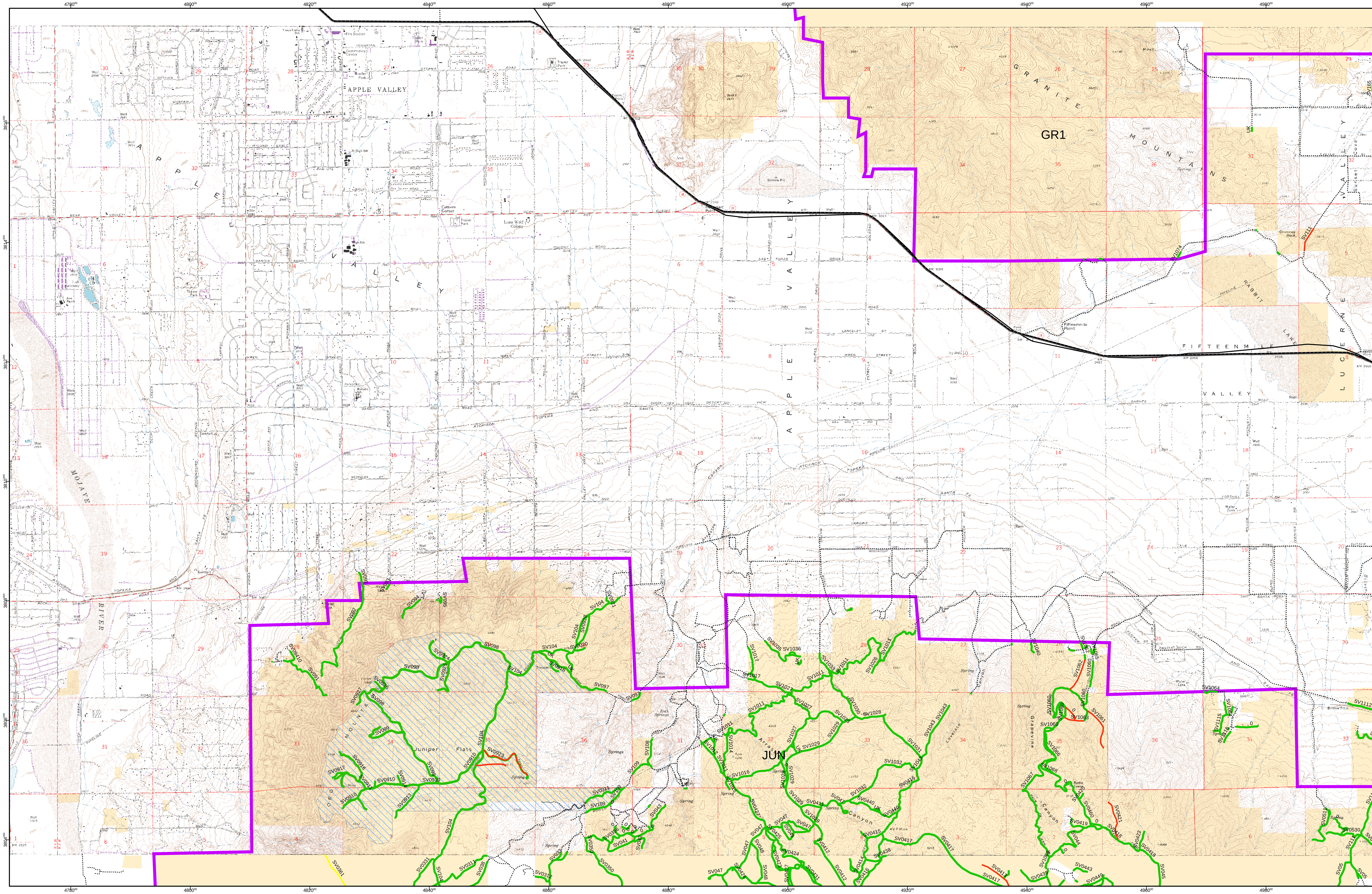
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

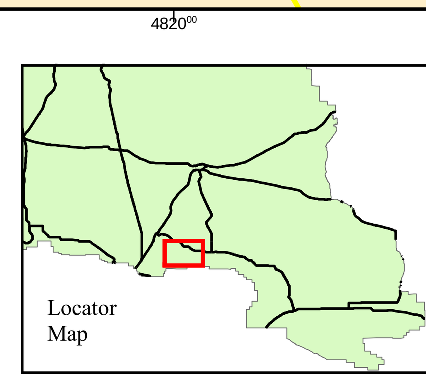
No Action - West Mojave Route Designation Program

Map 69- Apple Valley South, Fifteenmile Valley



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N W E S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

Highways
Major Roads
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACECs
Open Areas

Proposed Designations

Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 70- Lucerne Valley, Cougar Buttes

GR1

BH1

JUN

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

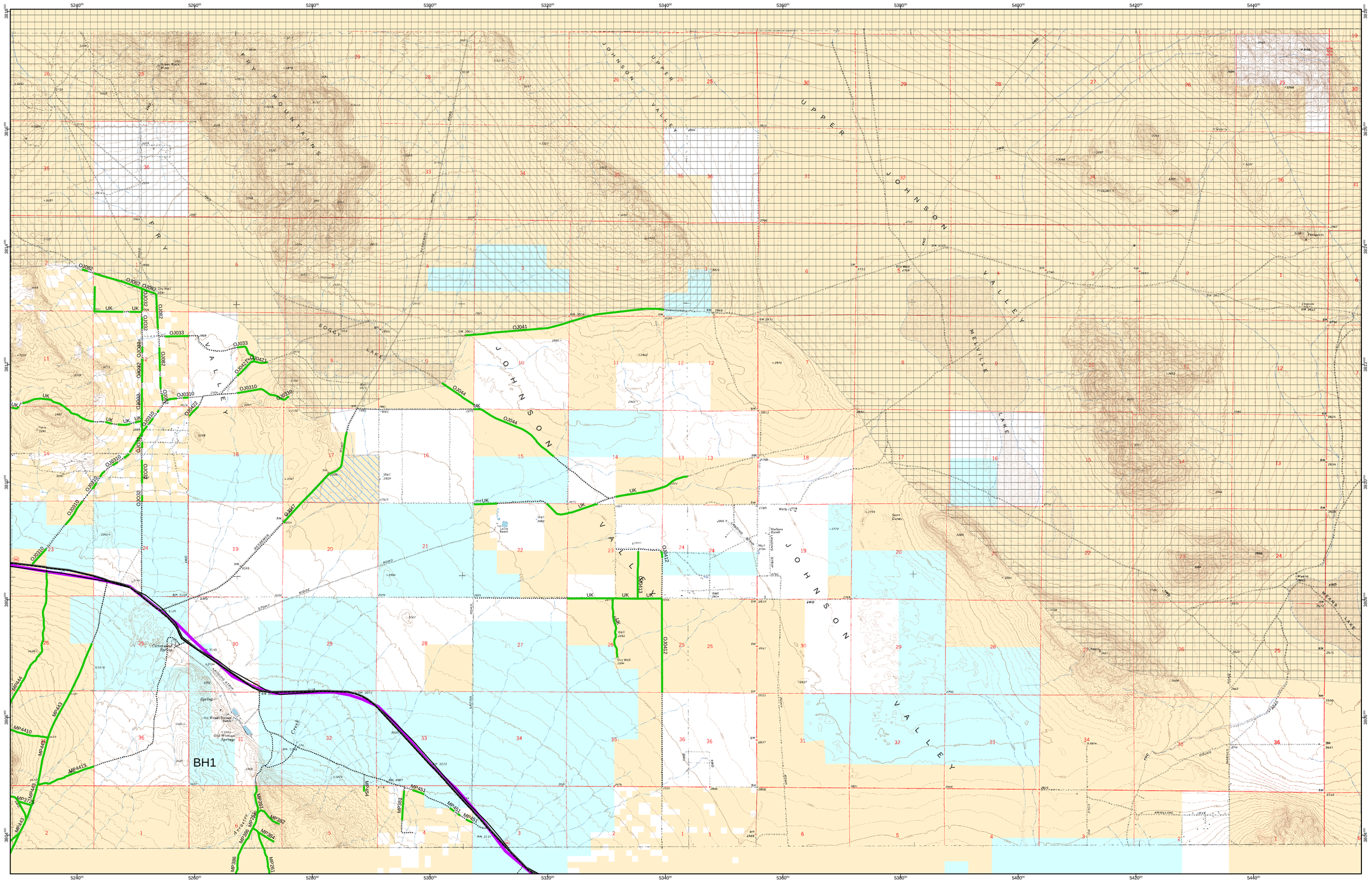
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

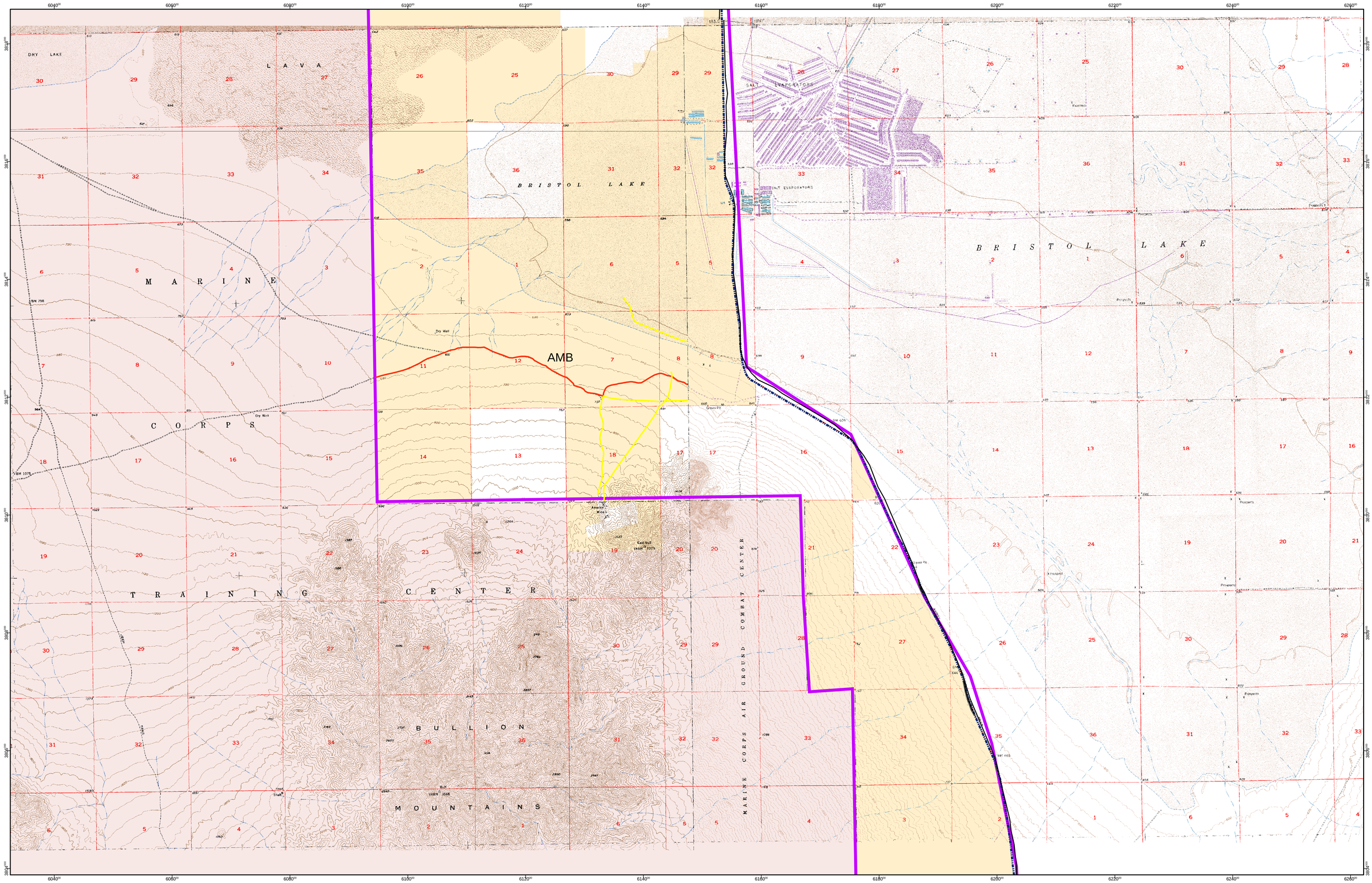
No Action - West Mojave Route Designation Program

Map 71A- Old Woman Springs, Melville Lake



No Action - West Mojave Route Designation Program

Map 71B- Lead Mountain NE, Bristol Lake NW



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

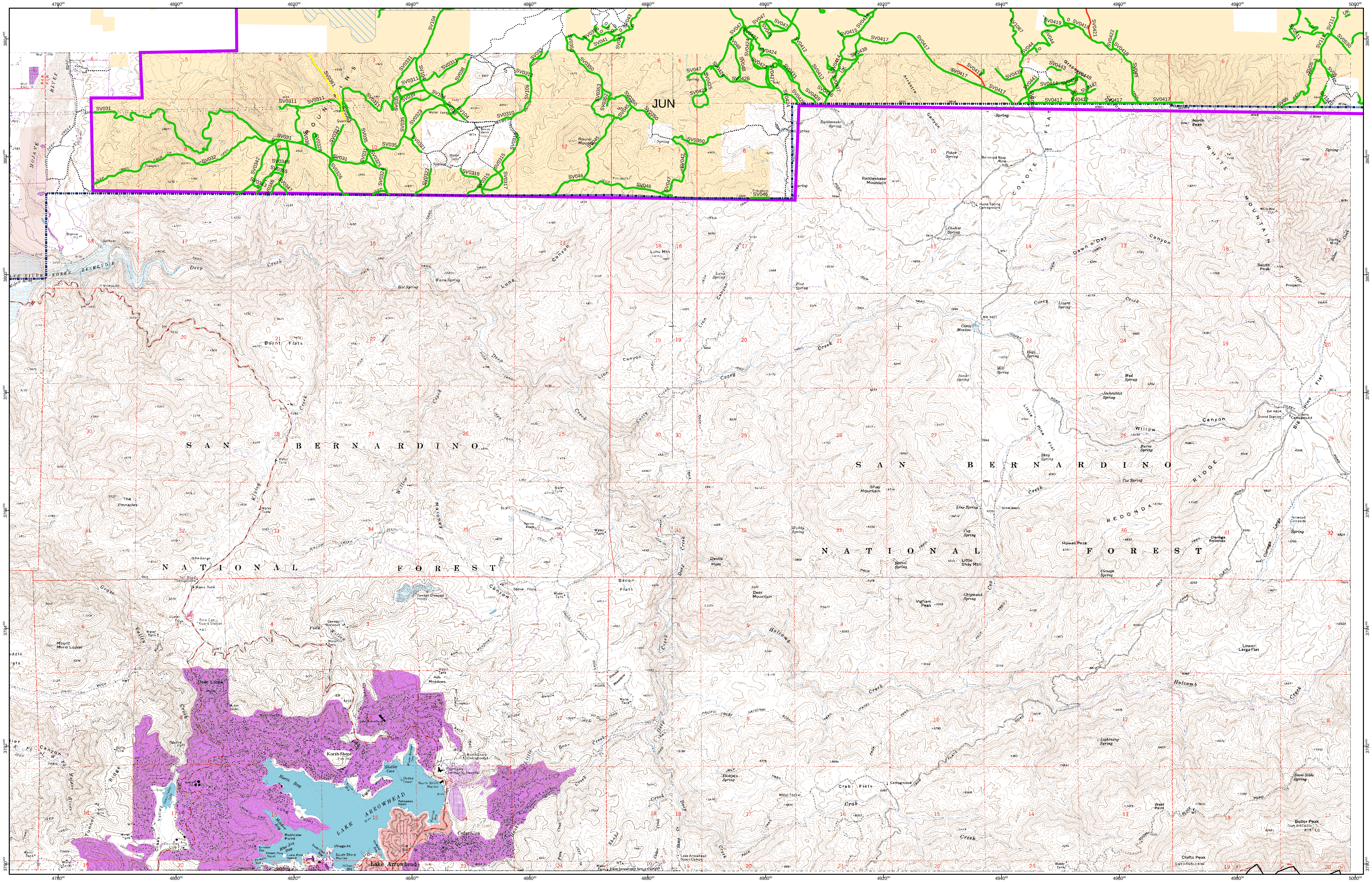
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

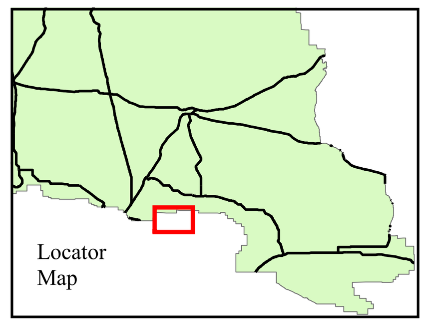
No Action - West Mojave Route Designation Program

Map 72- Lake Arrowhead, Butler Peak



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N S E W

SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

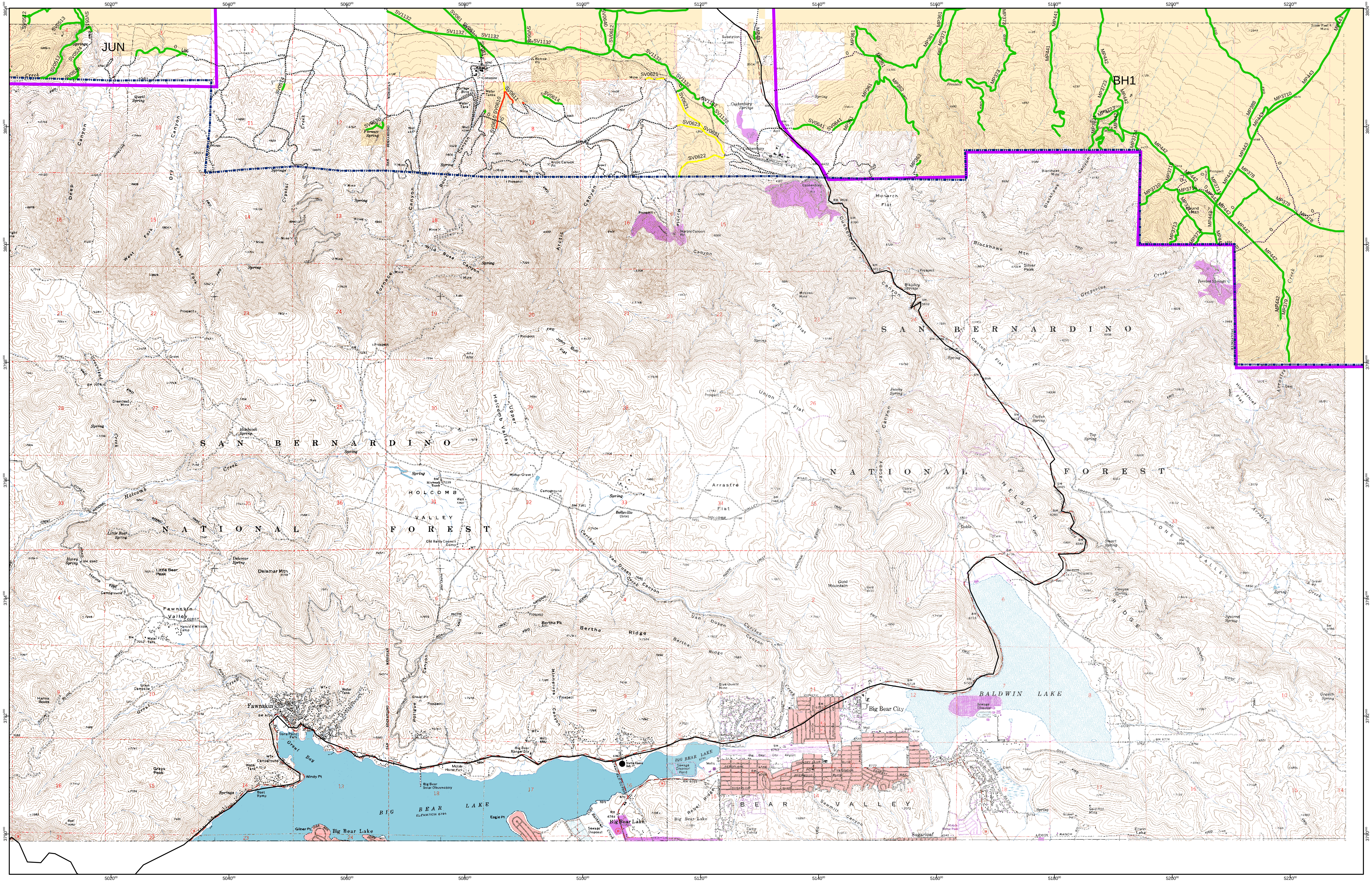
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional Private

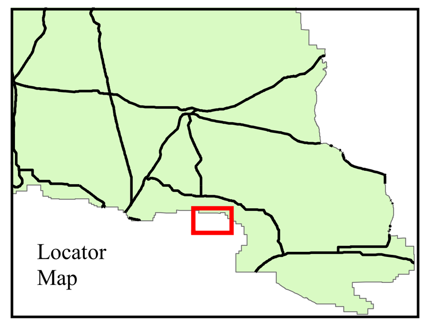
No Action - West Mojave Route Designation Program

Map 73- Fawnskin, Big Bear City



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

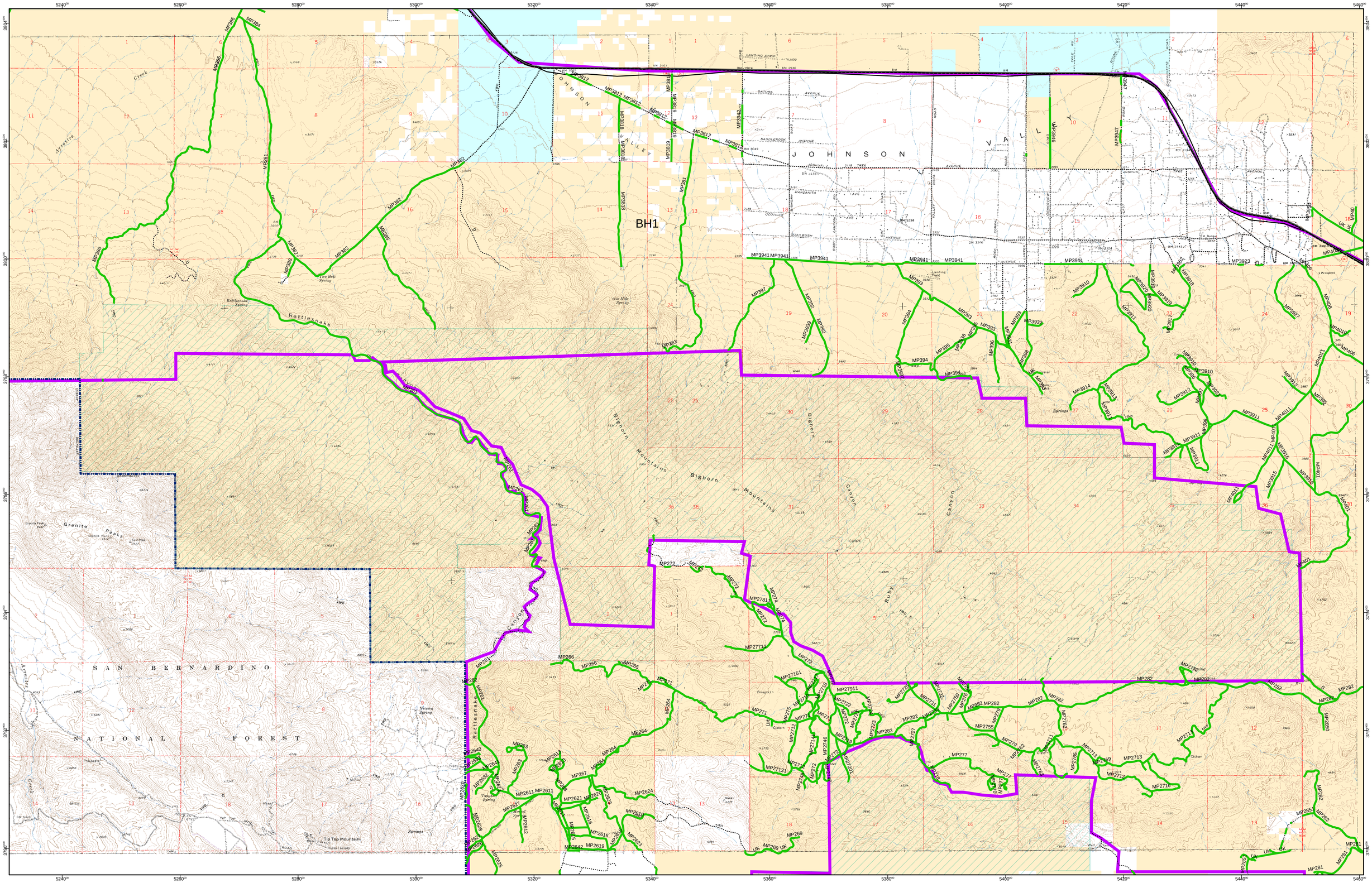
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 74- Rattlesnake Canyon, Bighorn Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

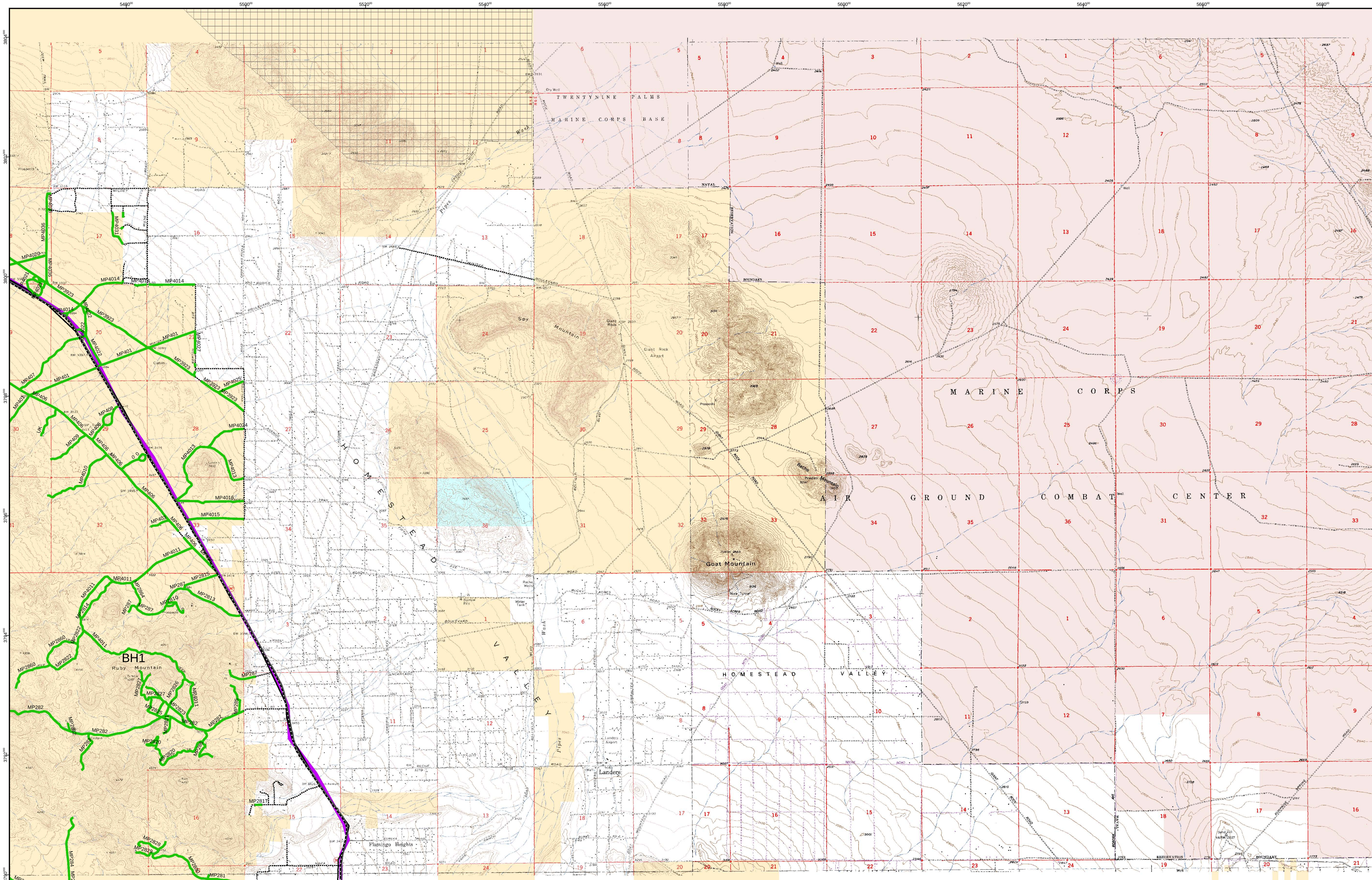
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

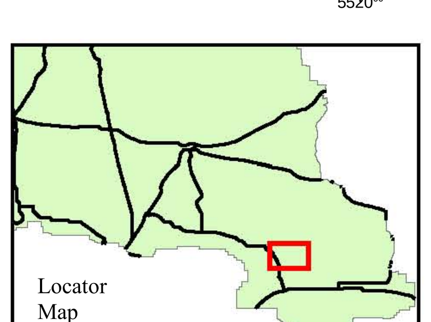
No Action - West Mojave Route Designation Program

Map 75- Landers, Goat Mountain



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2
Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

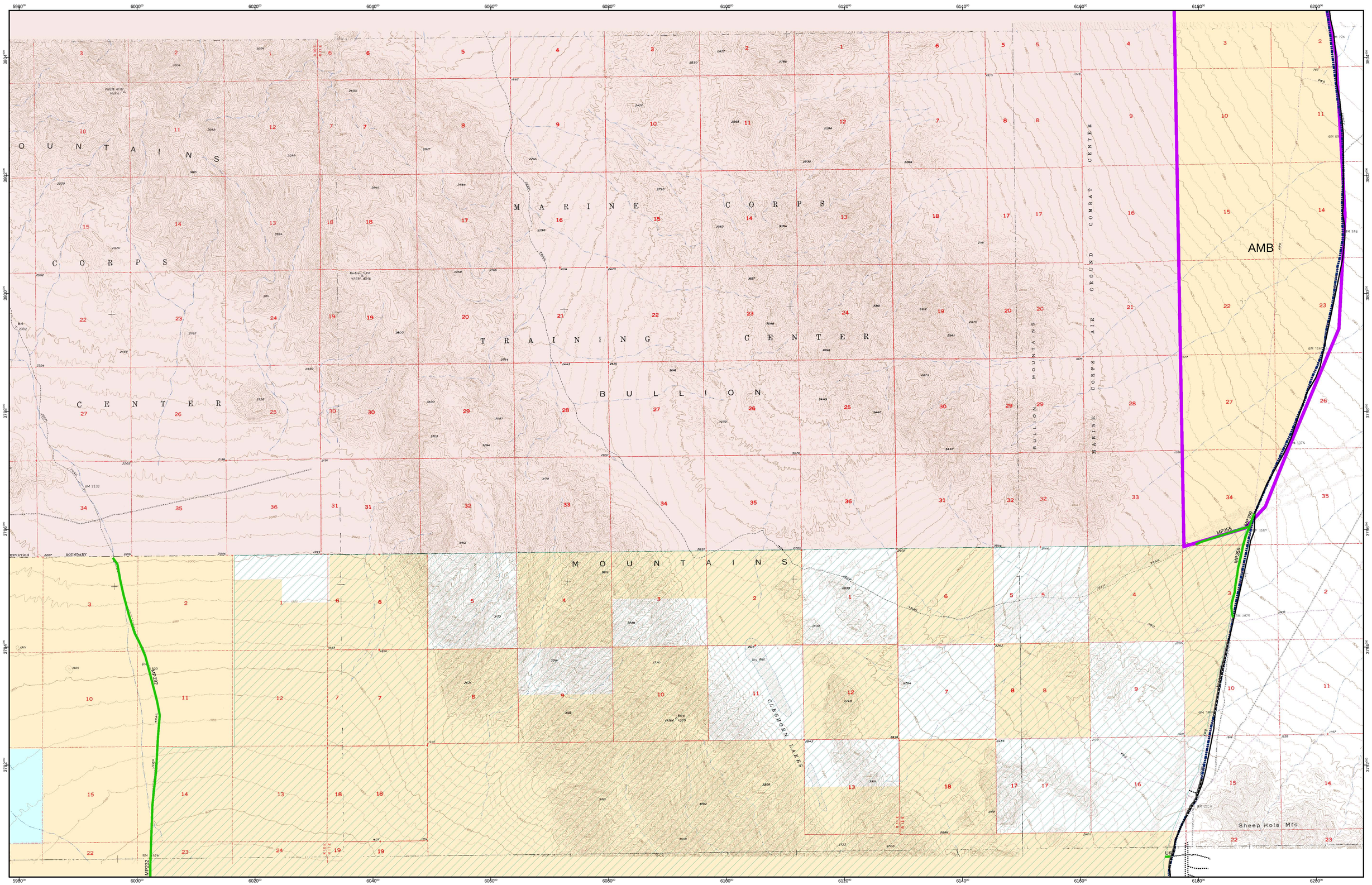
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

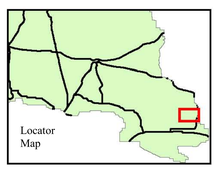
No Action - West Mojave Route Designation Program

Map 76- Lead Mountain SW, Cleghorn Lakes, Bristol Lake SW



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

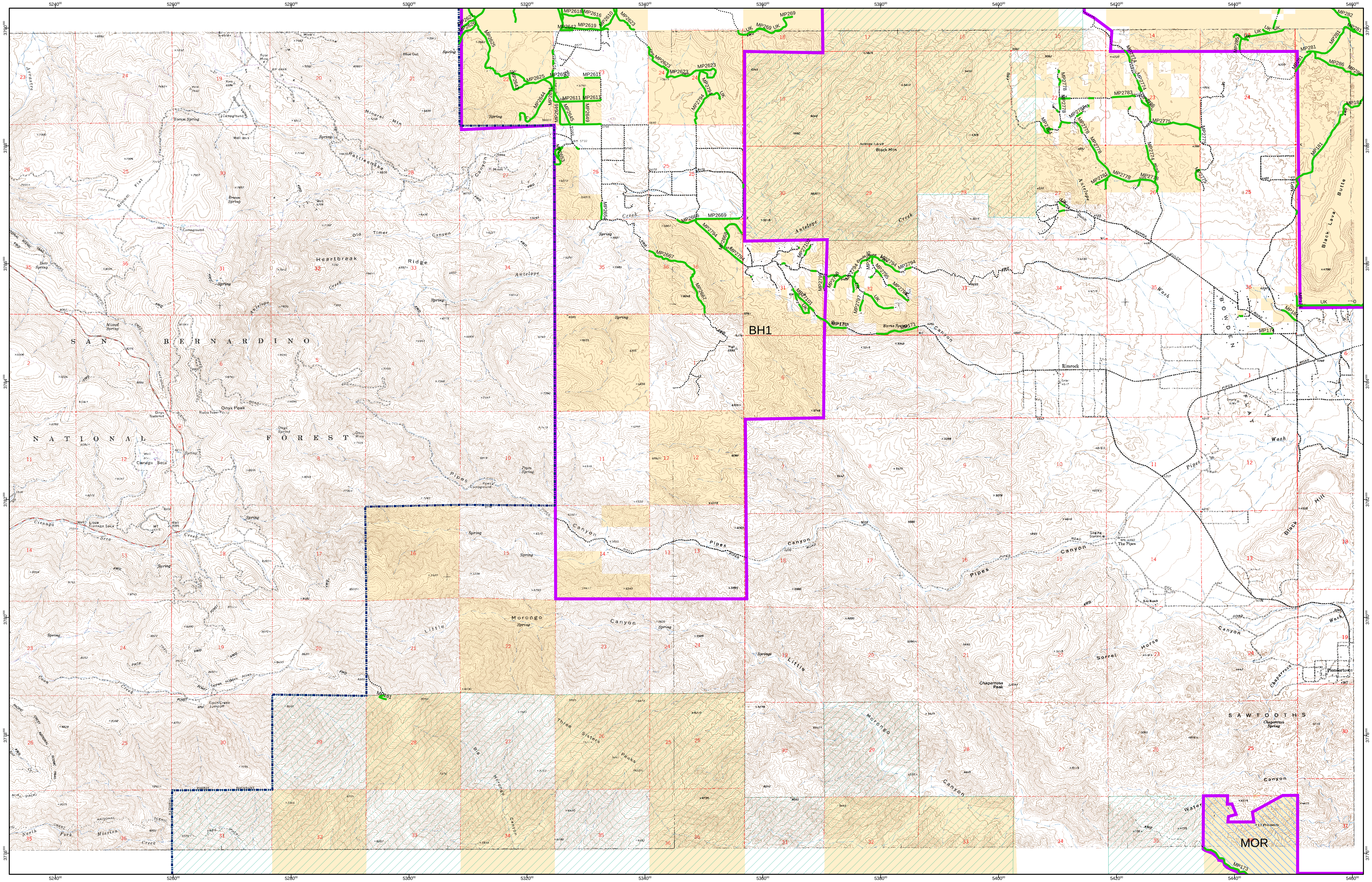
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

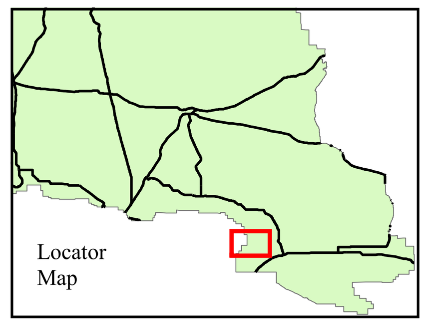
No Action - West Mojave Route Designation Program

Map 77- Onyx Peak, Rimrock



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

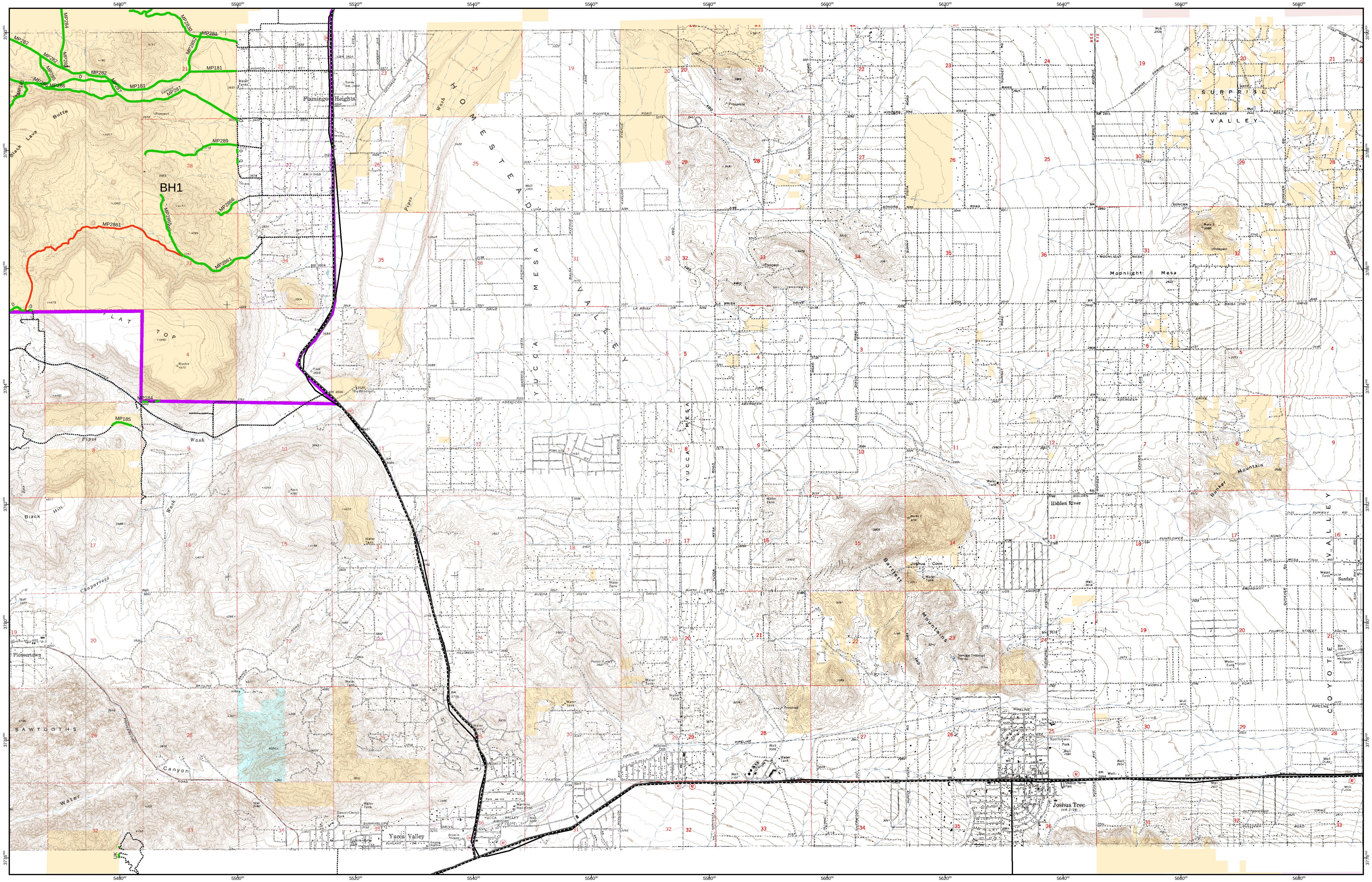
0 500 1,000 2,000 3,000 Meters

Legend

Highways	**Proposed Designations**	**Land Ownership**
Major Roads	Open	BLM
MAZ Boundaries	Closed	National Park Service
WM Plan Boundary	Limited	Military
BLM Wilderness	Public Road	State Lands
ACECs	Undesignated or Unknown	County/City/Regional
Open Areas		Private

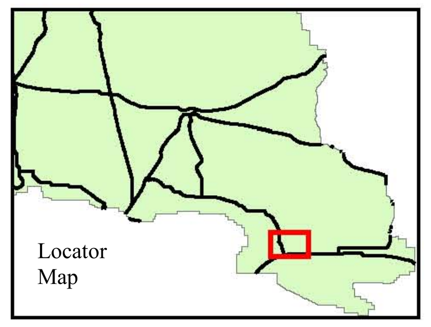
No Action - West Mojave Route Designation Program

Map 78- Yucca Valley North, Joshua Tree North



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

Highways
Major Roads
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACECs
Open Areas

Proposed Designations

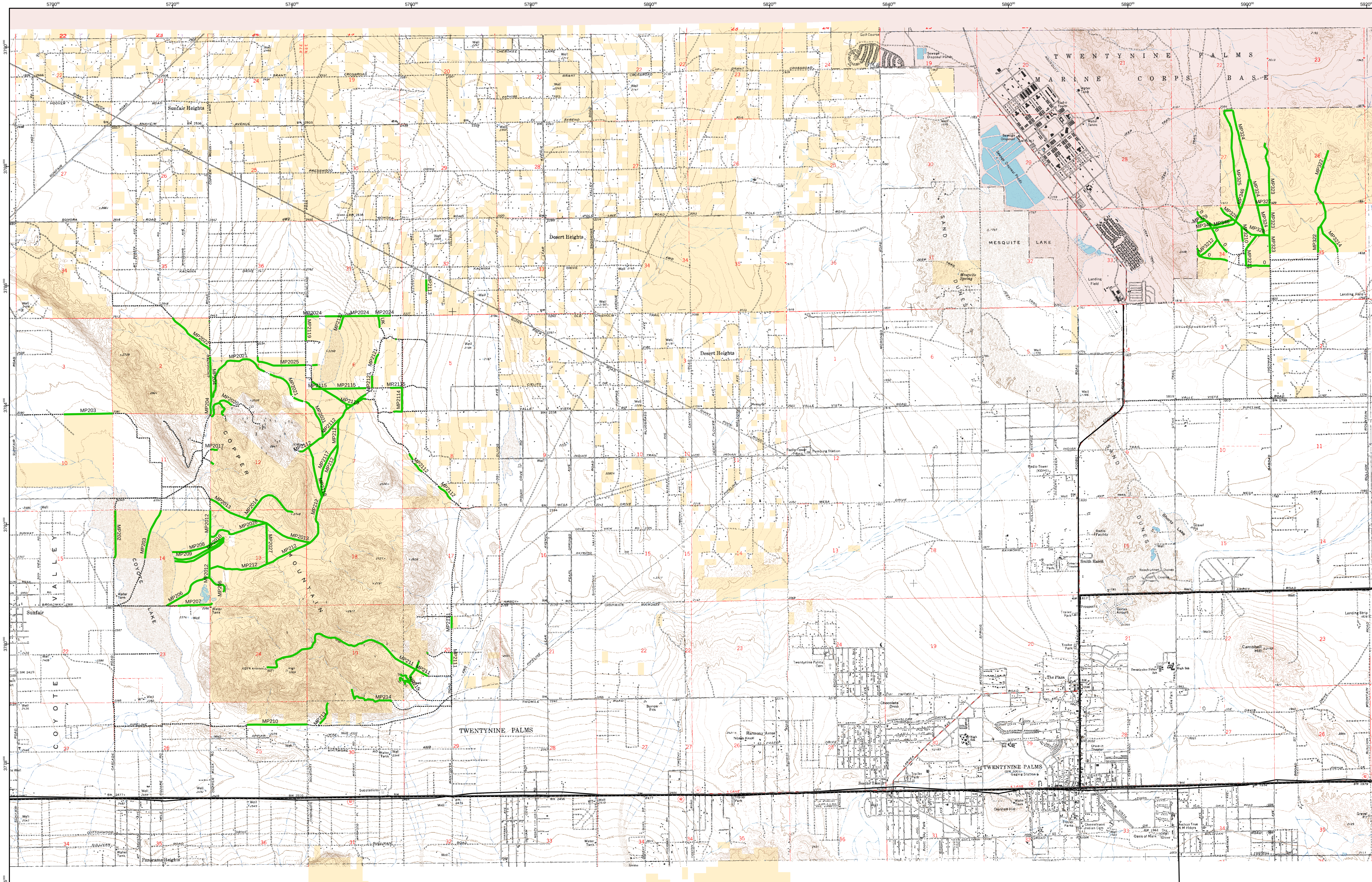
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

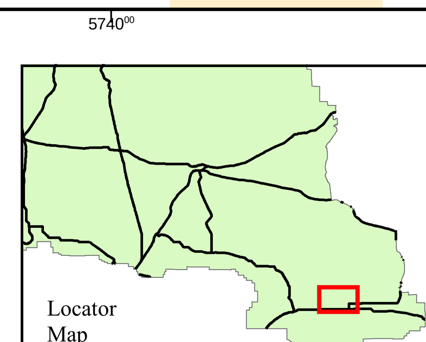
No Action - West Mojave Route Designation Program

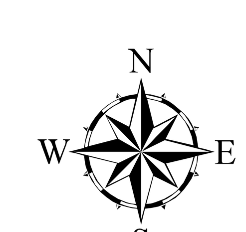
Map 79- Sunfair, Twentynine Palms



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003





SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

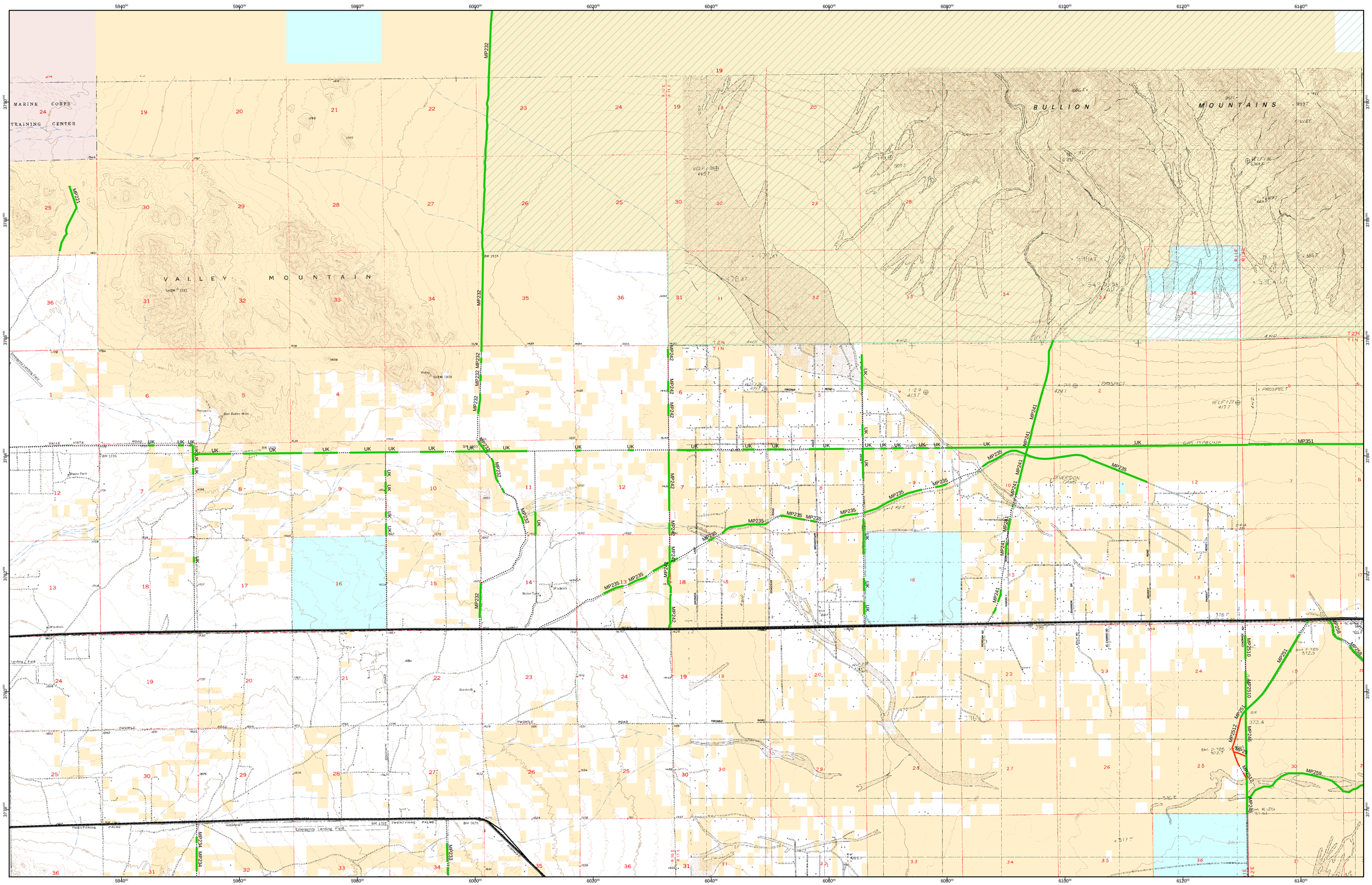
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 80- Valley Mountain, East of Valley Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

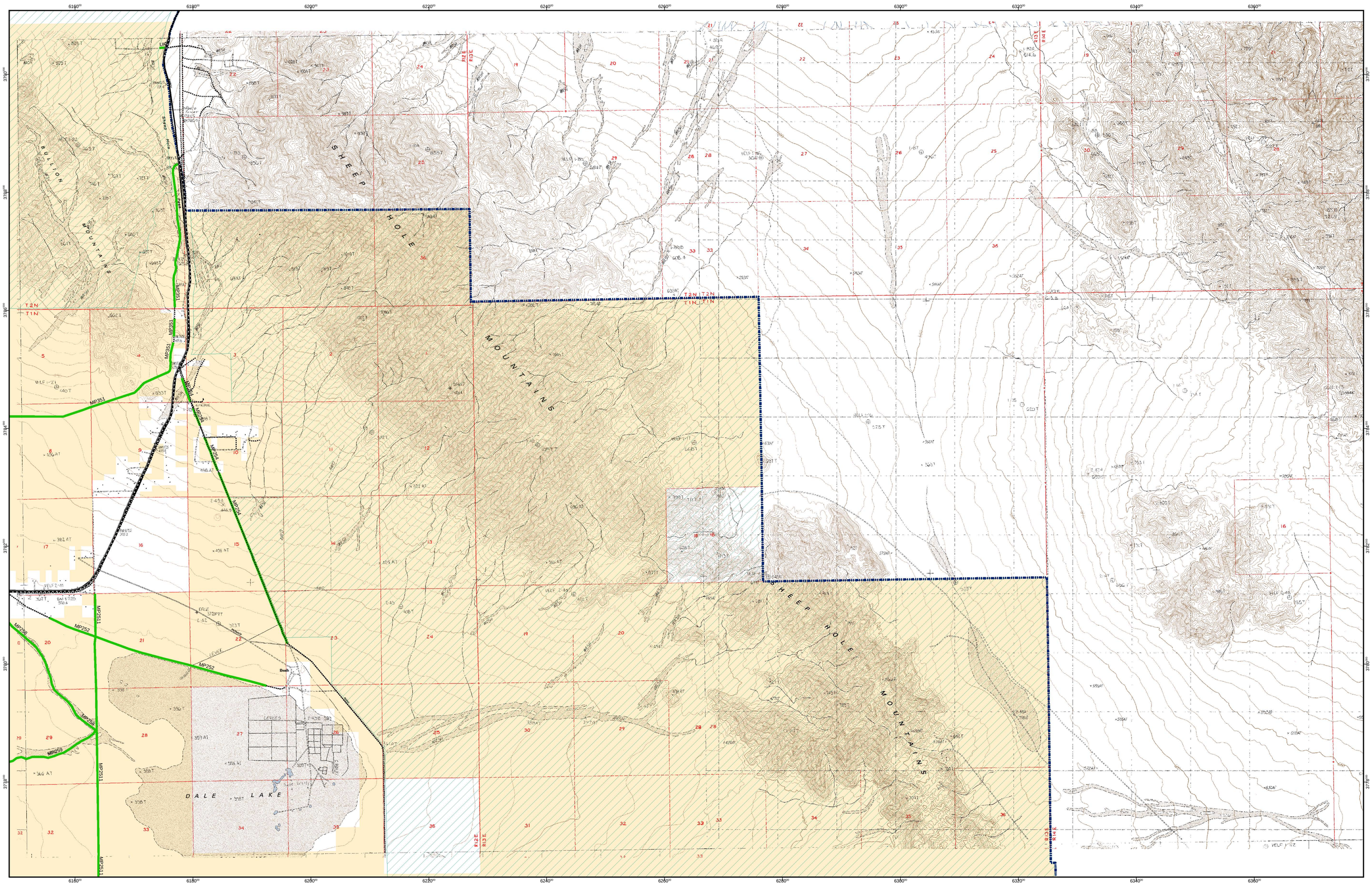
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

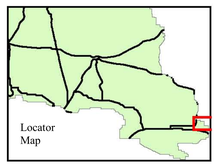
No Action - West Mojave Route Designation Program

Map 81- Dale Lake, East of Dale Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

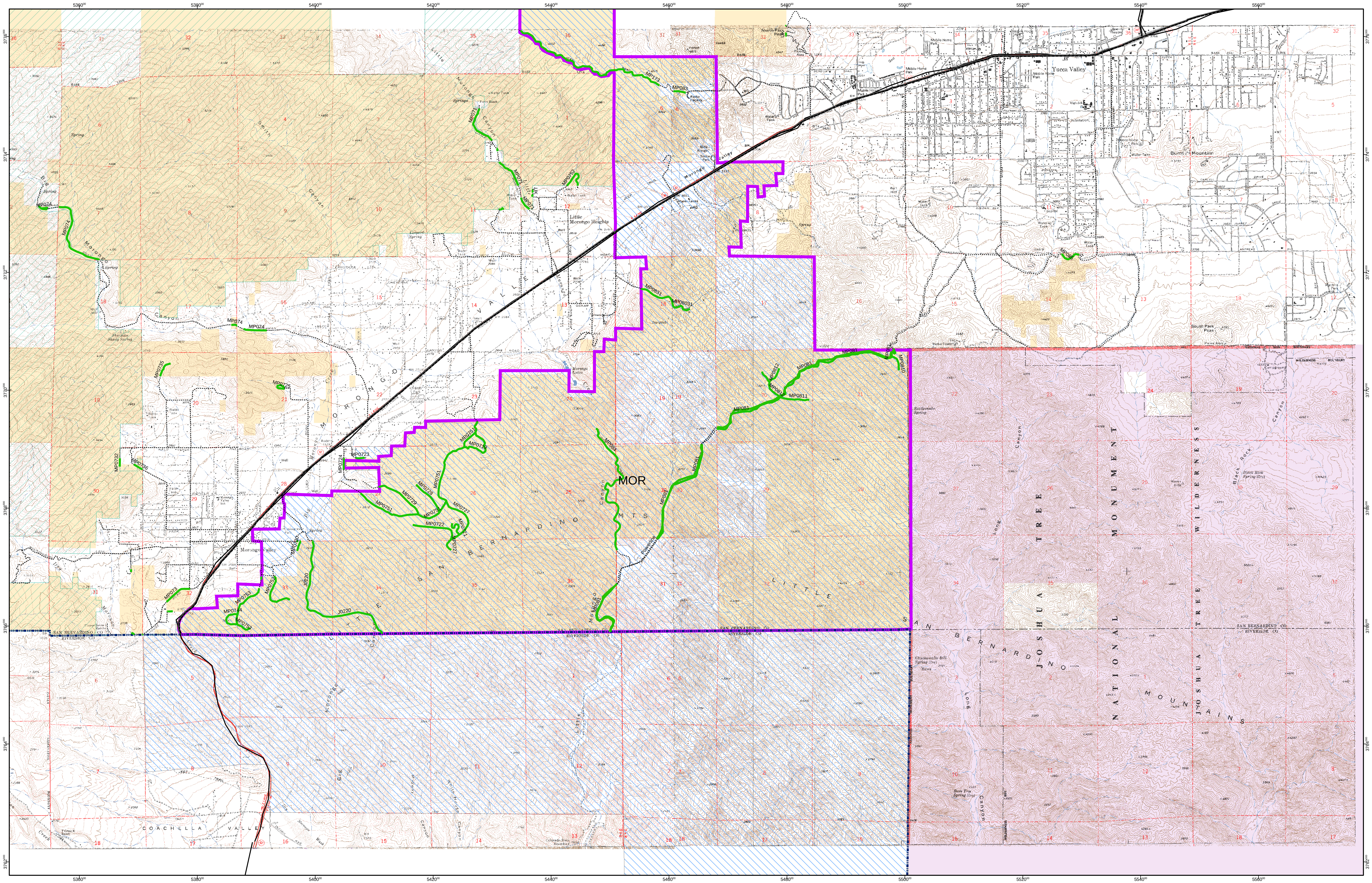
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

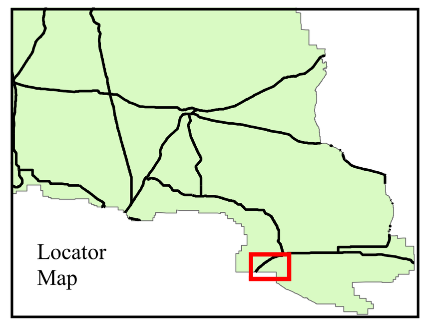
No Action - West Mojave Route Designation Program

Map 82- Morongo Valley, Yucca Valley South



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

Highways
Major Roads
MAZ Boundaries
WM Plan Boundary
BLM Wilderness
ACECs
Open Areas

Proposed Designations

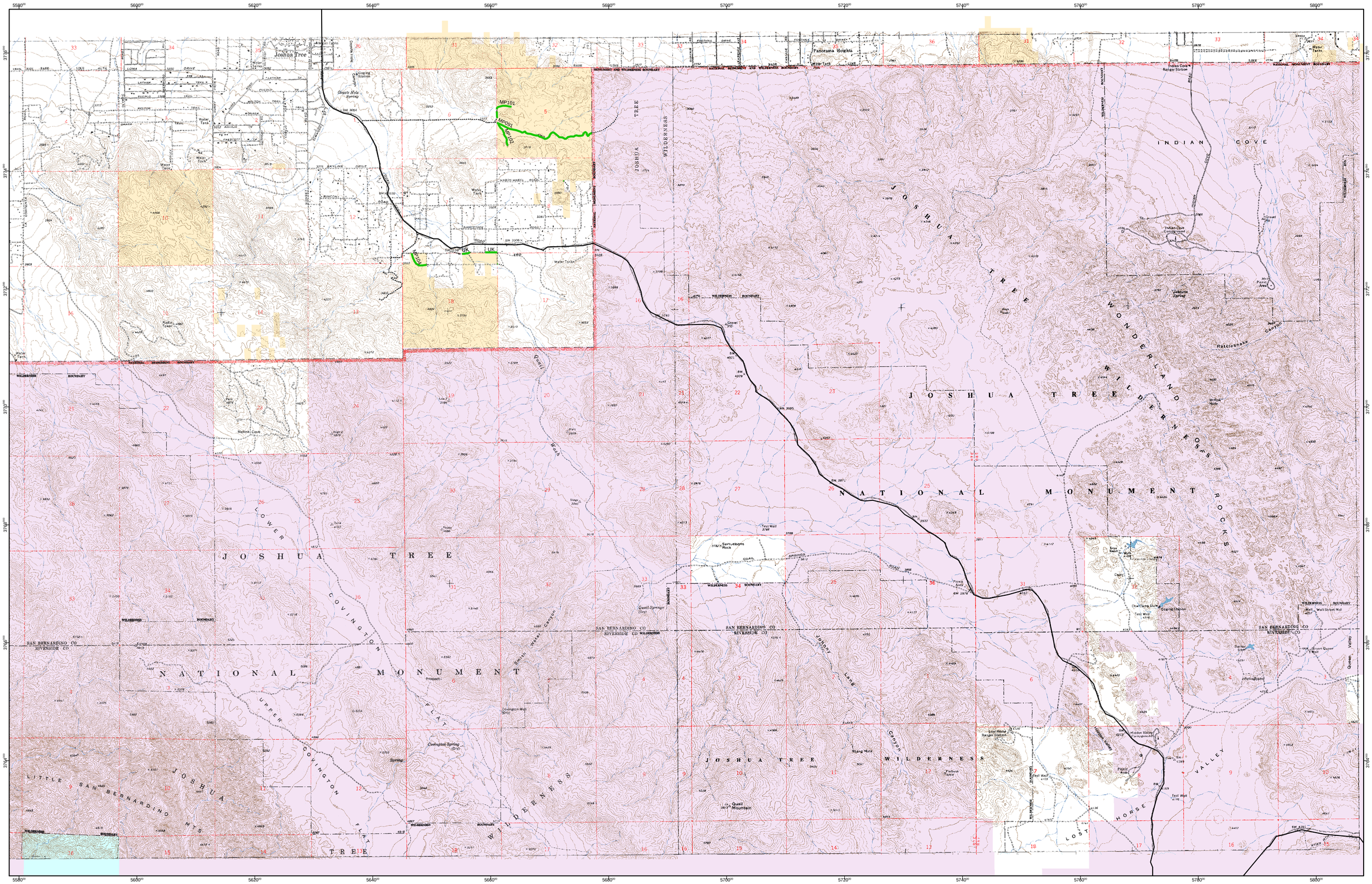
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

No Action - West Mojave Route Designation Program

Map 83- Joshua Tree South, Indian Cove



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

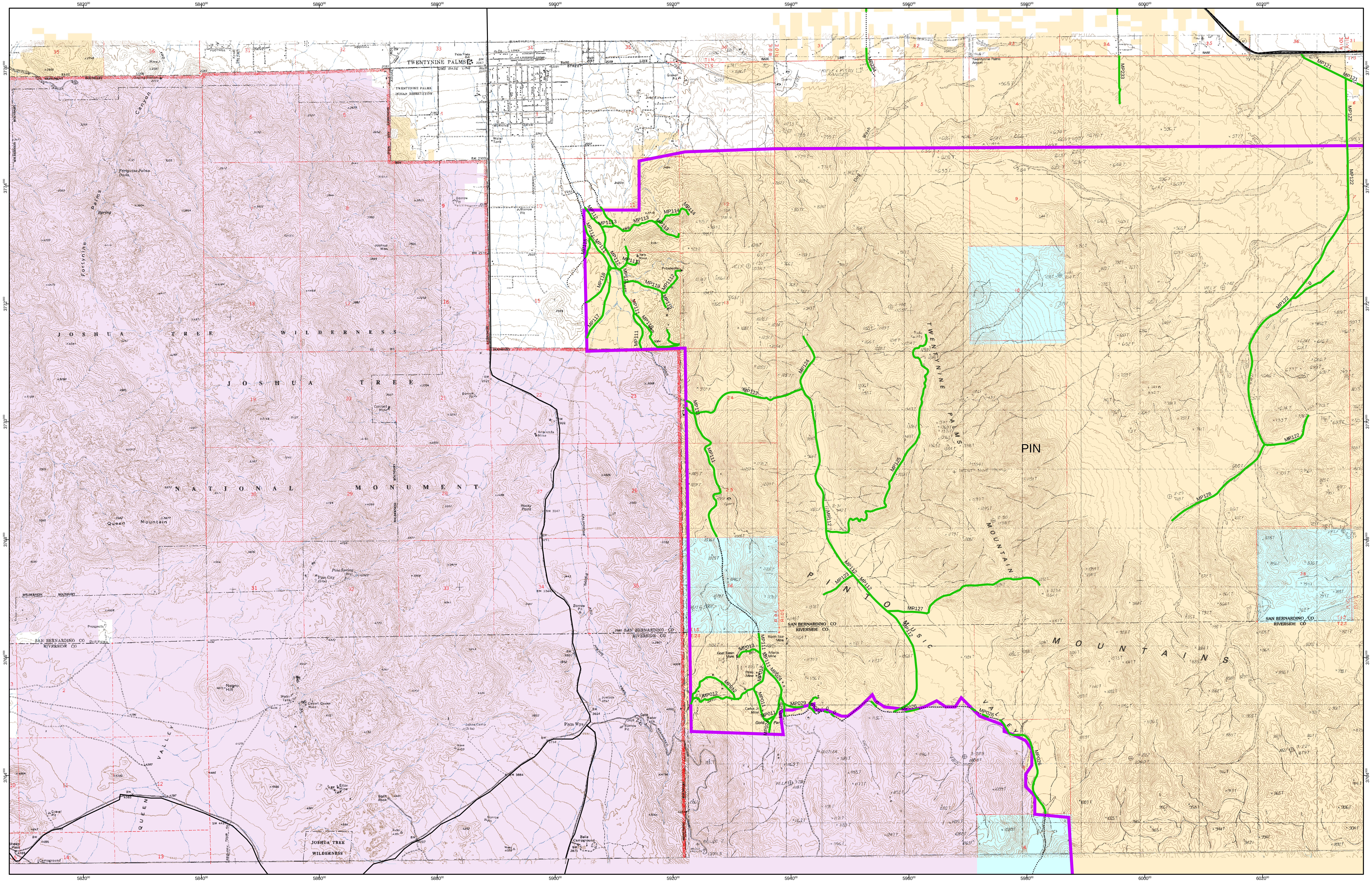
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

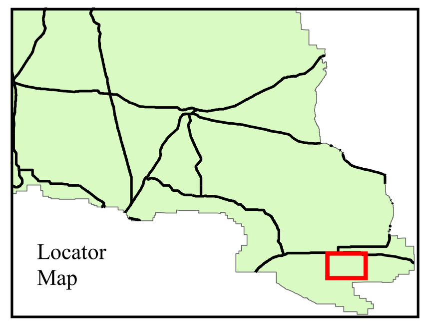
No Action - West Mojave Route Designation Program

Map 84- Queen Mountain, Twentynine Palms Mountain



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

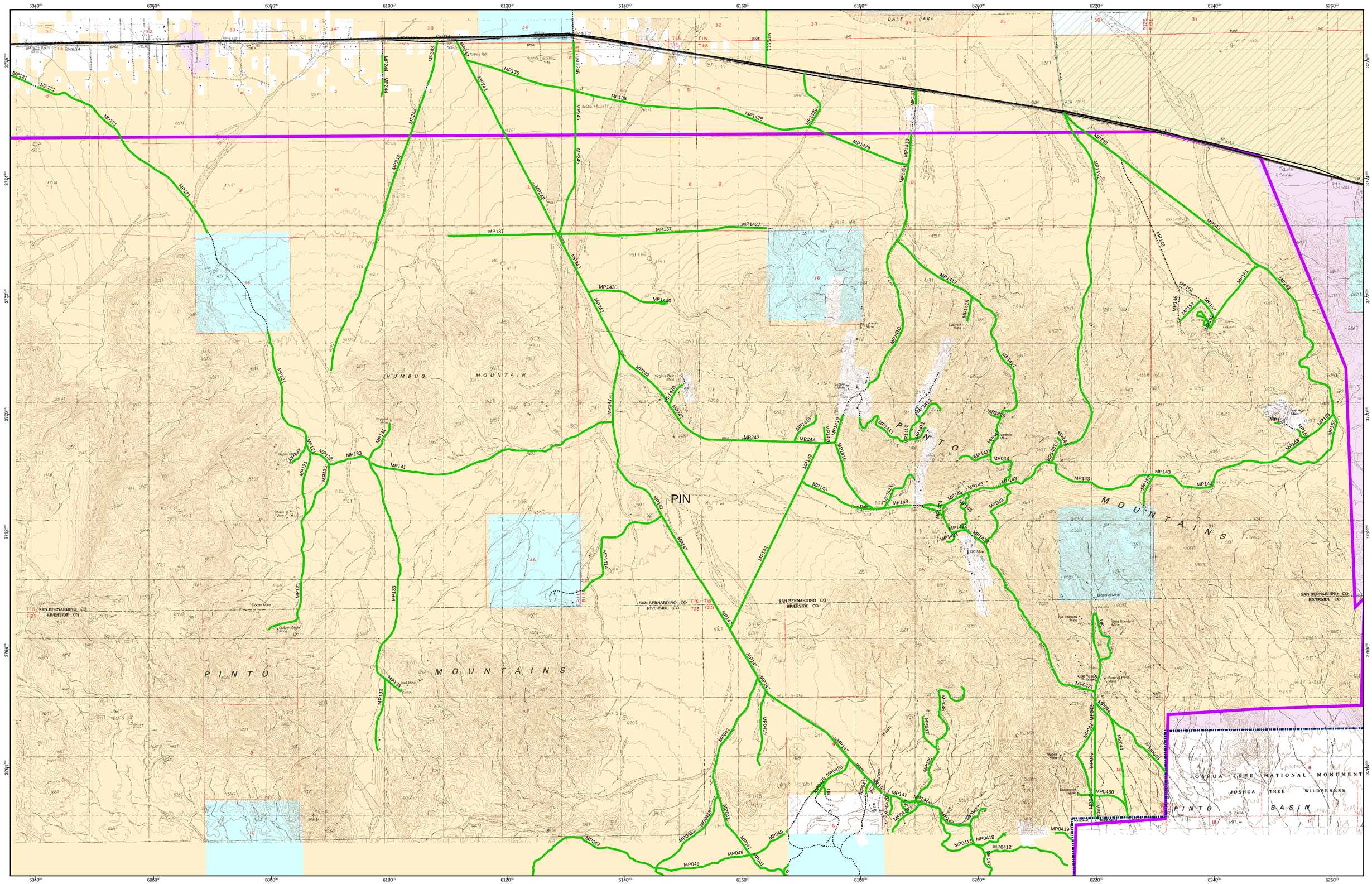
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

No Action - West Mojave Route Designation Program

Map 85- Humbug Mountain, New Dale



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

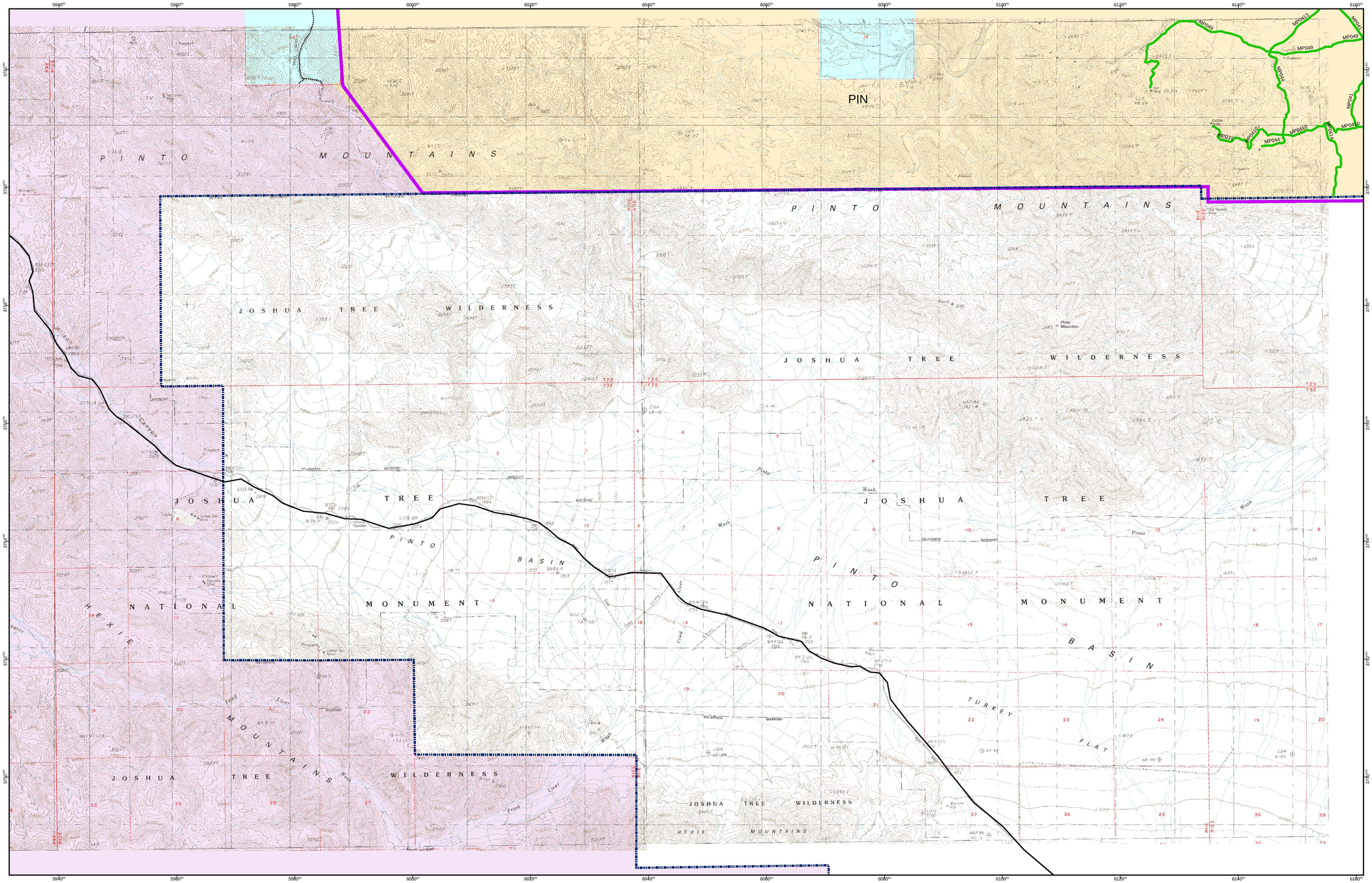
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

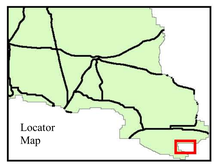
No Action - West Mojave Route Designation Program

Map 86- Fried Liver Wash, Pinto Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

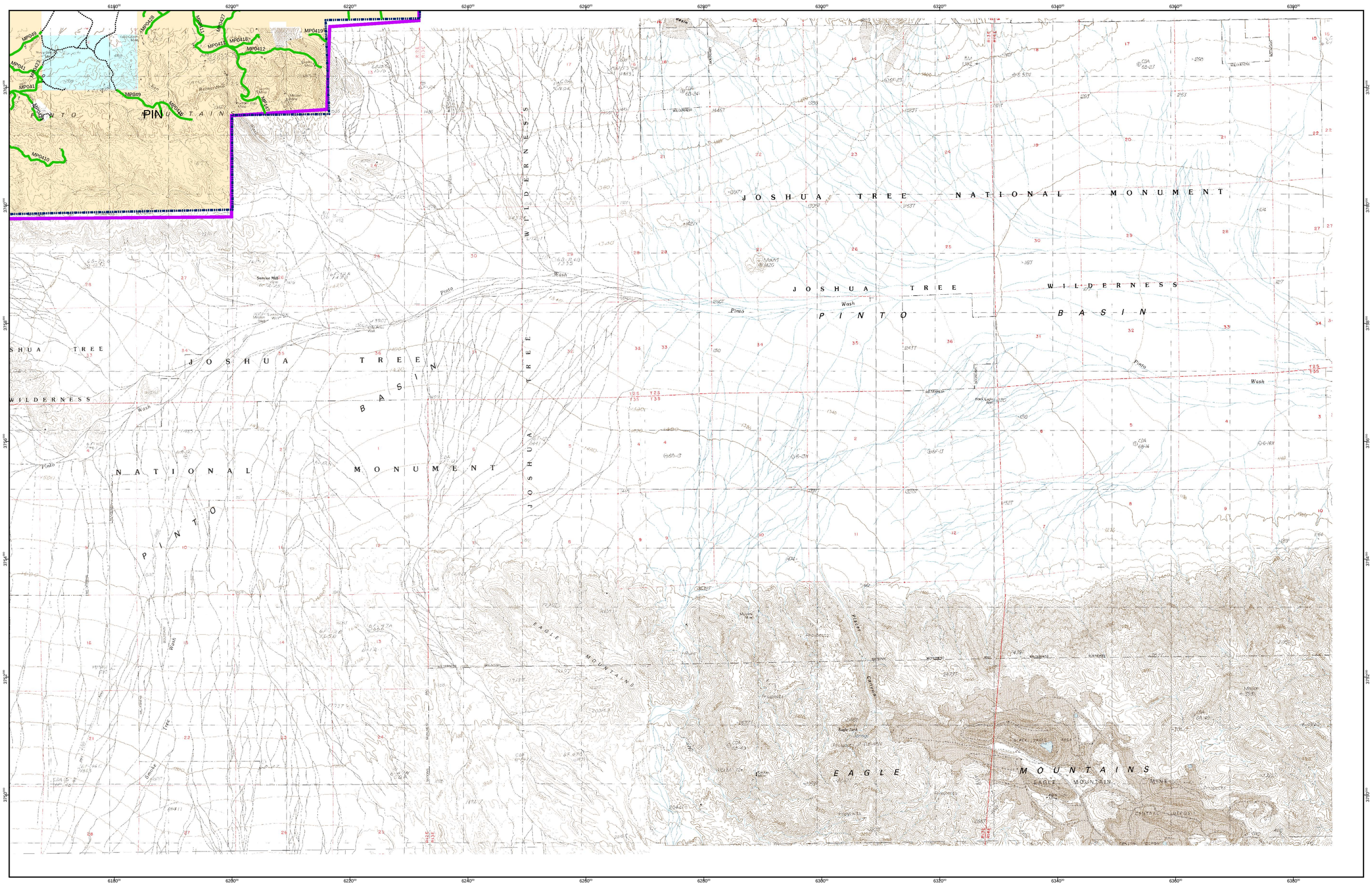
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

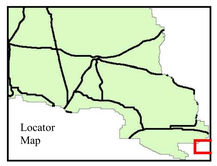
No Action - West Mojave Route Designation Program

Map 87- San Bernadino Wash, Placer Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

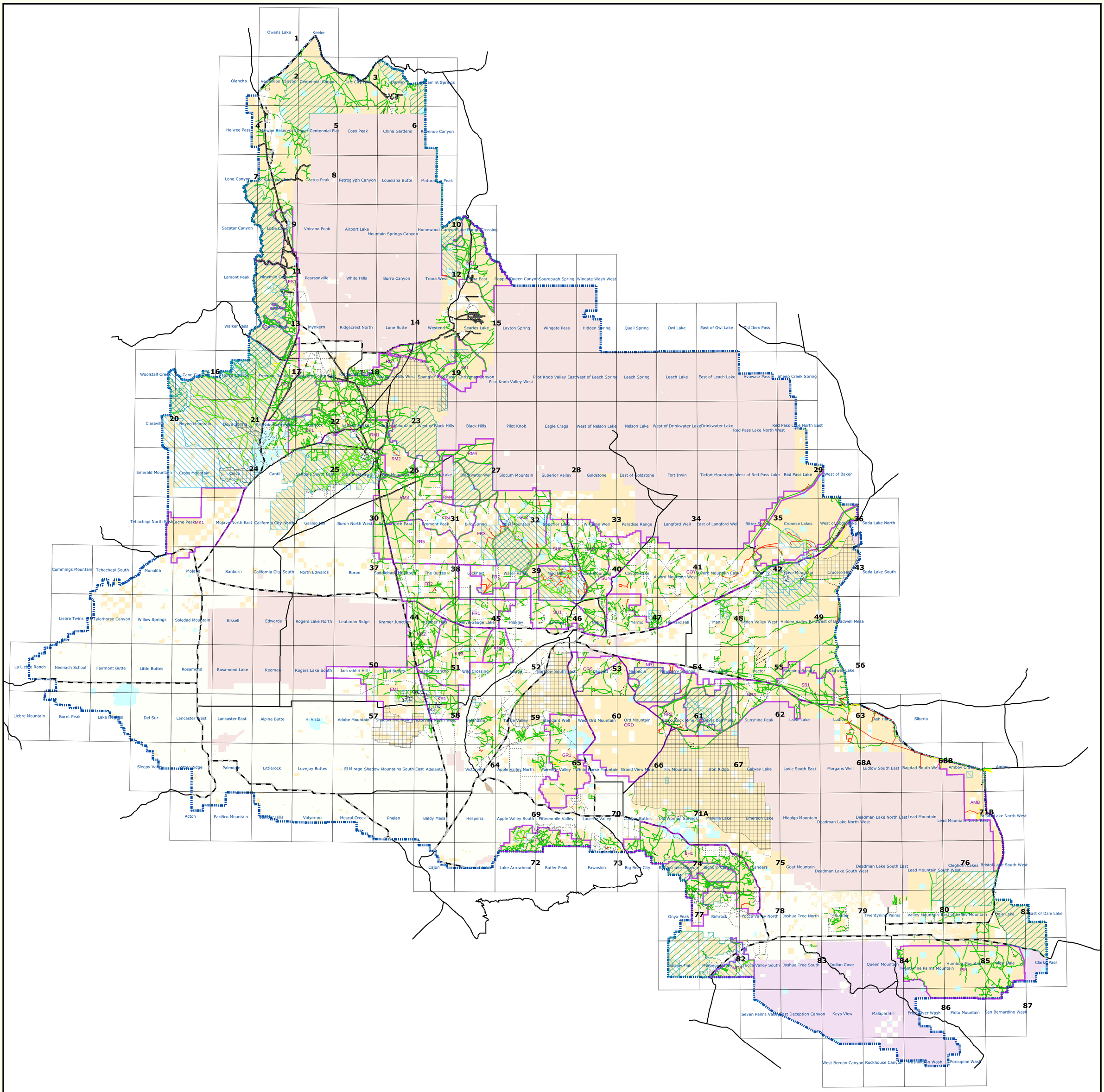
- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private



10 5 0 10 20 Miles

Map Projection .....Universe Transverse Mercator
Datum .....North American 1983
Scale.....1: 390,000
N. Pratini 3/5/2003

WM Plan Boundary
ACEC Designation Areas
Wilderness
Open Areas
Subregion Boundaries
Highways
Major Roads

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

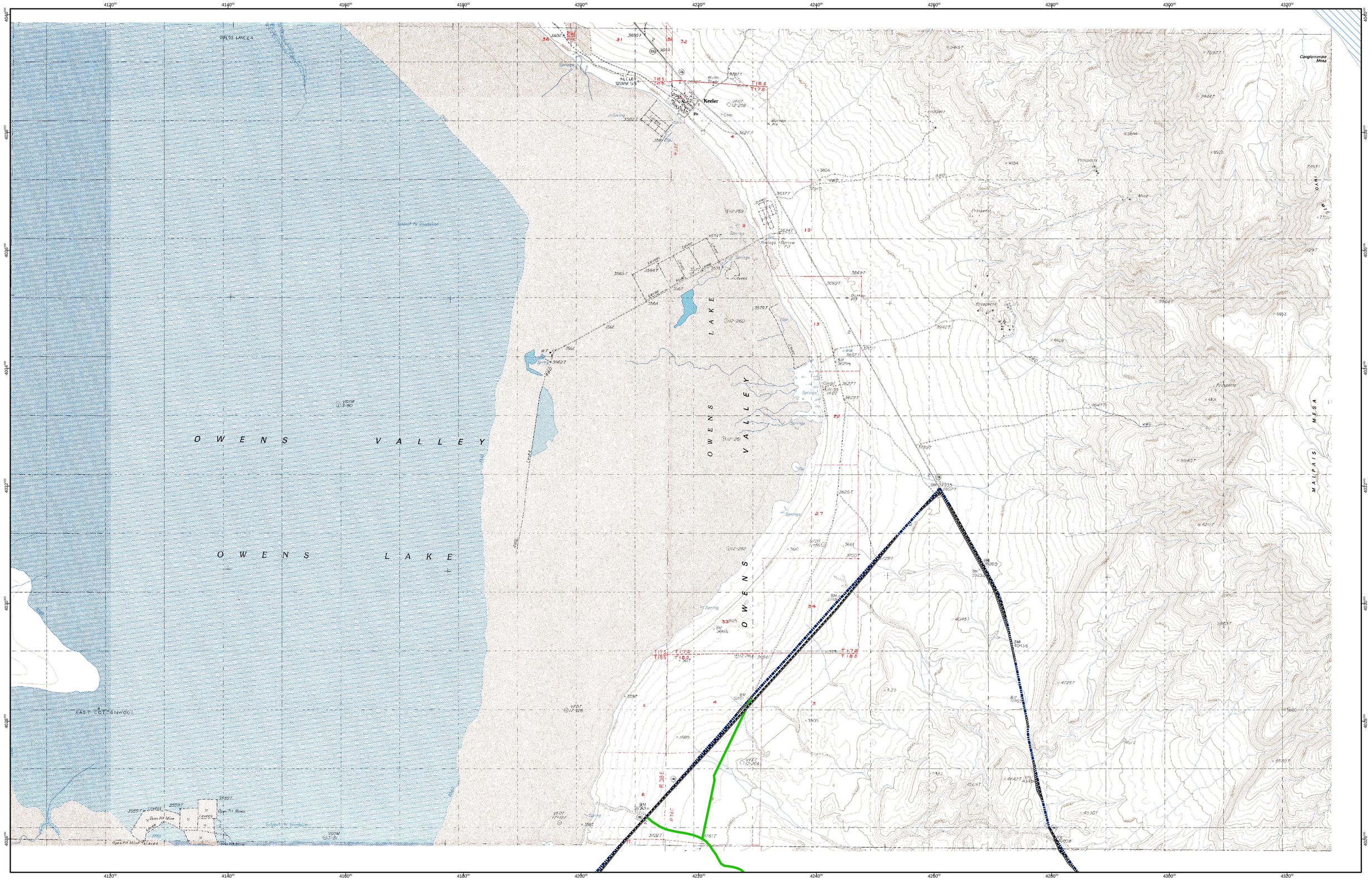
NO ACTION
Route Map Index
West Mojave Route Designation Program

N
W E
S

Designations apply to BLM lands only

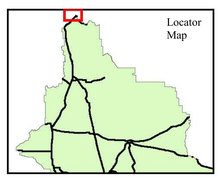
Proposed Action - West Mojave Route Designation Program

Map 1 - Owens Lake, Keeler



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

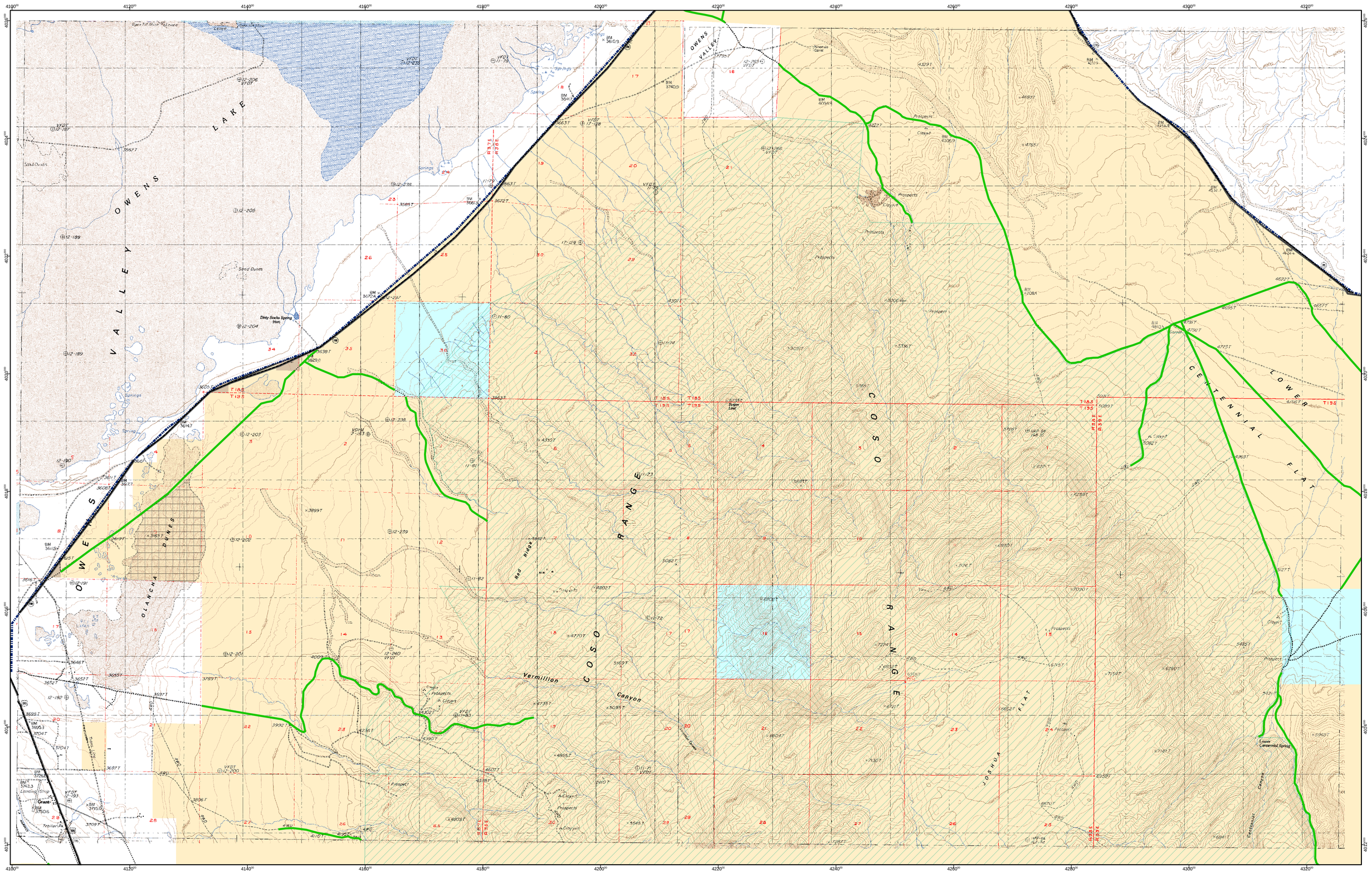
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

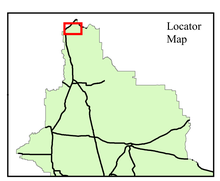
Proposed Action - West Mojave Route Designation Program

Map 2 - Vermillion Canyon, Centennial Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

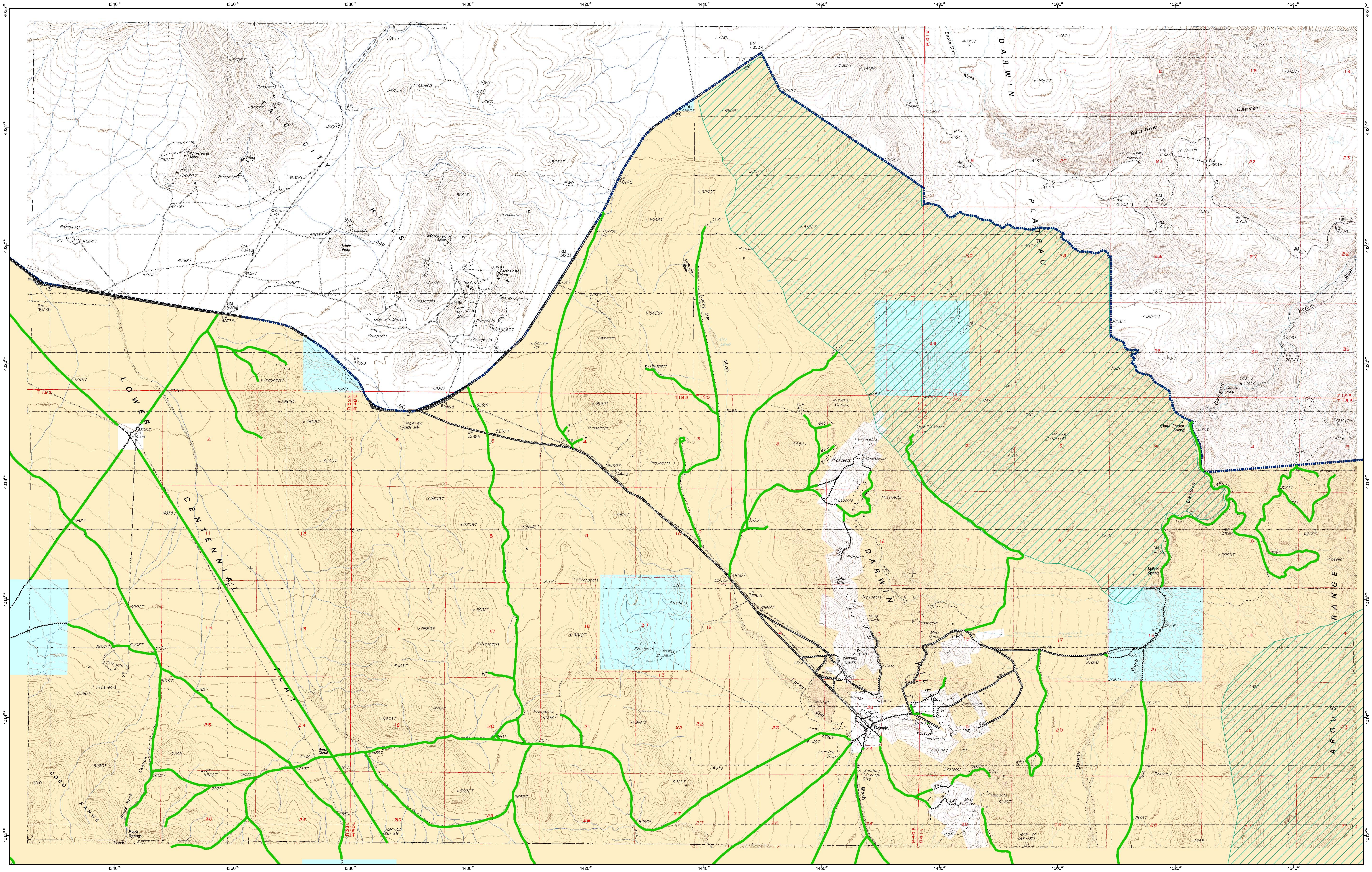
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

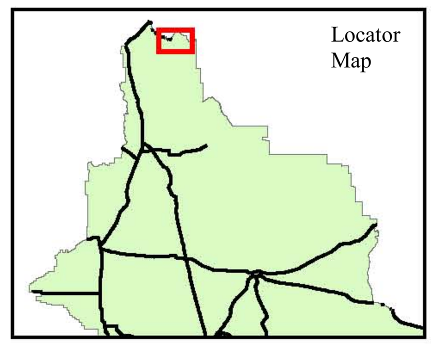
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

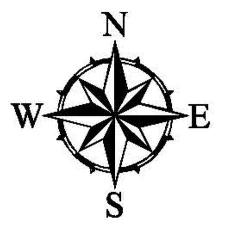
Map 3 - Talc City Hills, Darwin





Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003



SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

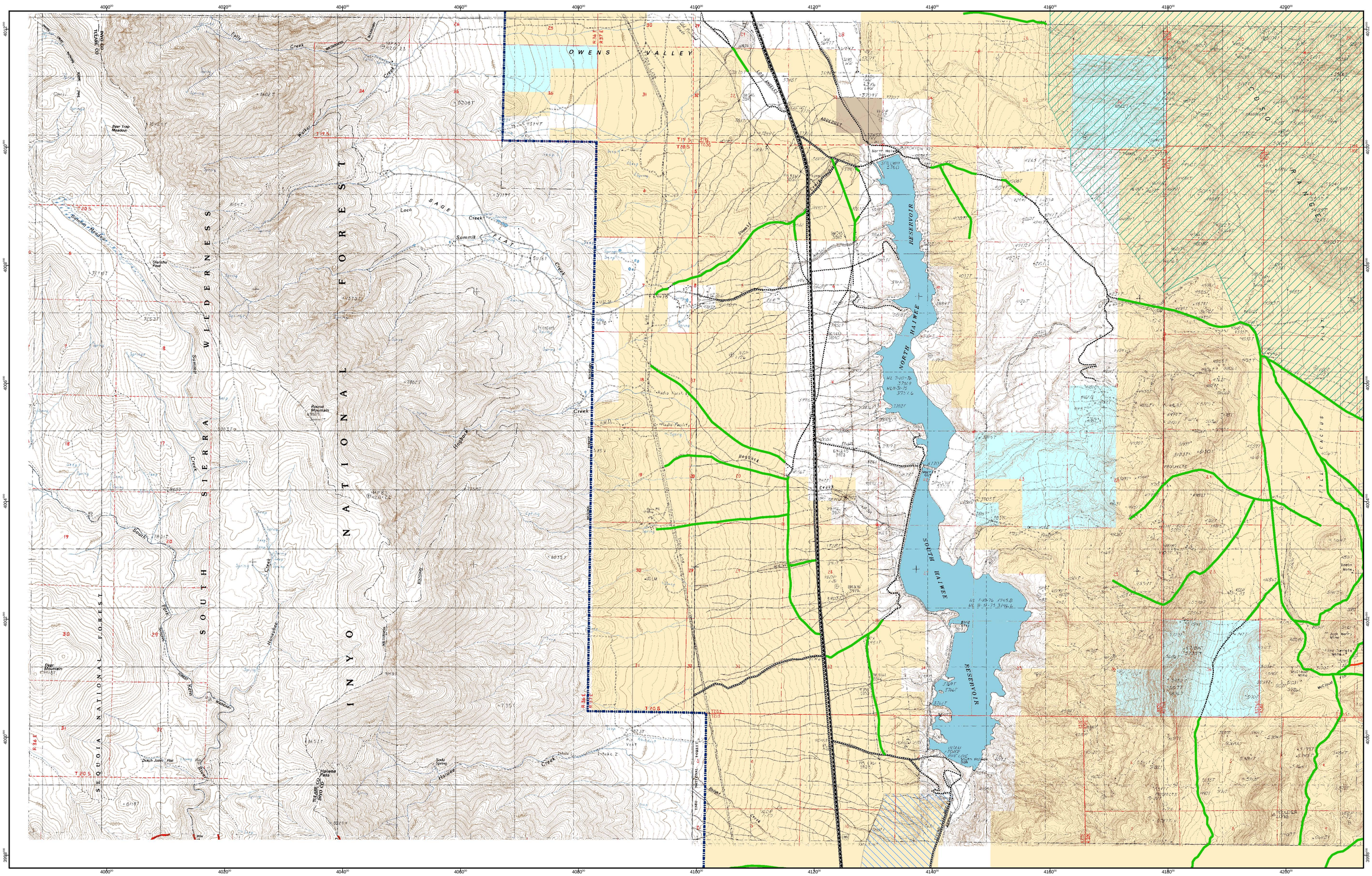
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

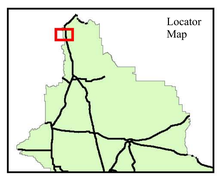
Proposed Action - West Mojave Route Designation Program

Map 4 - Haiwee Pass, Haiwee Reservoirs



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

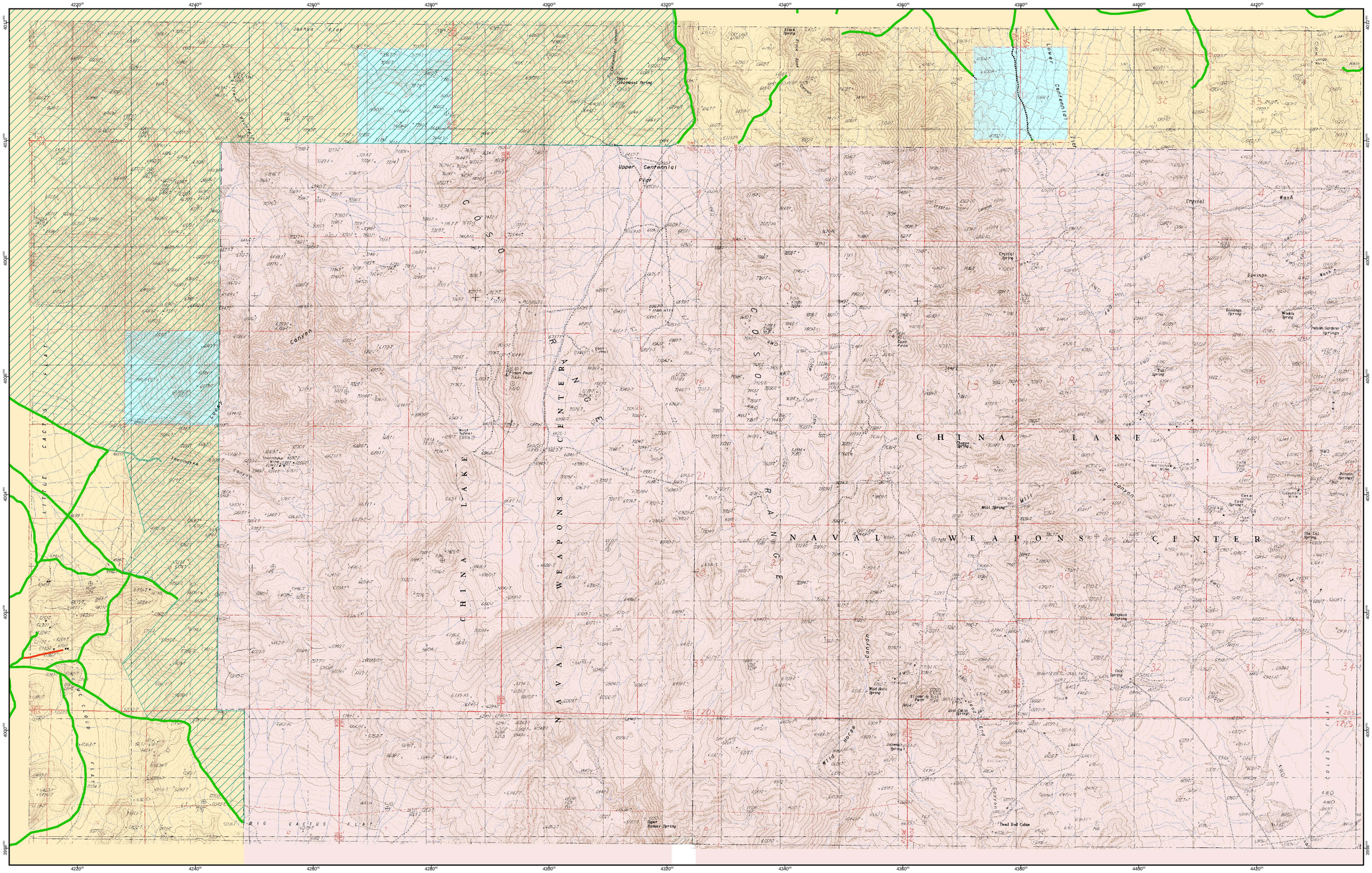
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 5 - Upper Centennial Flat, Coso Peak



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

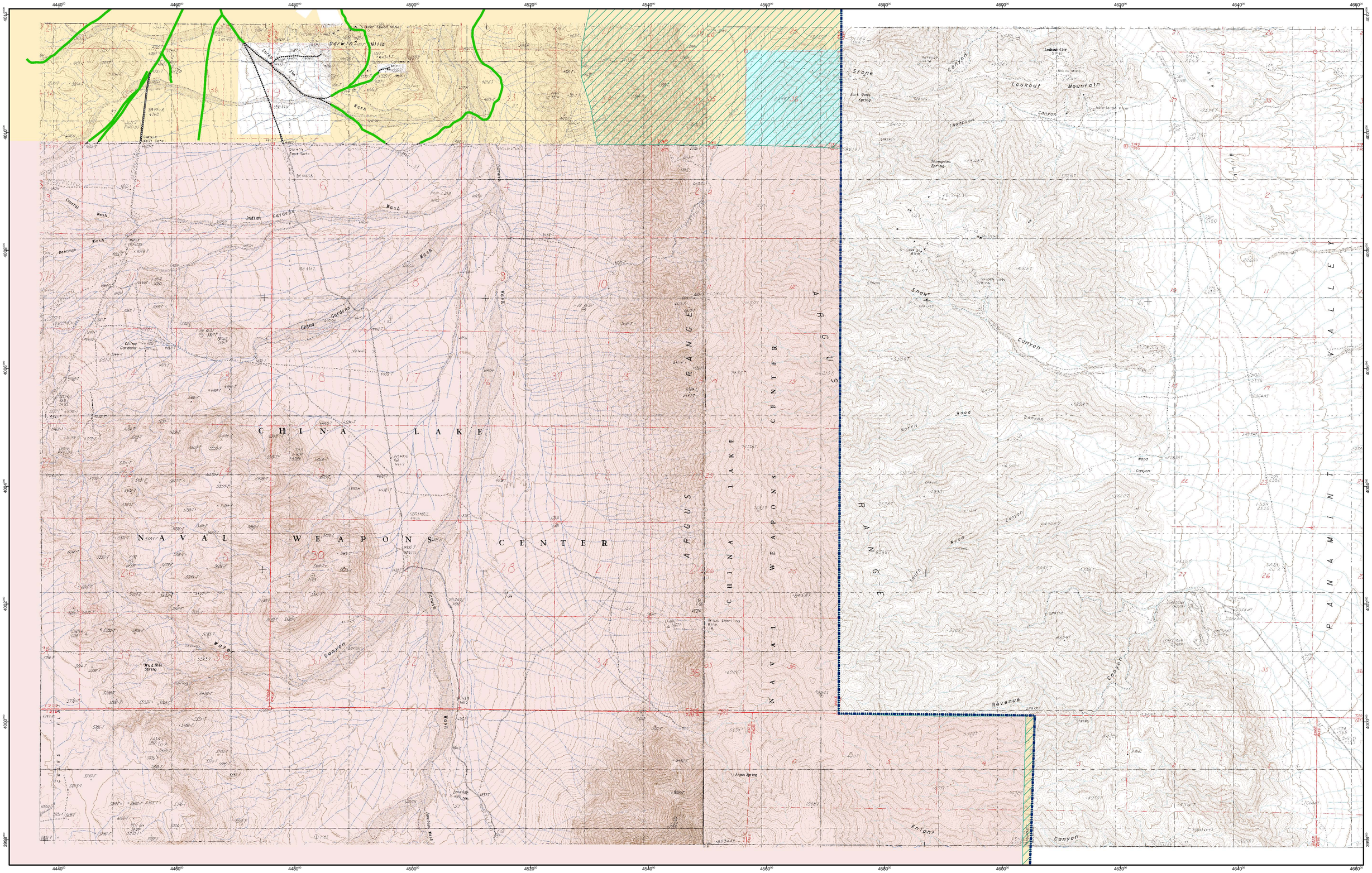
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

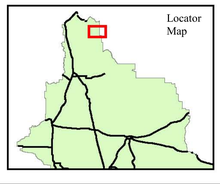
Proposed Action - West Mojave Route Designation Program

Map 6 - China Gardens, Revenue Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

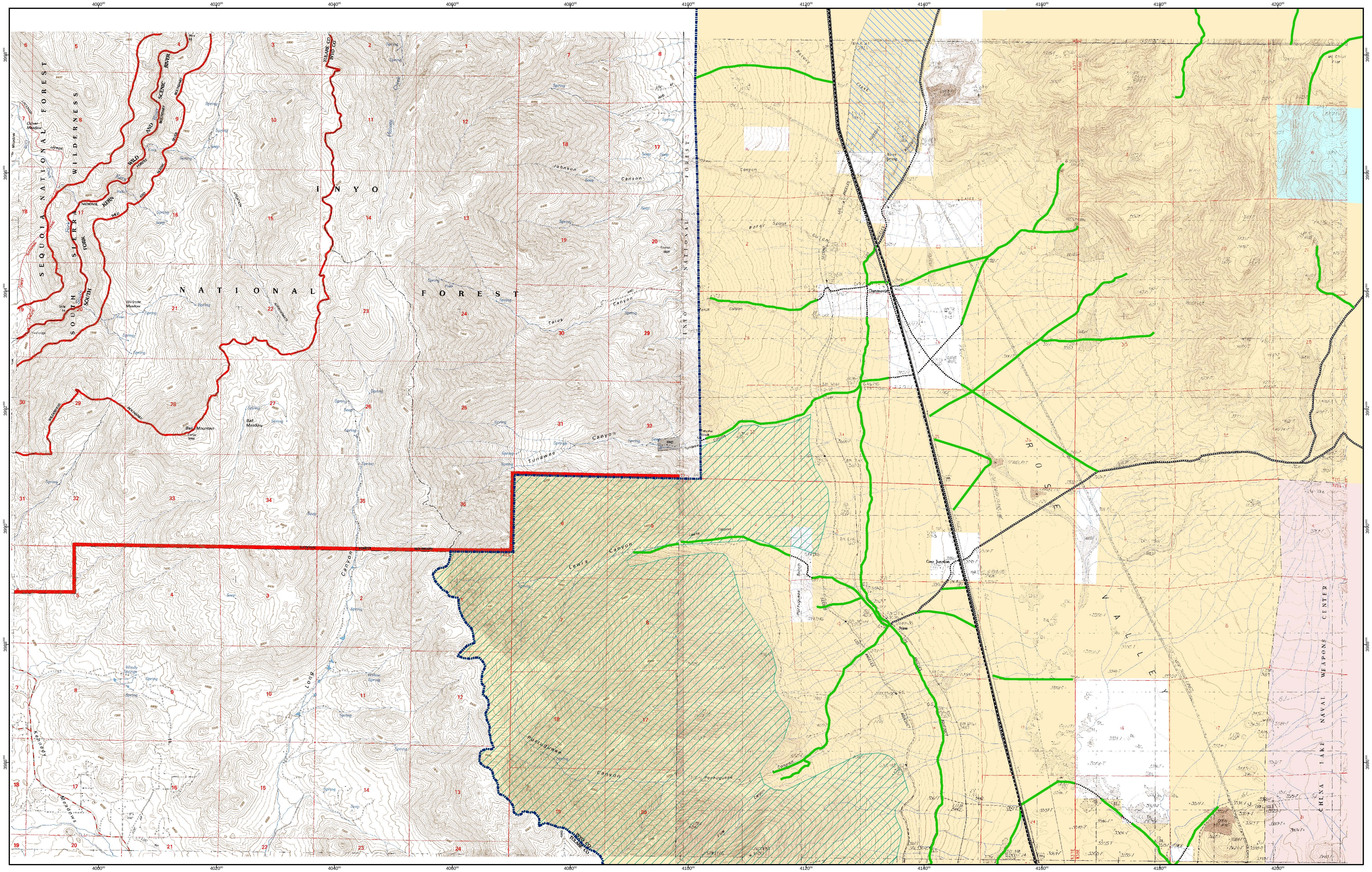
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

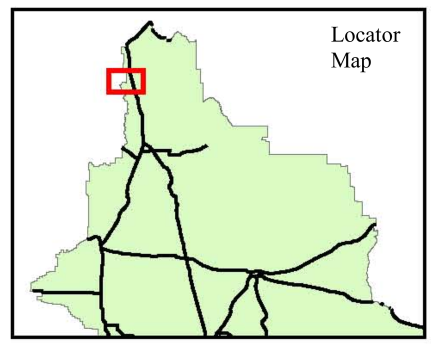
Proposed Action - West Mojave Route Designation Program

Map 7 - Long Canyon, Coso Junction



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003



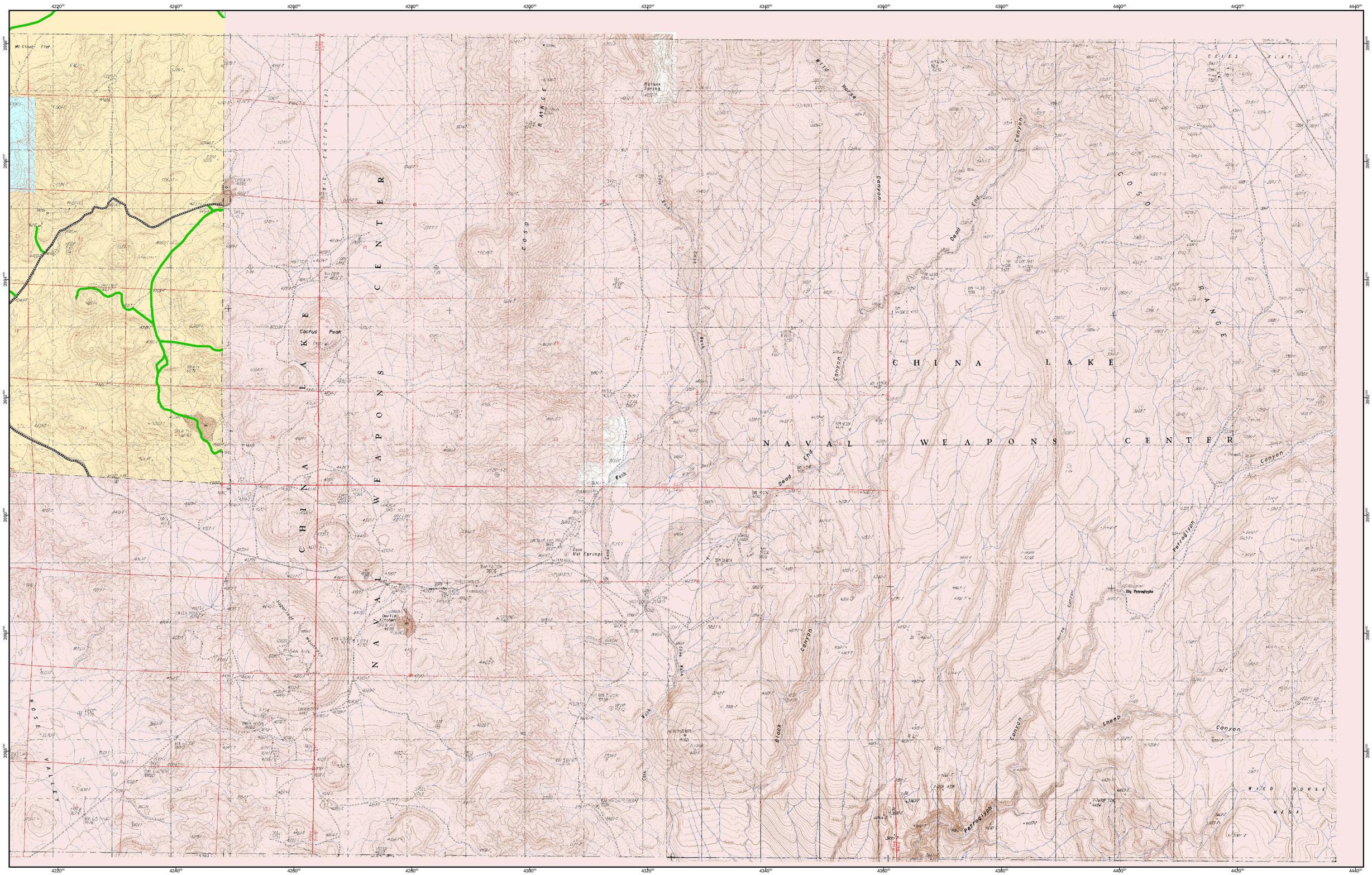
SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

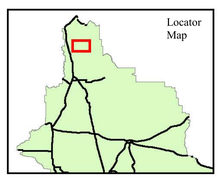
Proposed Action - West Mojave Route Designation Program

Map 8 - Cactus Peak, Petroglyph Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

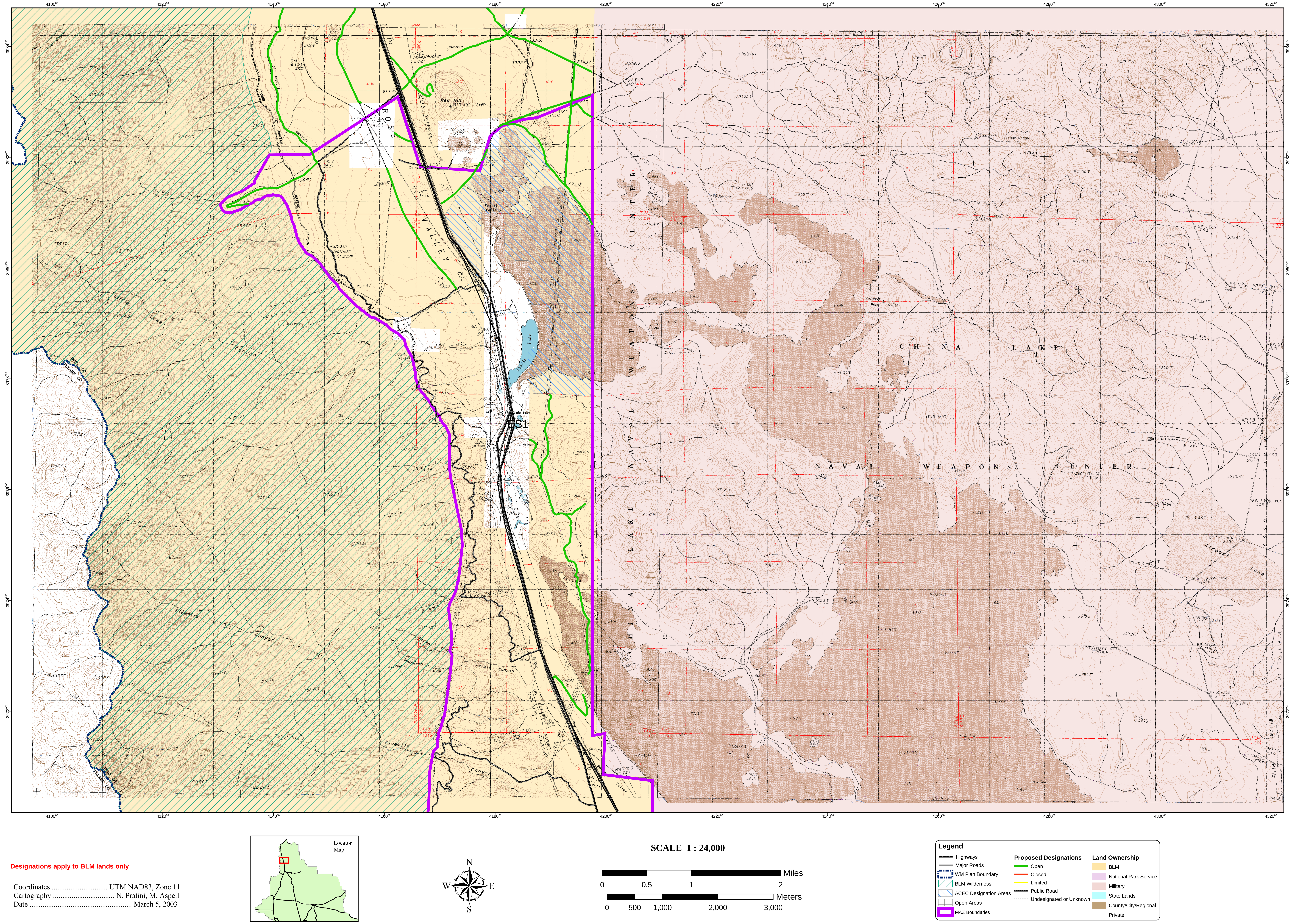
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 9 - Little Lake, Volcano Peak

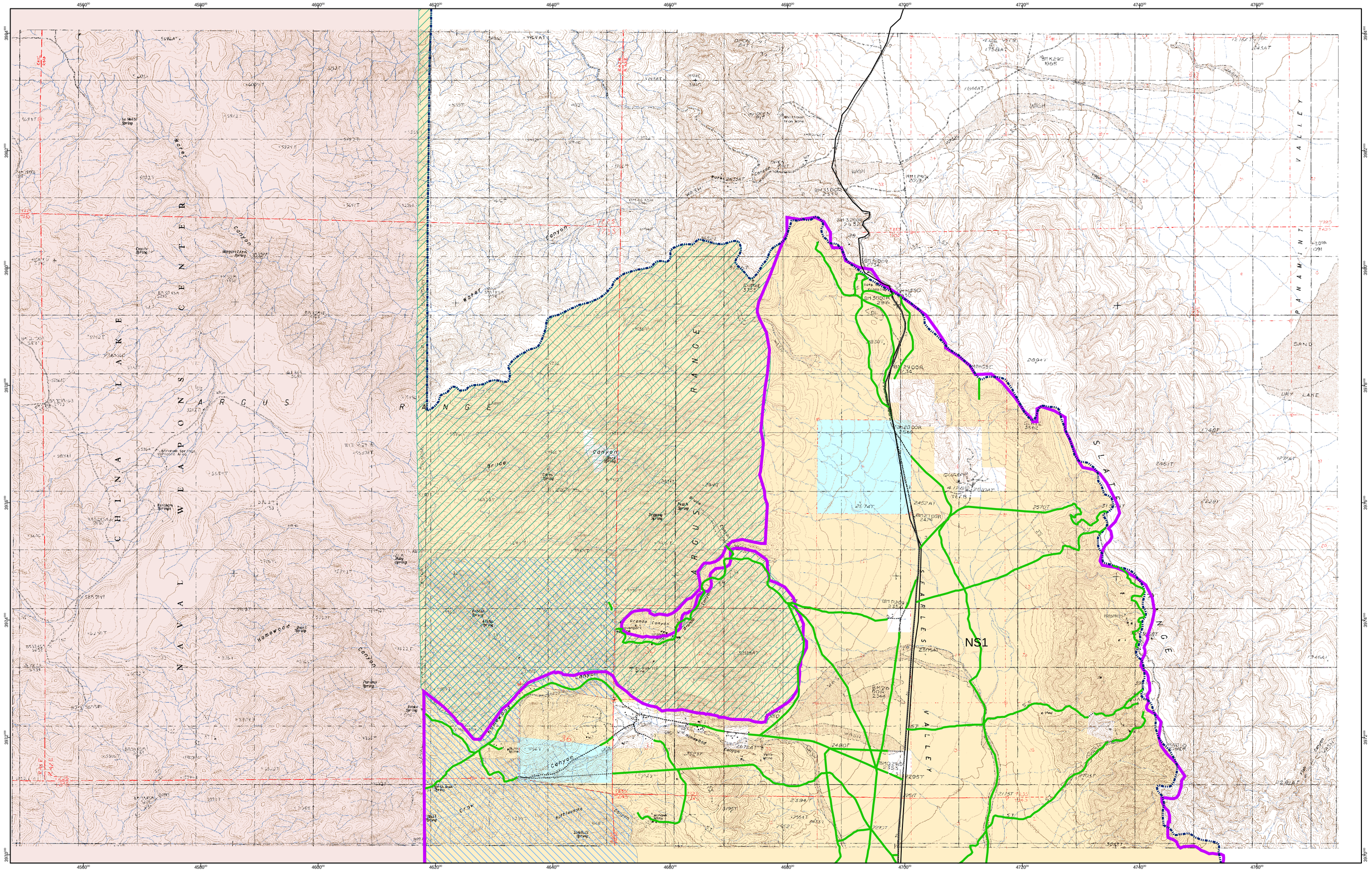


Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003

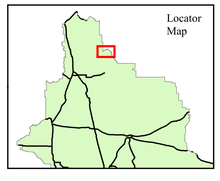
Proposed Action - West Mojave Route Designation Program

Map 10 - Homewood Canyon, Slate Range Crossing



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

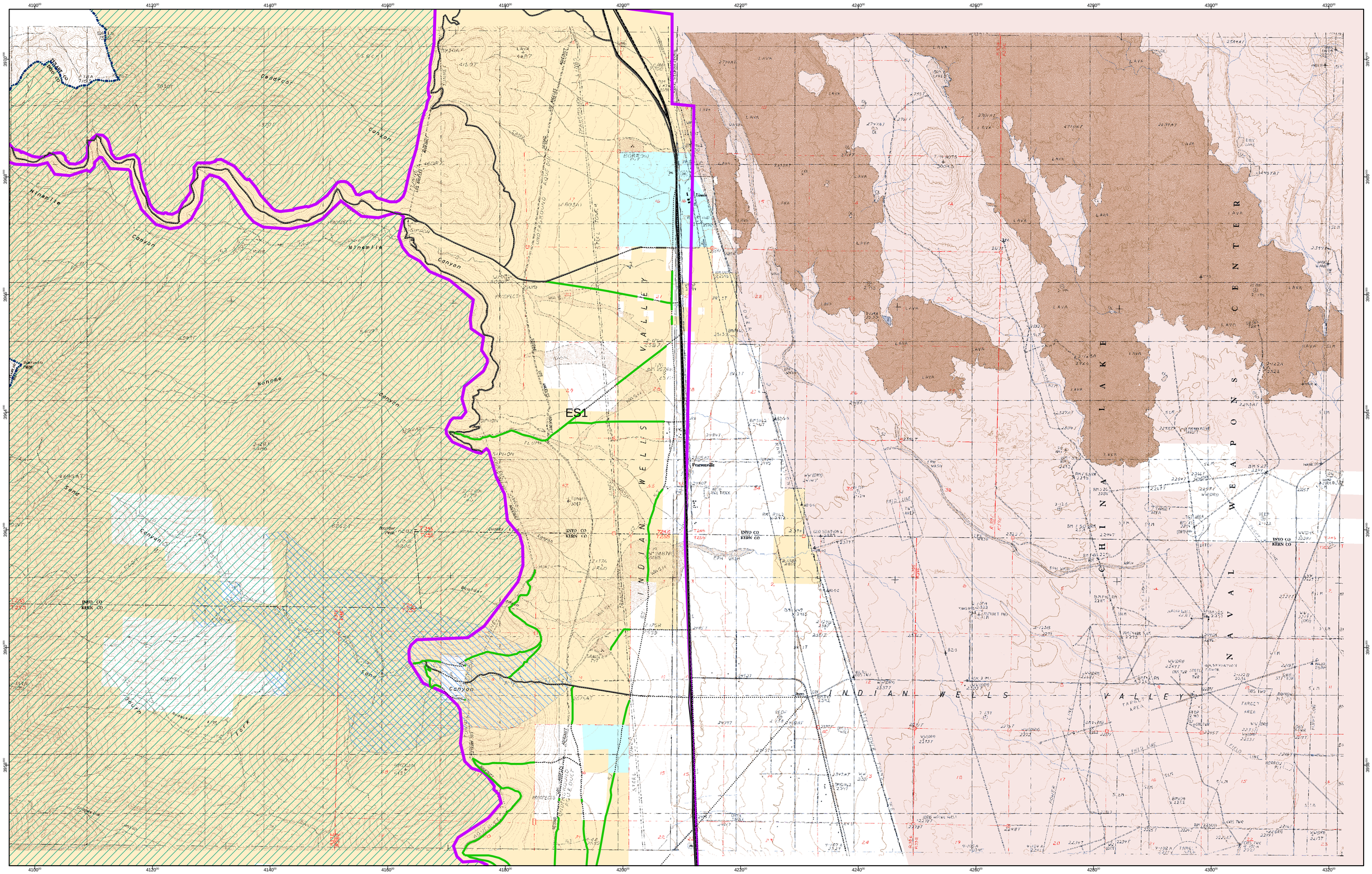
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

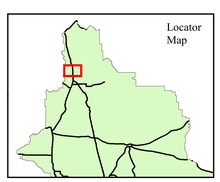
Proposed Action - West Mojave Route Designation Program

Map 11 - Ninemile Canyon, Pearsonville



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

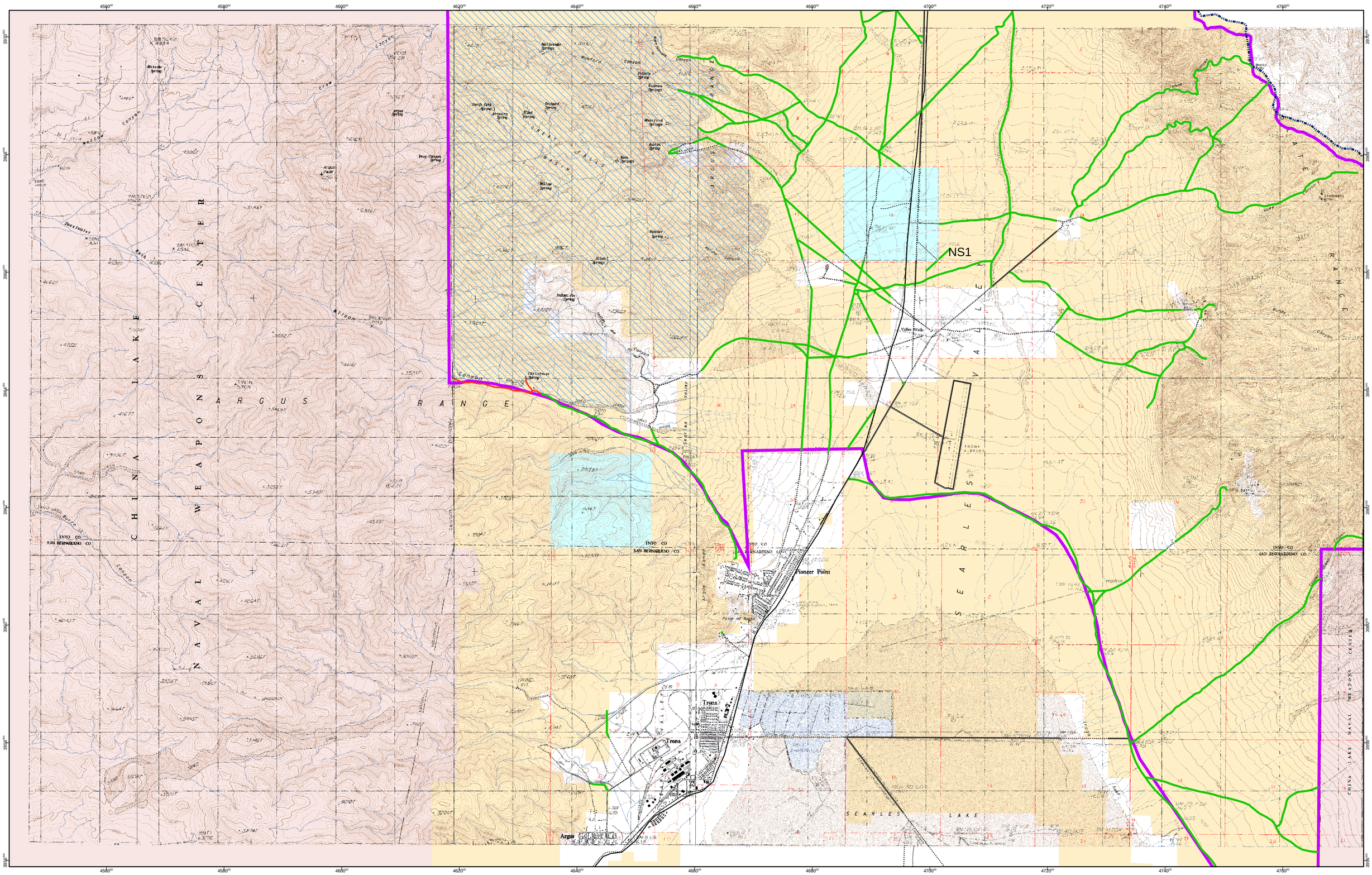
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

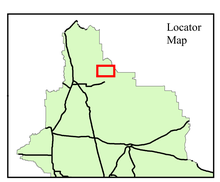
Proposed Action - West Mojave Route Designation Program

Map 12 - Trona West, Trona East



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

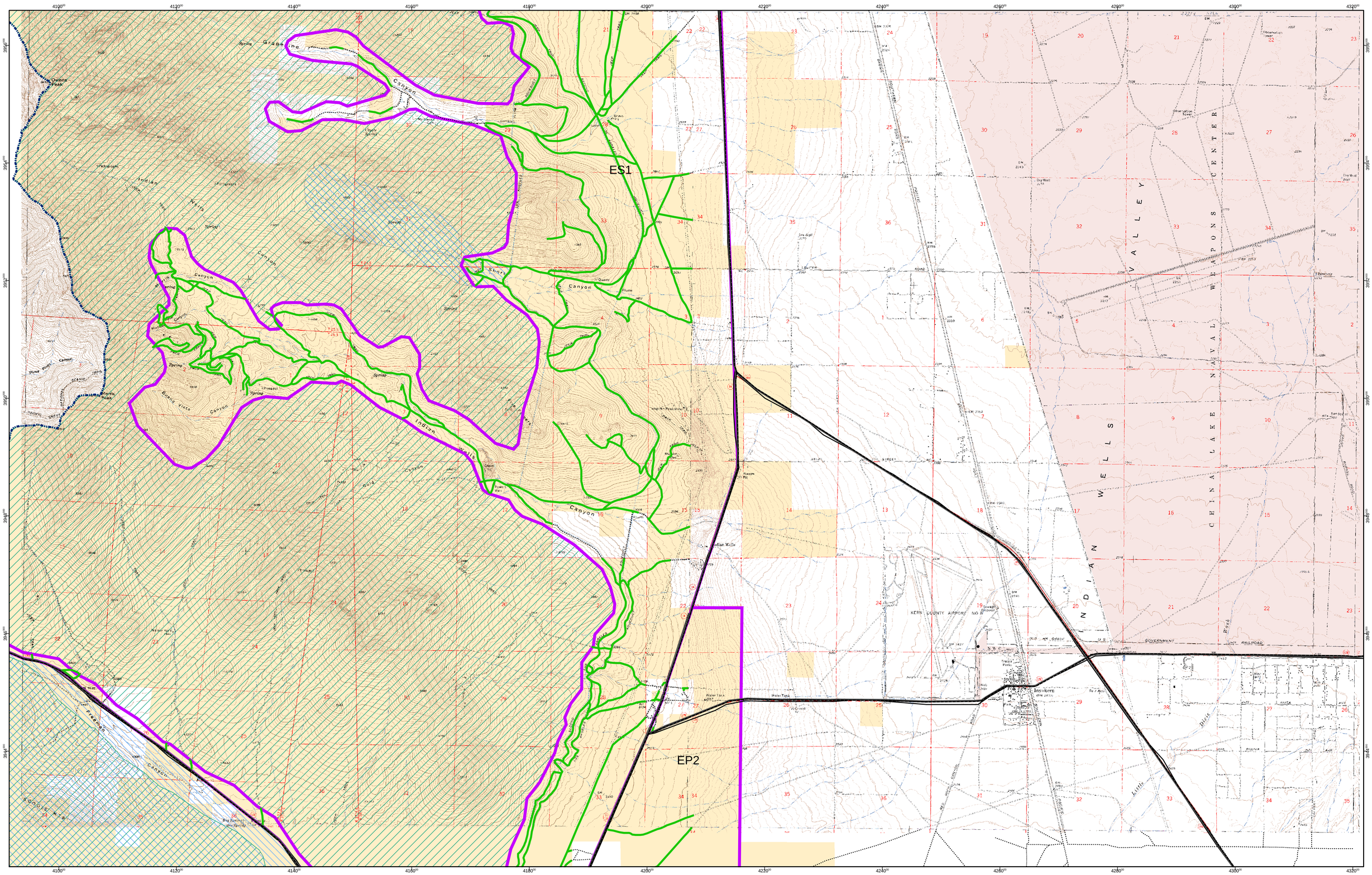
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

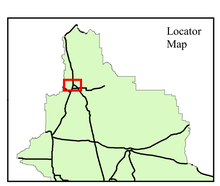
Proposed Action - West Mojave Route Designation Program

Map 13 - Owens Peak, Inyokern



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

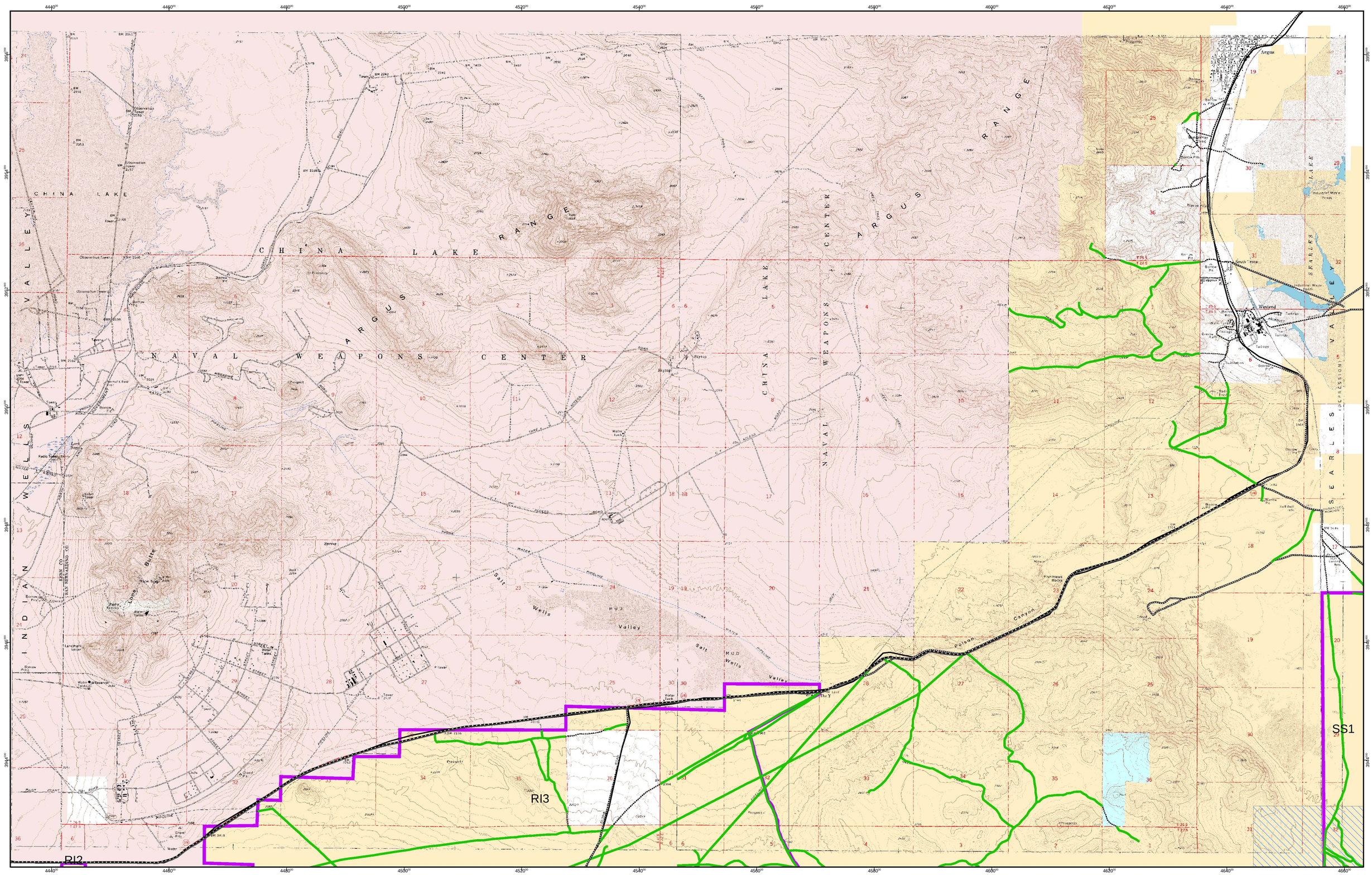
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 14 - Lone Butte, Westend



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

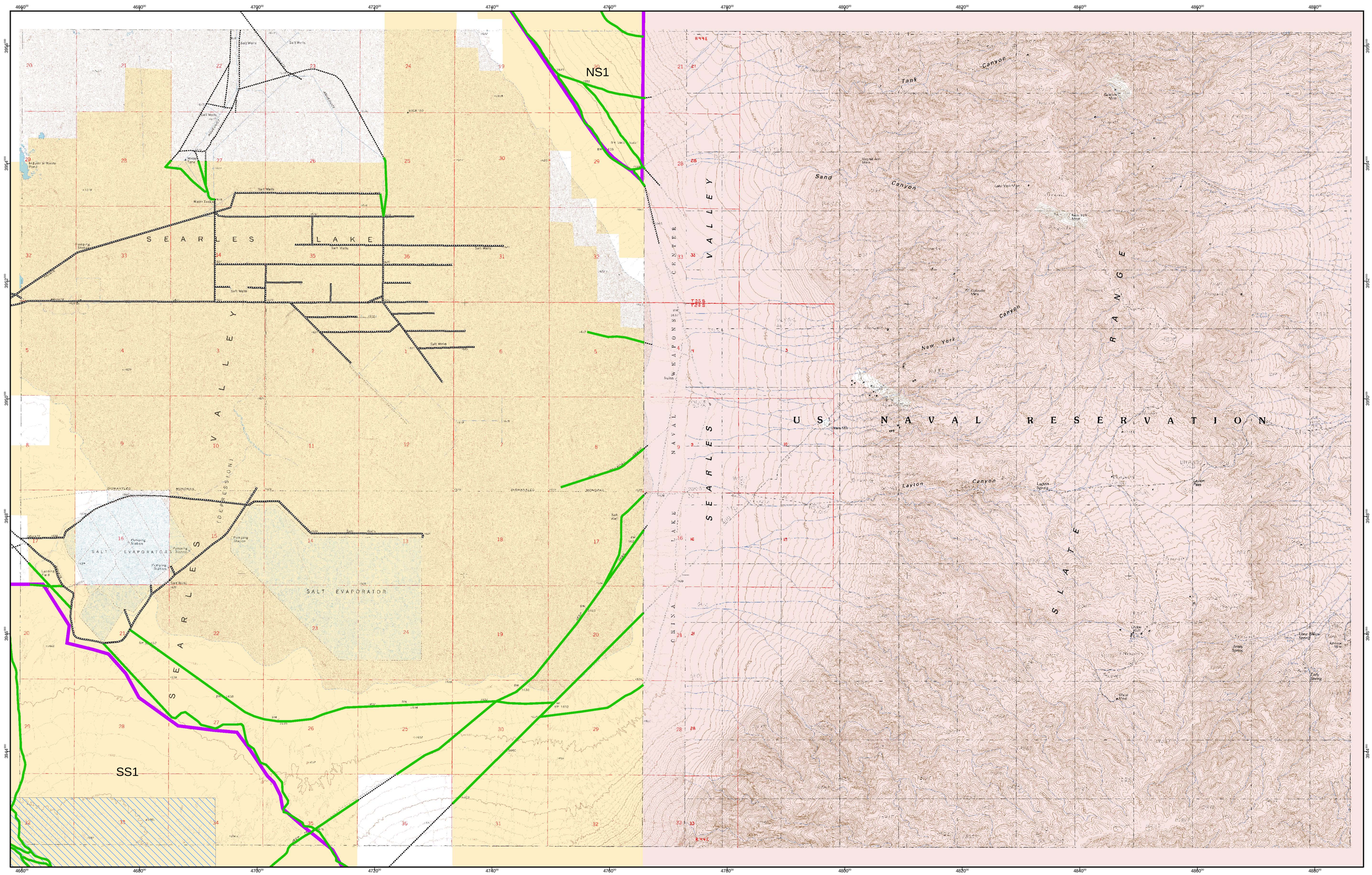
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

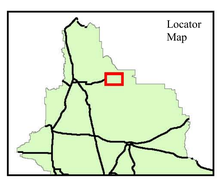
Proposed Action - West Mojave Route Designation Program

Map 15 - Searles Lake, Layton Spring



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

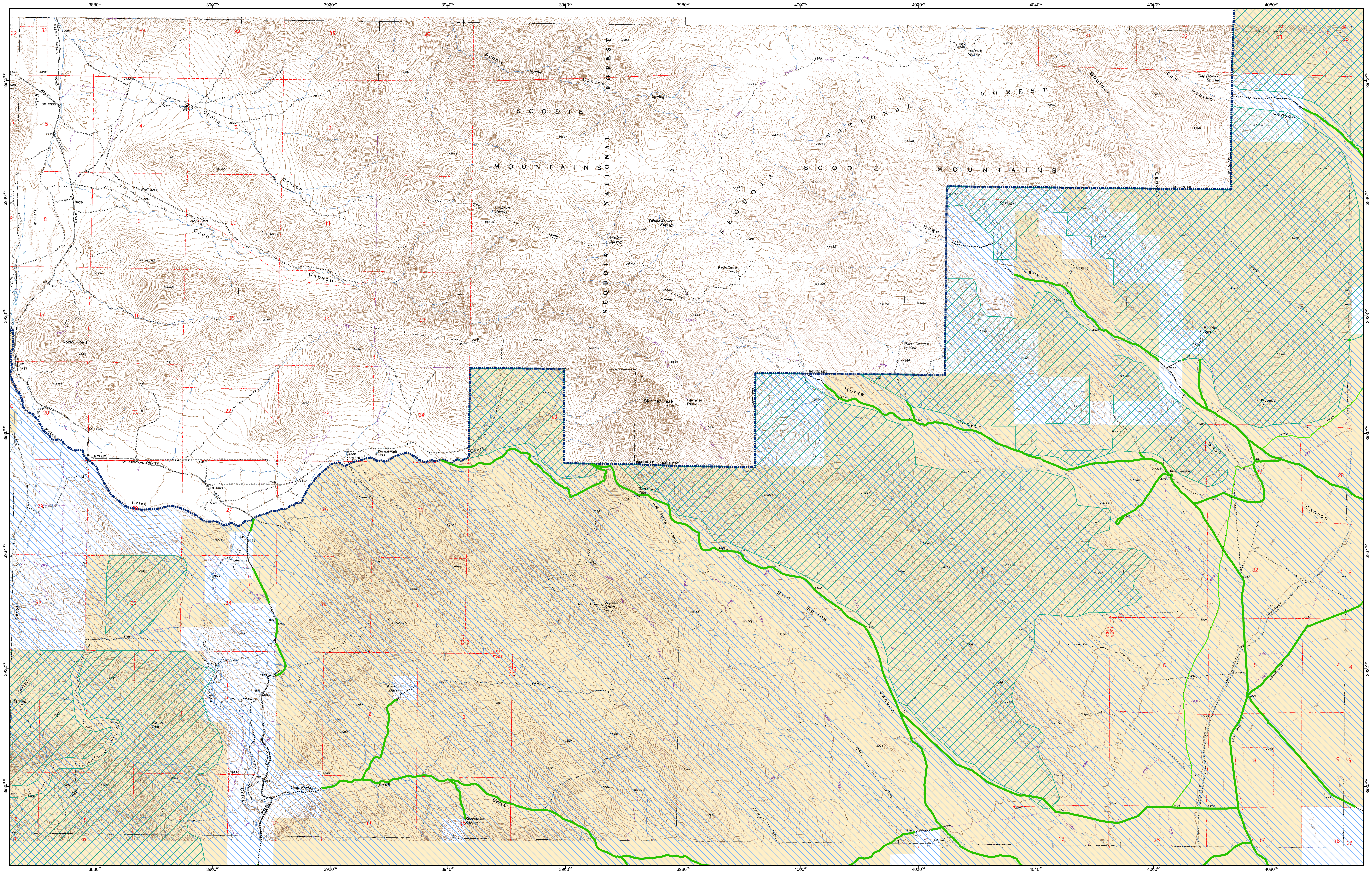
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

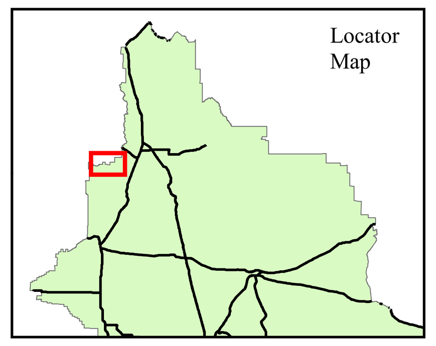
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 16 - Cane Canyon, Horse Canyon





Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

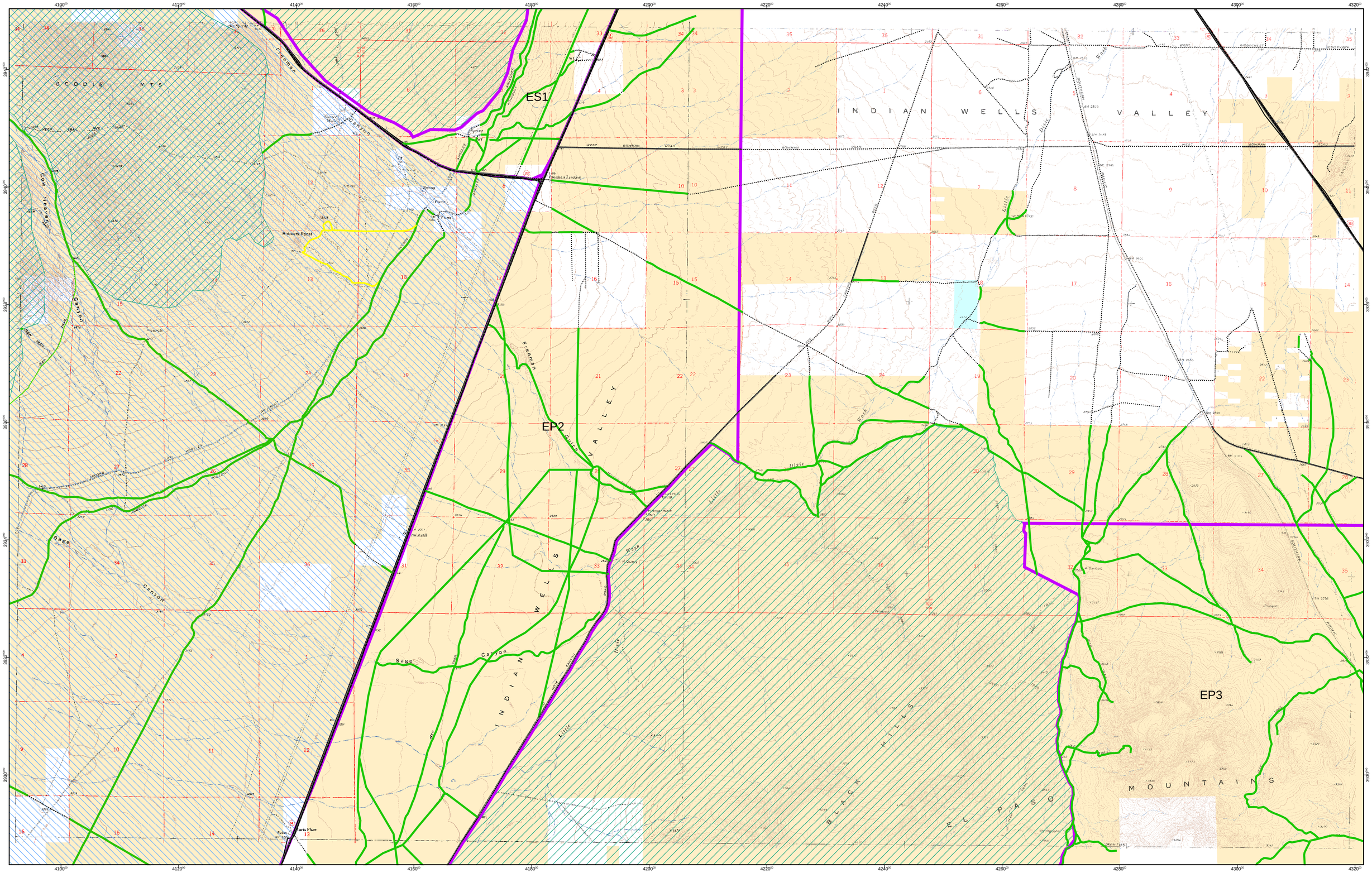
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 17 - Freeman Junction, Inyokern South East



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

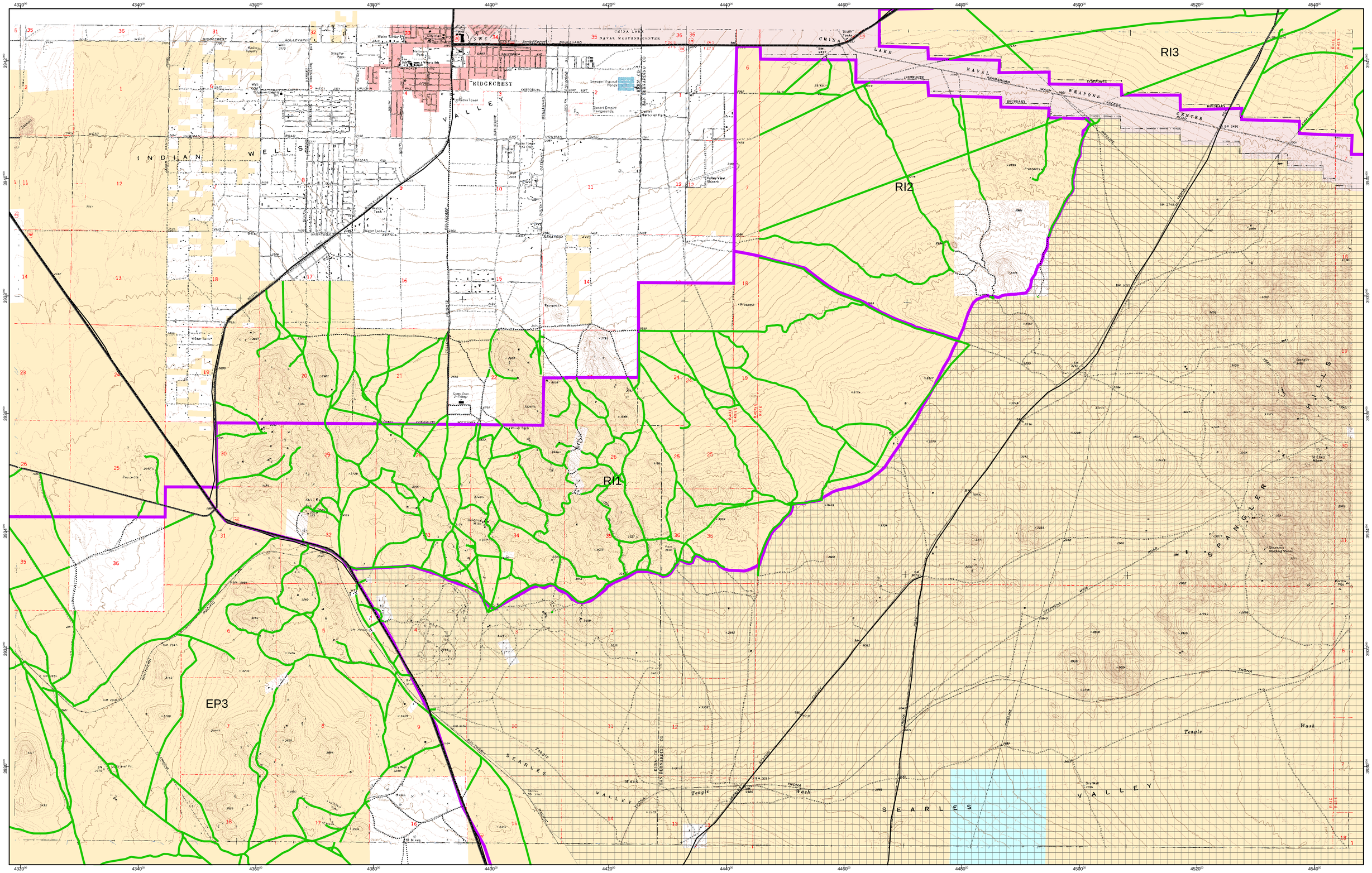
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

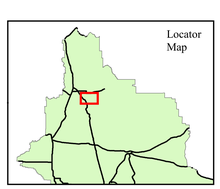
Proposed Action - West Mojave Route Designation Program

Map 18 - Ridgecrest South, Spangler Hills West



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 19 - Spangler Hills East, Christmas Canyon

RI3

SS1

S E A R L E S V A L L E Y (DRY LAKE)

S E A R L E S V A L L E Y D E P R E S S I O N

S E A R L E S V A L L E Y C E N T E R

S P A N G L E R H I L L S

C H I N A L A K E N A V A L W E A P O N S C E N T E R

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

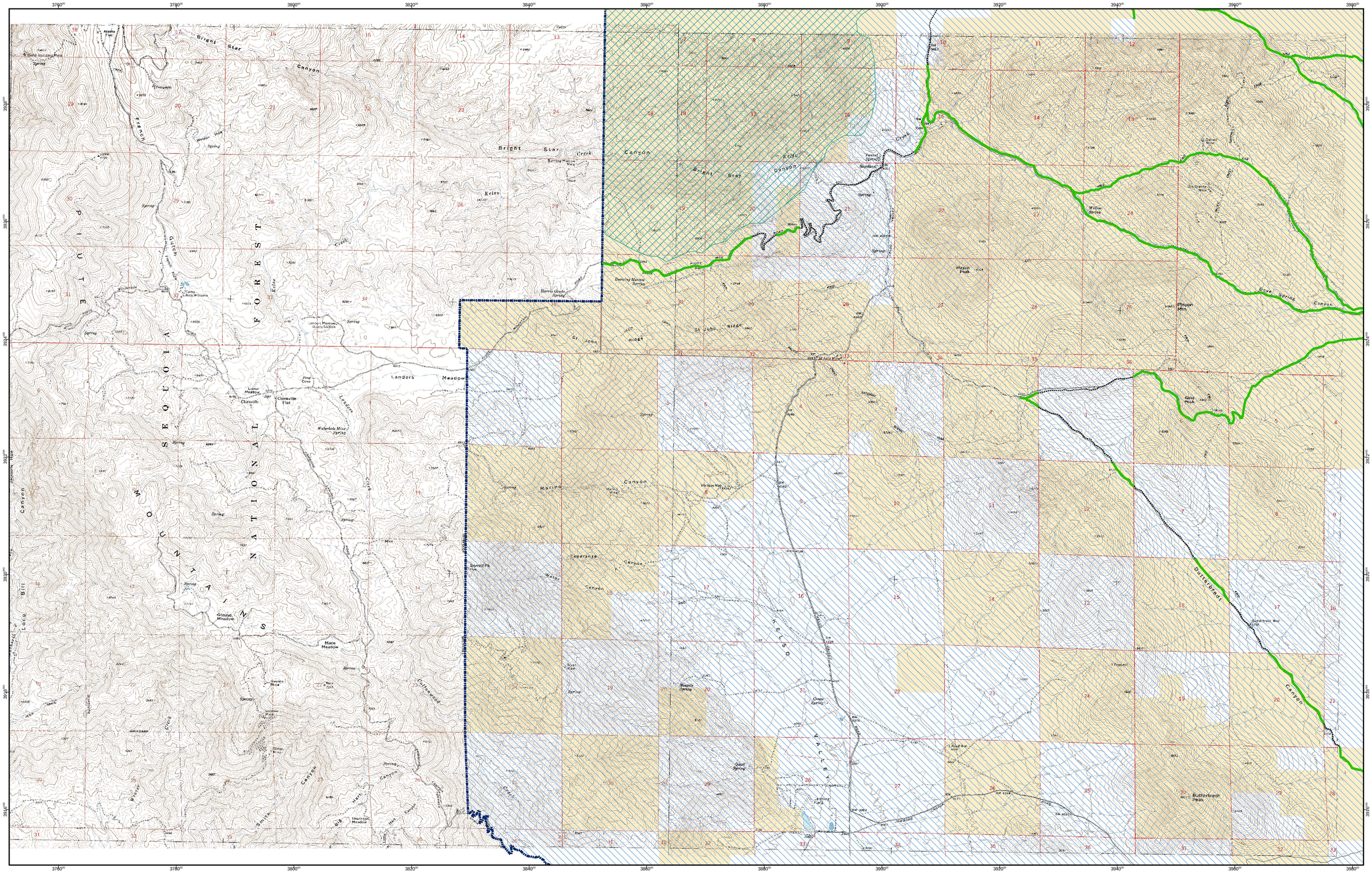
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 20 - Claraville, Pinyon Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

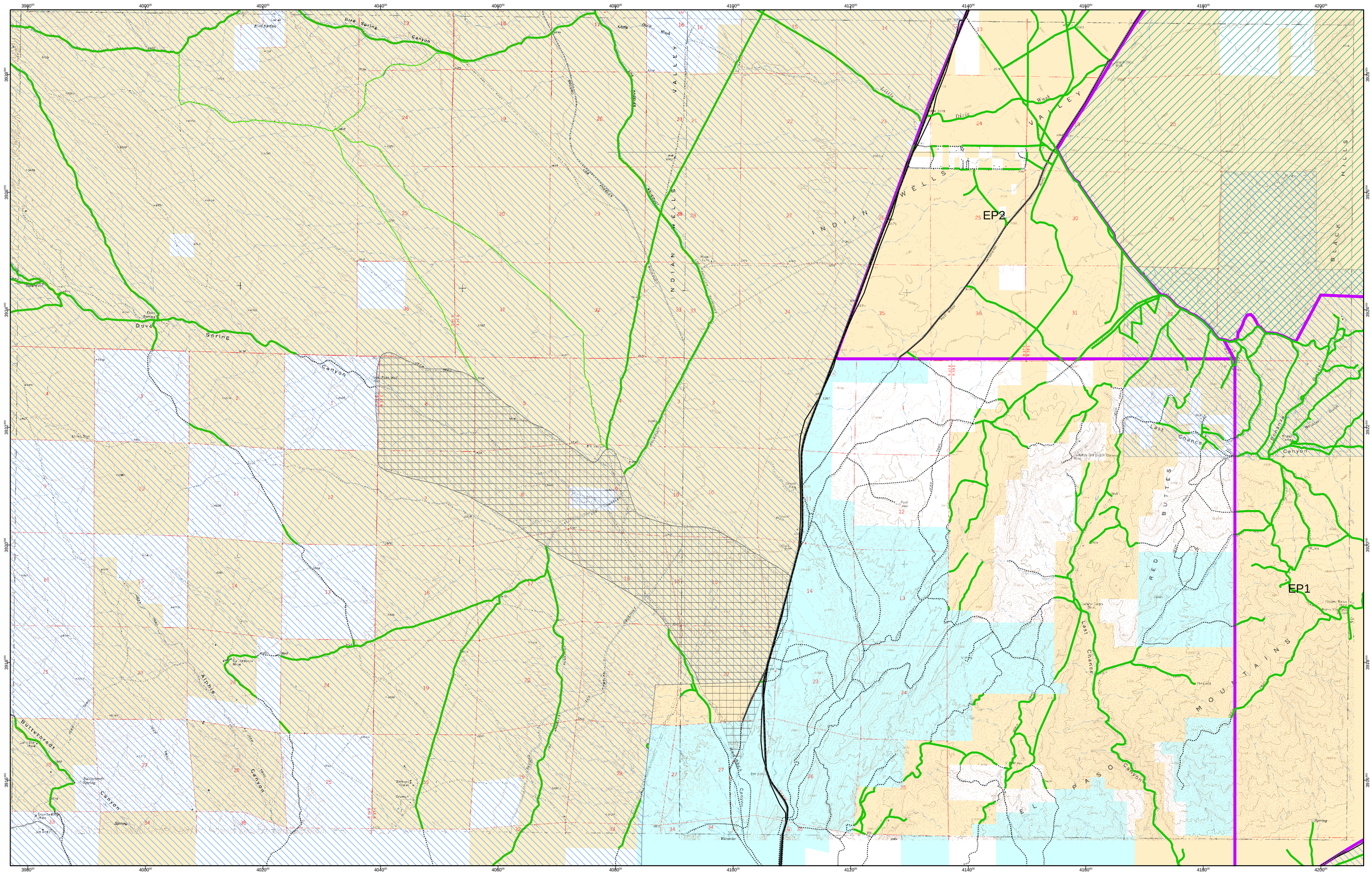
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

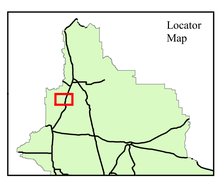
Proposed Action - West Mojave Route Designation Program

Map 21 - Dove Spring, Saltdale North West



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

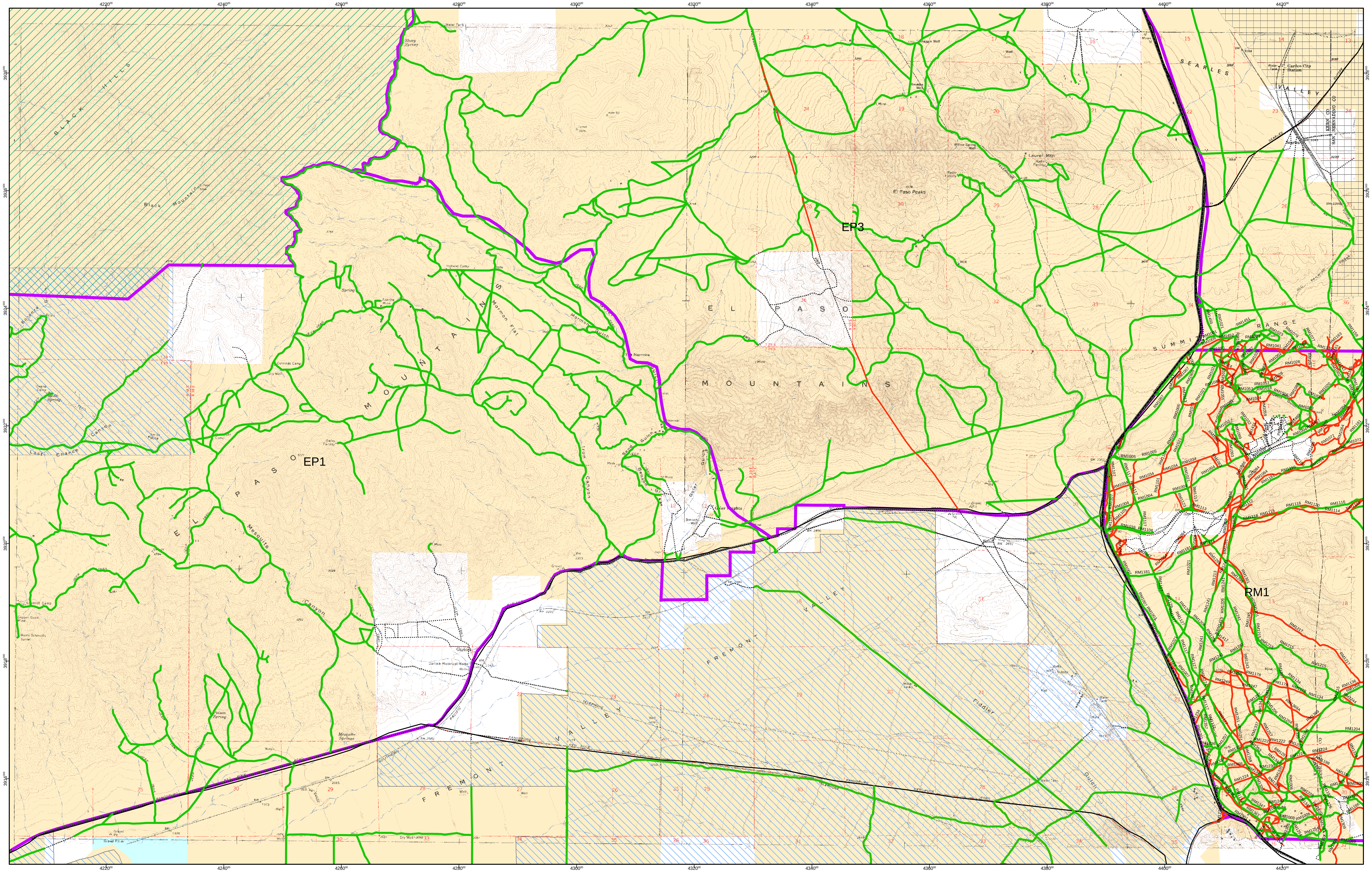
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

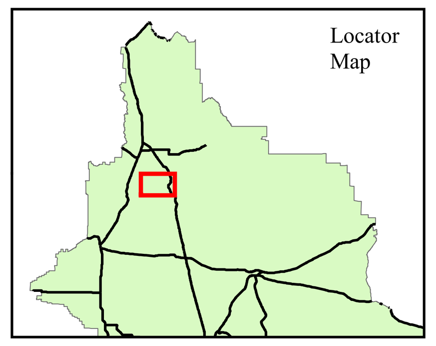
Proposed Action - West Mojave Route Designation Program

Map 22 - Garlock, El Paso Peaks



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003



SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2
Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

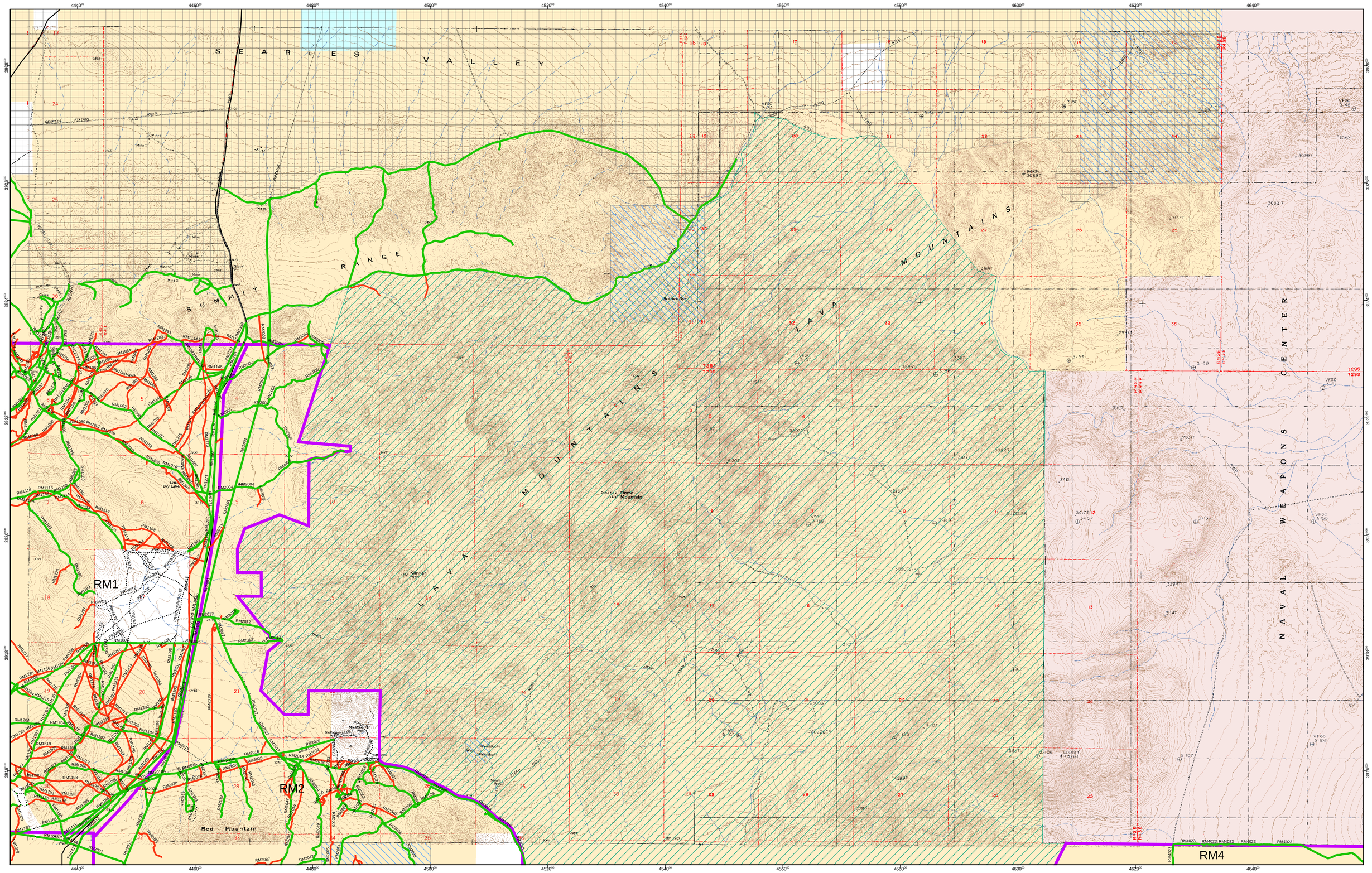
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 23 - Klinker Mountain, West of Black Hills



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

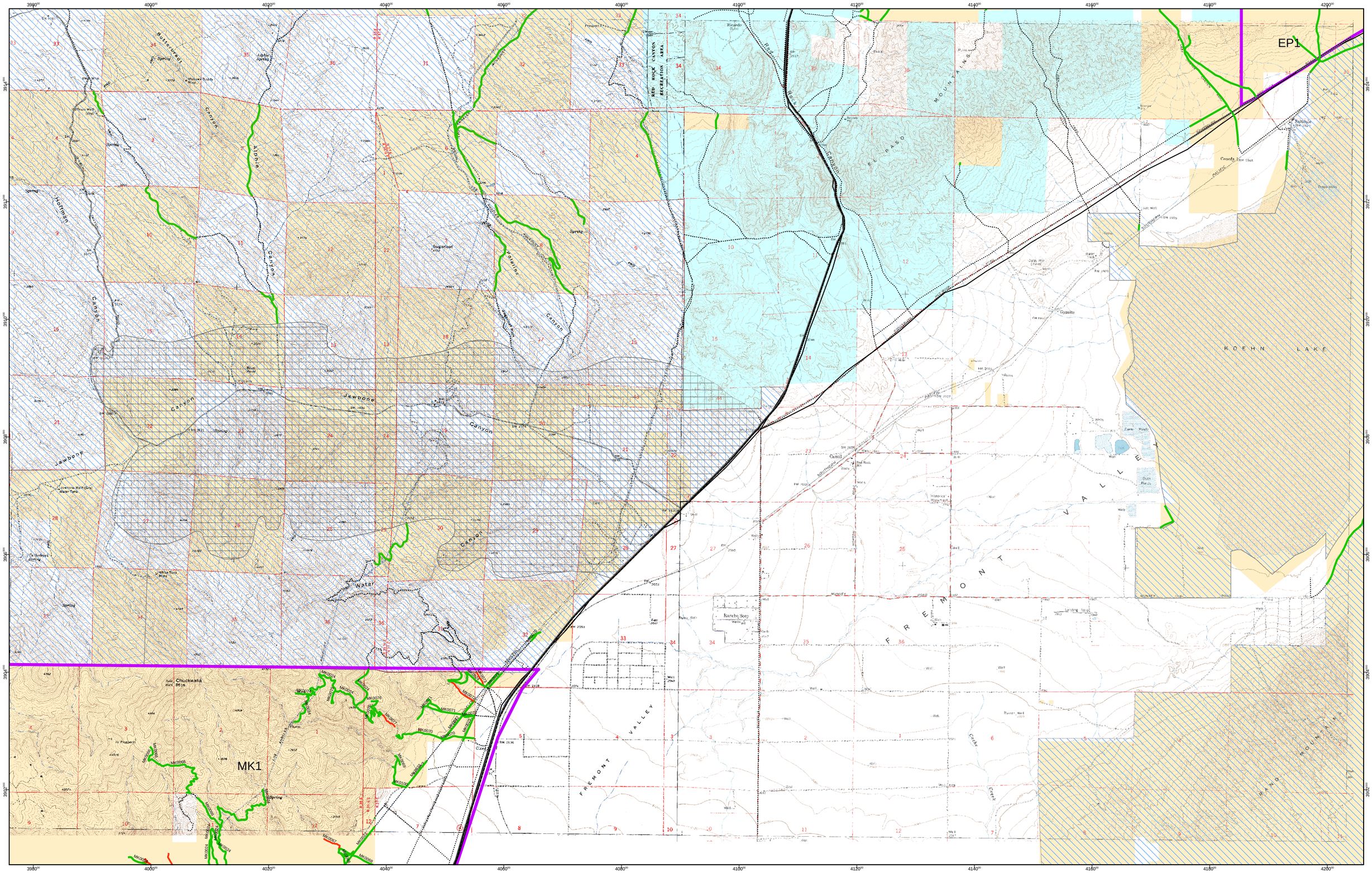
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 24 - Cinco, Cantil



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 25 - Saltdale South East, Johannesburg

EP1

RM1

RM3

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 26 - Red Mountain, Cuddeback Lake

RM1

RM2

RM3

RM4

RED MOUNTAIN

Red Mountain

Atolia

ALMOND COVE

Almond Mountain

CUDDEBACK LAKE

CUDDEBACK (DRY) LAKE

AIR FORCE RANGE

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 27 - Blackwater Well, Slocum Mountain

RM4

FR3

SU2

NAVAL WEAPONS CENTER

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

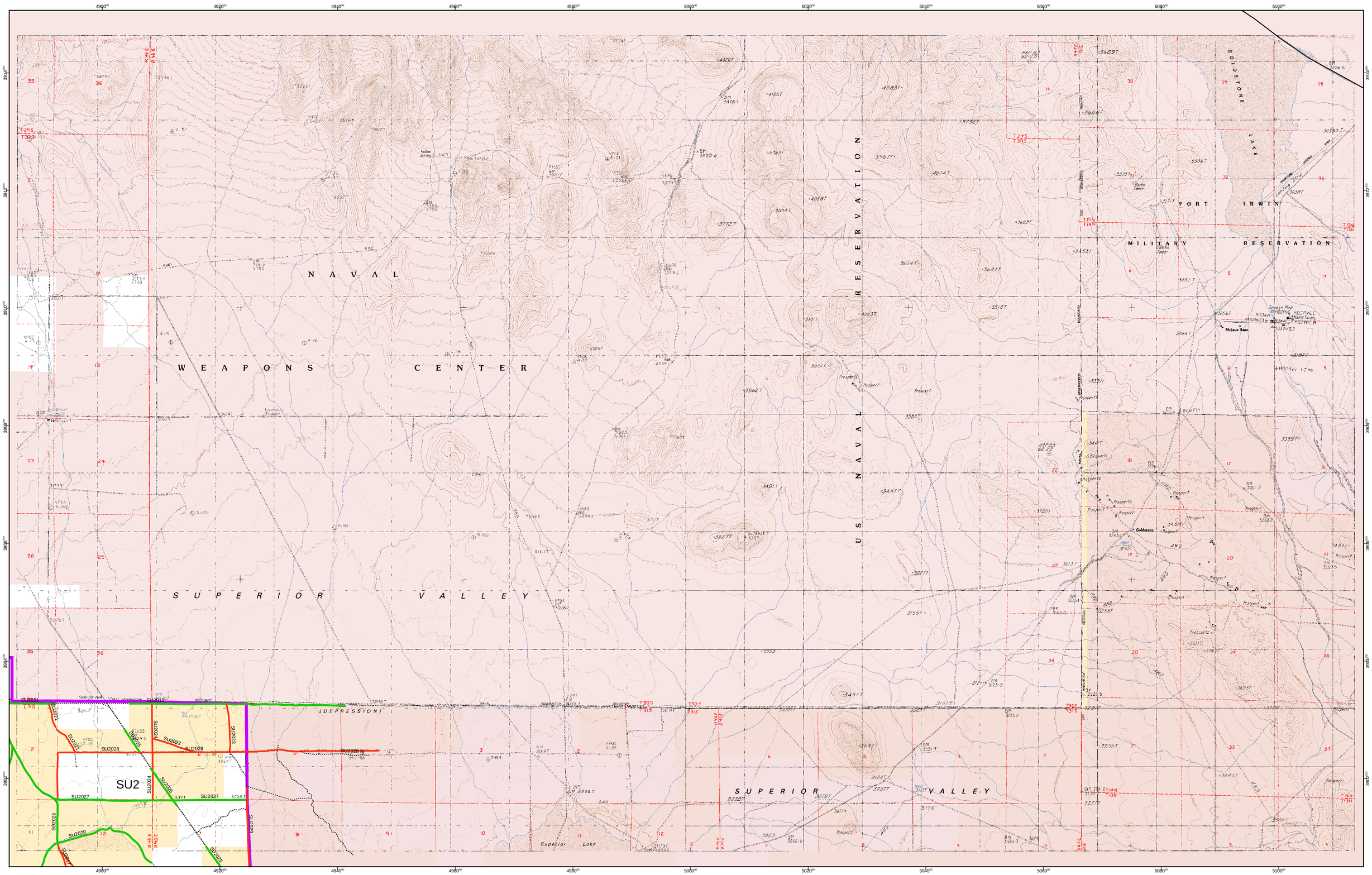
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

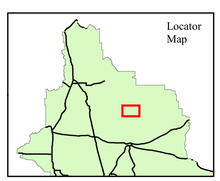
Proposed Action - West Mojave Route Designation Program

Map 28 - Superior Valley, Goldstone



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

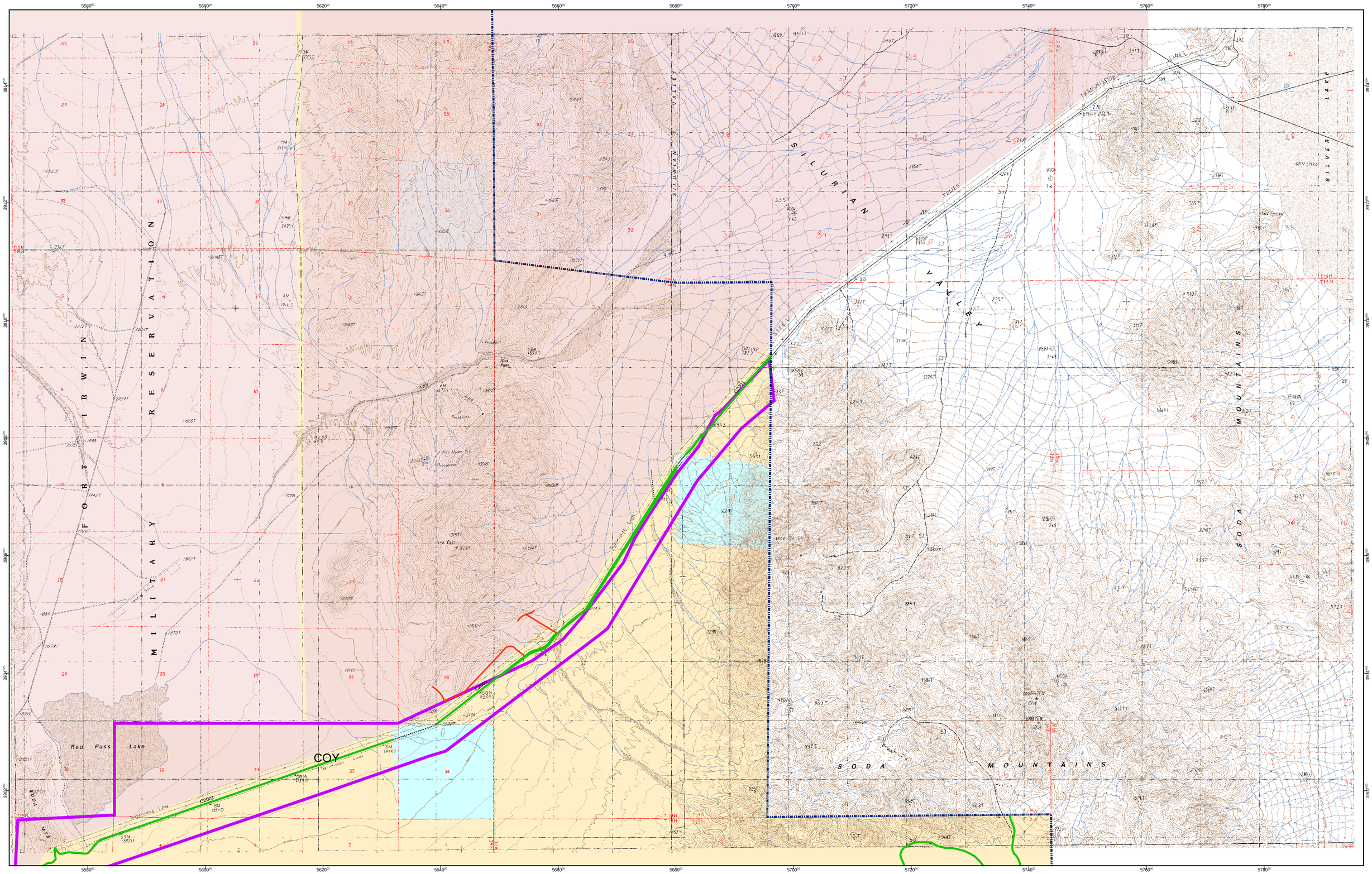
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 29 - Red Pass Lake, West of Baker



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

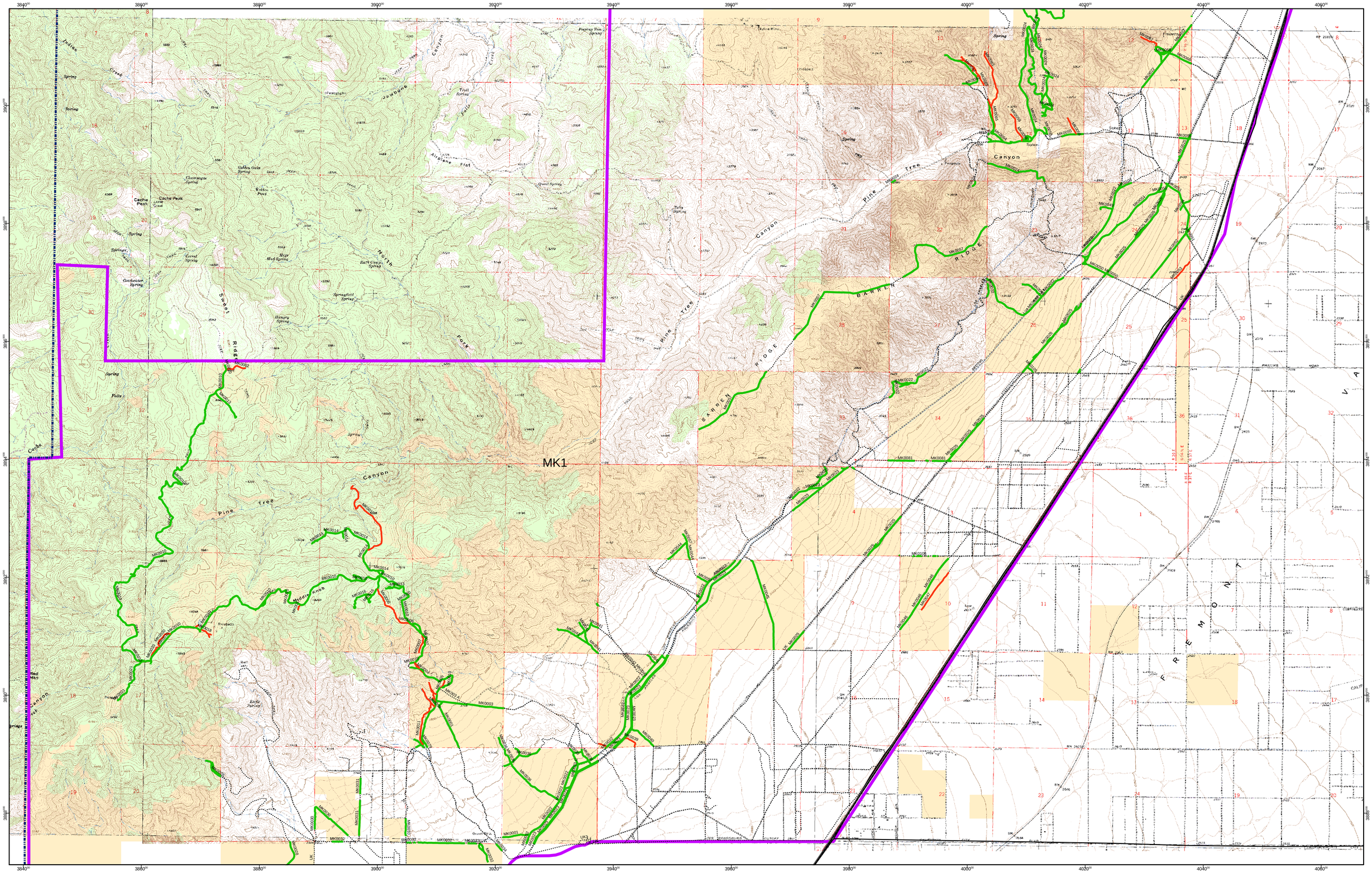
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 30A - Tehachapi NE, Cache Peak, Mojave NE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N W E S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

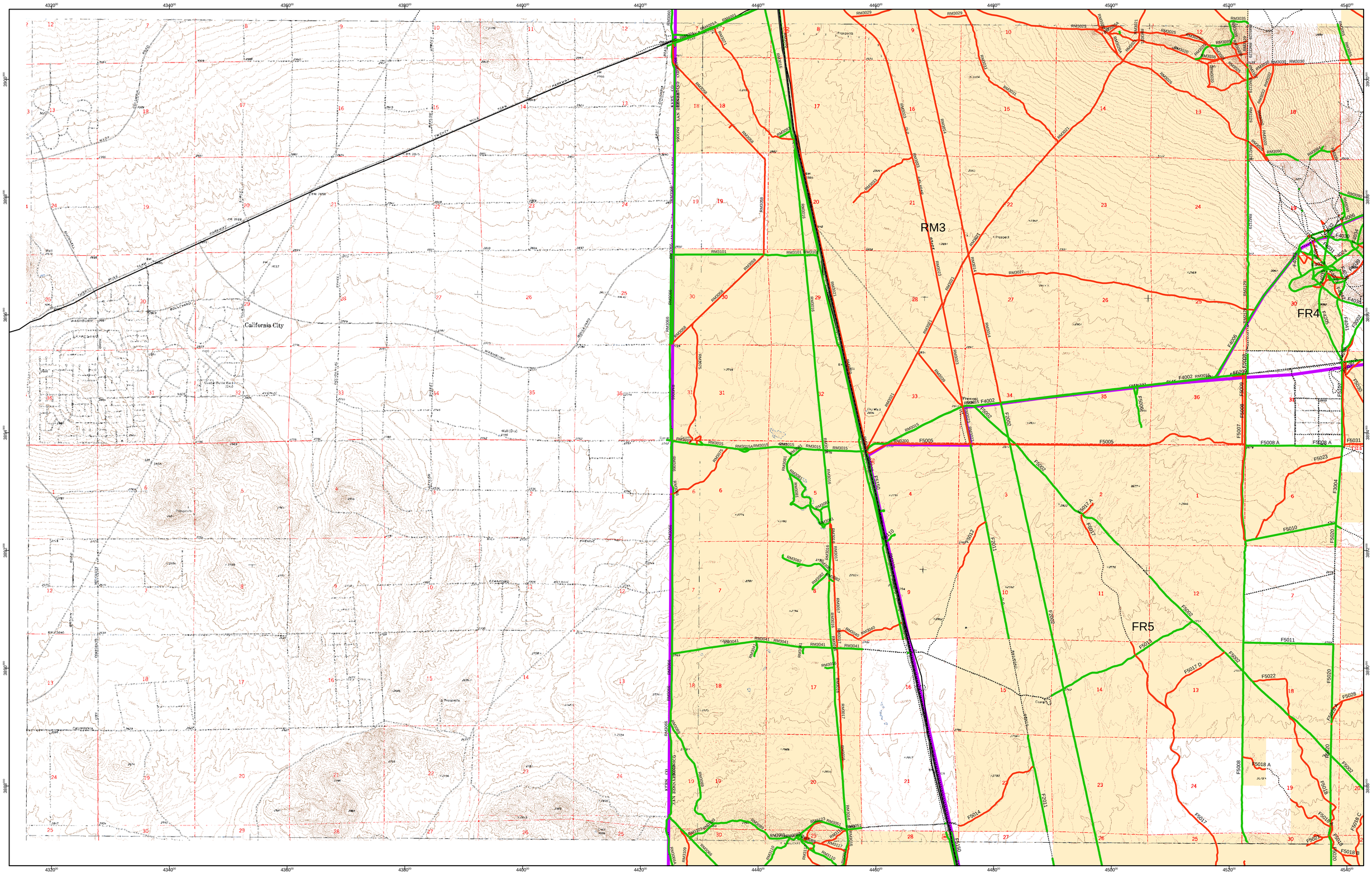
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

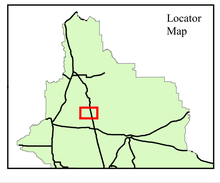
Proposed Action - West Mojave Route Designation Program

Map 30B - Boron NW, Boron NE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 31 - Fremont Peak, Bird Spring

RM3

RM4

RM4

SU2

FR4

FR5

FR3

GRAVEL HILLS

GRAVEL HILLS

Fremont Peak

Locator Map

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 32 - Opal Mountain, Superior Lake

SU2

SU3

SU5

FR3

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

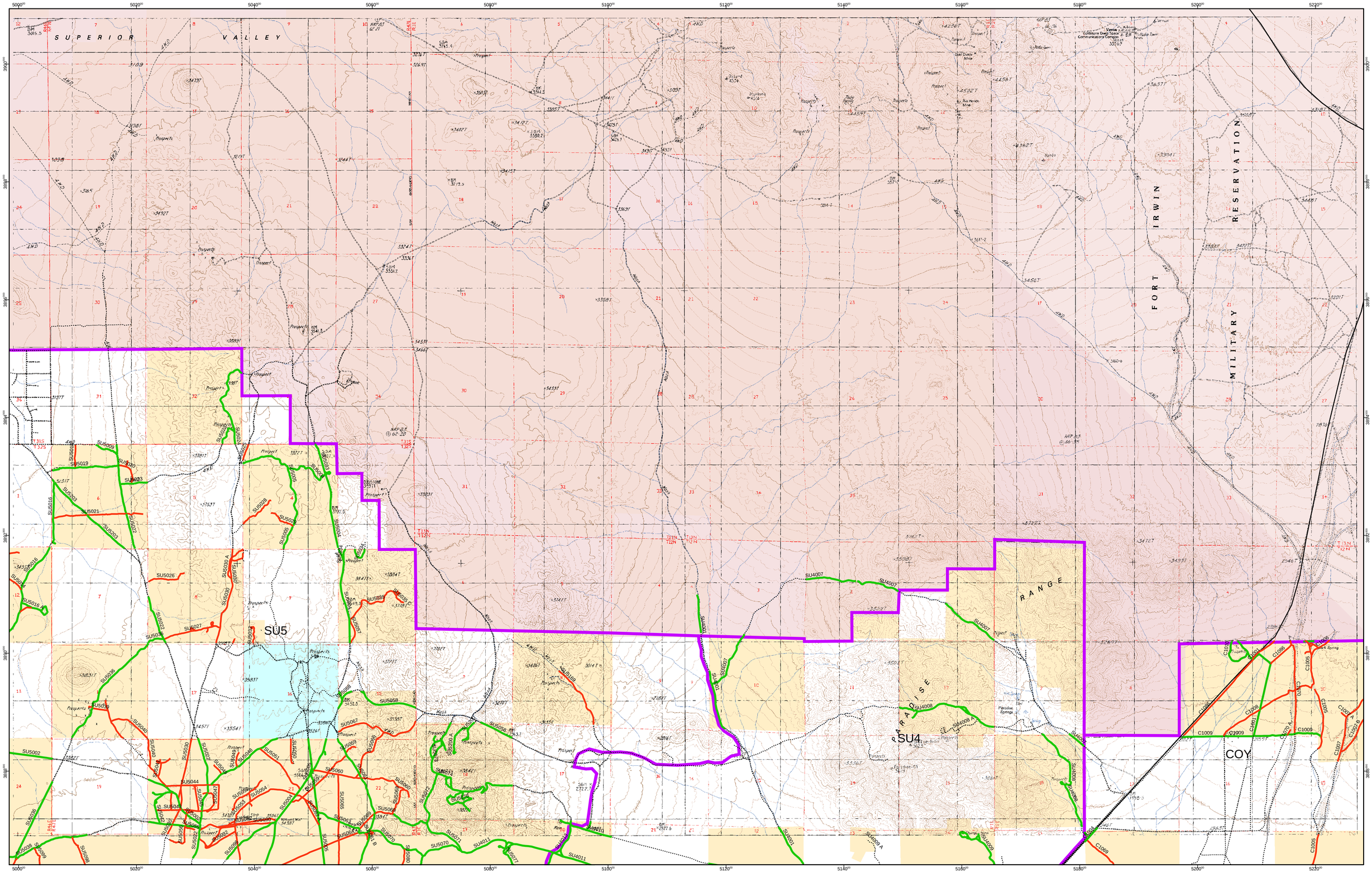
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

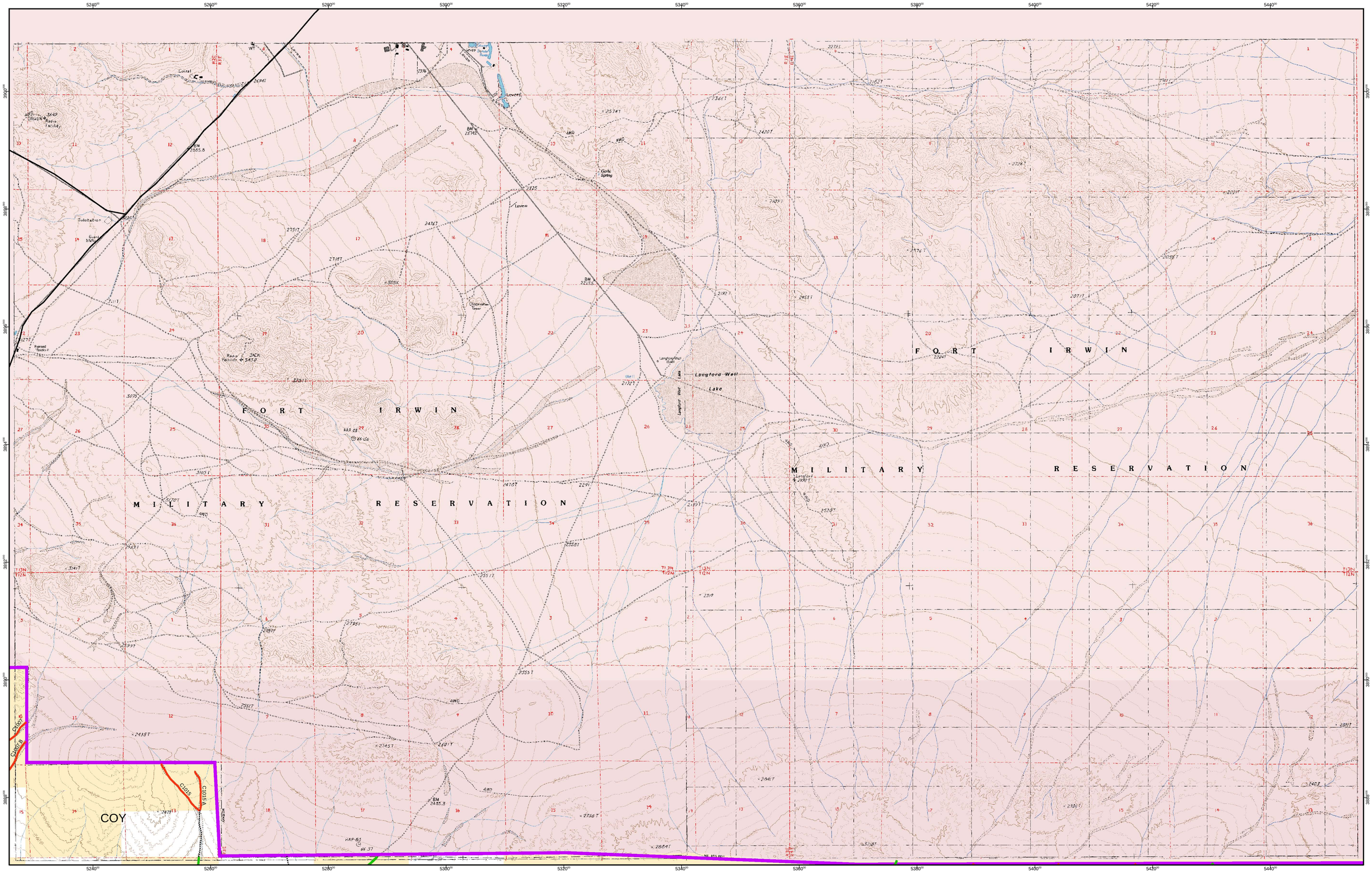
Proposed Action - West Mojave Route Designation Program

Map 33 - Williams Well, Paradise Range


SUPERIOR
VALLEY
FORT IRWIN
MILITARY
RESERVATION
PARADISE
RANGE
SU5
SU4
COY
SU5009
SU5019
SU5020
SU5023
SU5021
SU5016
SU5026
SU5027
SU5036
SU5040
SU5002
SU5044
SU5041
SU5042
SU5043
SU5045
SU5046
SU5047
SU5048
SU5049
SU5050
SU5051
SU5052
SU5053
SU5054
SU5055
SU5056
SU5057
SU5058
SU5059
SU5060
SU5061
SU5062
SU5063
SU5064
SU5065
SU5066
SU5067
SU5068
SU5069
SU5070
SU5071
SU5072
SU5073
SU5074
SU5075
SU5076
SU5077
SU5078
SU5079
SU5080
SU5081
SU5082
SU5083
SU5084
SU5085
SU5086
SU5087
SU5088
SU5089
SU5090
SU5091
SU5092
SU5093
SU5094
SU5095
SU5096
SU5097
SU5098
SU5099
SU5100
SU5101
SU5102
SU5103
SU5104
SU5105
SU5106
SU5107
SU5108
SU5109
SU5110
SU5111
SU5112
SU5113
SU5114
SU5115
SU5116
SU5117
SU5118
SU5119
SU5120
SU5121
SU5122
SU5123
SU5124
SU5125
SU5126
SU5127
SU5128
SU5129
SU5130
SU5131
SU5132
SU5133
SU5134
SU5135
SU5136
SU5137
SU5138
SU5139
SU5140
SU5141
SU5142
SU5143
SU5144
SU5145
SU5146
SU5147
SU5148
SU5149
SU5150
SU5151
SU5152
SU5153
SU5154
SU5155
SU5156
SU5157
SU5158
SU5159
SU5160
SU5161
SU5162
SU5163
SU5164
SU5165
SU5166
SU5167
SU5168
SU5169
SU5170
SU5171
SU5172
SU5173
SU5174
SU5175
SU5176
SU5177
SU5178
SU5179
SU5180
SU5181
SU5182
SU5183
SU5184
SU5185
SU5186
SU5187
SU5188
SU5189
SU5190
SU5191
SU5192
SU5193
SU5194
SU5195
SU5196
SU5197
SU5198
SU5199
SU5200
SU4001
SU4002
SU4003
SU4004
SU4005
SU4006
SU4007
SU4008
SU4008 A
SU4009
SU4009 A
SU4010
SU4011
SU4012
SU4013
SU4014
SU4015
SU4016
SU4017
SU4018
SU4019
SU4020
SU4021
SU4022
SU4023
SU4024
SU4025
SU4026
SU4027
SU4028
SU4029
SU4030
SU4031
SU4032
SU4033
SU4034
SU4035
SU4036
SU4037
SU4038
SU4039
SU4040
SU4041
SU4042
SU4043
SU4044
SU4045
SU4046
SU4047
SU4048
SU4049
SU4050
SU4051
SU4052
SU4053
SU4054
SU4055
SU4056
SU4057
SU4058
SU4059
SU4060
SU4061
SU4062
SU4063
SU4064
SU4065
SU4066
SU4067
SU4068
SU4069
SU4070
SU4071
SU4072
SU4073
SU4074
SU4075
SU4076
SU4077
SU4078
SU4079
SU4080
SU4081
SU4082
SU4083
SU4084
SU4085
SU4086
SU4087
SU4088
SU4089
SU4090
SU4091
SU4092
SU4093
SU4094
SU4095
SU4096
SU4097
SU4098
SU4099
SU4100
SU4101
SU4102
SU4103
SU4104
SU4105
SU4106
SU4107
SU4108
SU4109
SU4110
SU4111
SU4112
SU4113
SU4114
SU4115
SU4116
SU4117
SU4118
SU4119
SU4120
SU4121
SU4122
SU4123
SU4124
SU4125
SU4126
SU4127
SU4128
SU4129
SU4130
SU4131
SU4132
SU4133
SU4134
SU4135
SU4136
SU4137
SU4138
SU4139
SU4140
SU4141
SU4142
SU4143
SU4144
SU4145
SU4146
SU4147
SU4148
SU4149
SU4150
SU4151
SU4152
SU4153
SU4154
SU4155
SU4156
SU4157
SU4158
SU4159
SU4160
SU4161
SU4162
SU4163
SU4164
SU4165
SU4166
SU4167
SU4168
SU4169
SU4170
SU4171
SU4172
SU4173
SU4174
SU4175
SU4176
SU4177
SU4178
SU4179
SU4180
SU4181
SU4182
SU4183
SU4184
SU4185
SU4186
SU4187
SU4188
SU4189
SU4190
SU4191
SU4192
SU4193
SU4194
SU4195
SU4196
SU4197
SU4198
SU4199
SU4200
SU4201
SU4202
SU4203
SU4204
SU4205
SU4206
SU4207
SU4208
SU4209
SU4210
SU4211
SU4212
SU4213
SU4214
SU4215
SU4216
SU4217
SU4218
SU4219
SU4220
SU4221
SU4222
SU4223
SU4224
SU4225
SU4226
SU4227
SU4228
SU4229
SU4230
SU4231
SU4232
SU4233
SU4234
SU4235
SU4236
SU4237
SU4238
SU4239
SU4240
SU4241
SU4242
SU4243
SU4244
SU4245
SU4246
SU4247
SU4248
SU4249
SU4250
SU4251
SU4252
SU4253
SU4254
SU4255
SU4256
SU4257
SU4258
SU4259
SU4260
SU4261
SU4262
SU4263
SU4264
SU4265
SU4266
SU4267
SU4268
SU4269
SU4270
SU4271
SU4272
SU4273
SU4274
SU4275
SU4276
SU4277
SU4278
SU4279
SU4280
SU4281
SU4282
SU4283
SU4284
SU4285
SU4286
SU4287
SU4288
SU4289
SU4290
SU4291
SU4292
SU4293
SU4294
SU4295
SU4296
SU4297
SU4298
SU4299
SU4300
SU4301
SU4302
SU4303
SU4304
SU4305
SU4306
SU4307
SU4308
SU4309
SU4310
SU4311
SU4312
SU4313
SU4314
SU4315
SU4316
SU4317
SU4318
SU4319
SU4320
SU4321
SU4322
SU4323
SU4324
SU4325
SU4326
SU4327
SU4328
SU4329
SU4330
SU4331
SU4332
SU4333
SU4334
SU4335
SU4336
SU4337
SU4338
SU4339
SU4340
SU4341
SU4342
SU4343
SU4344
SU4345
SU4346
SU4347
SU4348
SU4349
SU4350
SU4351
SU4352
SU4353
SU4354
SU4355
SU4356
SU4357
SU4358
SU4359
SU4360
SU4361
SU4362
SU4363
SU4364
SU4365
SU4366
SU4367
SU4368
SU4369
SU4370
SU4371
SU4372
SU4373
SU4374
SU4375
SU4376
SU4377
SU4378
SU4379
SU4380
SU4381
SU4382
SU4383
SU4384
SU4385
SU4386
SU4387
SU4388
SU4389
SU4390
SU4391
SU4392
SU4393
SU4394
SU4395
SU4396
SU4397
SU4398
SU4399
SU4400
SU4401
SU4402
SU4403
SU4404
SU4405
SU4406
SU4407
SU4408
SU4409
SU4410
SU4411
SU4412
SU4413
SU4414
SU4415
SU4416
SU4417
SU4418
SU4419
SU4420
SU4421
SU4422
SU4423
SU4424
SU4425
SU4426
SU4427
SU4428
SU4429
SU4430
SU4431
SU4432
SU4433
SU4434
SU4435
SU4436
SU4437
SU4438
SU4439
SU4440
SU4441
SU4442
SU4443
SU4444
SU4445
SU4446
SU4447
SU4448
SU4449
SU4450
SU4451
SU4452
SU4453
SU4454
SU4455
SU4456
SU4457
SU4458
SU4459
SU4460
SU4461
SU4462
SU4463
SU4464
SU4465
SU4466
SU4467
SU4468
SU4469
SU4470
SU4471
SU4472
SU4473
SU4474
SU4475
SU4476
SU4477
SU4478
SU4479
SU4480
SU4481
SU4482
SU4483
SU4484
SU4485
SU4486
SU4487
SU4488
SU4489
SU4490
SU4491
SU4492
SU4493
SU4494
SU4495
SU4496
SU4497
SU4498
SU4499
SU4500
SU4501
SU4502
SU4503
SU4504
SU4505
SU4506
SU4507
SU4508
SU4509
SU4510
SU4511
SU4512
SU4513
SU4514
SU4515
SU4516
SU4517
SU4518
SU4519
SU4520
SU4521
SU4522
SU4523
SU4524
SU4525
SU4526
SU4527
SU4528
SU4529
SU4530
SU4531
SU4532
SU4533
SU4534
SU4535
SU4536
SU4537
SU4538
SU4539
SU4540
SU4541
SU4542
SU4543
SU4544
SU4545
SU4546
SU4547
SU4548
SU4549
SU4550
SU4551
SU4552
SU4553
SU4554
SU4555
SU4556
SU4557
SU4558
SU4559
SU4560
SU4561
SU4562
SU4563
SU4564
SU4565
SU4566
SU4567
SU4568
SU4569
SU4570
SU4571
SU4572
SU4573
SU4574
SU4575
SU4576
SU4577
SU4578
SU4579
SU4580
SU4581
SU4582
SU4583
SU4584
SU4585
SU4586
SU4587
SU4588
SU4589
SU4590
SU4591
SU4592
SU4593
SU4594
SU4595
SU4596
SU4597
SU4598
SU4599
SU4600
SU4601
SU4602
SU4603
SU4604
SU4605
SU4606
SU4607
SU4608
SU4609
SU4610
SU4611
SU4612
SU4613
SU4614
SU4615
SU4616
SU4617
SU4618
SU4619
SU4620
SU4621
SU4622
SU4623
SU4624
SU4625
SU4626
SU4627
SU4628
SU4629
SU4630
SU4631
SU4632
SU4633
SU4634
SU4635
SU4636
SU4637
SU4638
SU4639
SU4640
SU4641
SU4642
SU4643
SU4644
SU4645
SU4646
SU4647
SU4648
SU4649
SU4650
SU4651
SU4652
SU4653
SU4654
SU4655
SU4656
SU4657
SU4658
SU4659
SU4660
SU4661
SU4662
SU4663
SU4664
SU4665
SU4666
SU4667
SU4668
SU4669
SU4670
SU4671
SU4672
SU4673
SU4674
SU4675
SU4676
SU4677
SU4678
SU4679
SU4680
SU4681
SU4682
SU4683
SU4684
SU4685
SU4686
SU4687
SU4688
SU4689
SU4690
SU4691
SU4692
SU4693
SU4694
SU4695
SU4696
SU4697
SU4698
SU4699
SU4700
SU4701
SU4702
SU4703
SU4704
SU4705
SU4706
SU4707
SU4708
SU4709
SU4710
SU4711
SU4712
SU4713
SU4714
SU4715
SU4716
SU4717
SU4718
SU4719
SU4720
SU4721
SU4722
SU4723
SU4724
SU4725
SU4726
SU4727
SU4728
SU4729
SU4730
SU4731
SU4732
SU4733
SU4734
SU4735
SU4736
SU4737
SU4738
SU4739
SU4740
SU4741
SU4742
SU4743
SU4744
SU4745
SU4746
SU4747
SU4748
SU4749
SU4750
SU4751
SU4752
SU4753
SU4754
SU4755
SU4756
SU4757
SU4758
SU4759
SU4760
SU4761
SU4762
SU4763
SU4764
SU4765
SU4766
SU4767
SU4768
SU4769
SU4770
SU4771
SU4772
SU4773
SU4774
SU4775
SU4776
SU4777
SU4778
SU4779
SU4780
SU4781
SU4782
SU4783
SU4784
SU4785
SU4786
SU4787
SU4788
SU4789
SU4790
SU4791
SU4792
SU4793
SU4794
SU4795
SU4796
SU4797
SU4798
SU4799
SU4800
SU4801
SU4802
SU4803
SU4804
SU4805
SU4806
SU4807
SU4808
SU4809
SU4810
SU4811
SU4812
SU4813
SU4814
SU4815
SU4816
SU4817
SU4818
SU4819
SU4820
SU4821
SU4822
SU4823
SU4824
SU4825
SU4826
SU4827
SU4828
SU4829
SU4830
SU4831
SU4832
SU4833
SU4834
SU4835
SU4836
SU4837
SU4838
SU4839
SU4840
SU4841
SU4842
SU4843
SU4844
SU4845
SU4846
SU4847
SU4848
SU4849
SU4850
SU4851
SU4852
SU4853
SU4854
SU4855
SU4856
SU4857
SU4858
SU4859
SU4860
SU4861
SU4862
SU4863
SU4864
SU4865
SU4866
SU4867
SU4868
SU4869
SU4870
SU4871
SU4872
SU4873
SU4874
SU4875
SU4876
SU4877
SU4878
SU4879
SU4880
SU4881
SU4882
SU4883
SU4884
SU4885
SU4886
SU4887
SU4888
SU4889
SU4890
SU4891
SU4892
SU4893
SU4894
SU4895
SU4896
SU4897
SU4898
SU4899
SU4900
SU4901
SU4902
SU4903
SU4904
SU4905
SU4906
SU4907
SU4908
SU4909
SU4910
SU4911
SU4912
SU4913
SU4914
SU4915
SU4916
SU4917
SU4918
SU4919
SU4920
SU4921
SU4922
SU4923
SU4924
SU4925
SU4926
SU4927
SU4928
SU4929
SU4930
SU4931
SU4932
SU4933
SU4934
SU4935
SU4936
SU4937
SU4938
SU4939
SU4940
SU4941
SU4942
SU4943
SU4944
SU4945
SU4946
SU4947
SU4948
SU4949
SU4950
SU4951
SU4952
SU4953
SU4954
SU4955
SU4956
SU4957
SU4958
SU4959
SU4960
SU4961
SU4962
SU4963
SU4964
SU4965
SU4966
SU4967
SU4968
SU4969
SU4970
SU4971
SU4972
SU4973
SU4974
SU4975
SU4976
SU4977
SU4978
SU4979
SU4980
SU4981
SU4982
SU4983
SU4984
SU4985
SU4986
SU4987
SU4988
SU4989
SU4990
SU4991
SU4992
SU4993
SU4994
SU4995
SU4996
SU4997
SU4998
SU4999
SU5000
SU5001
SU5002
SU5003
SU5004
SU5005
SU5006
SU5007
SU5008
SU5009
SU5010
SU5011
SU5012
SU5013
SU5014
SU5015
SU5016
SU5017
SU5018
SU5019
SU5020
SU5021
SU5022
SU5023
SU5024
SU5025
SU5026
SU5027
SU5028
SU5029
SU5030
SU5031
SU5032
SU5033
SU5034
SU5035
SU5036
SU5037
SU5038
SU5039
SU5040
SU5041
SU5042
SU5043
SU5044
SU5045
SU5046
SU5047
SU5048
SU5049
SU5050
SU5051
SU5052
SU5053
SU5054
SU5055
SU5056
SU5057
SU5058
SU5059
SU5060
SU5061
SU5062
SU5063
SU5064
SU5065
SU5066
SU5067
SU5068
SU5069
SU5070
SU5071
SU5072
SU5073
SU5074
SU5075
SU5076
SU5077
SU5078
SU5079
SU5080
SU5081
SU5082
SU5083
SU5084
SU5085
SU5086
SU5087
SU5088
SU5089
SU5090
SU5091
SU5092
SU5093
SU5094
SU5095
SU5096
SU5097
SU5098
SU5099
SU5100
SU5101
SU5102
SU5103
SU5104
SU5105
SU5106
SU5107
SU5108
SU5109
SU5110
SU5111
SU5112
SU5113
SU5114
SU5115
SU5116
SU5117
SU5118
SU5119
SU5120
SU5121
SU5122
SU5123
SU5124
SU5125
SU5126
SU5127
SU5128
SU5129
SU5130
SU5131
SU5132
SU5133
SU5134
SU5135
SU5136
SU5137
SU5138
SU5139
SU5140
SU5141
SU5142
SU5143
SU5144
SU5145
SU5146
SU5147
SU5148
SU5149
SU5150
SU5151
SU5152
SU5153
SU5154
SU5155
SU5156
SU5157
SU5158
SU5159
SU5160
SU5161
SU5162
SU5163
SU5164
SU5165
SU5166
SU5167
SU5168
SU5169
SU5170
SU5171
SU5172
SU5173
SU5174
SU5175
SU5176
SU5177
SU5178
SU5179
SU5180
SU5181
SU5182
SU5183
SU5184
SU5185
SU5186
SU5187
SU5188
SU5189
SU5190
SU5191
SU5192
SU5193
SU5194
SU5195
SU5196
SU5197
SU5198
SU5199
SU5200
SU4001
SU4002
SU4003
SU4004
SU4005
SU4006
SU4007
SU4008
SU4008 A
SU4009
SU4009 A
SU4010
SU4011
SU4012
SU4013
SU4014
SU4015
SU4016
SU4017
SU4018
SU4019
SU4020
SU4021
SU4022
SU4023
SU4024
SU4025
SU4026
SU4027
SU4028
SU4029
SU4030
SU4031
SU4032
SU4033
SU4034
SU4035
SU4036
SU4037
SU4038
SU4039
SU4040
SU4041
SU4042
SU4043
SU4044
SU4045
SU4046
SU4047
SU4048
SU4049
SU4050
SU4051
SU4052
SU4053
SU4054
SU4055
SU4056
SU4057
SU4058
SU4059
SU4060
SU4061
SU4062
SU4063
SU4064
SU4065
SU4066
SU4067
SU4068
SU4069
SU4070
SU4071
SU4072
SU4073
SU4074
SU4075
SU4076
SU4077
SU4078
SU4079
SU4080
SU4081
SU4082
SU4083
SU4084
SU4085
SU4086
SU4087
SU4088
SU4089
SU4090
SU4091
SU4092
SU4093
SU4094
SU4095
SU4096
SU4097
SU4098
SU4099
SU4100
SU4101
SU4102
SU4103
SU4104
SU4105
SU4106
SU4107
SU4108
SU4109
SU4110
SU4111
SU4112
SU4113
SU4114
SU4115
SU4116
SU4117
SU4118
SU4119
SU4120
SU4121
SU4122
SU4123
SU4124
SU4125
SU4126
SU4127
SU4128
SU4129
SU4130
SU4131
SU4132
SU4133
SU4134
SU4135
SU4136
SU4137
SU4138
SU4139
SU4140
SU4141
SU4142
SU4143
SU4144
SU4145
SU4146
SU4147
SU4148
SU4149
SU4150
SU4151
SU4152
SU4153
SU4154
SU4155
SU4156
SU4157
SU4158
SU4159
SU4160
SU4161
SU4162
SU4163
SU4164
SU4165
SU4166
SU4167
SU4168
SU4169
SU4170
SU4171
SU4172
SU4173
SU4174
SU4175
SU4176
SU4177
SU4178
SU4179
SU4180
SU4181
SU4182
SU4183
SU4184
SU4185
SU4186
SU4187
SU4188
SU4189
SU4190
SU4191
SU4192
SU4193
SU4194
SU4195
SU4196
SU4197
SU4198
SU4199
SU4200
SU4201
SU4202
SU4203
SU4204
SU4205
SU4206
SU4207
SU4208
SU4209
SU4210
SU4211
SU4212
SU4213
SU4214
SU4215
SU4216
SU4217
SU4218
SU4219
SU4220
SU4221
SU4222
SU4223
SU4224
SU4225
SU4226
SU4227
SU4228
SU4229
SU4230
SU4231
SU4232
SU4233
SU4234
SU4235
SU4236
SU4237
SU4238
SU4239
SU4240
SU4241
SU4242
SU4243
SU4244
SU4245
SU4246
SU4247
SU4248
SU4249
SU4250
SU4251
SU4252
SU4253
SU4254
SU4255
SU4256
SU4257
SU4258
SU4259
SU4260
SU4261
SU4262
SU4263
SU4264
SU4265
SU4266
SU4267
SU4268
SU4269
SU4270
SU4271
SU4272
SU4273
SU4274
SU4275
SU4276
SU4277
SU4278
SU4279
SU4280
SU4281
SU4282
SU4283
SU4284
SU4285
SU4286
SU4287
SU4288
SU4289
SU4290
SU4291
SU4292
SU4293
SU4294
SU4295
SU4296
SU4297
SU4298
SU4299
SU4300
SU4301
SU4302
SU4303
SU4304
SU4305
SU4306
SU4307
SU4308
SU4309
SU4310
SU4311
SU4312
SU4313
SU4314
SU4315
SU4316
SU4317
SU4318
SU4319
SU4320
SU4321
SU4322
SU4323
SU4324
SU4325
SU4326
SU4327
SU4328
SU4329
SU4330
SU4331
SU4332
SU4333
SU4334
SU4335
SU4336
SU4337
SU4338
SU4339
SU4340
SU4341
SU4342
SU4343
SU4344
SU4345
SU4346
SU4347
SU4348
SU4349
SU4350
SU4351
SU4352
SU4353
SU4354
SU4355
SU4356
SU4357
SU4358
SU4359
SU4360
SU4361
SU4362
SU4363
SU4364
SU4365
SU4366
SU4367
SU4368
SU4369
SU4370
SU4371
SU4372
SU4373
SU4374
SU4375
SU4376
SU4377
SU4378
SU4379
SU4380
SU4381
SU4382
SU4383
SU4384
SU4385
SU4386
SU4387
SU4388
SU4389
SU4390
SU4391
SU4392
SU4393
SU4394
SU4395
SU4396
SU4397
SU4398
SU4399
SU4400
SU4401
SU4402
SU4403
SU4404
SU4405
SU4406
SU4407
SU4408
SU4409
SU4410
SU4411
SU4412
SU4413
SU4414
SU4415
SU4416
SU4417
SU4418
SU4419
SU4420
SU4421
SU4422
SU4423
SU4424
SU4425
SU4426
SU4427
SU4428
SU4429
SU4430
SU4431
SU4432
SU4433
SU4434
SU4435
SU4436
SU4437
SU4438
SU4439
SU4440
SU4441
SU4442
SU4443
SU4444
SU4445
SU4446
SU4447
SU4448
SU4449
SU4450
SU4451
SU4452
SU4453
SU4454
SU4455
SU4456
SU4457
SU4458
SU4459
SU4460
SU4461
SU4462
SU4463
SU4464
SU4465
SU4466
SU4467
SU4468
SU4469
SU4470
SU4471
SU4472
SU4473
SU4474
SU4475
SU4476
SU4477
SU4478
SU4479
SU4480
SU4481
SU4482
SU4483
SU4484
SU4485
SU4486
SU4487
SU4488
SU4489
SU4490
SU4491
SU4492
SU4493
SU4494
SU4495
SU4496
SU4497
SU4498
SU4499
SU4500
SU4501
SU4502
SU4503
SU4504
SU4505
SU4506
SU4507
SU4508
SU4509
SU4510
SU4511
SU4512
SU4513
SU4514
SU4515
SU4516
SU4517
SU4518
SU4519
SU4520
SU4521
SU4522
SU4523
SU4524
SU4525
SU4526
SU4527
SU4528
SU4529
SU4530
SU4531
SU4532
SU4533
SU4534
SU4535
SU4536
SU4537
SU4538
SU4539
SU4540
SU4541
SU4542
SU4543
SU4544
SU4545
SU4546
SU4547
SU4548
SU4549
SU4550
SU4551
SU4552
SU4553
SU4554
SU4555
SU4556
SU4557
SU4558
SU4559
SU4560
SU4561
SU4562
SU4563
SU4564
SU4565
SU4566
SU4567
SU4568
SU4569
SU4570
SU4571
SU4572
SU4573
SU4574
SU4575
SU4576
SU4577
SU4578
SU4579
SU4580
SU4581
SU4582
SU4583
SU4584
SU4585
SU4586
SU4587
SU4588
SU4589
SU4590
SU4591
SU4592
SU4593
SU4594
SU4595
SU4596
SU4597
SU4598
SU4599
SU4600
SU4601
SU4602
SU4603
SU4604
SU4605
SU4606
SU4607
SU4608
SU4609
SU4610
SU4611
SU4612
SU4613
SU4614
SU4615
SU4616
SU4617
SU4618
SU4619
SU4620
SU4621
SU4622
SU4623
SU4624
SU4625
SU4626
SU4627
SU4628
SU4629
SU4630
SU4631
SU4632
SU4633
SU4634
SU4635
SU4636
SU4637
SU4638
SU4639
SU4640
SU4641
SU4642
SU4643
SU4644
SU4645
SU4646
SU4647
SU4648
SU4649
SU4650
SU4651
SU4652
SU4653
SU4654
SU4655
SU4656
SU4657
SU4658
SU4659
SU4660
SU4661
SU4662
SU4663
SU4664
SU4665
SU4666
SU4667
SU4668
SU4669
SU4670
SU4671
SU4672
SU4673
SU4674
SU4675
SU4676
SU4677
SU4678
SU4679
SU4680
SU4681
SU4682
SU4683
SU4684
SU4685
SU4686
SU4687
SU4688
SU4689
SU4690
SU4691
SU4692
SU4693
SU4694
SU4695
SU4696
SU4697
SU4698
SU4699
SU4700
SU4701
SU4702
SU4703
SU4704
SU4705
SU4706
SU4707
SU4708
SU4709
SU4710
SU4711
SU4712
SU4713
SU4714
SU4715
SU4716
SU4717
SU4718
SU4719
SU4720
SU4721
SU4722
SU4723
SU4724
SU4725
SU4726
SU4727
SU4728
SU4729
SU4730
SU4731
SU4732
SU4733
SU4734
SU4735
SU4736
SU4737
SU4738
SU4739
SU4740
SU4741
SU4742
SU4743
SU4744
SU4745
SU4746
SU4747
SU4748
SU4749
SU4750
SU4751
SU4752
SU4753
SU4754
SU4755
SU4756
SU4757
SU4758
SU4759
SU4760
SU4761
SU4762
SU4763
SU4764
SU4765
SU4766
SU4767
SU4768
SU4769
SU4770
SU4771
SU4772
SU4773
SU4774
SU4775
SU4776
SU4777
SU4778
SU4779
SU4780
SU4781
SU4782
SU4783
SU4784
SU4785
SU4786
SU4787
SU4788
SU4789
SU4790
SU4791
SU4792
SU4793
SU4794
SU4795
SU4796
SU4797
SU4798
SU4799
SU4800
SU4801
SU4802
SU4803
SU4804
SU4805
SU4806
SU4807
SU4808
SU4809
SU4810
SU4811
SU4812
SU4813
SU4814
SU4815
SU4816
SU4817
SU4818
SU4819
SU4820
SU4821
SU4822
SU4823
SU4824
SU4825
SU4826
SU4827
SU4828
SU4829
SU4830
SU4831
SU4832
SU4833
SU4834
SU4835
SU4836
SU4837
SU4838
SU4839
SU4840
SU4841
SU4842
SU4843
SU4844
SU4845
SU4846
SU4847
SU4848
SU4849
SU4850
SU4851
SU4852
SU4853
SU4854
SU4855
SU4856
SU4857
SU4858
SU4859
SU4860
SU4861
SU4862
SU4863
SU4864
SU4865
SU4866
SU4867
SU4868
SU4869
SU4870
SU4871
SU4872
SU4873
SU4874
SU4875
SU4876
SU4877
SU4878
SU4879
SU4880
SU4881
SU4882
SU4883
SU4884
SU4885
SU4886
SU4887
SU4888
SU4889
SU4890
SU4891
SU4892
SU4893
SU4894
SU4895
SU4896
SU4897
SU4898
SU4899
SU4900
SU4901
SU4902
SU4903
SU4904
SU4905
SU4906
SU4907
SU4908
SU4909
SU4910
SU4911
SU4912
SU4913
SU4914
SU4915
SU4916
SU4917
SU4918
SU4919
SU4920
SU4921
SU4922
SU4923
SU4924
SU4925
SU4926
SU4927
SU4928
SU4929
SU4930
SU4931
SU4932
SU4933
SU4934
SU4935
SU4936
SU4937
SU4938
SU4939
SU4940
SU4941
SU4942
SU4943
SU4944
SU4945
SU4946
SU4947
SU4948
SU4949
SU4950
SU4951
SU4952
SU4953
SU4954
SU4955
SU4956
SU4957
SU4958
SU4959
SU4960
SU4961
SU4962
SU4963
SU4964
SU4965
SU4966
SU4967
SU4968
SU4969
SU4970
SU4971
SU4972
SU4973
SU4974
SU4975
SU4976
SU4977
SU4978
SU4979
SU4980
SU4981
SU4982
SU4983
SU4984
SU4985
SU4986
SU4987
SU4988
SU4989
SU4990
SU4991
SU4992
SU4993
SU4994
SU4995
SU4996
SU4997
SU4998
SU4999
SU5000
SU5001
SU5002
SU5003
SU5004
SU5005
SU5006
SU5007
SU5008
SU5009
SU5010
SU5011
SU5012
SU5013
SU5014
SU5015
SU5016
SU5017
SU5018
SU5019
SU5020
SU5021
SU5022
SU5023
SU5024
SU5025
SU5026
SU5027
SU5028
SU5029
SU5030
SU5031
SU5032
SU5033
SU5034
SU5035
SU5036
SU5037
SU5038
SU5039
SU5040
SU5041
SU5042
SU5043
SU5044
SU5045
SU5046
SU5047
SU5048
SU5049
SU5050
SU5051
SU5052
SU5053
SU5054
SU5055
SU5056
SU5057
SU5058
SU5059
SU5060
SU5061
SU5062
SU5063
SU5064
SU5065
SU5066
SU5067
SU5068
SU5069
SU5070
SU5071
SU5072
SU5073
SU5074
SU5075
SU5076
SU5077
SU5078
SU5079
SU5080
SU5081
SU5082
SU5083
SU5084
SU5085
SU5086
SU5087
SU5088
SU5089
SU5090
SU5091
SU5092
SU5093
SU5094
SU5095
SU5096
SU5097
SU5098
SU5099
SU5100
SU5101
SU5102
SU5103
SU5104
SU5105
SU5106
SU5107
SU5108
SU5109
SU5110
SU5111
SU5112
SU5113
SU5114
SU5115
SU5116
SU5117
SU5118
SU5119
SU5120
SU5121
SU5122
SU5123
SU5124
SU5125
SU5126
SU5127
SU5128
SU5129
SU5130
SU5131
SU5132
SU5133
SU5134
SU5135
SU5136
SU5137
SU5138
SU5139
SU5140
SU5141
SU5142
SU5143
SU5144
SU5145
SU5146
SU5147
SU5148
SU5149
SU5150
SU5151
SU5152
SU5153
SU5154
SU5155
SU5156
SU5157
SU5158
SU5159
SU5160
SU5161
SU5162
SU5163
SU5164
SU5165
SU5166
SU5167
SU5168
SU5169
SU5170
SU5171
SU5172
SU5173
SU5174
SU5175
SU5176
SU5177
SU5178
SU5179
SU5180
SU5181
SU5182
SU5183
SU5184
SU5185
SU5186
SU5187
SU5188
SU5189
SU5190
SU5191
SU5192
SU5193
SU5194
SU5195
SU5196
SU5197
SU5198
SU5199
SU5200
SU4001
SU4002
SU4003
SU4004
SU4005
SU4006
SU4007
SU4008
SU4008 A
SU4009
SU4009 A
SU4010
SU4011
SU4012
SU4013
SU4014
SU4015
SU4016
SU4017
SU4018
SU4019
SU4020
SU4021
SU4022
SU4023
SU4024
SU4025
SU4026
SU4027
SU4028
SU4029
SU4030
SU4031
SU4032
SU4033
SU4034
SU4035
SU4036
SU4037
SU4038
SU4039
SU4040
SU4041
SU4042
SU4043
SU4044
SU4045
SU4046
SU4047
SU4048
SU4049
SU4050
SU4051
SU4052
SU4053
SU4054
SU4055
SU4056
SU4057
SU4058
SU4059
SU4060
SU4061
SU4062
SU4063
SU4064
SU4065
SU4066
SU4067
SU4068
SU4069
SU4070
SU4071
SU4072
SU4073
SU4074
SU4075
SU4076
SU4077
SU4078
SU4079
SU4080
SU4081
SU4082
SU4083
SU4084
SU4085
SU4086
SU4087
SU4088
SU4089
SU4090
SU4091
SU4092
SU4093
SU4094
SU4095
SU4096
SU4097
SU4098
SU4099
SU4100
SU4101
SU4102
SU4103
SU4104
SU4105
SU4106
SU4107
SU4108
SU4109
SU4110
SU4111
SU4112
SU4113
SU4114
SU4115
SU4116
SU4117
SU4118
SU4119
SU4120
SU4121
SU4122
SU4123
SU4124
SU4125
SU4126
SU4127
SU4128
SU4129
SU4130
SU4131
SU4132
SU4133
SU4134
SU4135
SU4136
SU4137
SU4138
SU4139
SU4140
SU4141
SU4142
SU4143
SU4144
SU4145
SU4146
SU4147
SU4148
SU4149
SU4150
SU4151
SU4152
SU4153
SU4154
SU4155
SU4156
SU4157
SU4158
SU4159
SU4160
SU4161
SU4162
SU4163
SU4164
SU4165
SU4166
SU4167
SU4168
SU4169
SU4170
SU4171
SU4172
SU4173
SU4174
SU4175
SU4176
SU4177
SU4178
SU4179
SU4180
SU4181
SU4182
SU4183
SU4184
SU4185
SU4186
SU4187
SU4188
SU4189
SU4190
SU4191
SU4192
SU4193
SU4194
SU4195
SU4196
SU4197
SU4198
SU4199
SU4200
SU4201
SU4202
SU4203
SU4204
SU4205
SU4206
SU4207
SU4208
SU4209
SU4210
SU4211
SU4212
SU4213
SU4214
SU4215
SU4216
SU4217
SU4218
SU4219
SU4220
SU4221
SU4222
SU4223
SU4224
SU4225
SU4226
SU4227
SU4228
SU4229
SU4230
SU4231
SU4232
SU4233
SU4234
SU4235
SU4236
SU4237
SU4238
SU4239
SU4240
SU4241
SU4242
SU4243
SU4244
SU4245
SU4246
SU4247
SU4248
SU4249
SU4250
SU4251
SU4252
SU4253
SU4254
SU4255
SU4256
SU4257
SU4258
SU4259
SU4260
SU4261
SU4262
SU4263
SU4264
SU4265
SU4266
SU4267
SU4268
SU4269
SU4270
SU4271
SU4272
SU4273
SU4274
SU4275
SU4276
SU4277
SU4278
SU4279
SU4280
SU4281
SU4282
SU4283
SU4284
SU4285
SU4286
SU4287
SU4288
SU4289
SU4290
SU4291
SU4292
SU4293
SU4294
SU4295
SU4296
SU4297
SU4298
SU4299
SU4300
SU4301
SU4302
SU4303
SU4304
SU4305
SU4306
SU4307
SU4308
SU4309
SU4310
SU4311
SU4312
SU4313
SU4314
SU4315
SU4316
SU4317
SU4318
SU4319
SU4320
SU4321
SU4322
SU4323
SU4324
SU4325
SU4326
SU4327
SU4328
SU4329
SU4330
SU4331
SU4332
SU4333
SU4334
SU4335
SU4336
SU4337
SU4338
SU4339
SU4340
SU4341
SU4342
SU4343
SU4344
SU4345
SU4346
SU4347
SU4348
SU4349
SU4350
SU4351
SU4352
SU4353
SU4354
SU4355
SU4356
SU4357
SU4358
SU4359
SU4360
SU4361
SU4362
SU4363
SU4364
SU4365
SU4366
SU4367
SU4368
SU4369
SU4370
SU4371
SU4372
SU4373
SU4374
SU4375
SU4376
SU4377
SU4378
SU4379
SU4380
SU4381
SU4382
SU4383
SU4384
SU4385
SU4386
SU4387
SU4388
SU4389
SU4390
SU4391
SU4392
SU4393
SU4394
SU4395
SU4396
SU4397
SU4398
SU4399
SU4400
SU4401
SU4402
SU4403
SU4404
SU4405
SU4406
SU4407
SU4408
SU4409
SU4410
SU4411
SU4412
SU4413
SU4414
SU4415
SU4416
SU4417
SU4418
SU4419
SU4420
SU4421
SU4422
SU4423
SU4424
SU4425
SU4426
SU4427
SU4428
SU4429
SU4430
SU4431
SU4432
SU4433
SU4434
SU4435
SU4436
SU4437
SU4438
SU4439
SU4440
SU4441
SU4442
SU4443
SU4444
SU4445
SU4446
SU4447
SU4448
SU4449
SU4450
SU4451
SU4452
SU4453
SU4454
SU4455
SU4456
SU4457
SU4458
SU4459
SU4460
SU4461
SU4462
SU4463
SU4464
SU4465
SU4466
SU4467
SU4468
SU4469
SU4470
SU4471
SU4472
SU4473
SU4474
SU4475
SU4476
SU4477
SU4478
SU4479
SU4480
SU4481
SU4482
SU4483
SU4484
SU4485
SU4486
SU4487
SU4488
SU4489
SU4490
SU4491
SU4492
SU4493
SU4494
SU4495
SU4496
SU4497
SU4498
SU4499
SU4500
SU4501
SU4502
SU4503
SU4504
SU4505
SU4506
SU4507
SU4508
SU4509
SU4510
SU4511
SU4512
SU4513
SU4514
SU4515
SU4516
SU4517
SU4518
SU4519
SU4520
SU4521
SU4522
SU4523
SU4524
SU4525
SU4526
SU4527
SU4528
SU4529
SU4530
SU4531
SU4532
SU4533
SU4534
SU4535
SU4536
SU4537
SU4538
SU4539
SU4540
SU4541
SU4542
SU4543
SU4544
SU4545
SU4546
SU4547
SU4548
SU4549
SU4550
SU4551
SU4552
SU4553
SU4554
SU4555
SU4556
SU4557
SU4558
SU4559
SU4560
SU4561
SU4562
SU4563
SU4564
SU4565
SU4566
SU4567
SU4568
SU4569
SU4570
SU4571
SU4572
SU4573
SU4574
SU4575
SU4576
SU4577
SU4578
SU4579
SU4580
SU4581
SU4582
SU4583
SU4584
SU4585
SU4586
SU4587
SU4588
SU

Proposed Action - West Mojave Route Designation Program

Map 34 - Langford Well, East of Langford Well



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

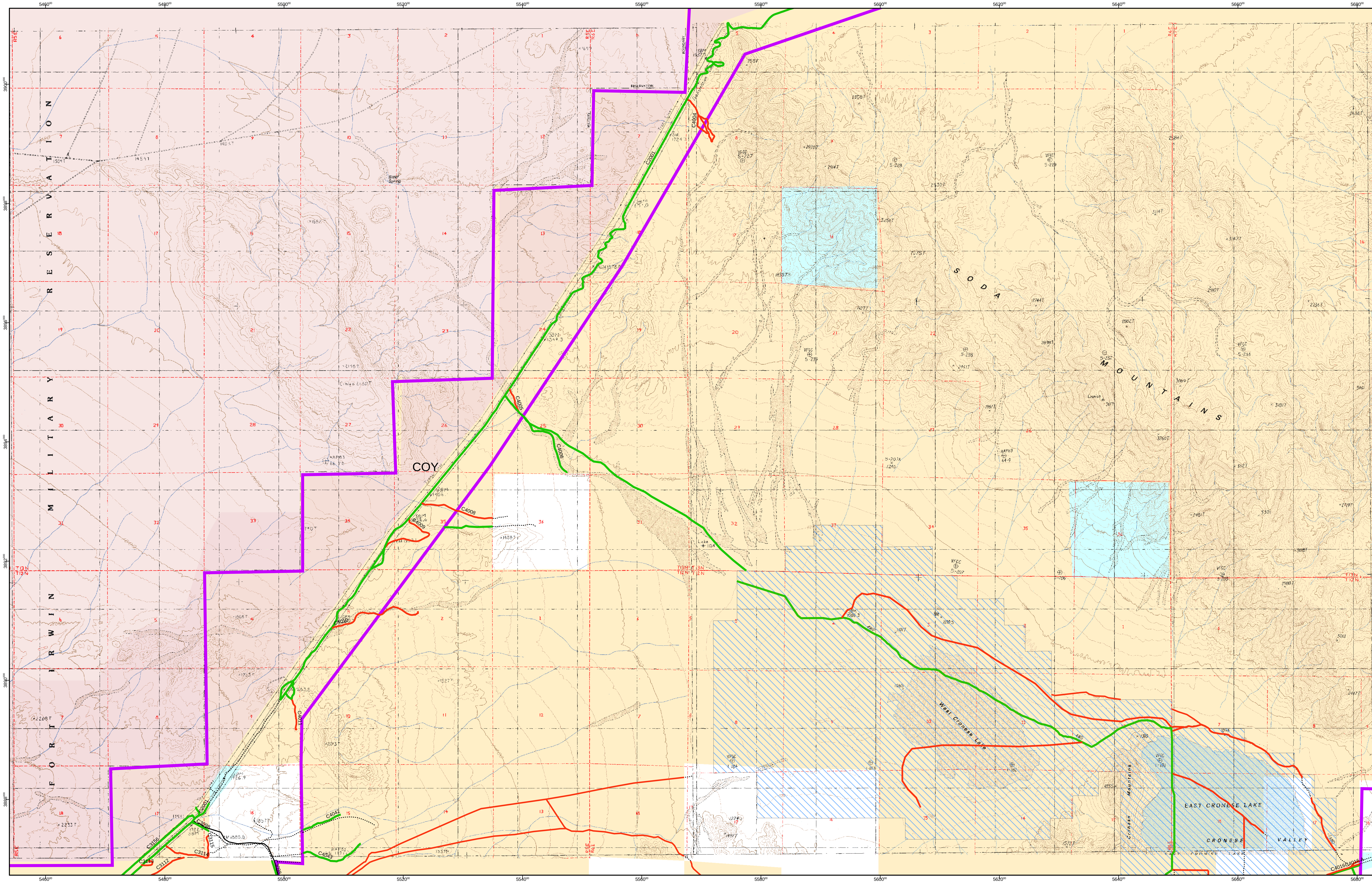
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

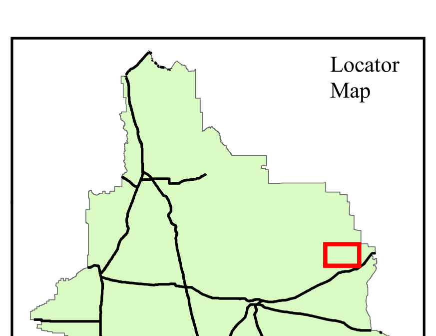
Proposed Action - West Mojave Route Designation Program

Map 35 - Bitter Spring, Cronese Lakes



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

Highways
Major Roads
WM Plan Boundary
BLM Wilderness
ACEC Designation Areas
Open Areas
MAZ Boundaries

Proposed Designations

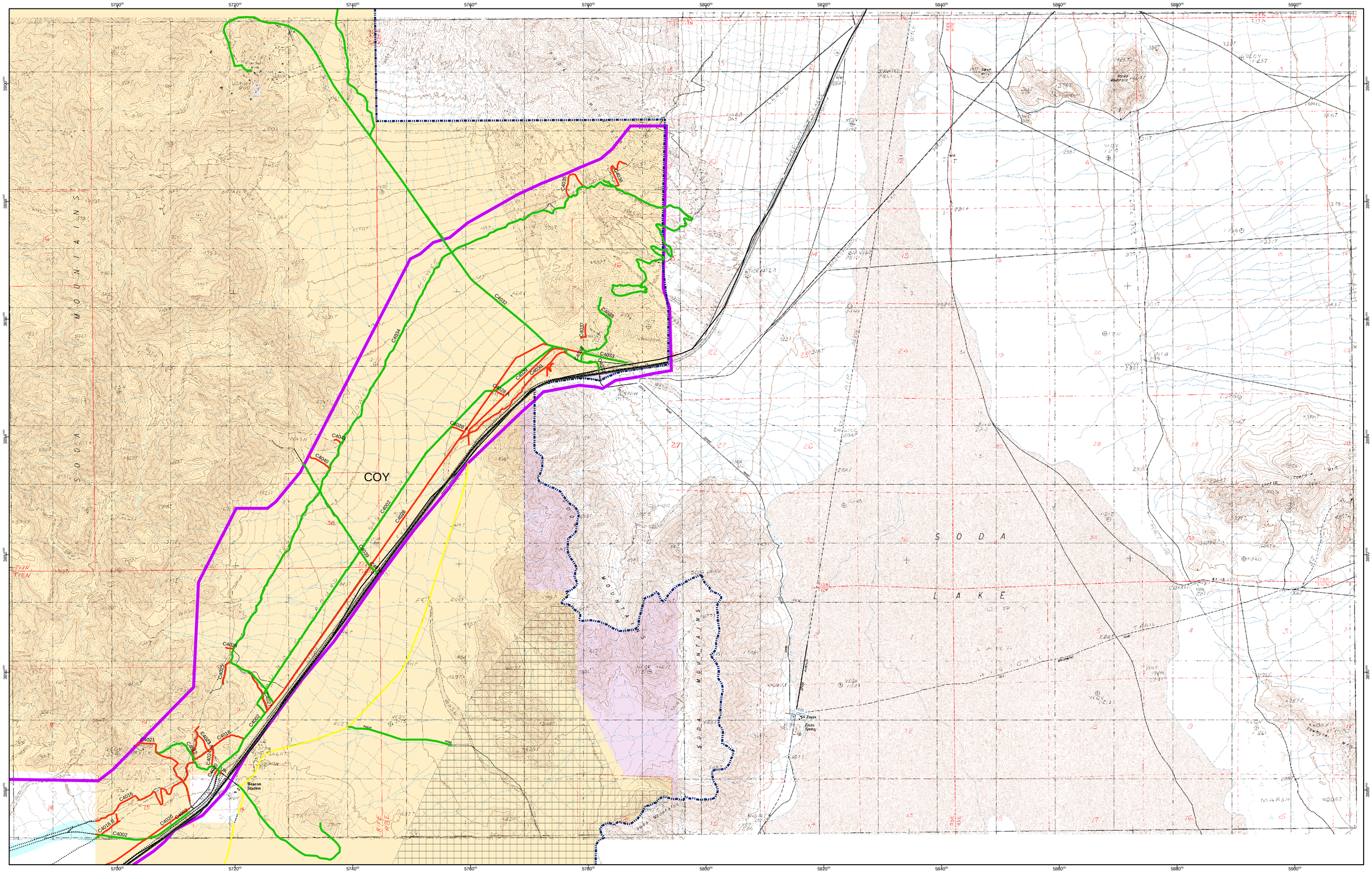
Open
Closed
Limited
Public Road
Undesignated or Unknown

Land Ownership

BLM
National Park Service
Military
State Lands
County/City/Regional
Private

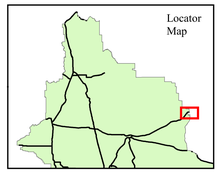
Proposed Action - West Mojave Route Designation Program

Map 36 - W of Soda Lake, Soda Lake N



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

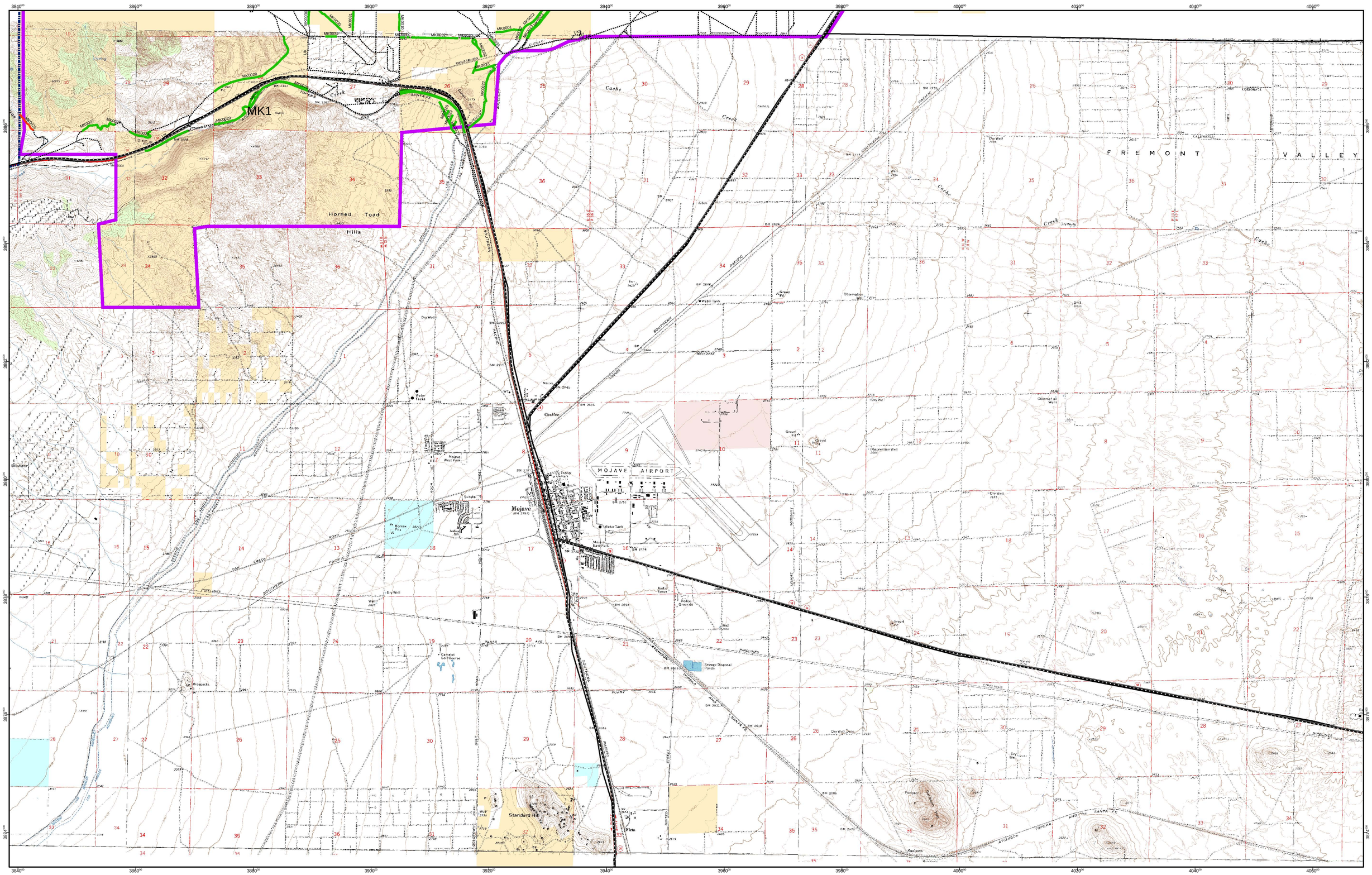
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

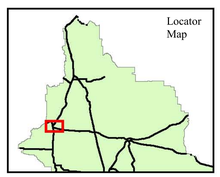
Proposed Action - West Mojave Route Designation Program

Map 37A - Monolith, Mojave, Sanborn



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

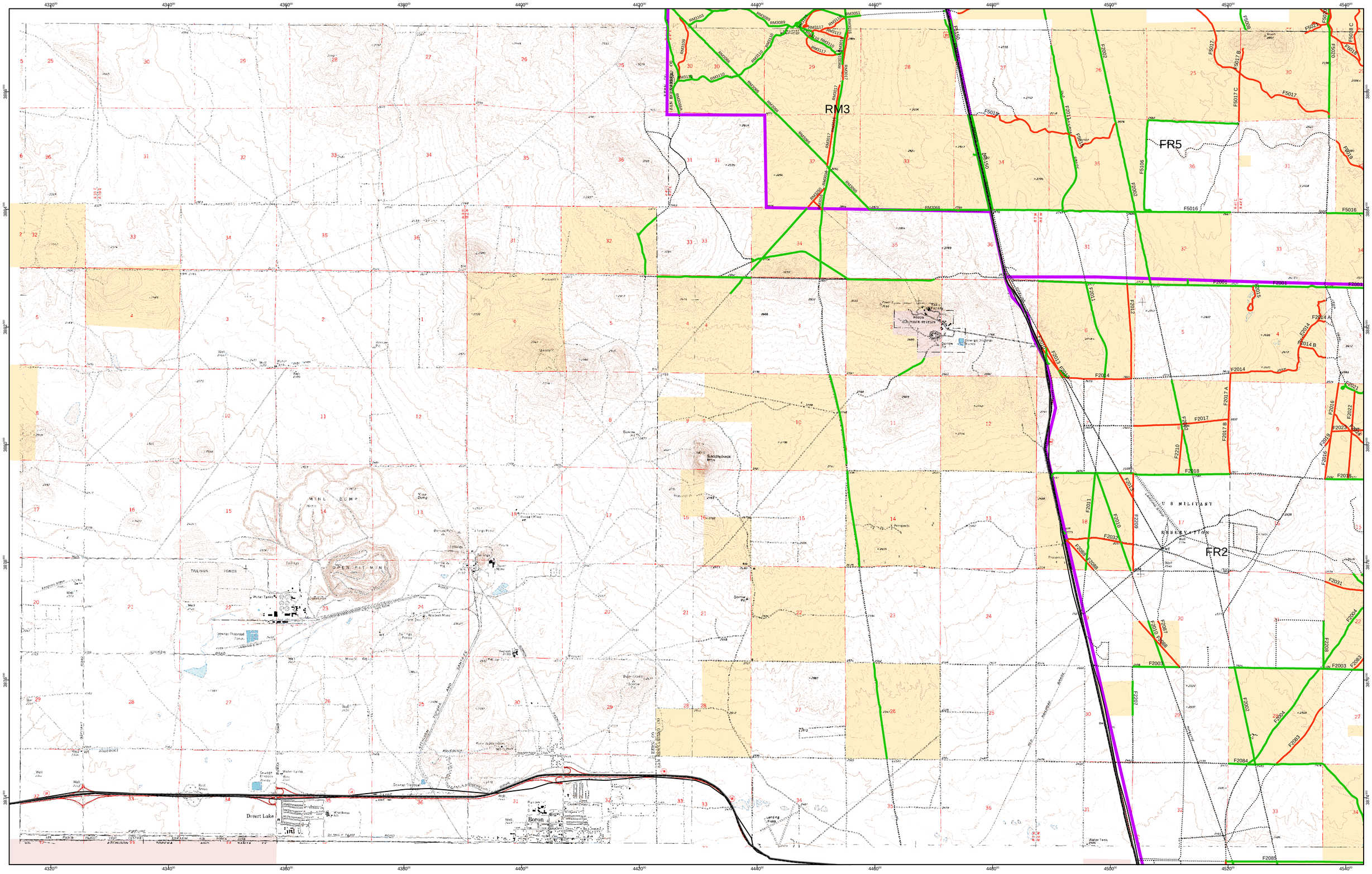
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

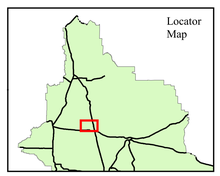
Proposed Action - West Mojave Route Designation Program

Map 37B - Boron, Saddleback Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 38 - The Buttes, Lockhart

FR5

FR3

FR2

FR1

FR1

HARPER LAKE

HARPER VALLEY

WATER VALLEY

THE BUTTES

Lockhart

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

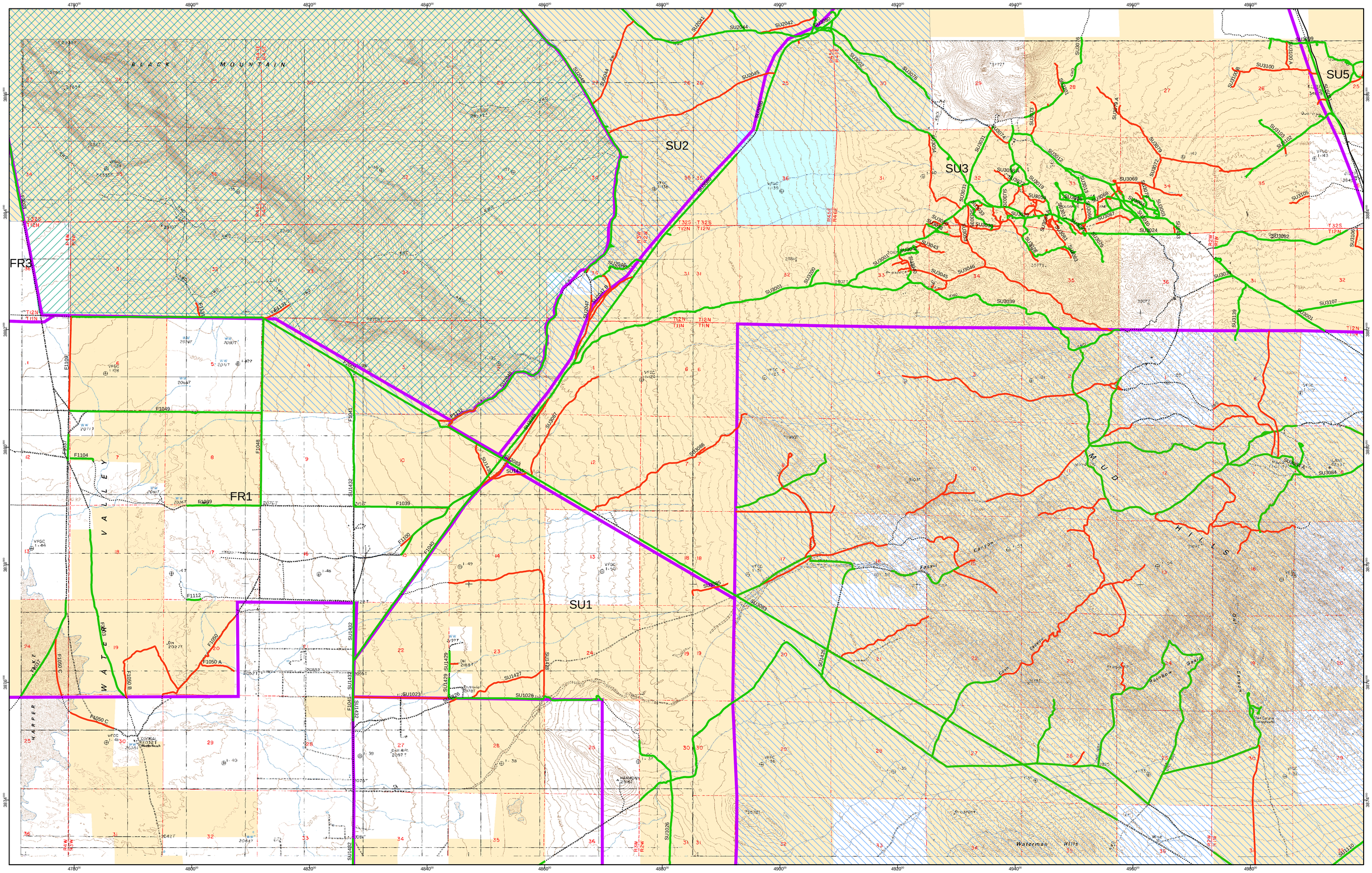
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 39 - Water Valley, Mud Hills



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

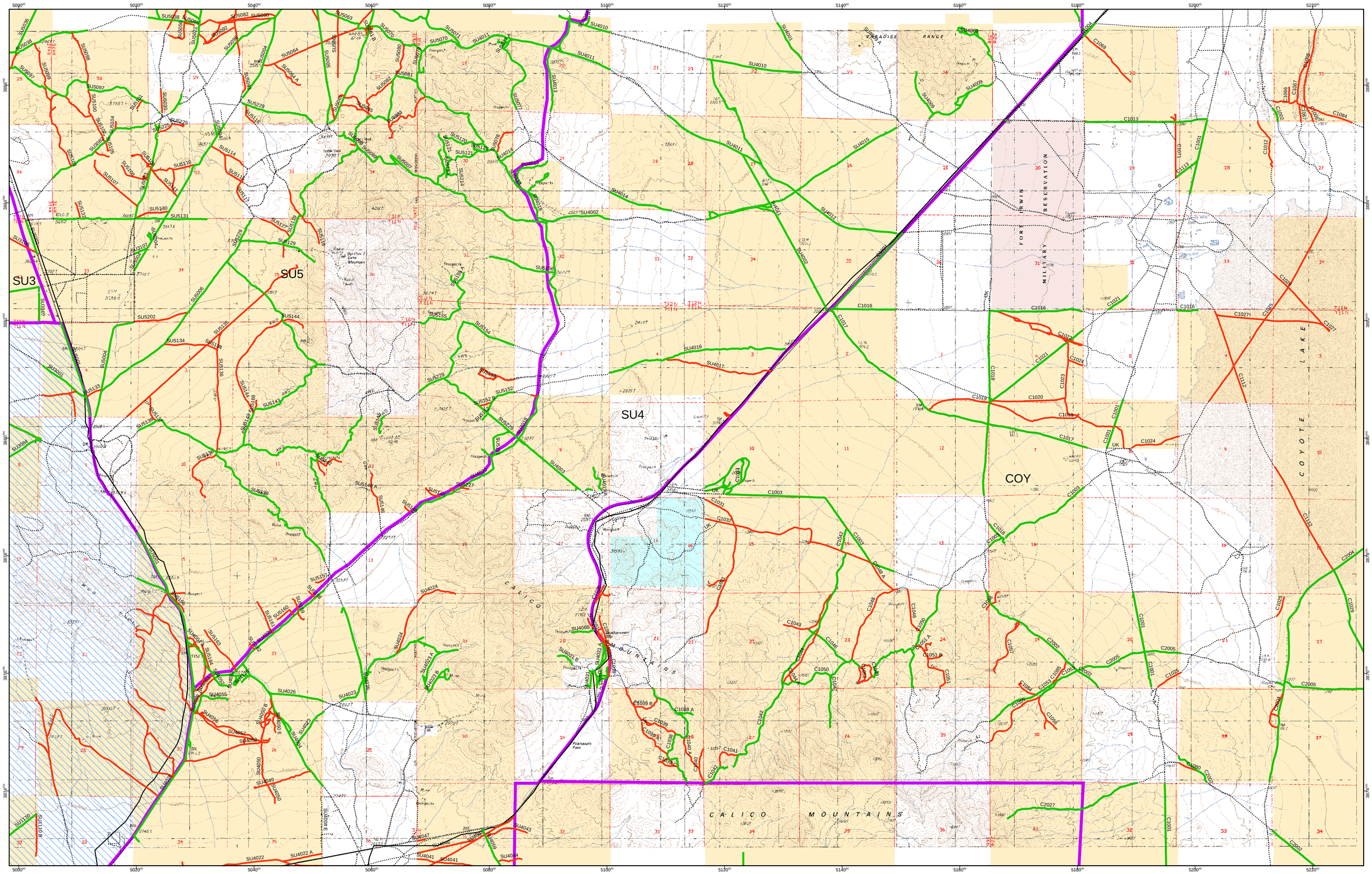
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 40 - Lane Mountain, Coyote Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003

SCALE 1 : 24,000

Miles: 0 0.5 1 2
Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

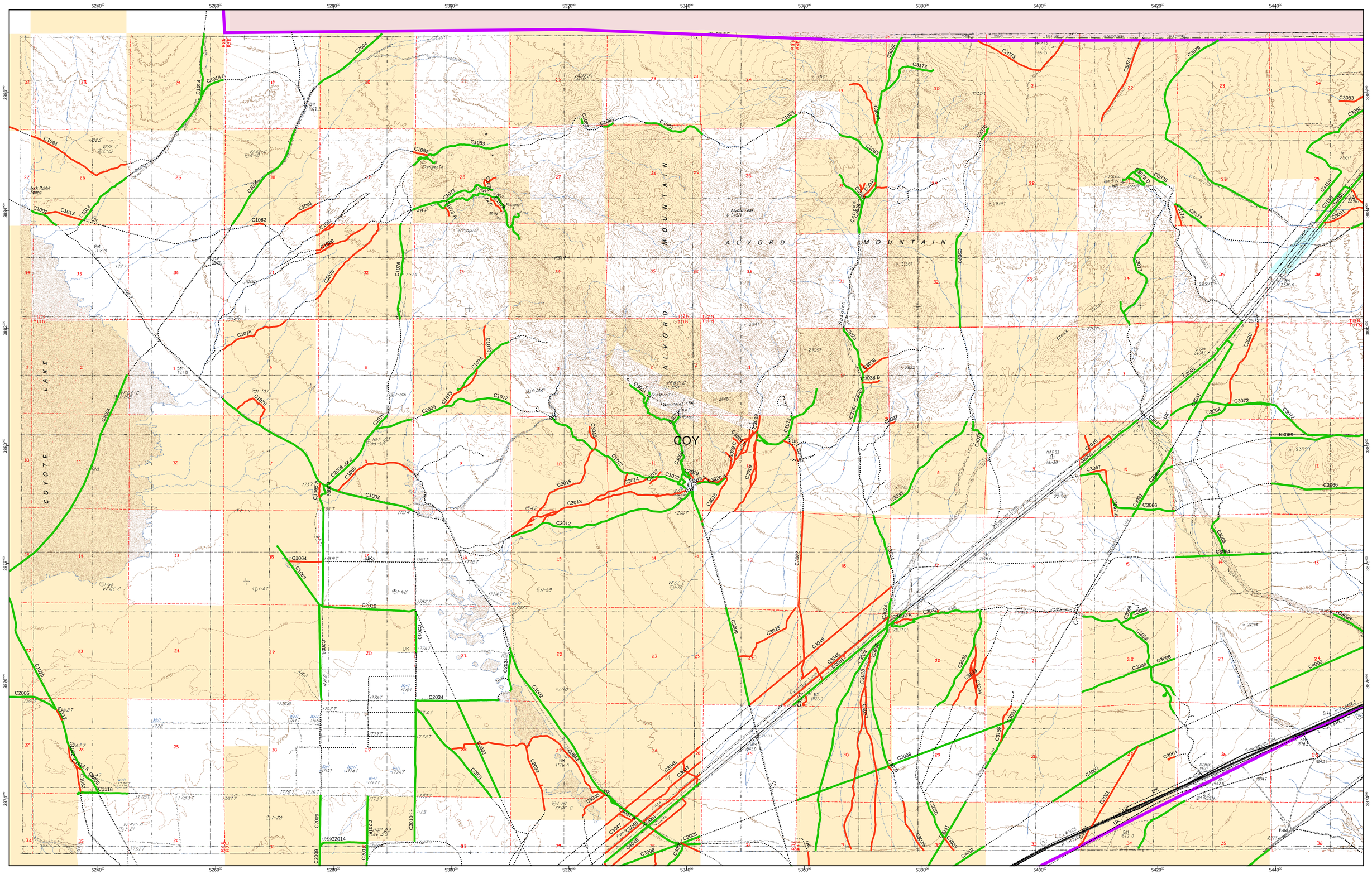
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

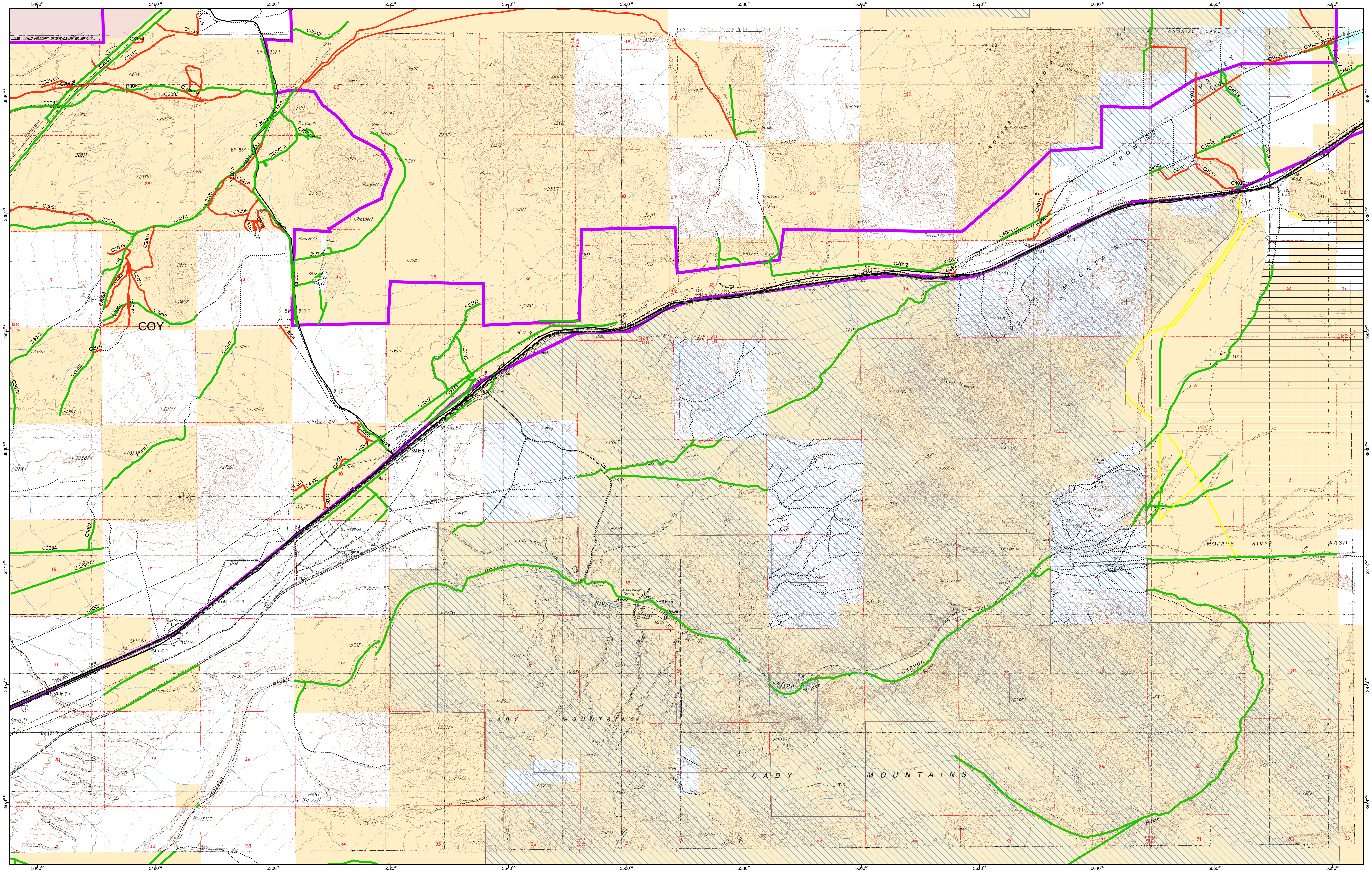
Proposed Action - West Mojave Route Designation Program

Map 41 - Alvord Mountain W, Alvord Mountain E


ALVORD MOUNTAIN
ALVORD MOUNTAIN
COY
LAKE
COYOTE
Jack Rabbit Spring
Alvord Peak
Stanislaus
Creek
Field
UK
C1064
C1002
C1013
C1014
C1014 A
C1082
C1081
C1083
C1077
C1077 A
C1079
C1078
C1074
C1073
C1072
C1072 A
C1065
C1065 A
C1062
C1062 A
C1116
C2004
C2009
C2009 A
C2010
C2010 A
C2014
C2015
C2005
C2034
C2032
C2031
C2033
C2029
C3172
C3024
C3073
C3074
C3079
C3083
C3082
C3078
C3078 D
C3155
C3081
C3041
C3041 A
C3038 B
C3038
C3037
C3036
C3035
C3034
C3033
C3032 A
C3032
C3031
C3030
C3029
C3028
C3027
C3026
C3025
C3023
C3022
C3021
C3020 A
C3020
C3019
C3018
C3017
C3016
C3015
C3014
C3013
C3012
C3009
C3008
C3045
C3046
C3047
C3048
C3001
C3061
C3068
G3072
C3072
C3069
C3067
C3066
C3065
C3064
C4002
C4001
C4045
C4046
C4047
C3039
C3040
C3042
C3043
C3044
C3049
C3050
C3051
C3052
C3053
C3054
C3055
C3056
C3057
C3058
C3059
C3060
C3062
C3063
C3070
C3071
C3075
C3076
C3077
C3080
C3084
C3085
C3086
C3087
C3088
C3089
C3090
C3091
C3092
C3093
C3094
C3095
C3096
C3097
C3098
C3099
C3100
C3101
C3102
C3103
C3104
C3105
C3106
C3107
C3108
C3109
C3110
C3111
C3112
C3113
C3114
C3115
C3116
C3117
C3118
C3119
C3120
C3121
C3122
C3123
C3124
C3125
C3126
C3127
C3128
C3129
C3130
C3131
C3132
C3133
C3134
C3135
C3136
C3137
C3138
C3139
C3140
C3141
C3142
C3143
C3144
C3145
C3146
C3147
C3148
C3149
C3150
C3151
C3152
C3153
C3154
C3156
C3157
C3158
C3159
C3160
C3161
C3162
C3163
C3164
C3165
C3166
C3167
C3168
C3169
C3170
C3171
C3173
C3174
C3175
C3176
C3177
C3178
C3179
C3180
C3181
C3182
C3183
C3184
C3185
C3186
C3187
C3188
C3189
C3190
C3191
C3192
C3193
C3194
C3195
C3196
C3197
C3198
C3199
C3200
C3201
C3202
C3203
C3204
C3205
C3206
C3207
C3208
C3209
C3210
C3211
C3212

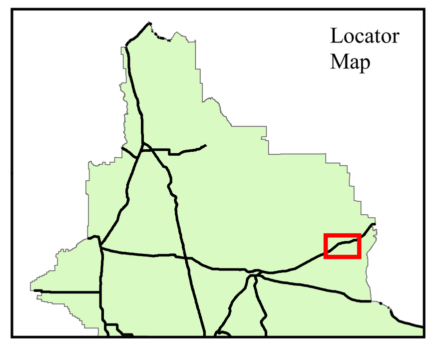
Proposed Action - West Mojave Route Designation Program

Map 42 - Dunn, Cave Mountain



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

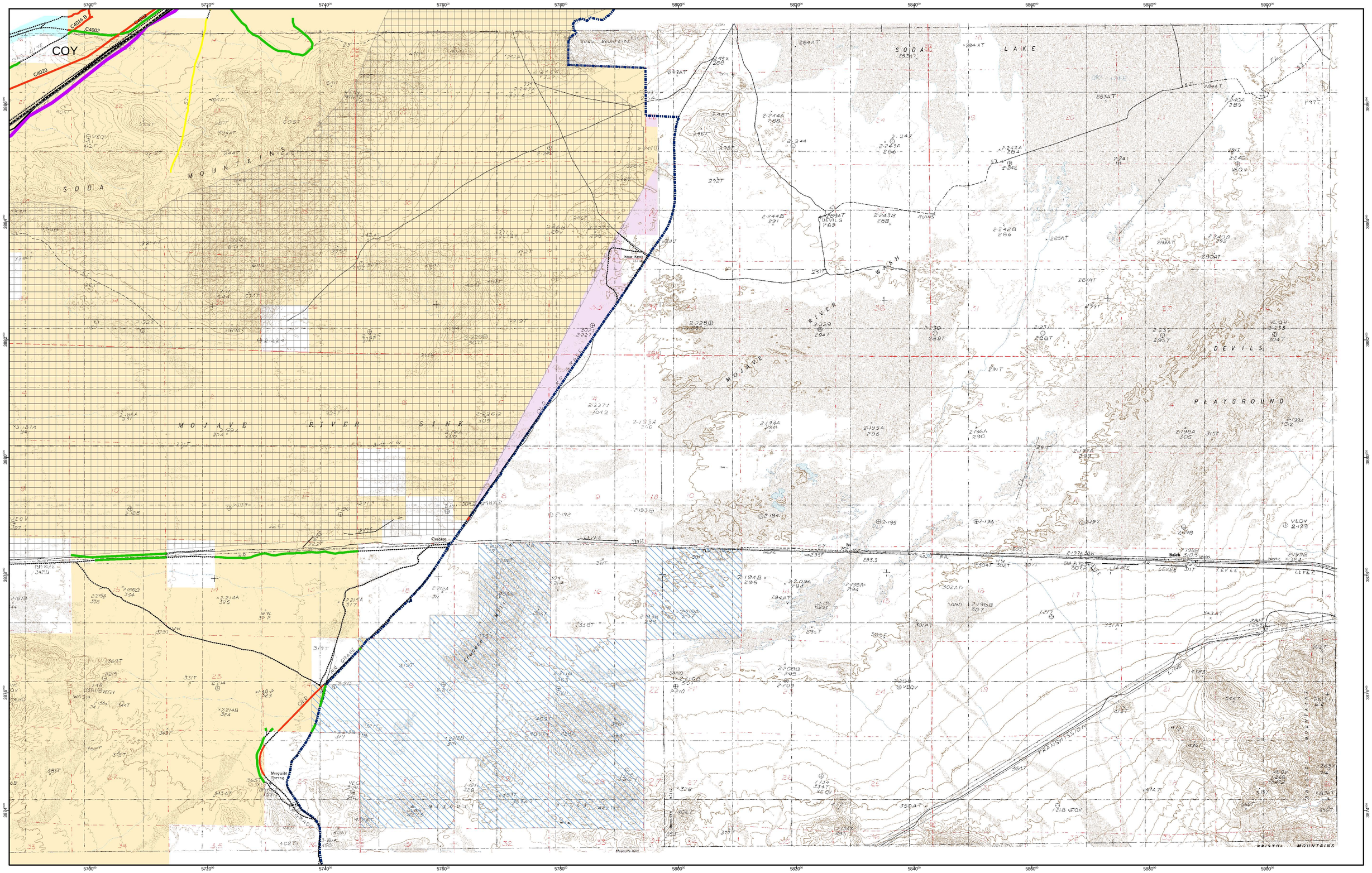
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

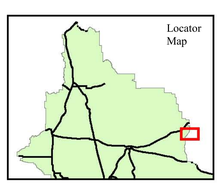
Proposed Action - West Mojave Route Designation Program

Map 43 - Crucero Hill, Soda Lake S



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... March 5, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACEC Designation Areas
- Open Areas
- MAZ Boundaries

Proposed Designations

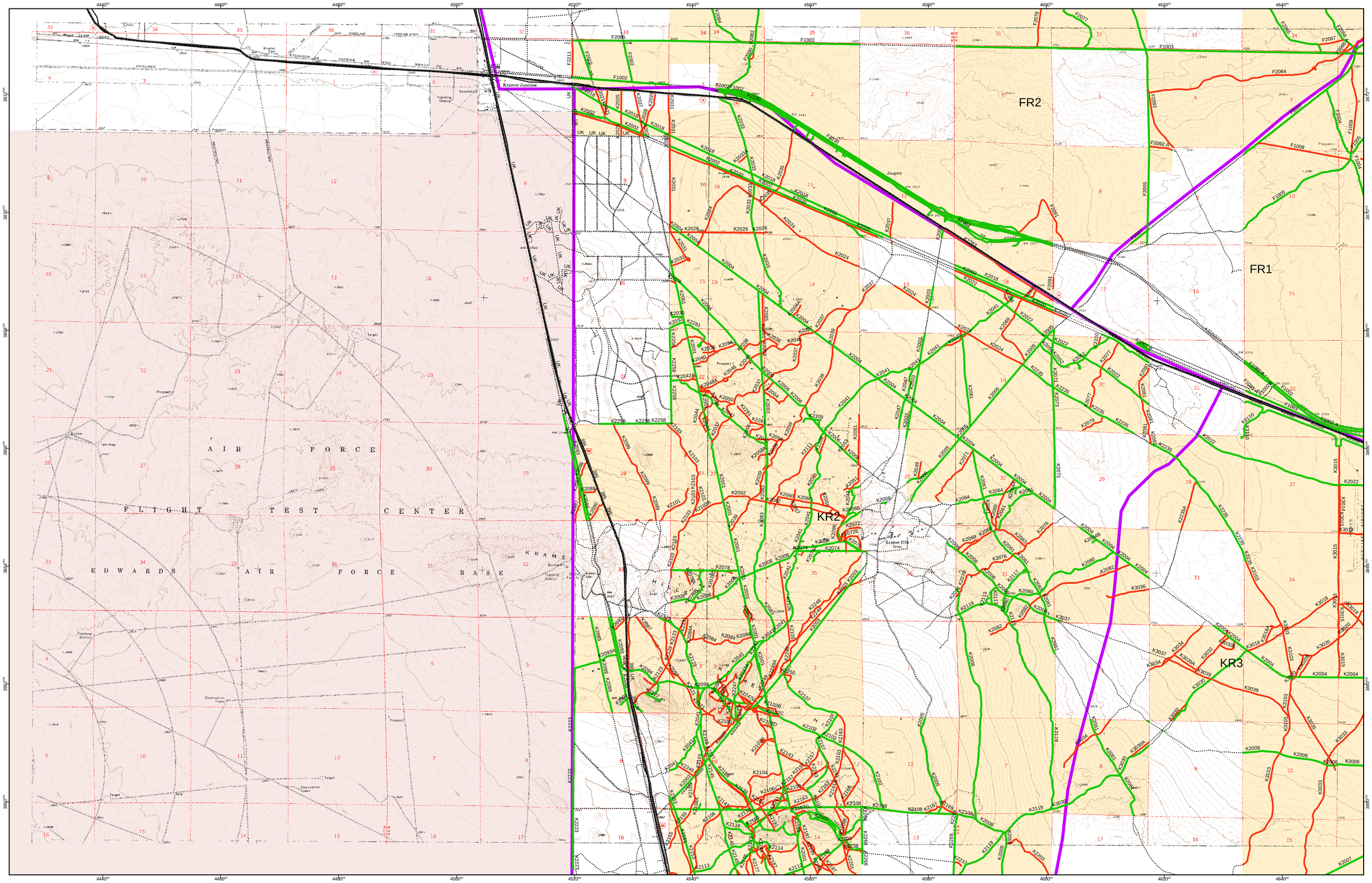
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

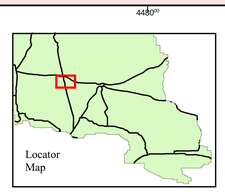
Proposed Action - West Mojave Route Designation Program

Map 44 - Kramer Junction, Kramer Hills



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

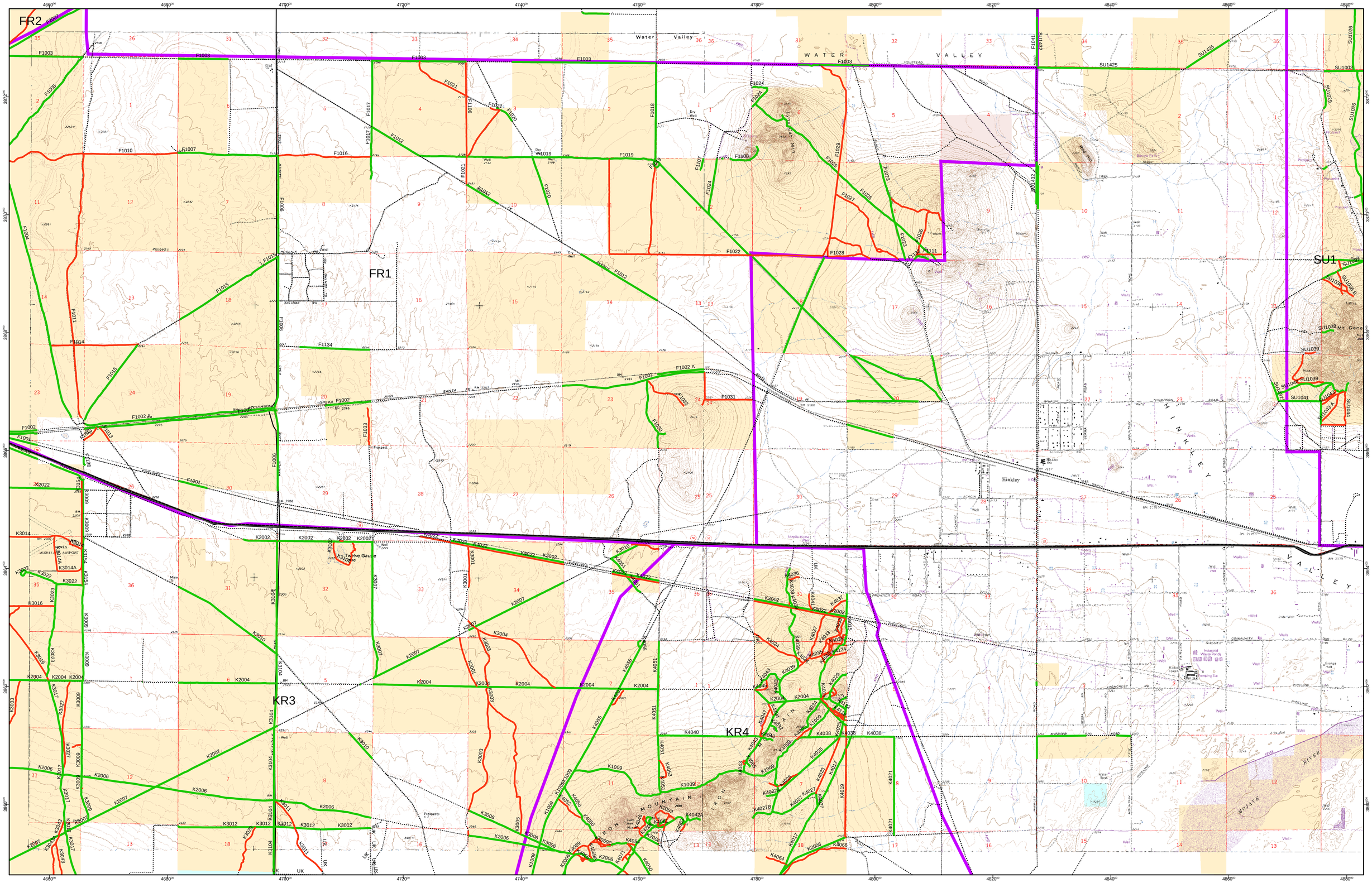
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 45 - Twelve Gauge Lake, Hinkley



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

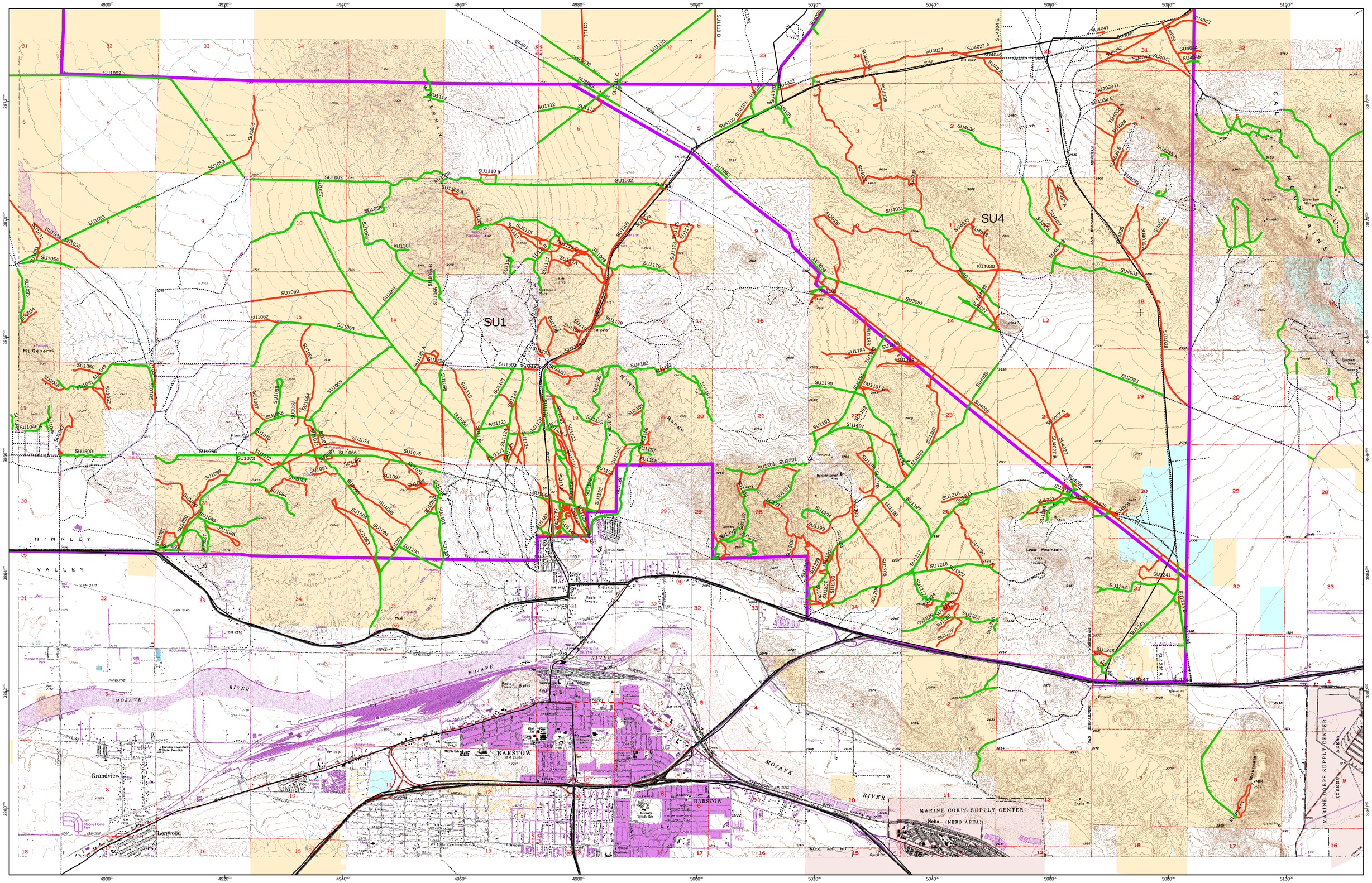
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

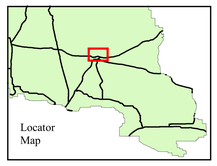
Proposed Action - West Mojave Route Designation Program

Map 46 - Barstow, Nebo



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

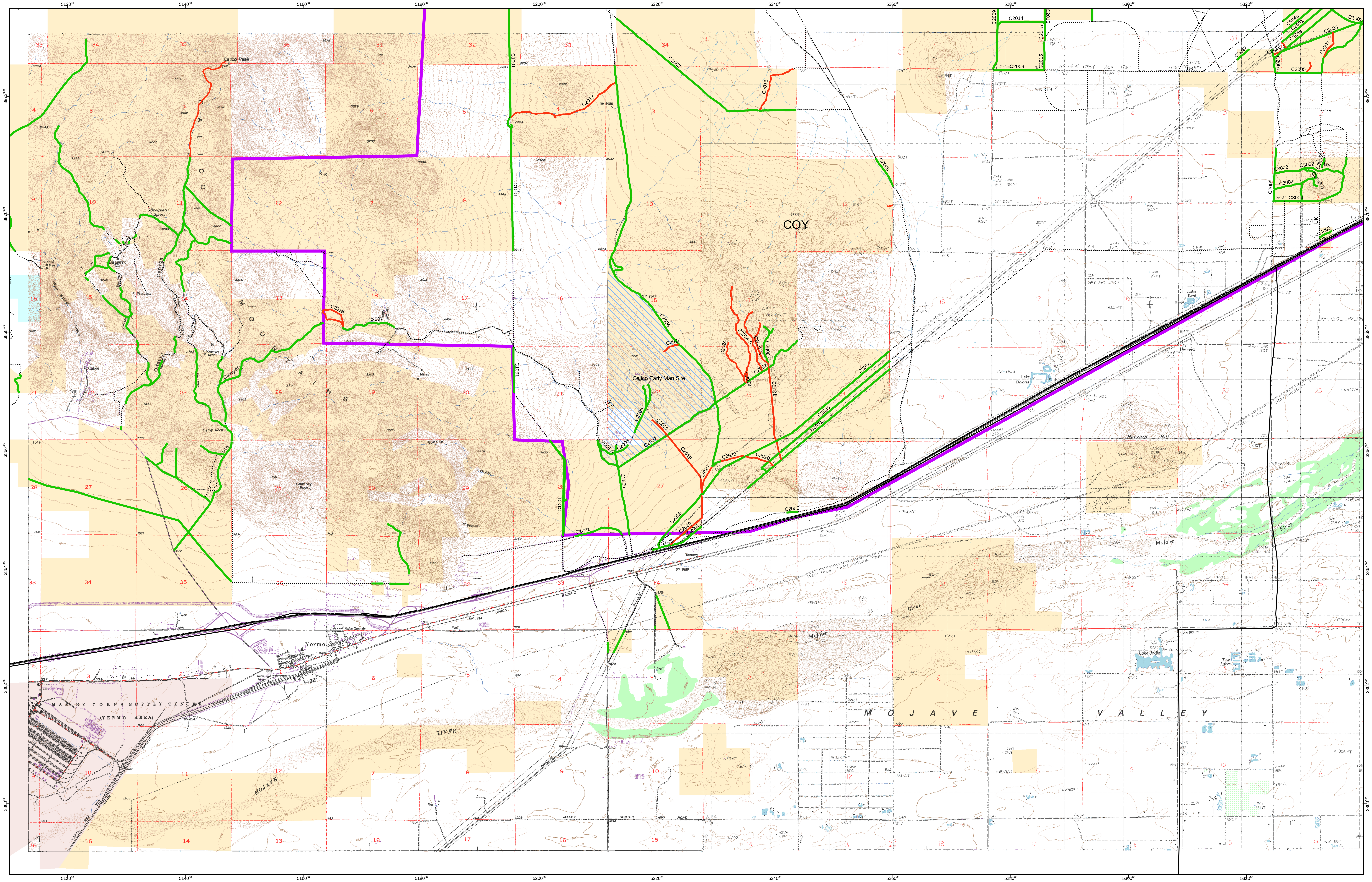
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

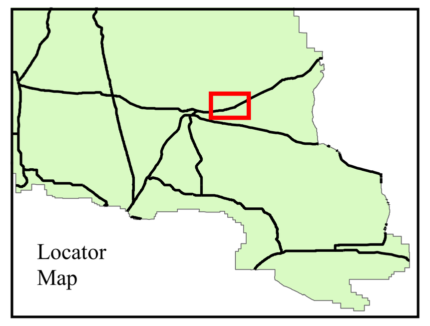
Proposed Action - West Mojave Route Designation Program

Map 47 - Yermo, Harvard Hill



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2
Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

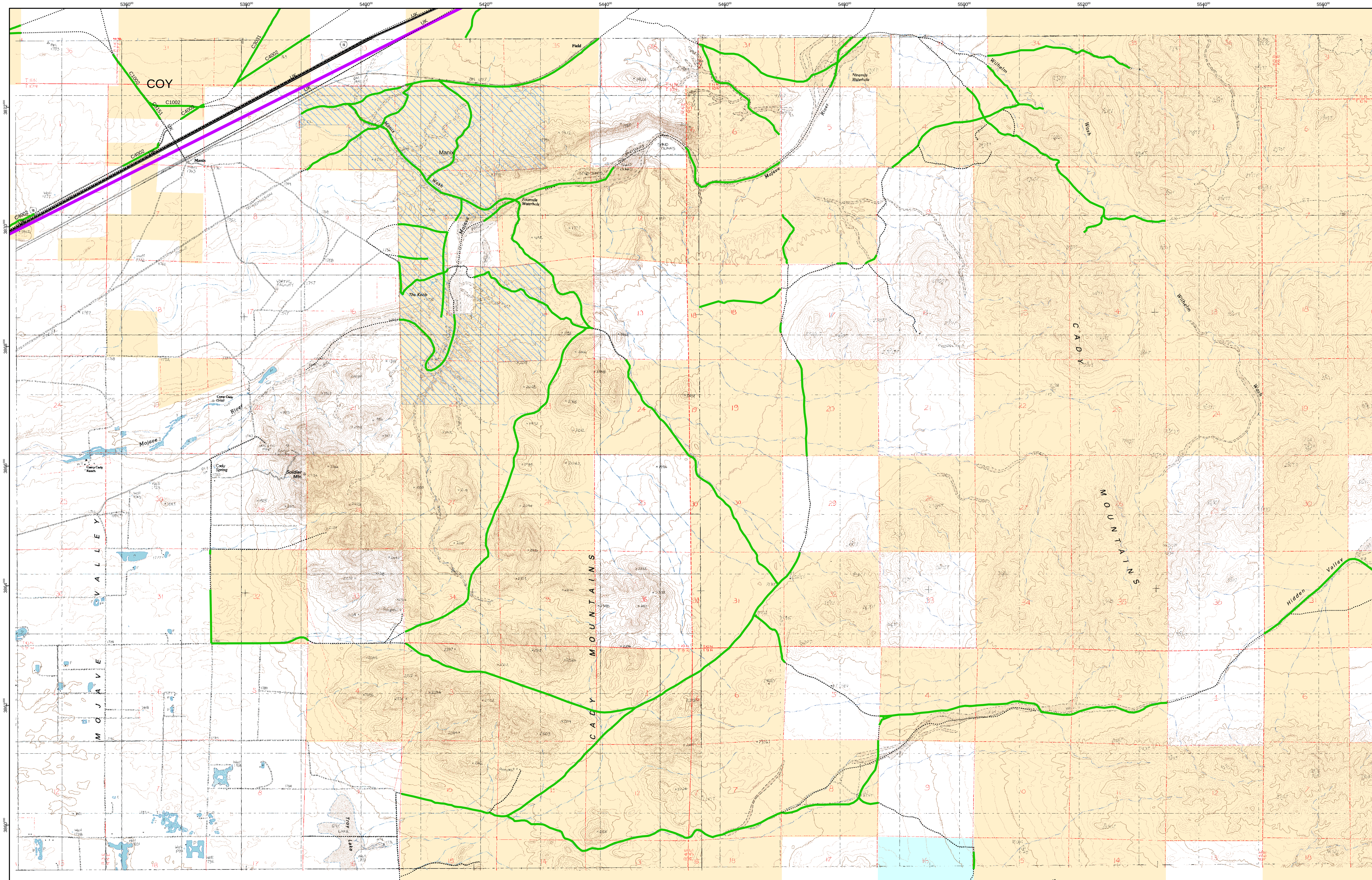
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

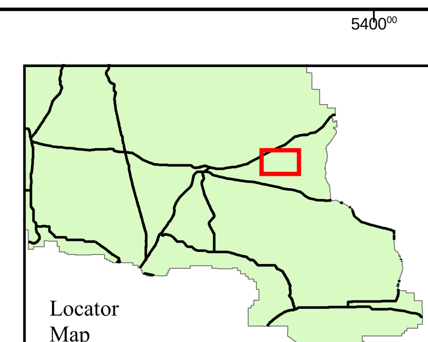
Proposed Action - West Mojave Route Designation Program

Map 48 - Manix, Hidden Valley West



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

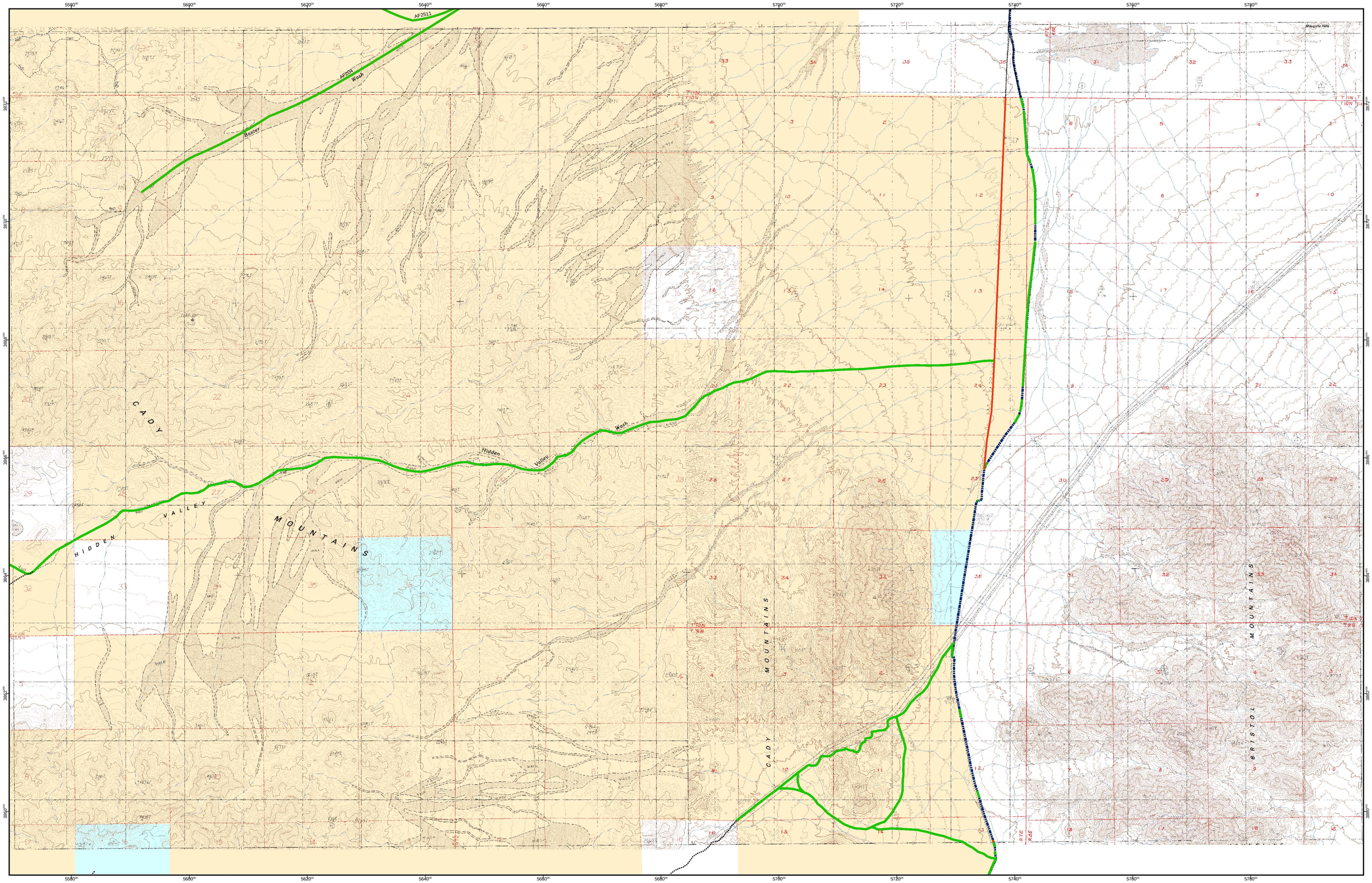
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

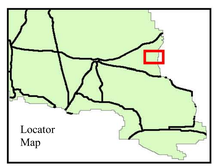
Proposed Action - West Mojave Route Designation Program

Map 49 - Hidden Valley East, West of Broadwell Mesa



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

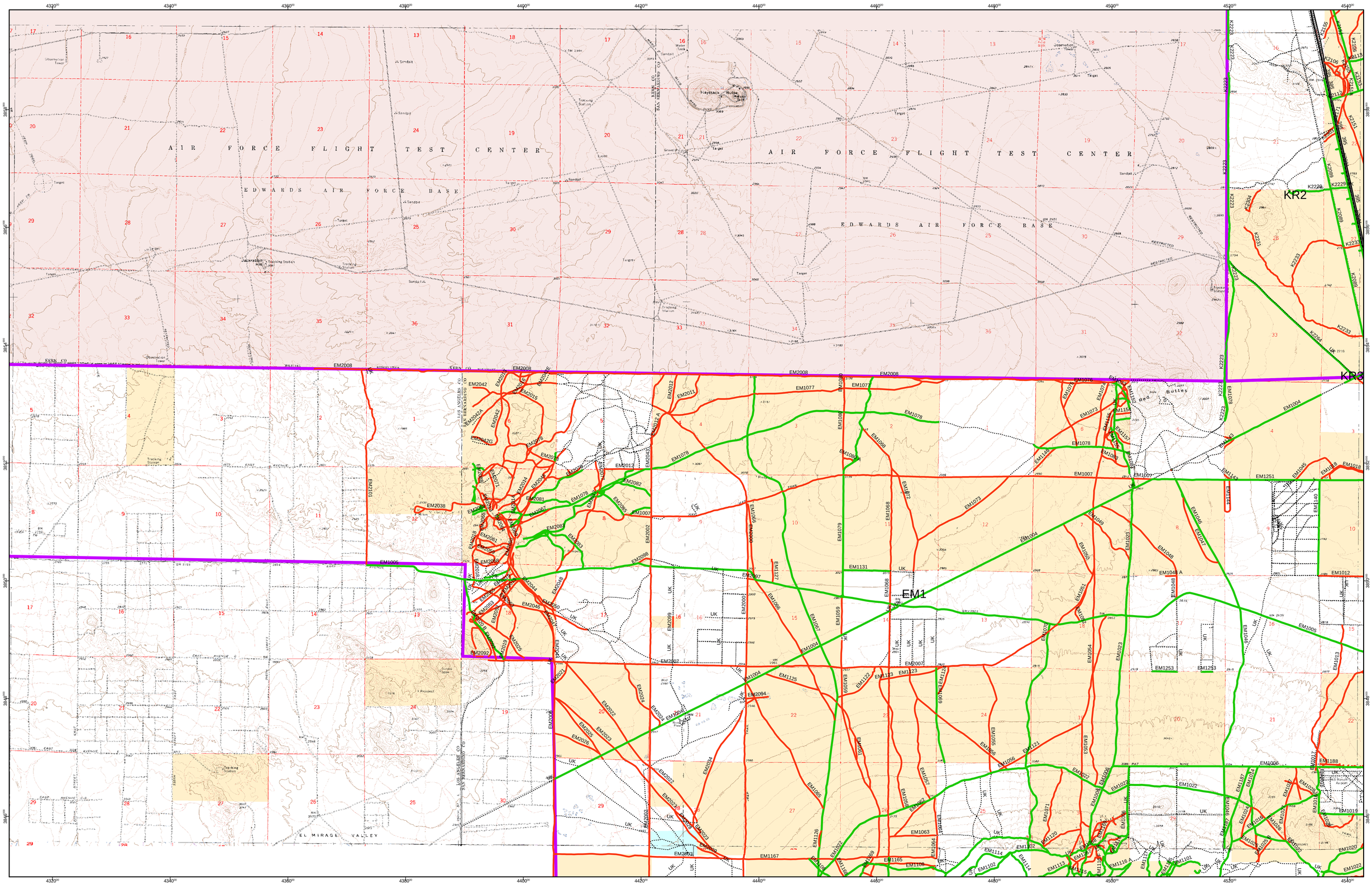
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 50 - Jackrabbit Hills, Red Buttes



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 51 - Astley Ranco, Wild Crossing

KR1

KR2

KR3

KR4

EM1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

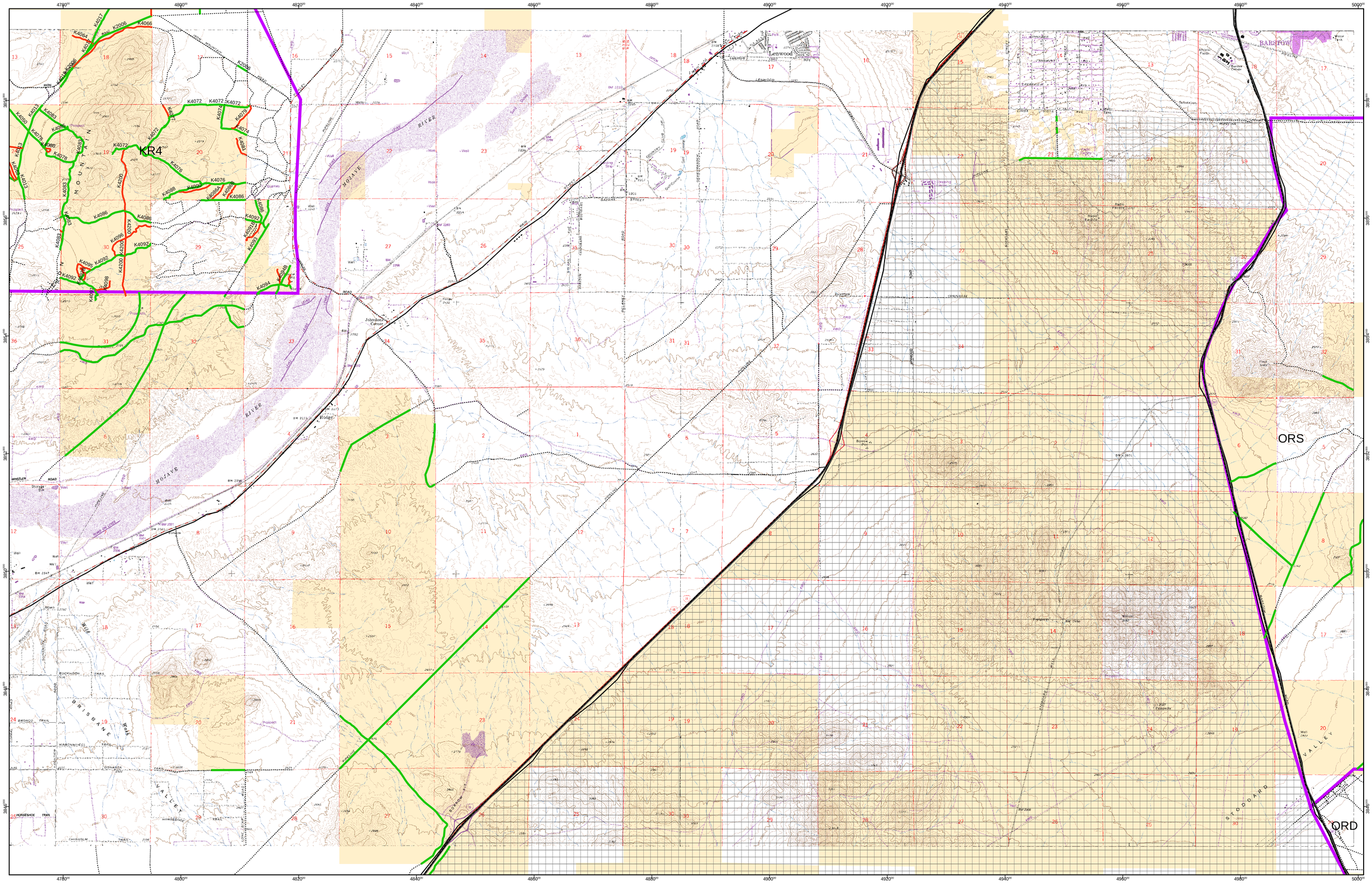
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 52 - Hodge, Barstow SE



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

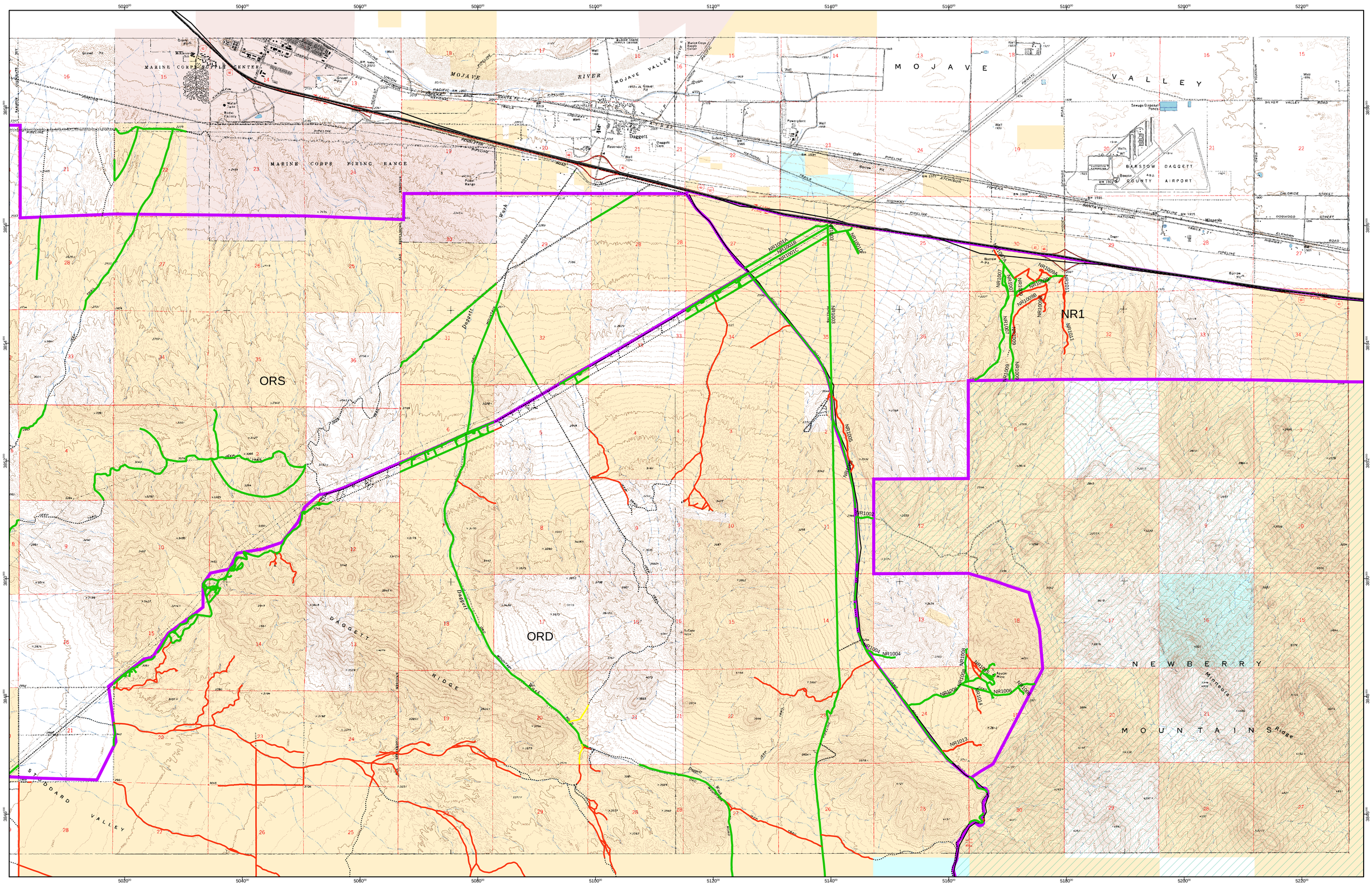
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 53 - Daggett, Minneola



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

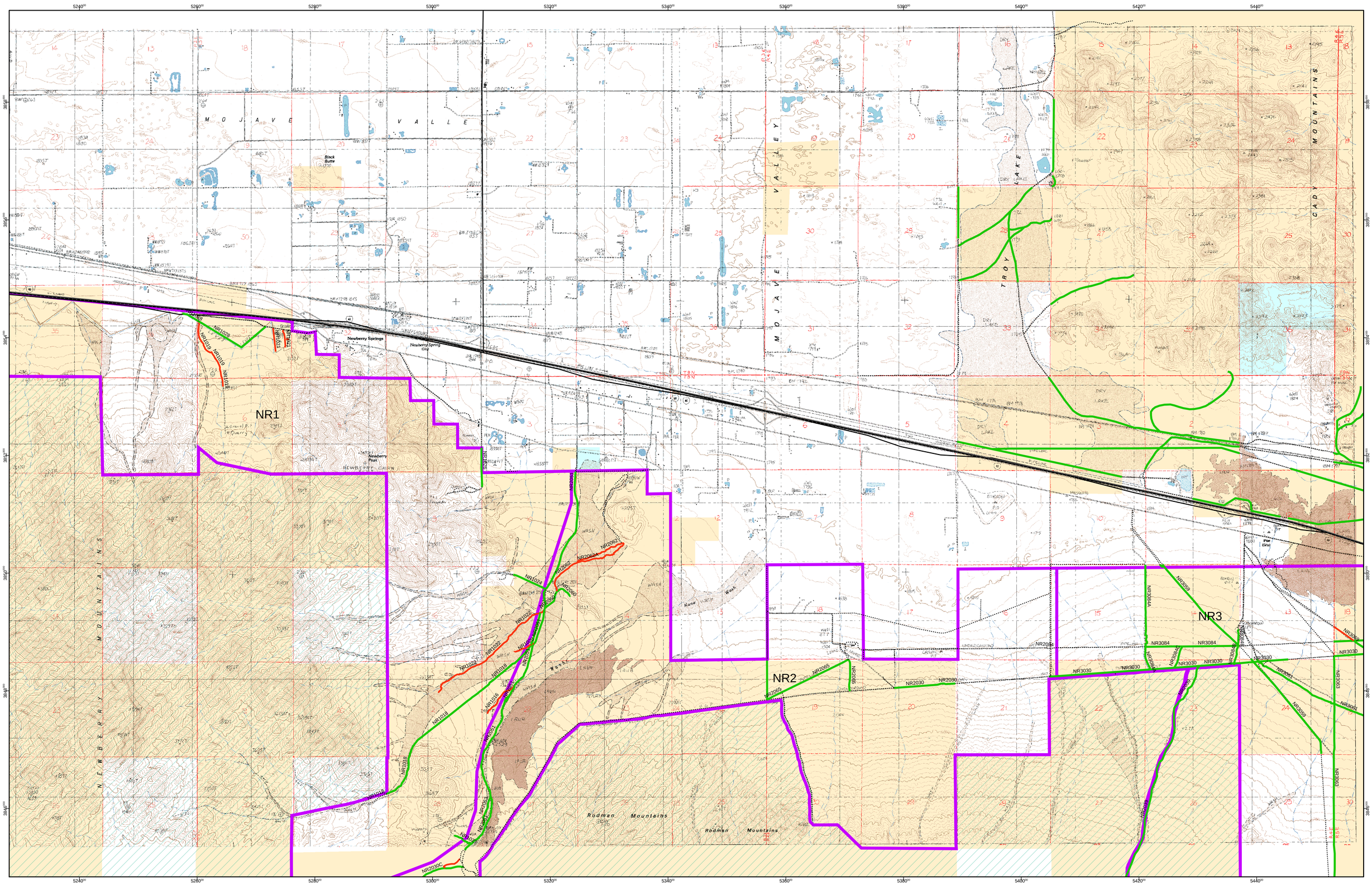
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 58 - Newberry Springs, Troy Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

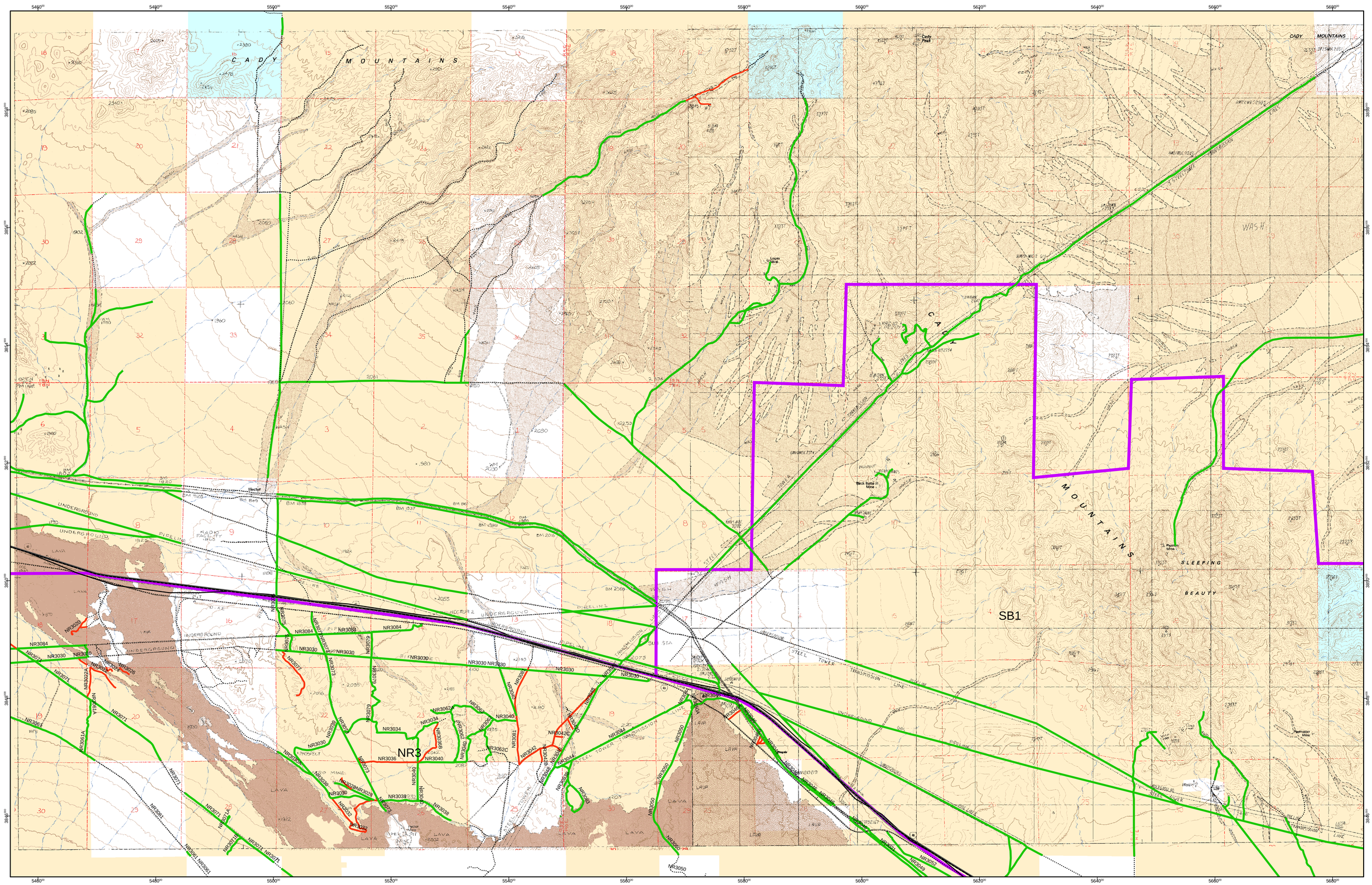
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 55 - Hector, Sleeping Beauty



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N W E S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

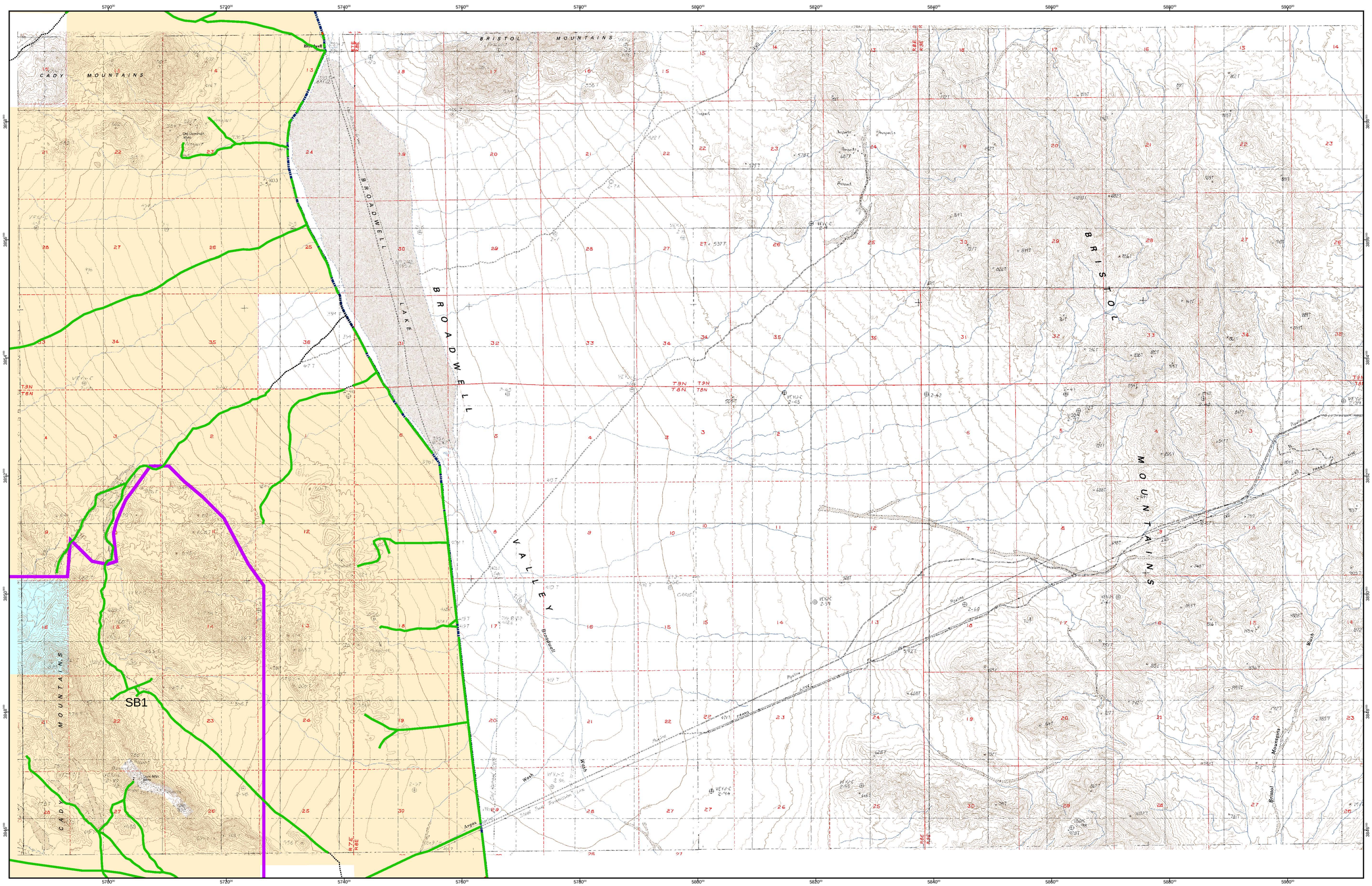
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

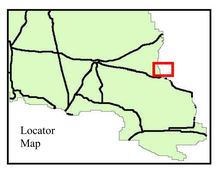
Proposed Action - West Mojave Route Designation Program

Map 56 - Broadwell Lake, East of Broadwell Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

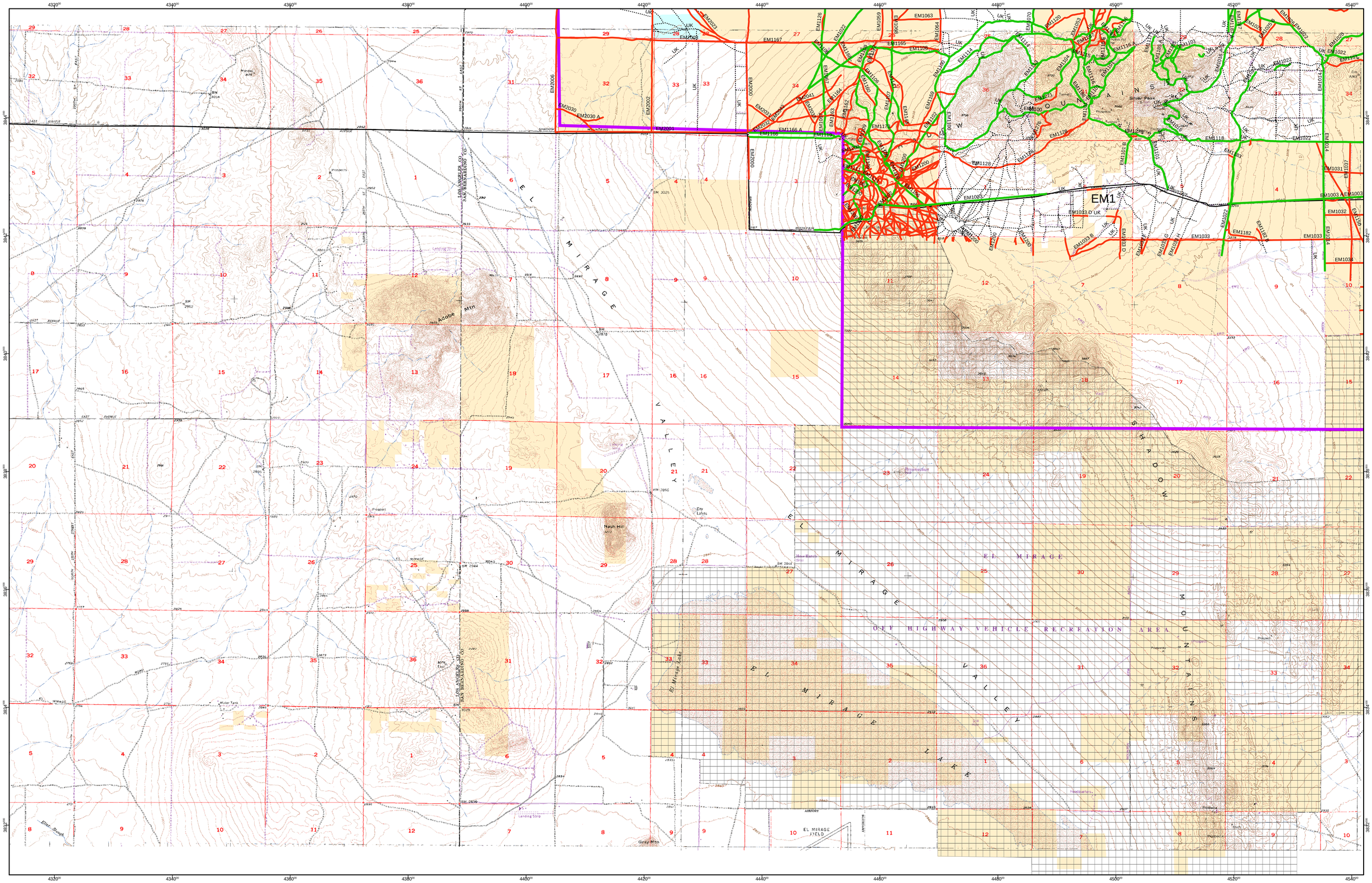
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 57 - Adobe Mountain, Shadow Mountains



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

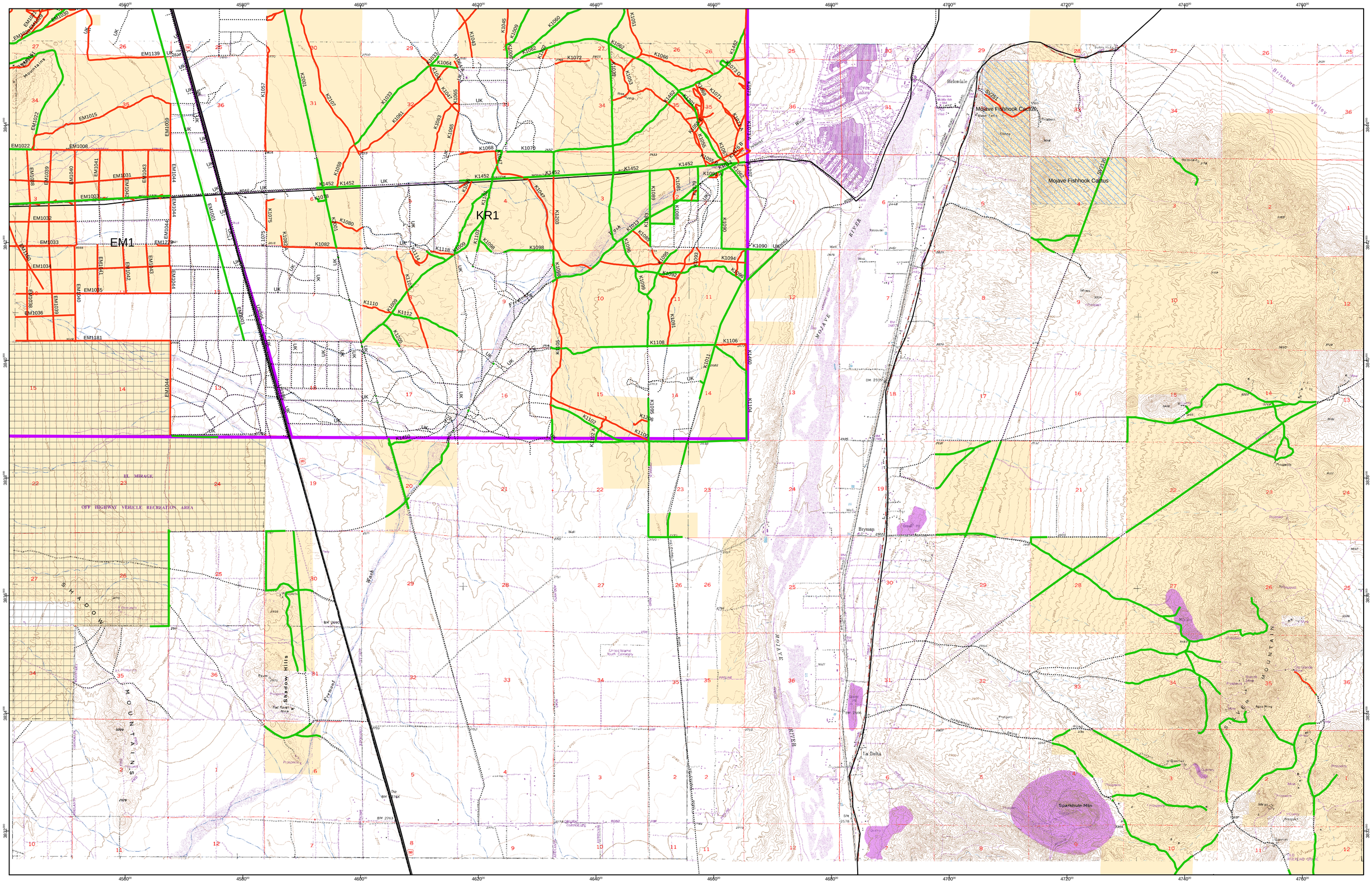
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 58 - Victorville NW, Helendale



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 59 - Turtle Valley, Stoddard Well

GR1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

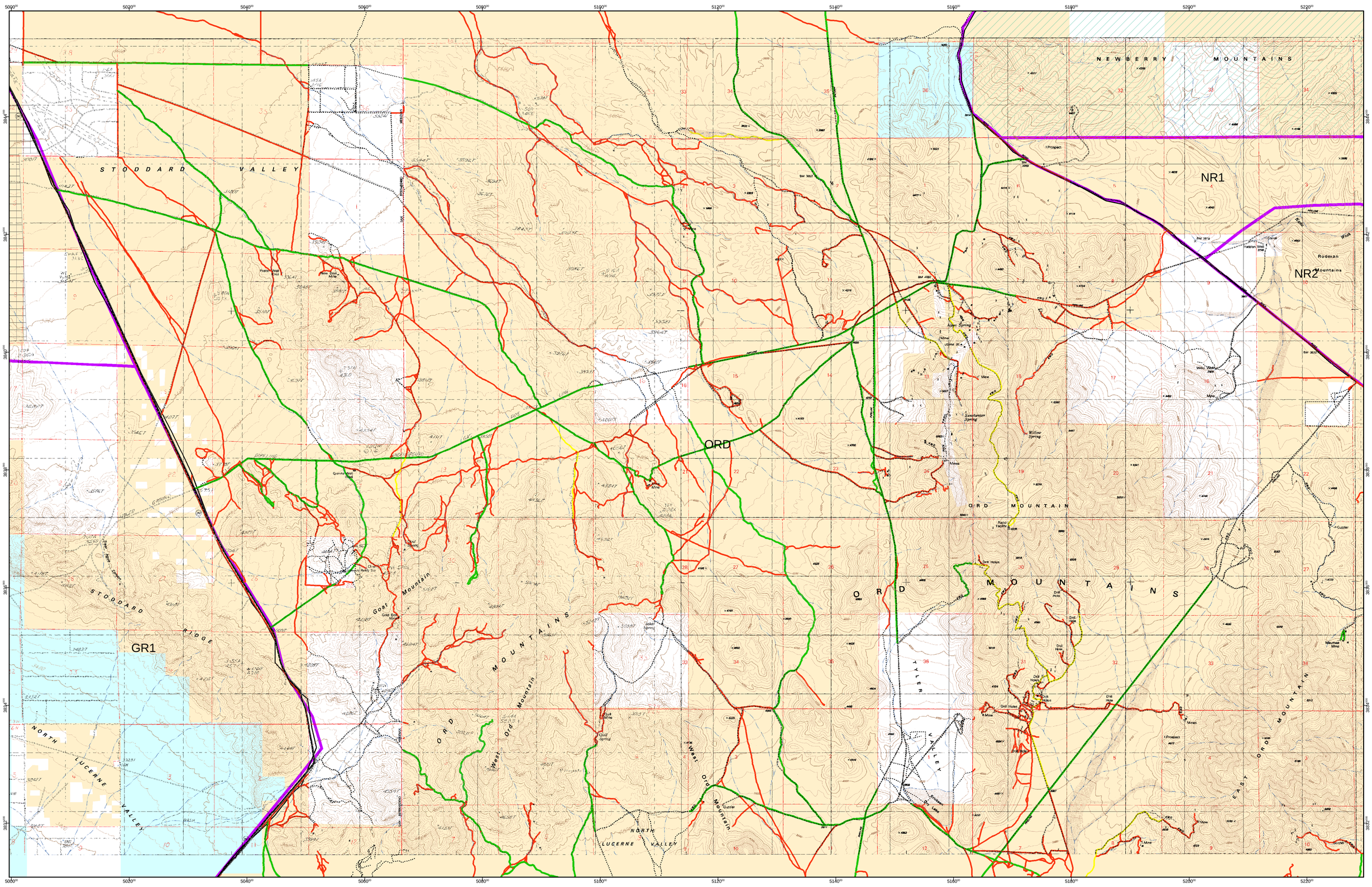
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 60 - West Ord Mountain, Ord Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

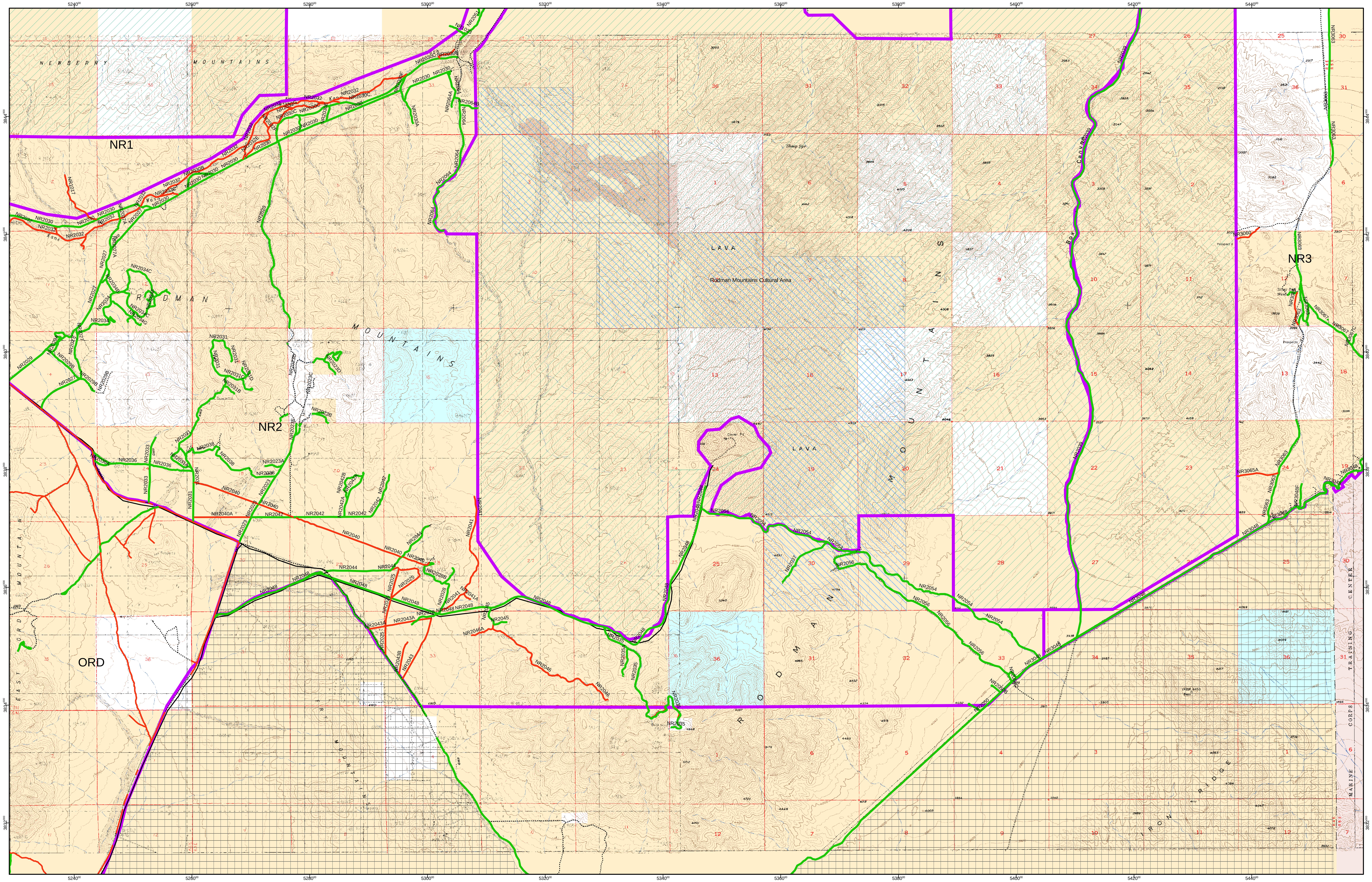
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

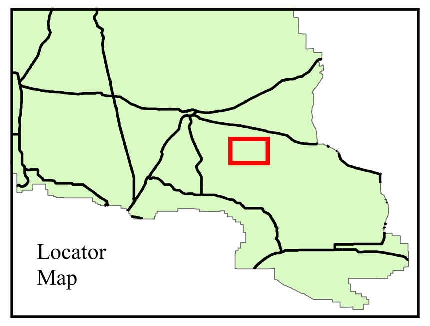
Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

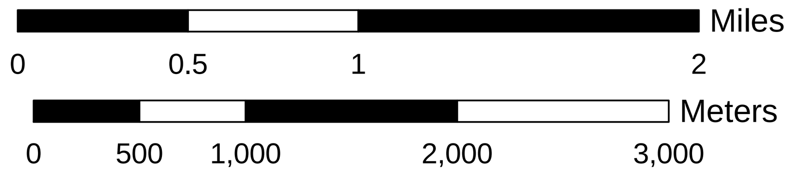
Proposed Action - West Mojave Route Designation Program

Map 61- Camp Rock Mine, Silver Bell Mine





SCALE 1 : 24,000



Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

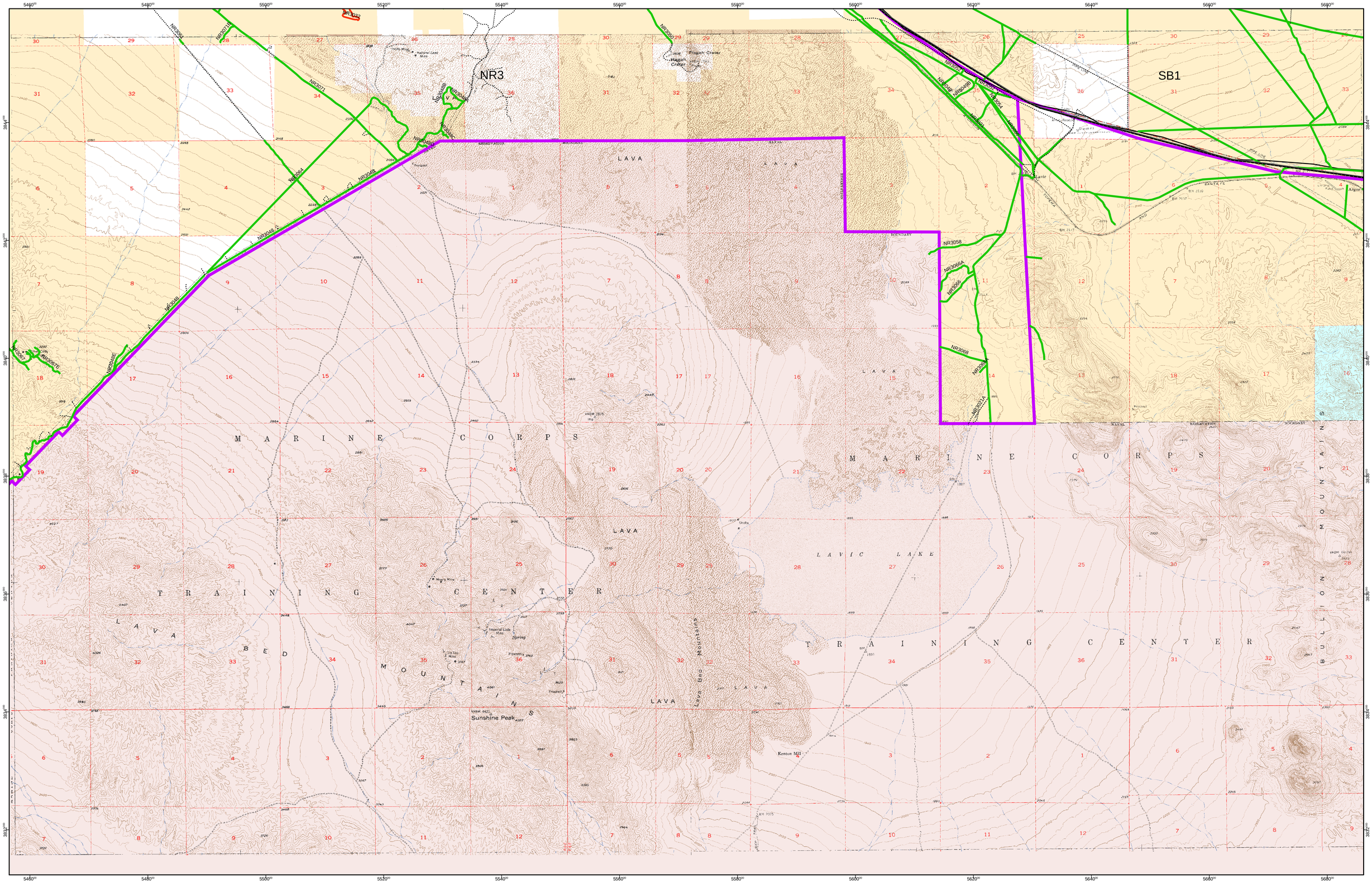
- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003

Proposed Action - West Mojave Route Designation Program

Map 62 - Sunshine Peak, Lavic Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

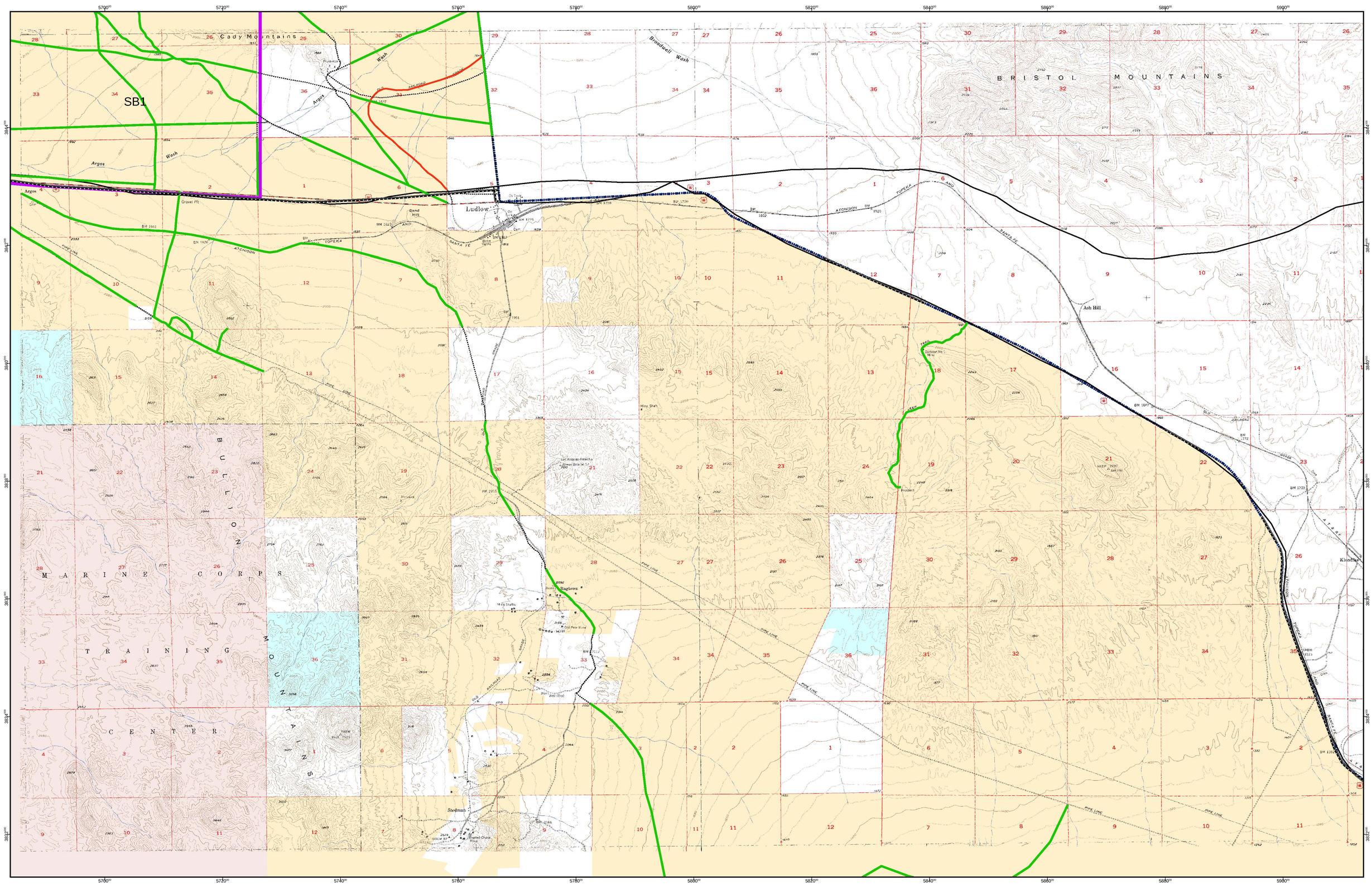
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

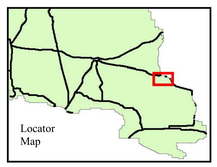
Proposed Action - West Mojave Route Designation Program

Map 63 - Ludlow, Ash Hill



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

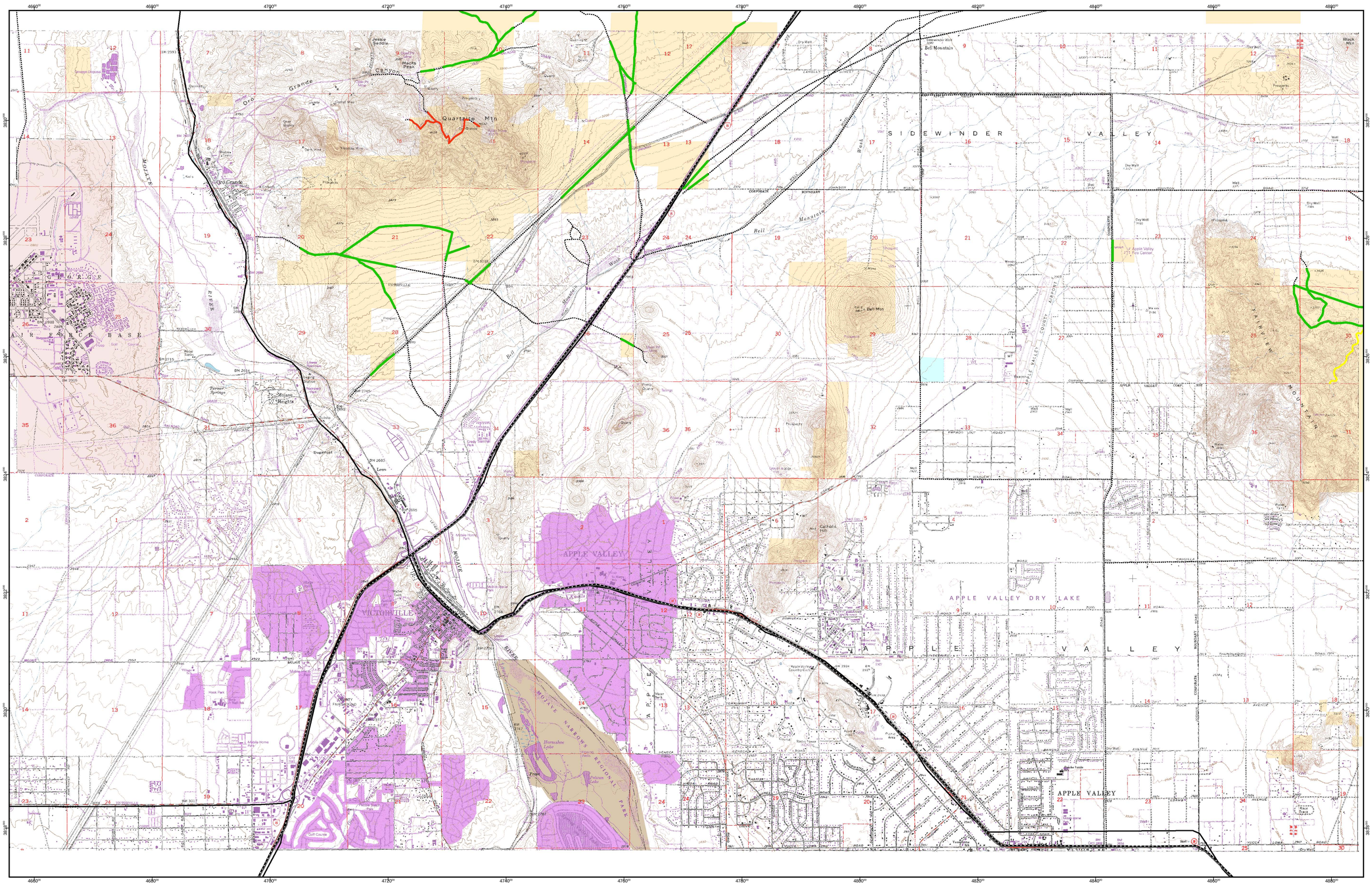
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 64 - Victorville, Apple Valley North



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

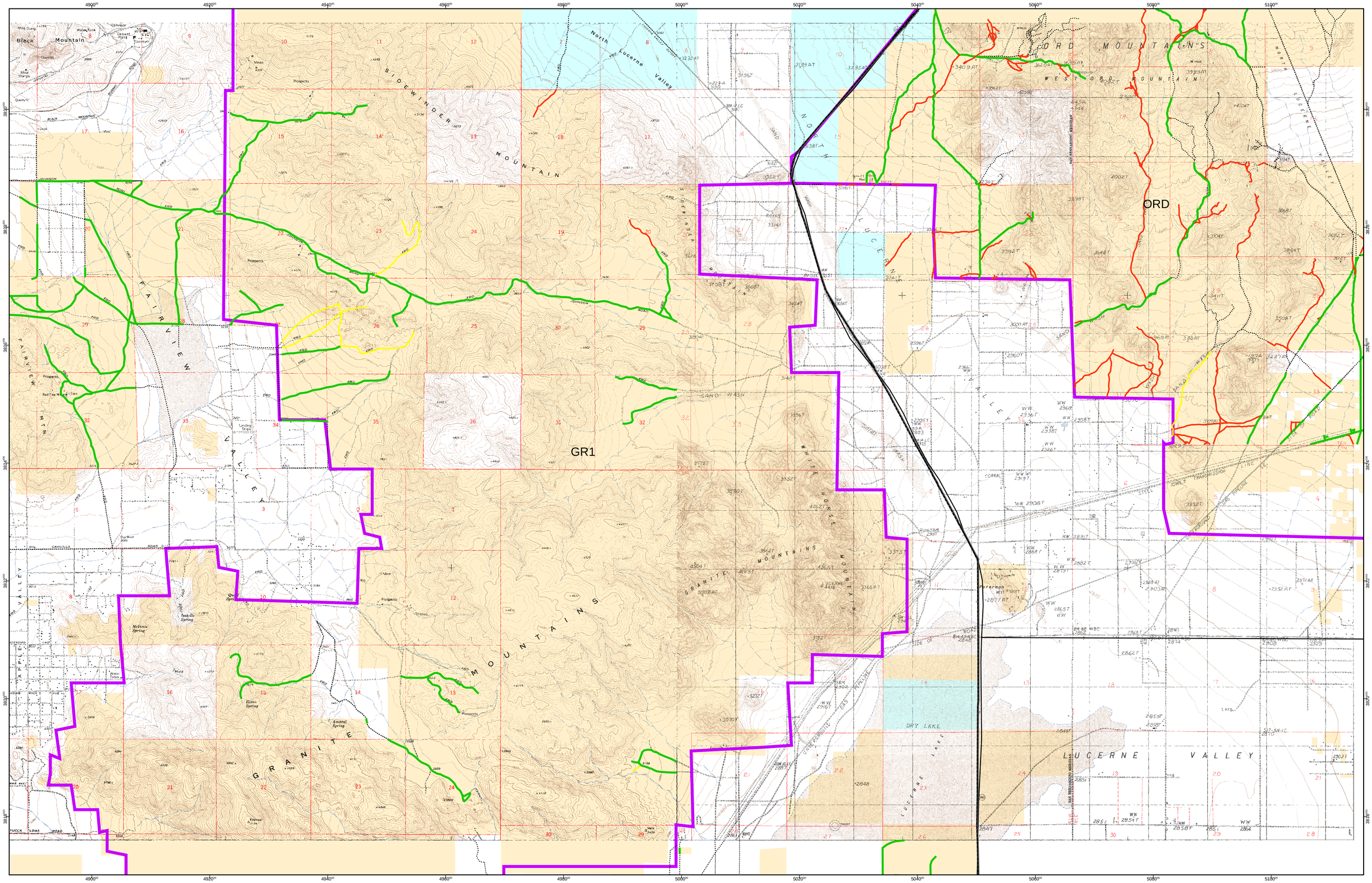
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 65 - Fairview Valley, White Horse Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

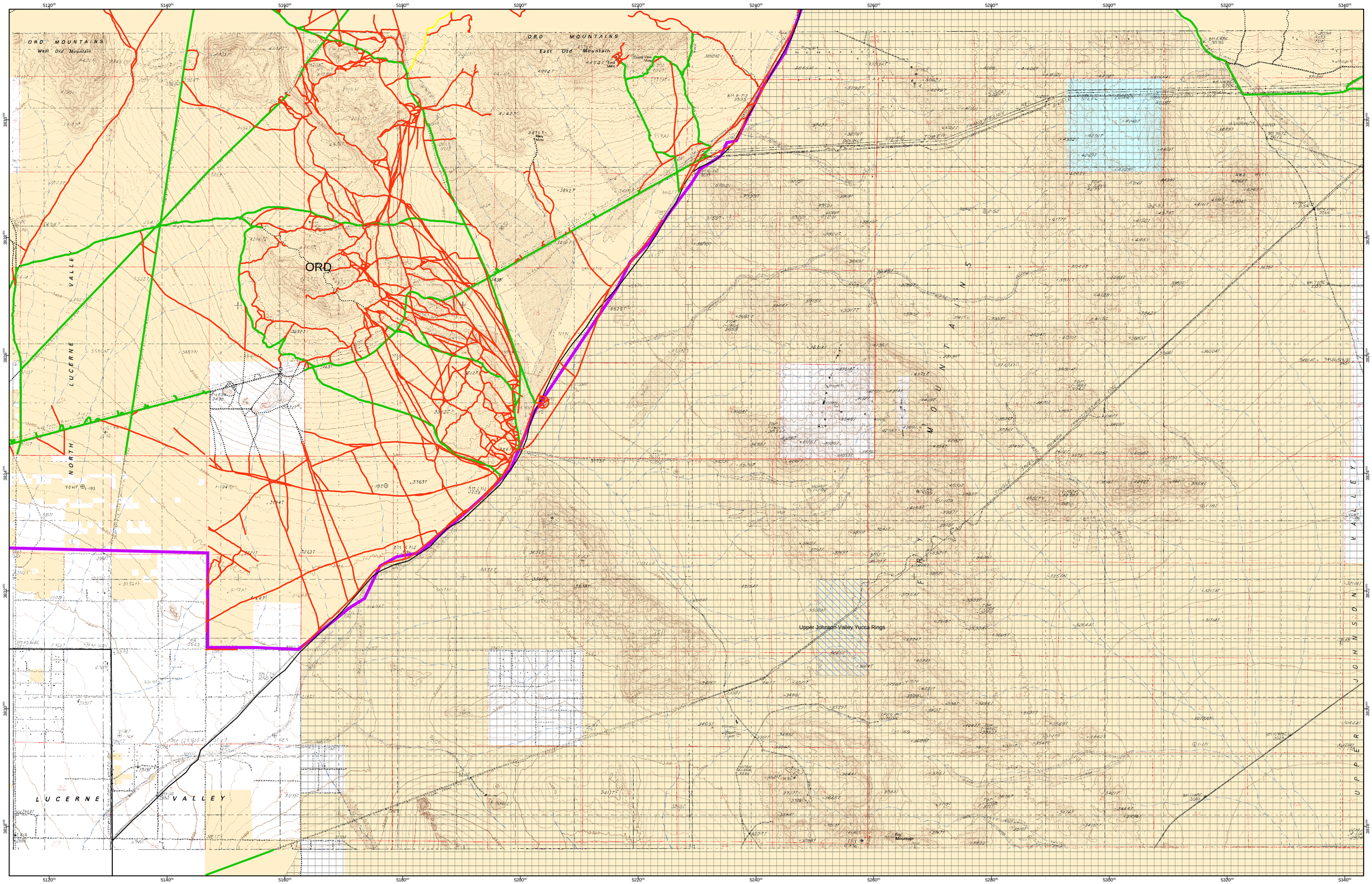
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 66- Grand View Mine, Fry Mountains



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

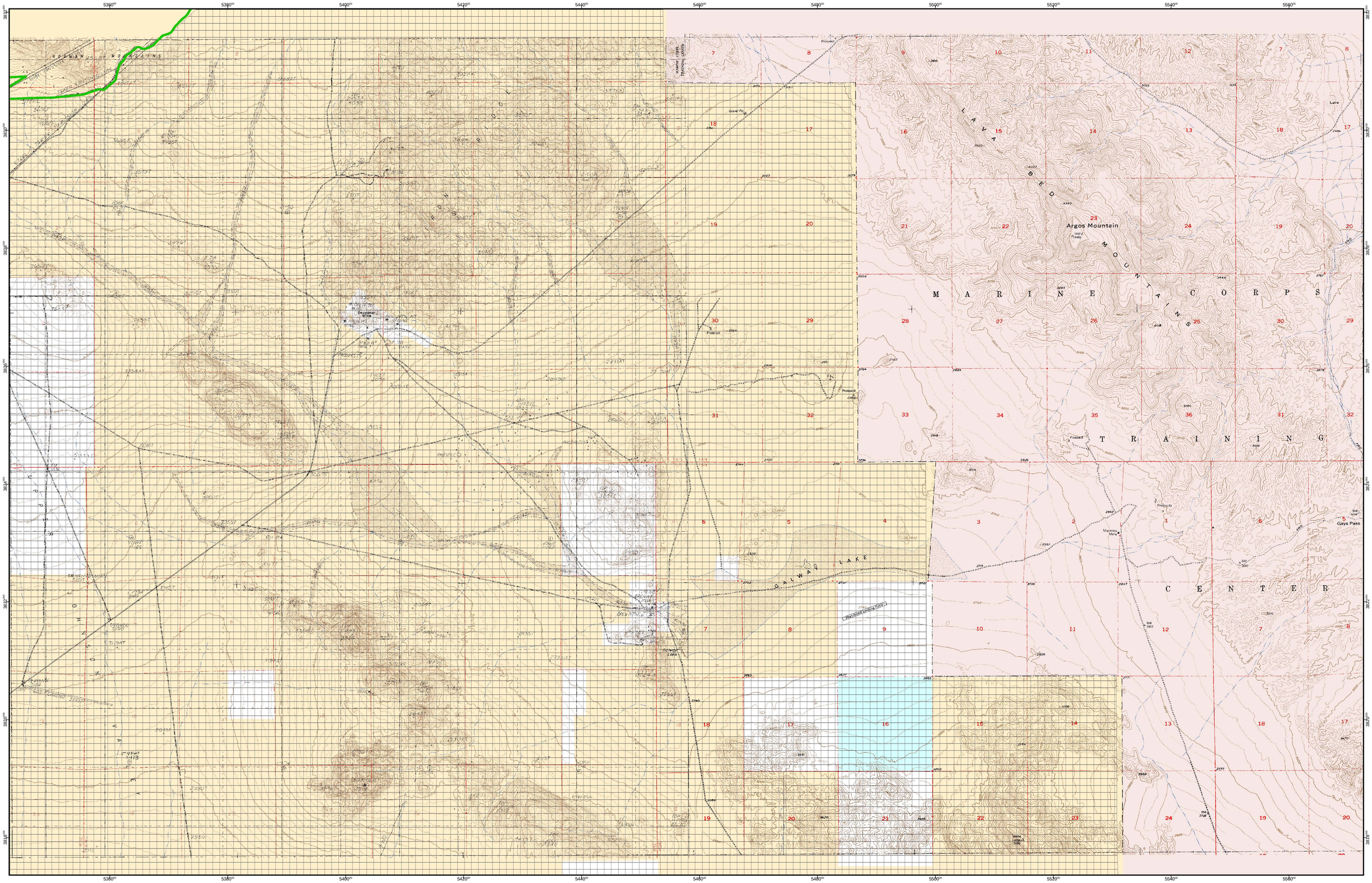
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 67 - Iron Ridge, Galway Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

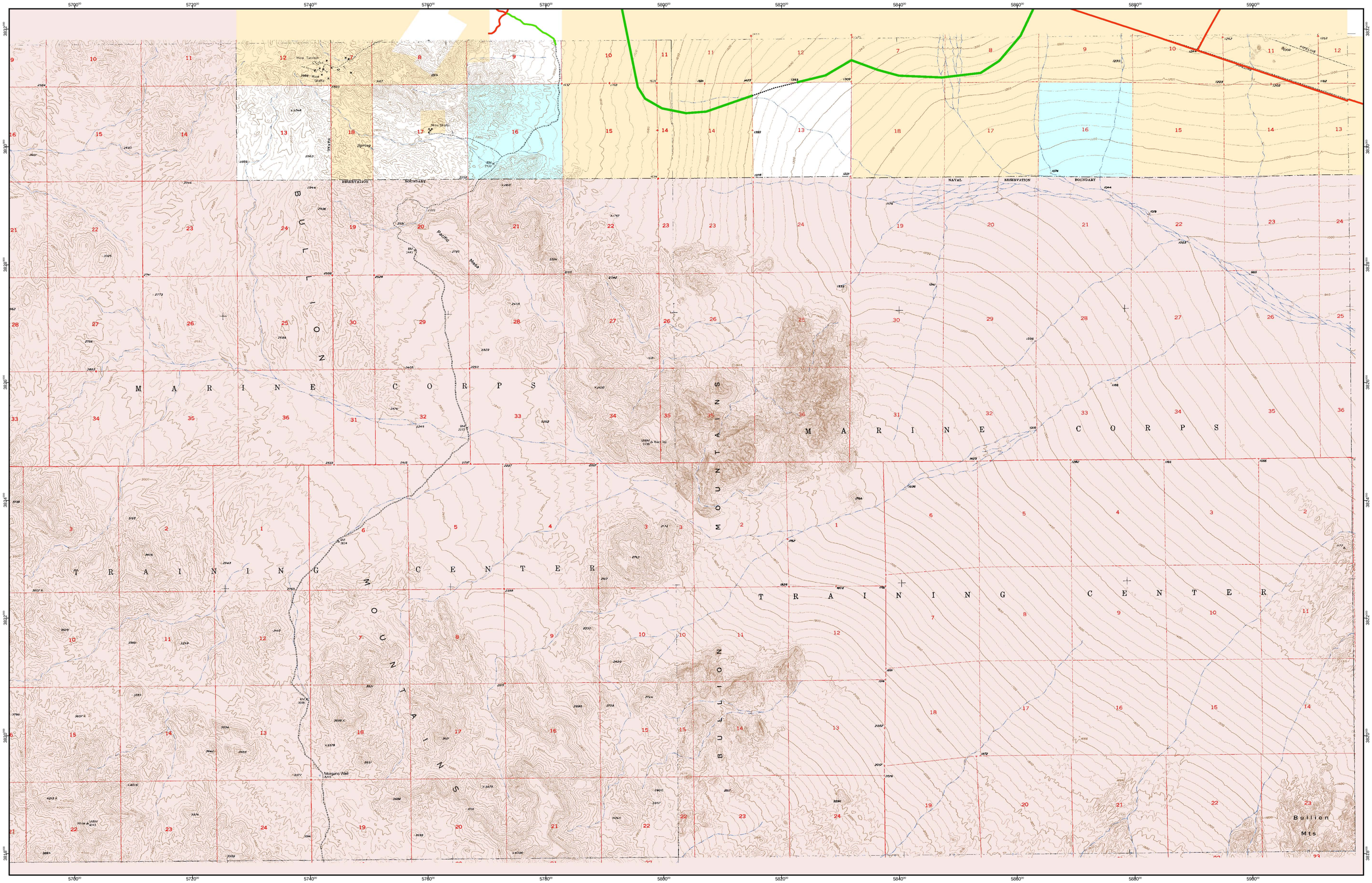
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

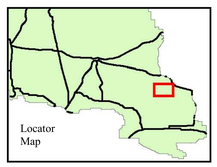
Proposed Action - West Mojave Route Designation Program

Map 68a - Morgans Well, Ludlow South East



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

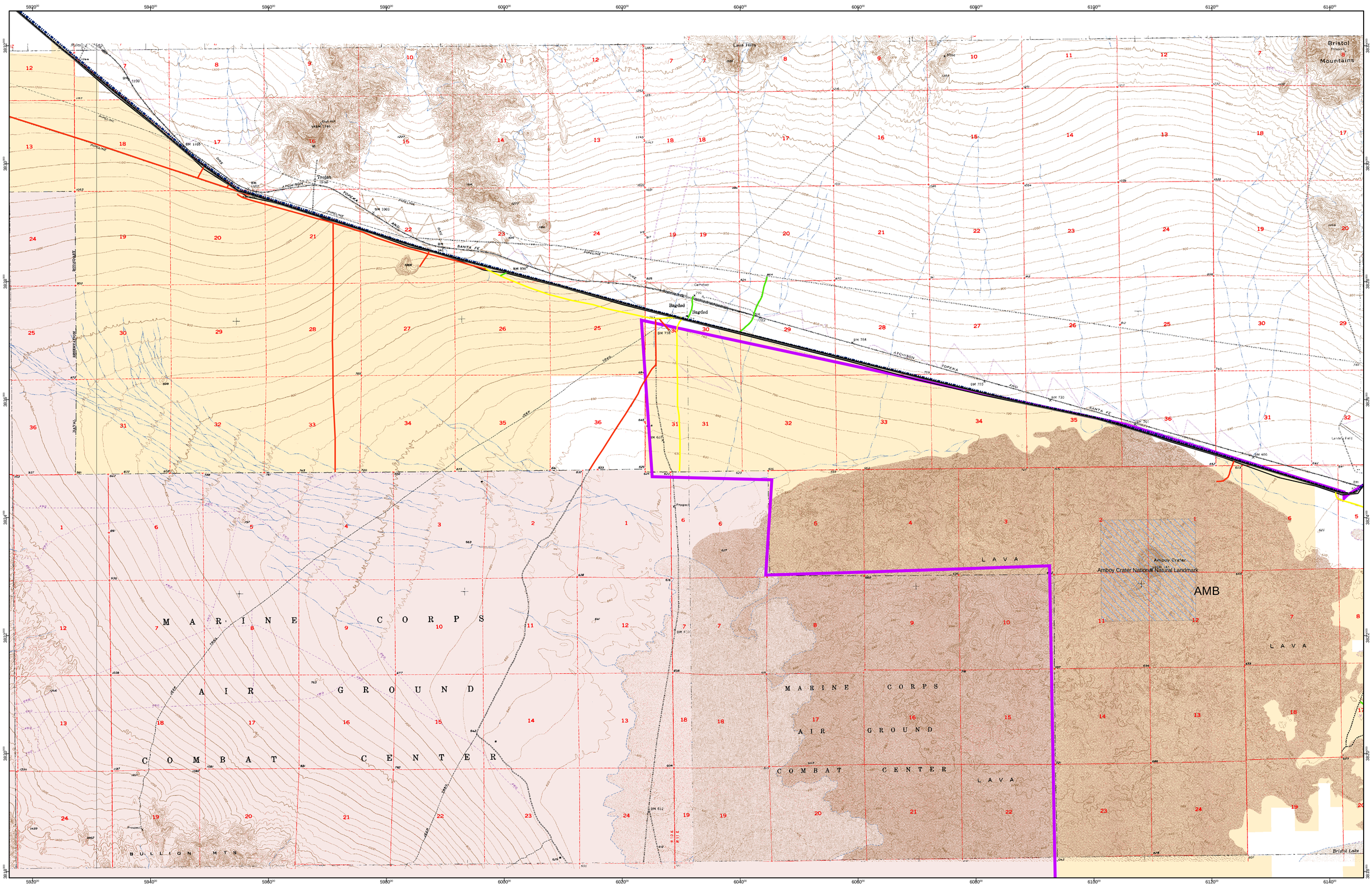
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

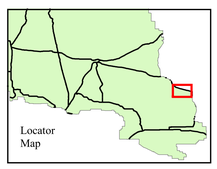
Proposed Action - West Mojave Route Designation Program

Map 68B - Bagdad SW, Amboy Crater



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

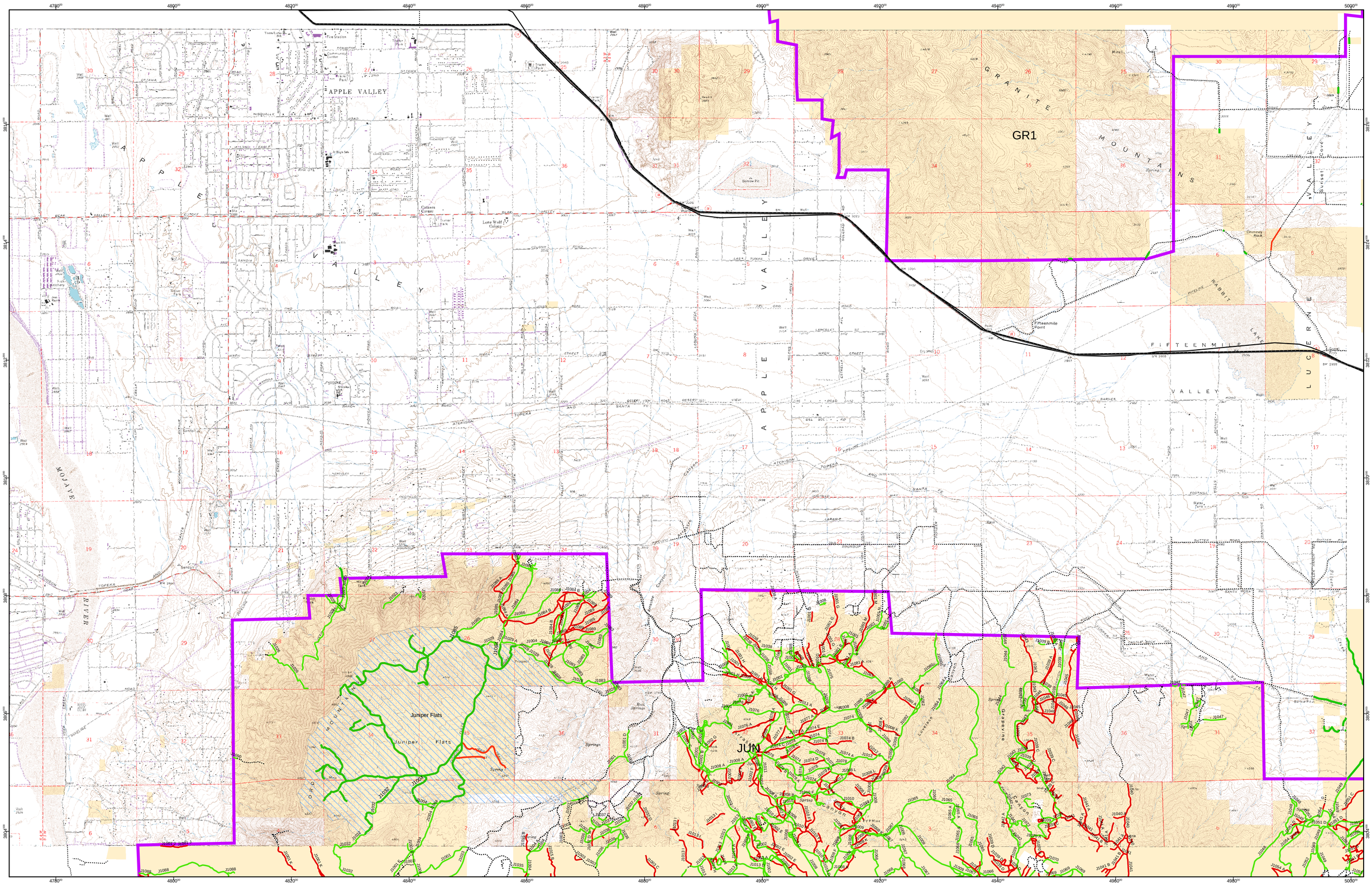
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

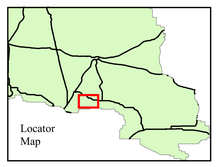
Proposed Action - West Mojave Route Designation Program

Map 69 - Apple Valley South, Fifteenmile Valley



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 70 - Lucerne Valley, Cougar Buttes

GR1

BH1

JUN

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 71 - Old Woman Springs, Melville Lake

BH1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

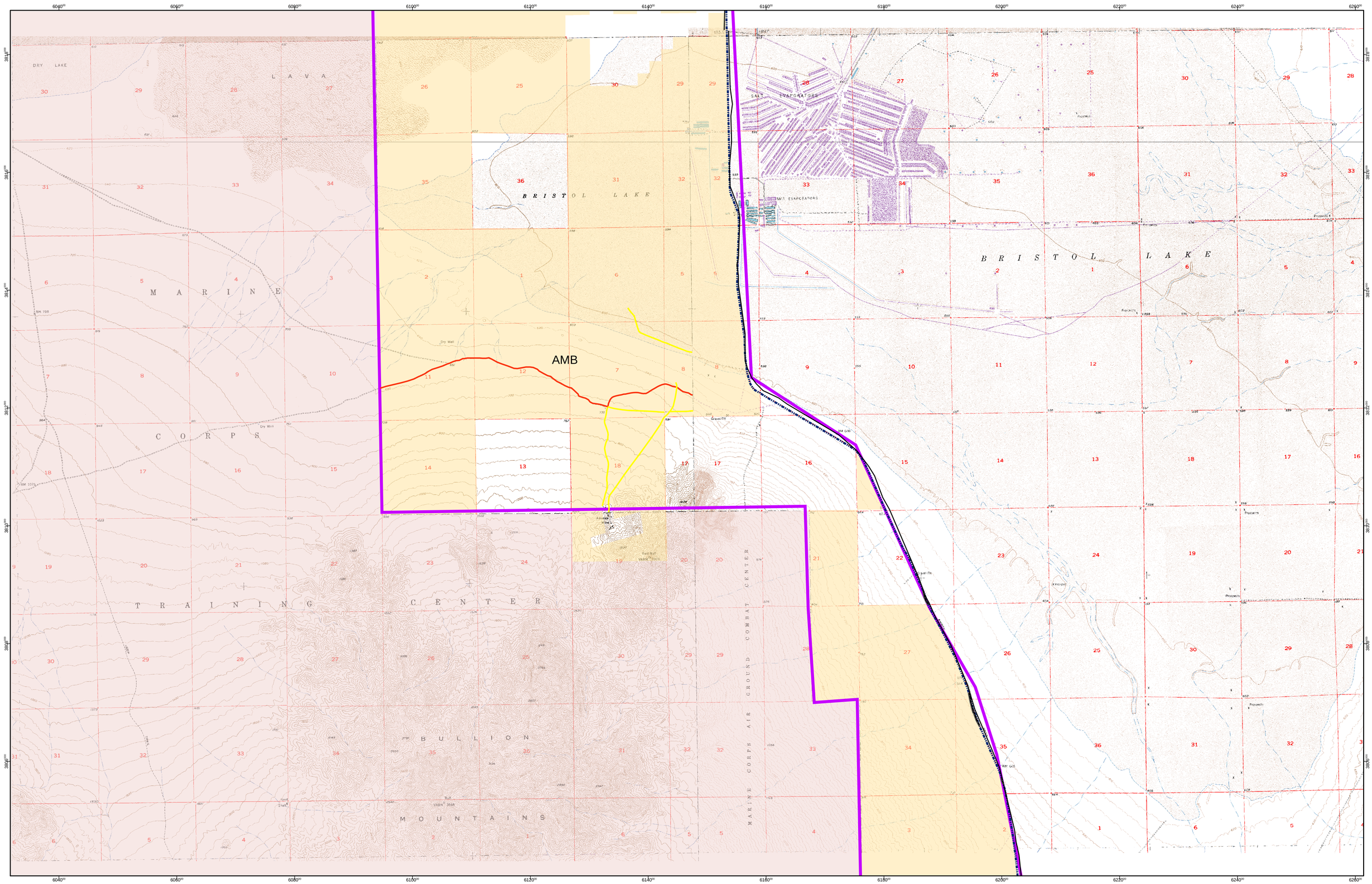
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 71b - Lead Mountain NE, Bristol Lake NW



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

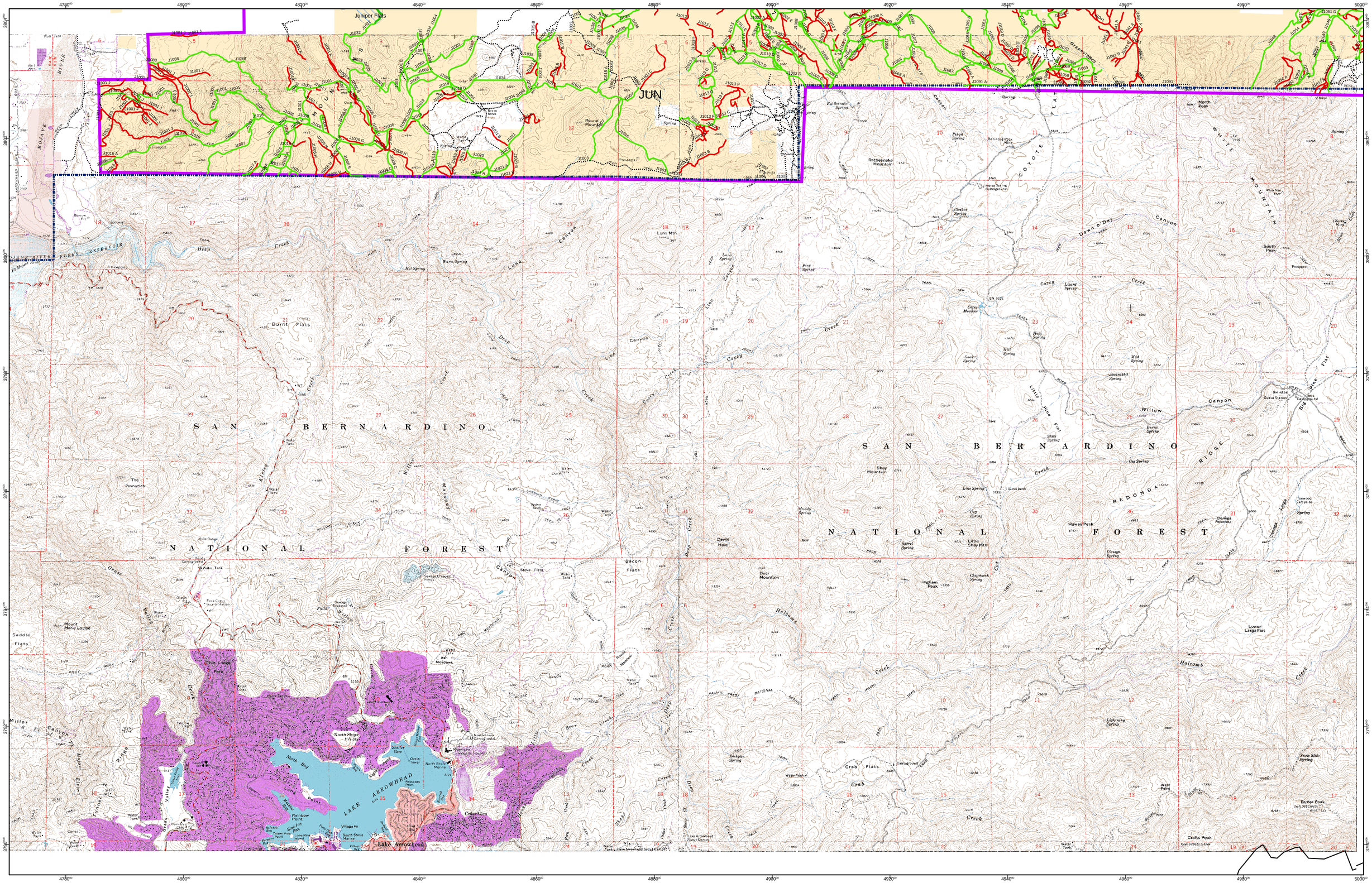
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 72 - Butler Peak, Lake Arrowhead



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs
- Open Areas

Proposed Designations

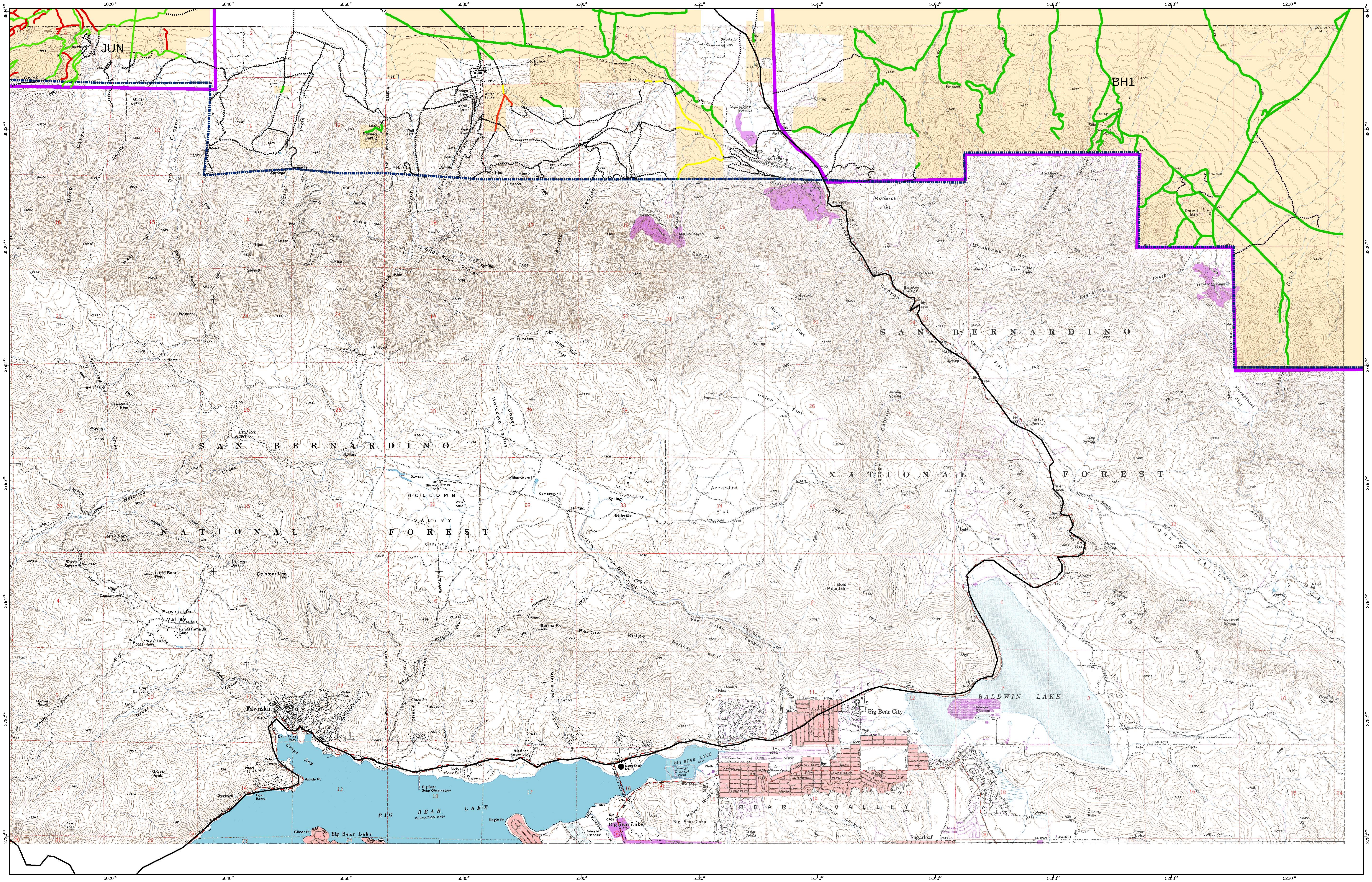
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 73 - Fawnskin, Big Bear City



Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

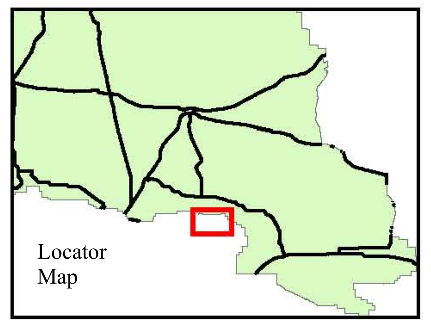
SCALE 1 : 24,000

Miles: 0, 0.5, 1, 2

Meters: 0, 500, 1,000, 2,000, 3,000

Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



Proposed Action - West Mojave Route Designation Program

Map 74 - Rattlesnake Canyon, Bighorn Canyon

BH1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

SCALE 1 : 24,000

0 0.5 1 2 Miles

0 500 1,000 2,000 3,000 Meters

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

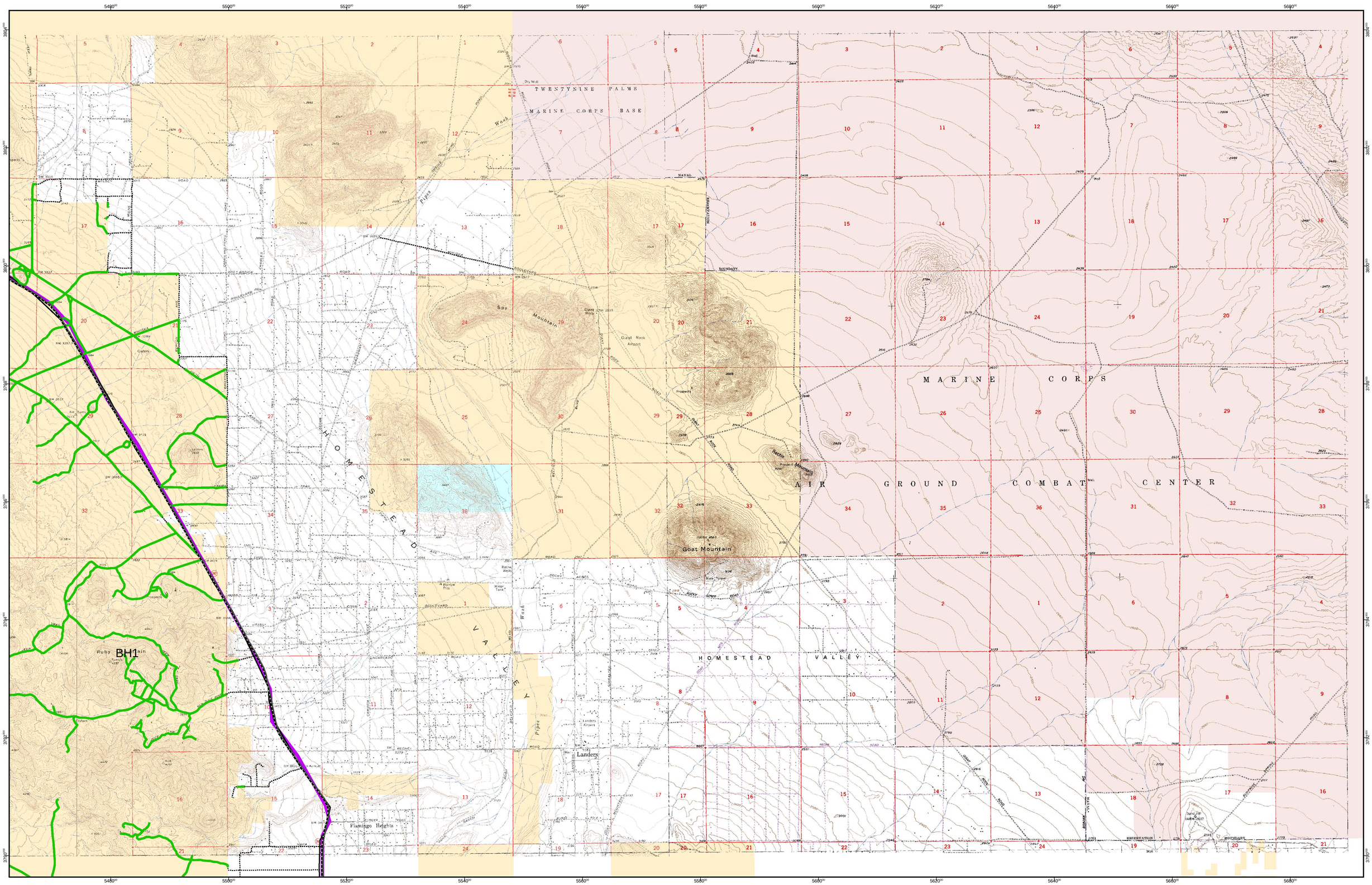
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

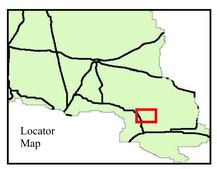
Proposed Action - West Mojave Route Designation Program

Map 75 - Landers, Goat Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

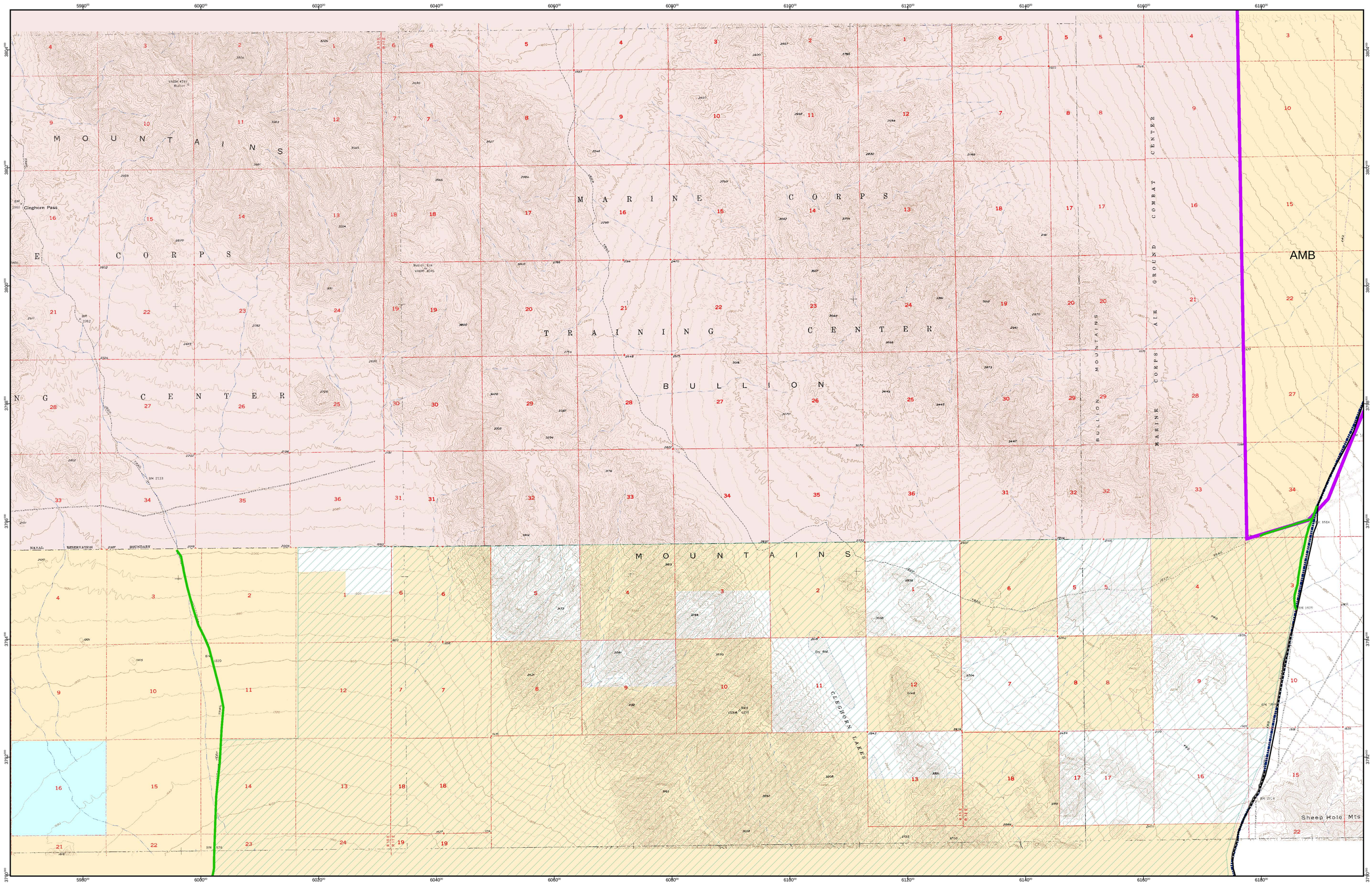
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 76 - Lead Mountain SW, Cleghorn Lakes, Bristol Lake SW



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 77 - Onyx Peak, Rimrock

BH1

Big Morongo Canyon
MOR

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 78 - Yucca Valley North, Joshua Tree North

BH1

Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

Locator Map

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- MAZ Boundaries
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

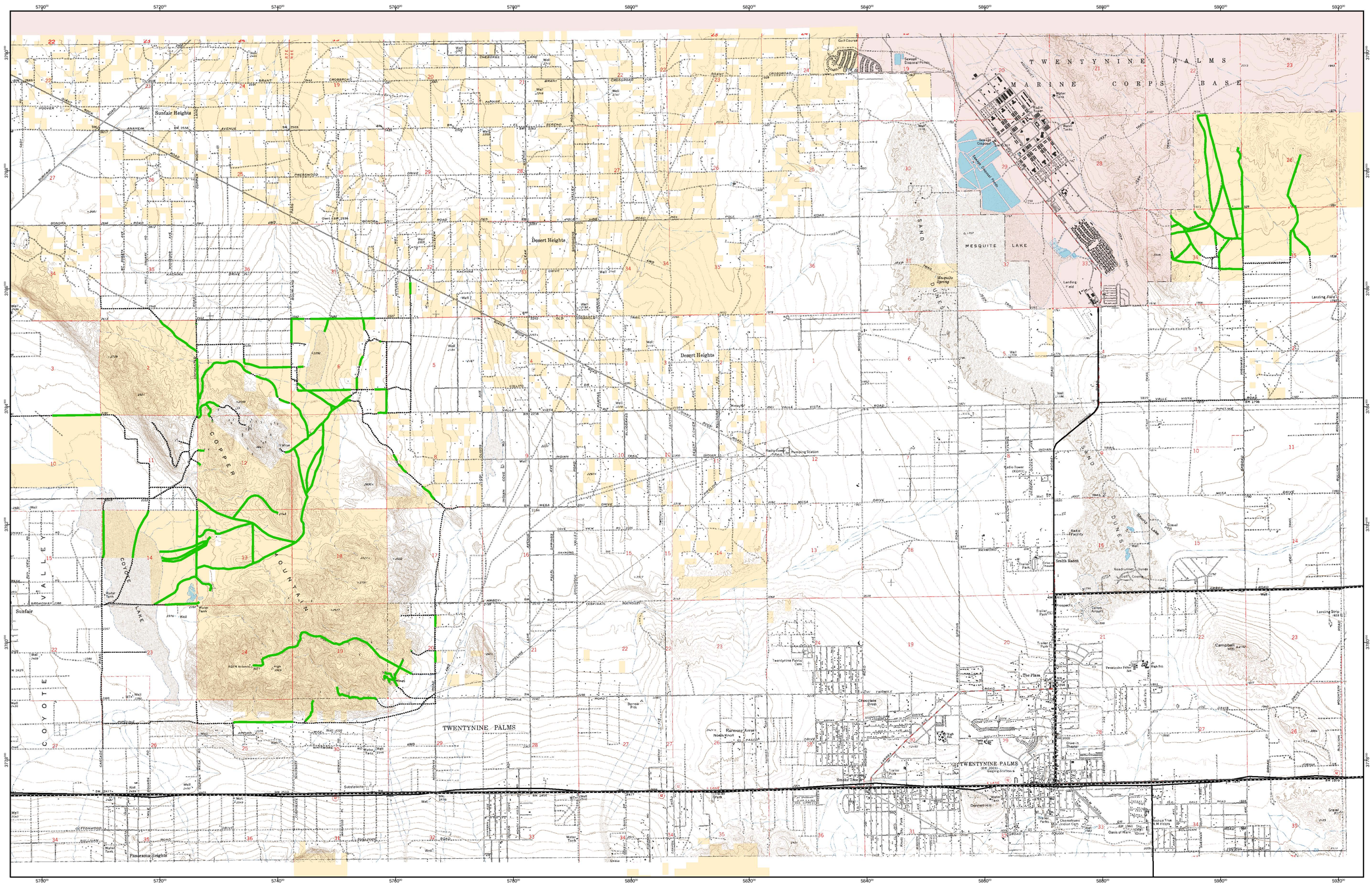
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

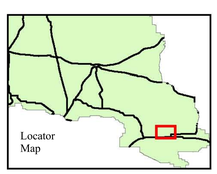
Proposed Action - West Mojave Route Designation Program

Map 79 - Sunfair, Twentynine Palms



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

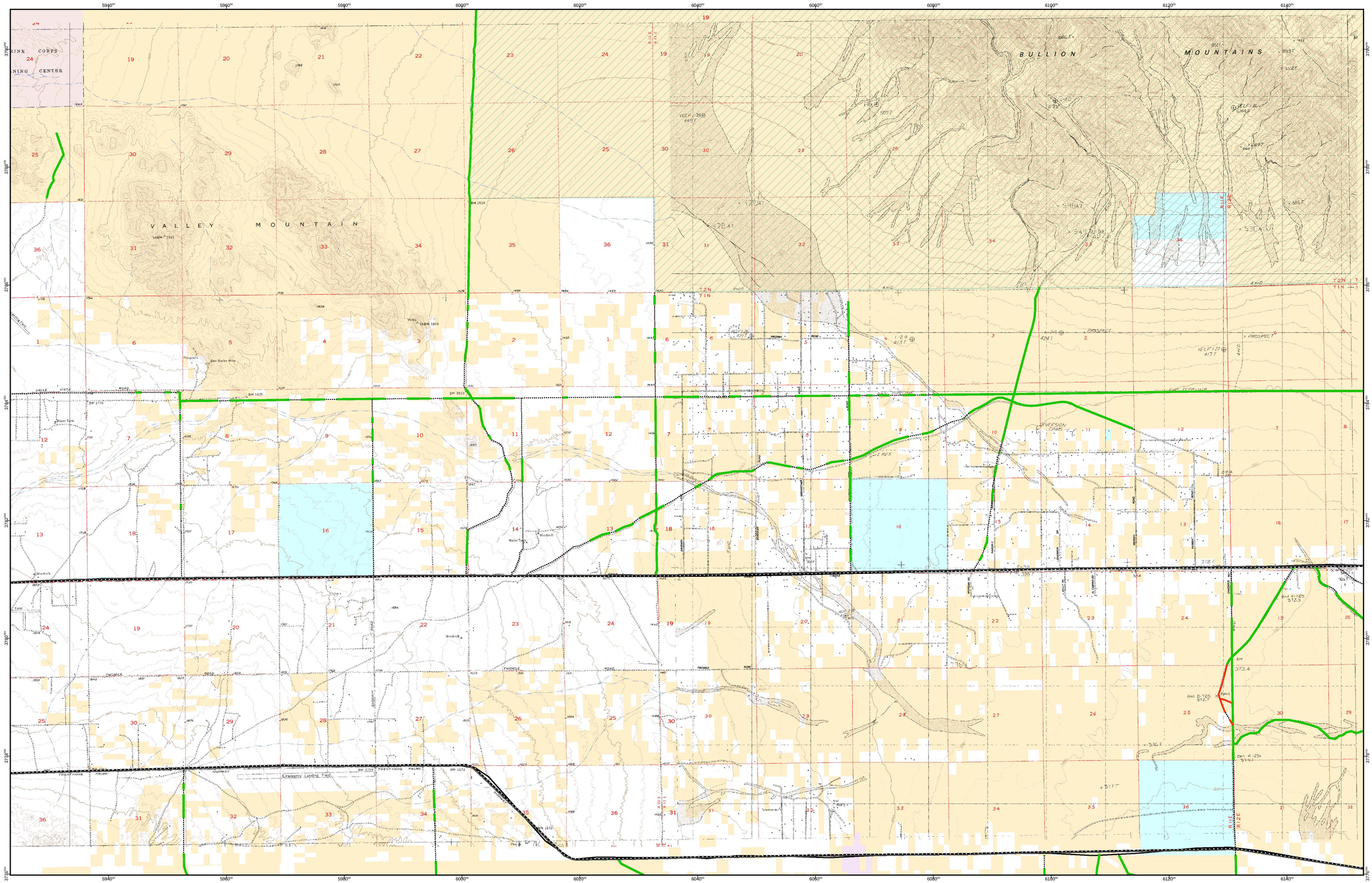
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

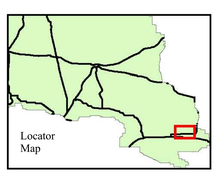
Proposed Action - West Mojave Route Designation Program

Map 80 - Valley Mountain, East of Valley Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

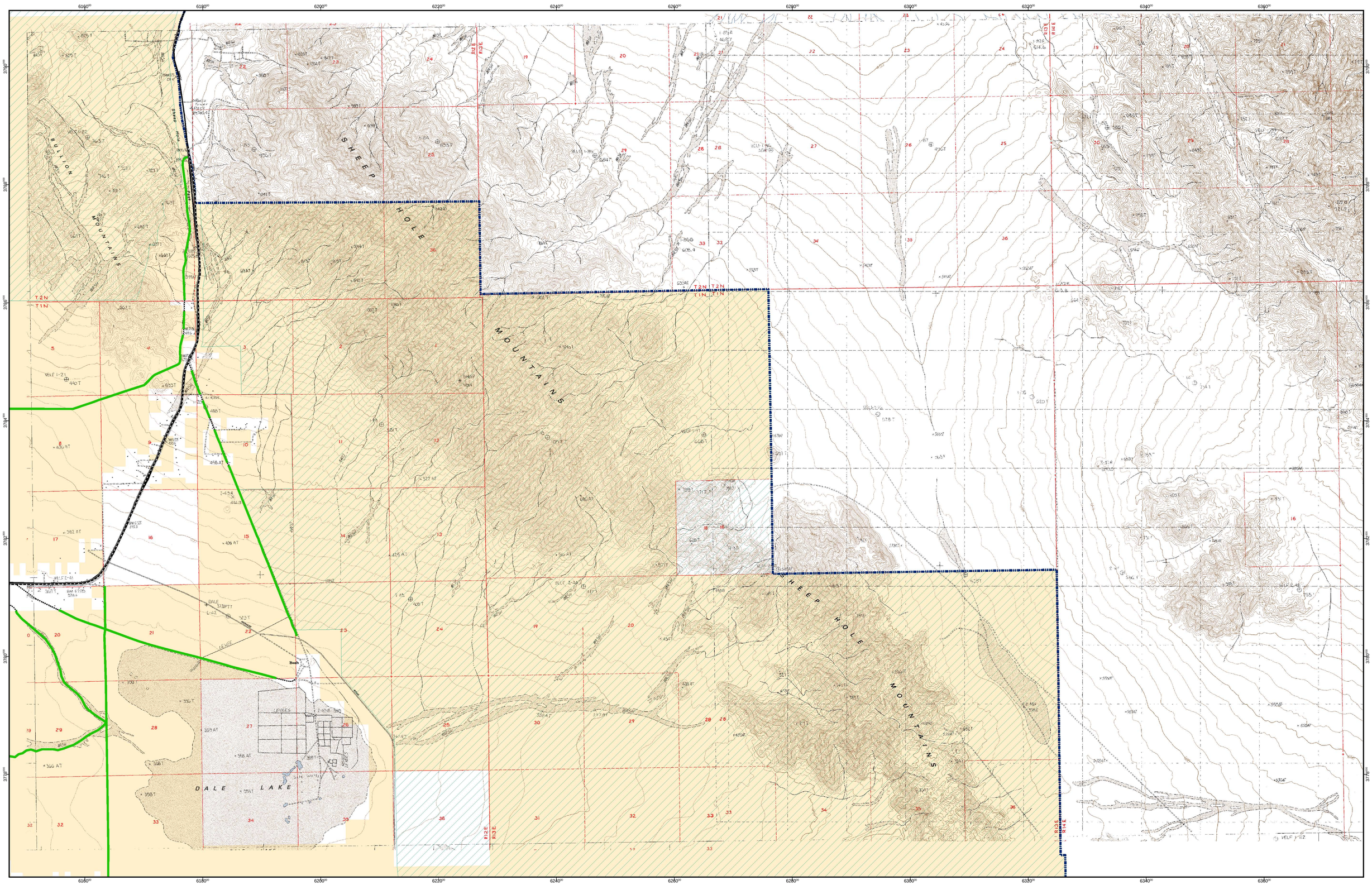
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

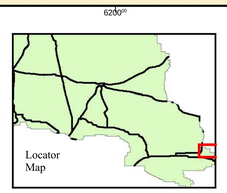
Proposed Action - West Mojave Route Designation Program

Map 81 - Dale Lake, East of Dale Lake



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

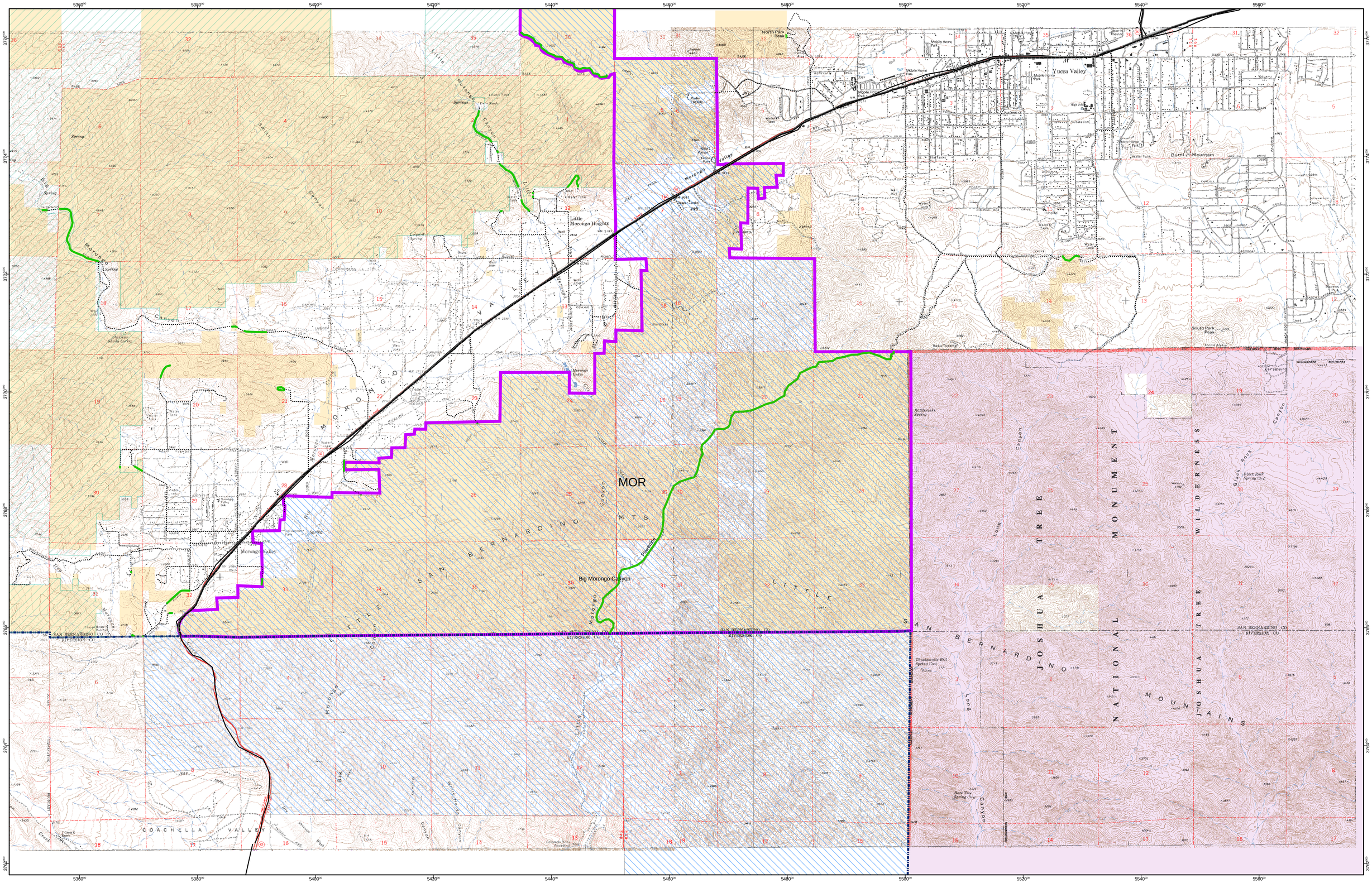
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 82 - Morongo Valley, Yucca Valley South



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

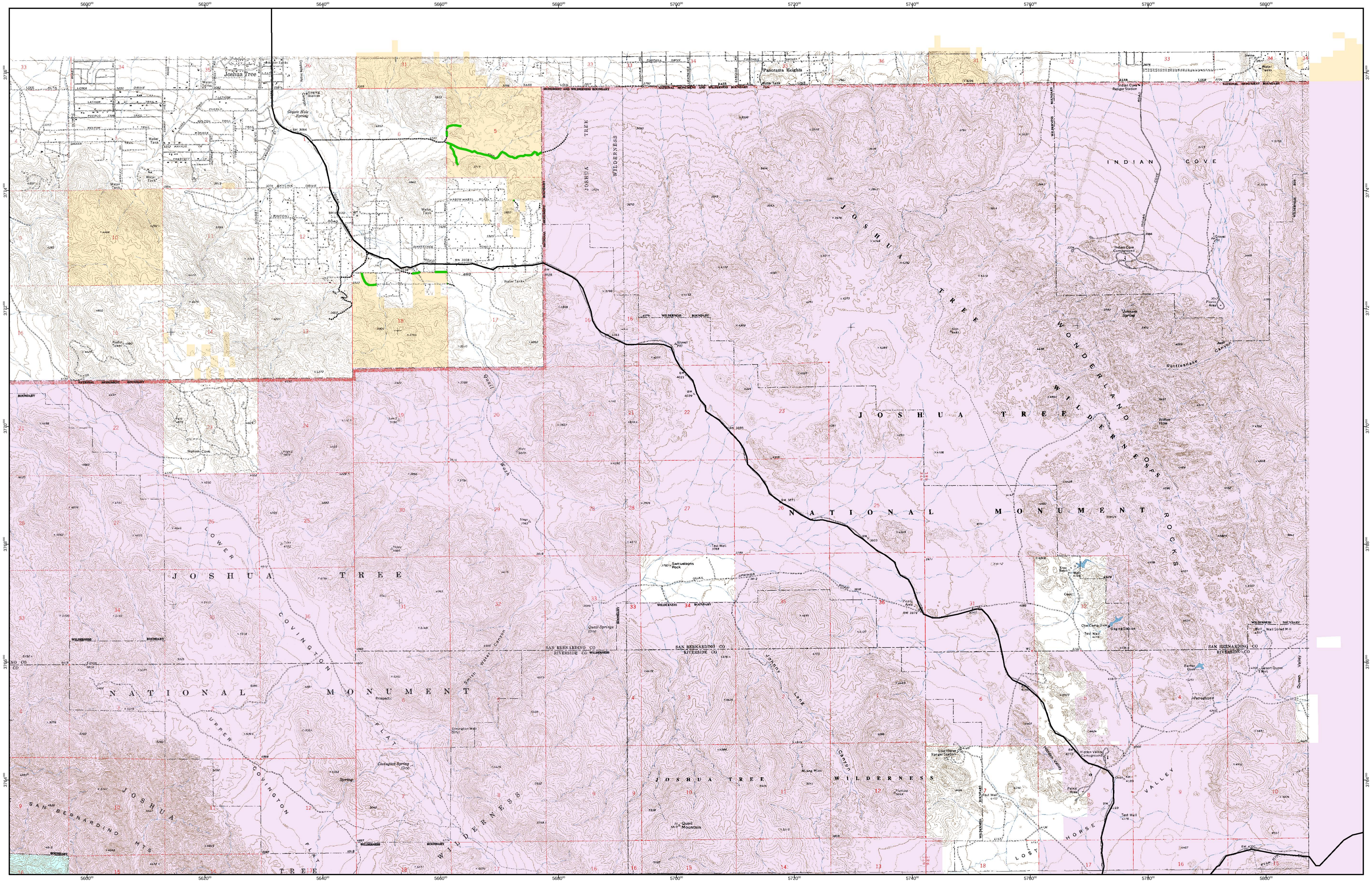
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

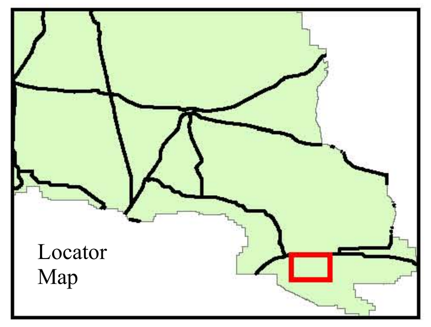
Proposed Action - West Mojave Route Designation Program

Map 83 - Joshua Tree South, Indian Cove



Designations apply to BLM lands only

Coordinates .... UTM NAD83, Zone 11
Cartography .... N. Pratini, M. Aspell
Date .... Feb. 25, 2003



N
W E
S

SCALE 1 : 24,000

Miles: 0 0.5 1 2

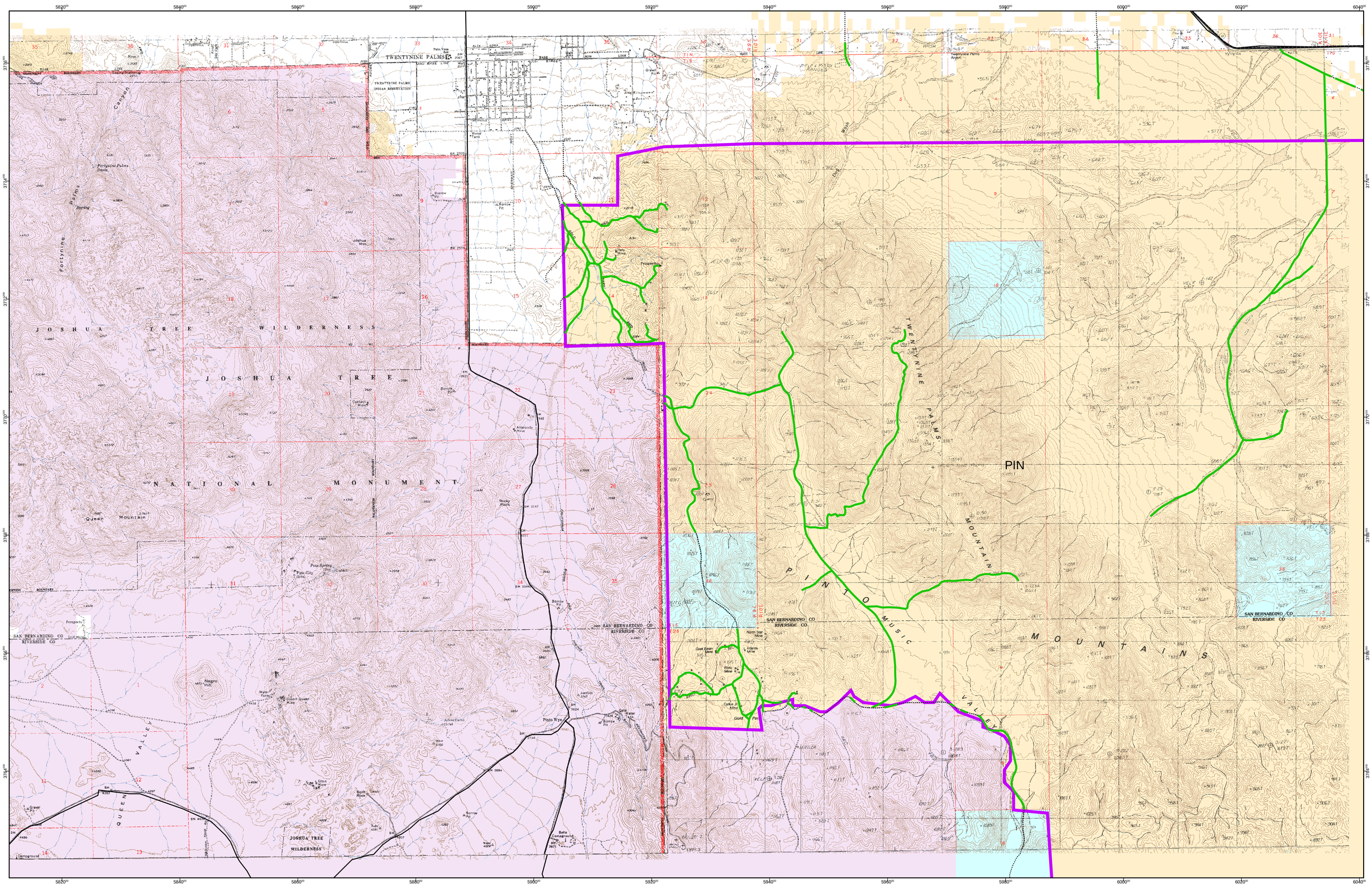
Meters: 0 500 1,000 2,000 3,000

Legend

	Proposed Designations	Land Ownership
Highways	Open	BLM
Major Roads	Closed	National Park Service
WM Plan Boundary	Limited	Military
BLM Wilderness	Public Road	State Lands
ACECs	Undesignated or Unknown	County/City/Regional
		Private

Proposed Action - West Mojave Route Designation Program

Map 84- Queen Mountain, Twentynine Palms Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

Miles: 0 0.5 1 2

Meters: 0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

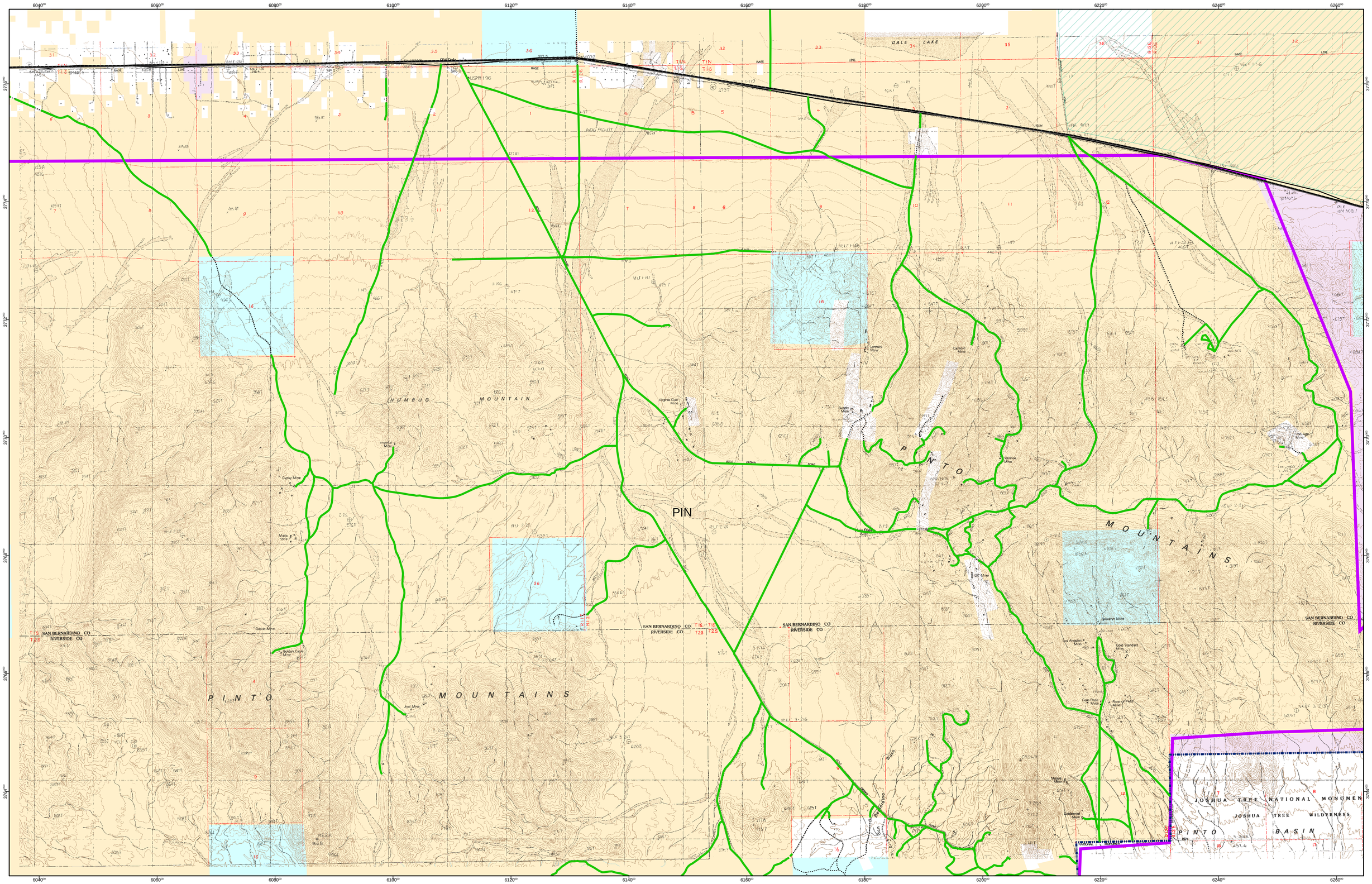
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 85 - Humbug Mountain, New Dale



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

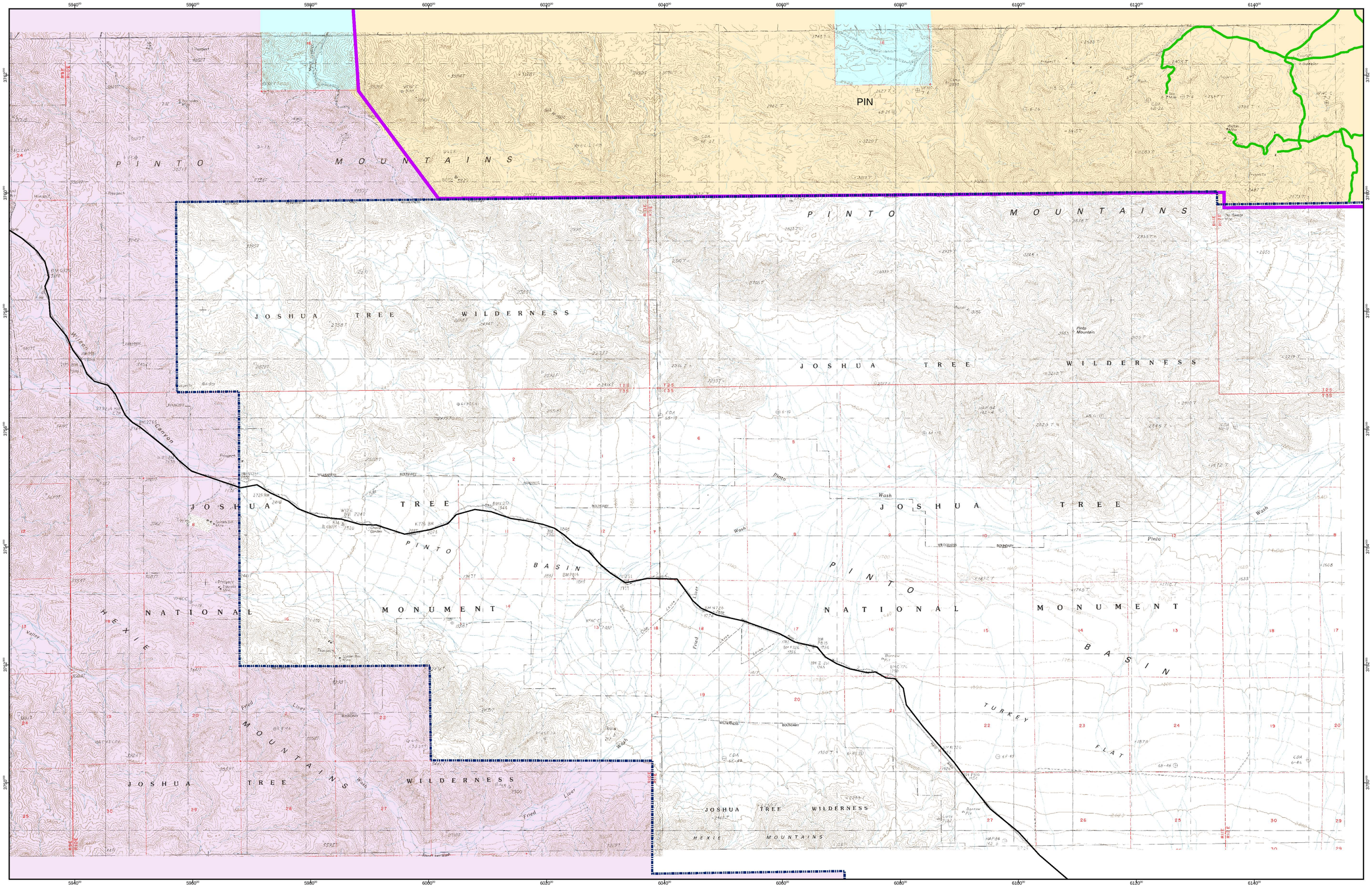
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 86 - Fried Liver Wash, Pinto Mountain



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

N
W E
S

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

- Highways
- Major Roads
- WM Plan Boundary
- BLM Wilderness
- ACECs

Proposed Designations

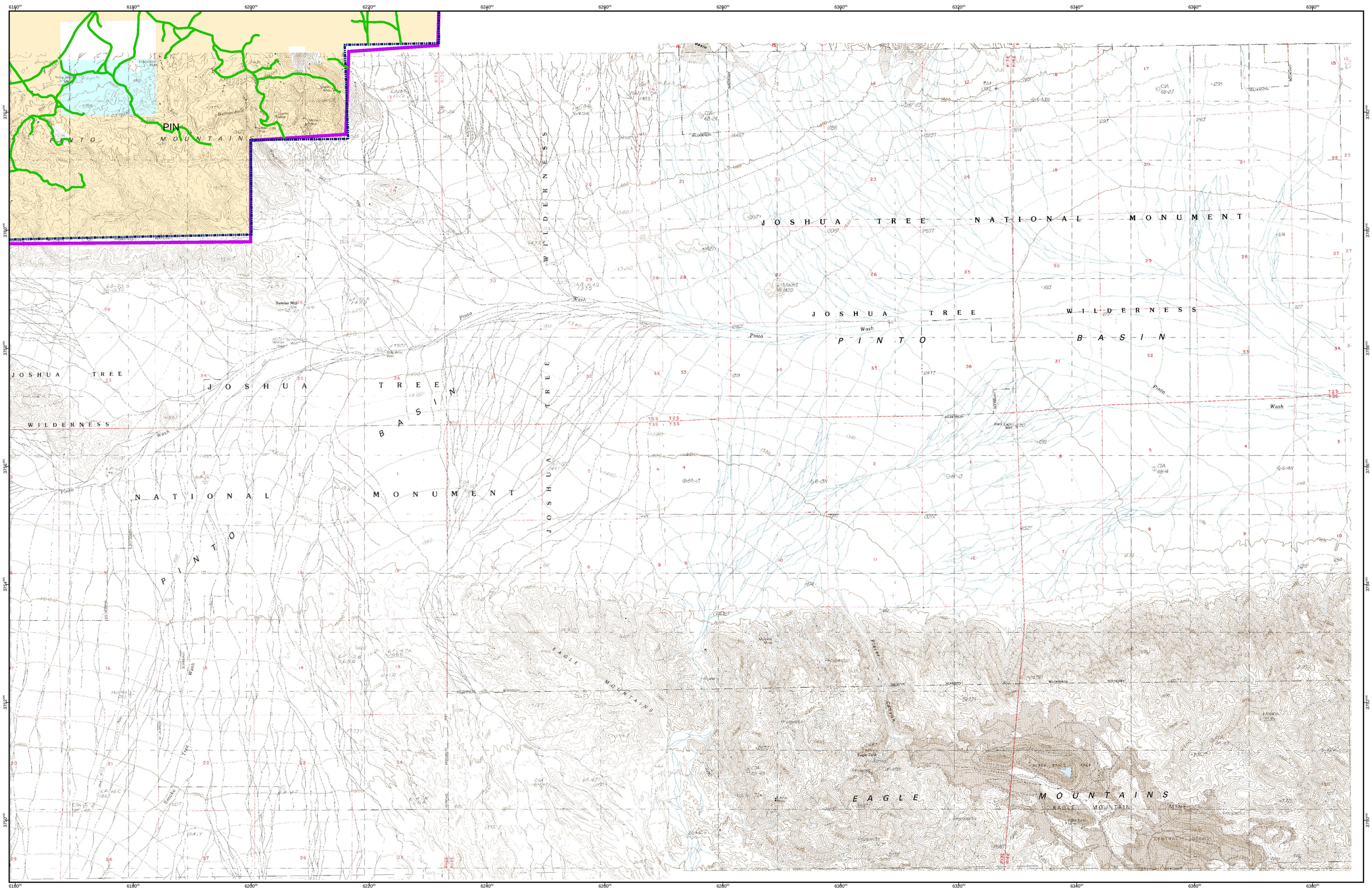
- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private

Proposed Action - West Mojave Route Designation Program

Map 87 - San Bernardino Wash, Placer Canyon



Designations apply to BLM lands only

Coordinates ..... UTM NAD83, Zone 11
Cartography ..... N. Pratini, M. Aspell
Date ..... Feb. 25, 2003

SCALE 1 : 24,000

Miles
0 0.5 1 2

Meters
0 500 1,000 2,000 3,000

Legend

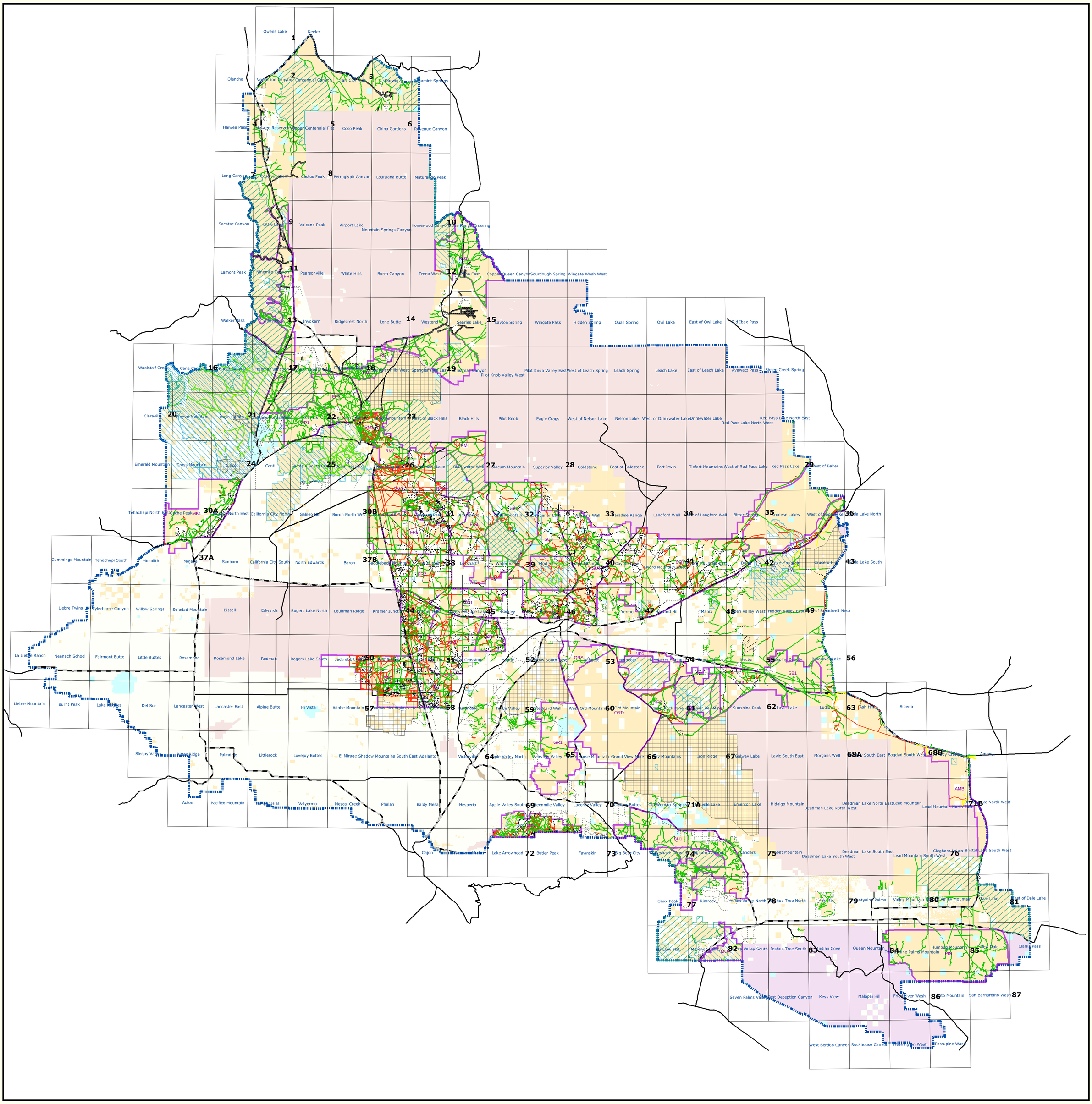
- Major Roads
- WM Plan Boundary
- BLM Wilderness

Proposed Designations

- Open
- Closed
- Limited
- Public Road
- Undesignated or Unknown

Land Ownership

- BLM
- National Park Service
- Military
- State Lands
- County/City/Regional
- Private



10 5 0 10 20 Miles

Map Projection .....Universe Transverse Mercator
Datum .....North American 1983
Scale.....1: 390,000
N. Pratini 3/5/2003

WM Plan Boundary
ACEC Designation Areas
Wilderness
Open Areas
Subregion Boundaries
Highways
Major Roads

Proposed Designations
Open
Closed
Limited
Public Road
Undesignated

Land Ownership
BLM
National Park Service
Military
State Lands
County/City/Regional
Private

PROPOSED ACTION
Route Map Index
West Mojave Route Designation Program

N W E S

Designations apply to BLM lands only