

**AERIAL APPLICATION OF
FIRE RETARDANT AND FOAM
AVOIDANCE AREAS**



SAN BERNARDINO NATIONAL FOREST - 2020



**San Bernardino
National Forest**



NATIONAL FOREST SERVICE DIRECTION AIRCRAFT OPERATIONAL GUIDANCE FOR RETARDANT AVOIDANCE AREAS

Chief's Direction (2011 Record of Decision): **Incident commanders and pilots are required to avoid aerial application of fire retardant in avoidance areas for certain threatened, endangered, proposed, candidate or sensitive (TEPCS) species or within the 300-foot (or larger) buffers on either side of waterways.**

This national direction is mandatory and would be implemented except in cases where human life or public safety is threatened and retardant use within avoidance areas could be reasonably expected to alleviate that threat.

Nothing in this decision changes the way aerially applied fire retardant is used outside of the mapped avoidance areas. All other fire suppression tactics are still available within avoidance areas.

These guidelines do not require helicopter or air tanker pilots to fly in a manner that endangers their aircraft or other aircraft or structures or that compromises the safety of ground personnel or the public. The Chief emphasizes that Firefighter and public safety continues to be our number one priority.

When approaching an avoidance area mapped for TEPCS species, waterway, or riparian vegetation visible to the pilot, the pilot will terminate the application of retardant approximately 300 feet before reaching the mapped avoidance area or waterway.

When crossing a mapped avoidance area, waterway, or riparian vegetation, the pilot will wait one second before applying retardant. Pilots will make adjustments for airspeed and ambient conditions such as wind to avoid the application of retardant within the 300-foot or larger buffer or avoidance area.

Although not mapped for protection, cultural resources, including historic properties, traditional cultural resources, and sacred sites will be given case-by-case consideration when ordering the aerial application of fire retardant. As necessary, incident commanders will consider the effects of aerial applications on known or suspected historic properties, any identified traditional cultural resources, and sacred sites. The Forest Service means to use cultural resources specialists, archaeologists, and tribal liaisons to assist in the Forest Service's consideration of effects and alternatives for protection.

AVOIDANCE AREAS MAPPED FOR THREATENED, ENDANGERED, PROPOSED, CANDIDATE, AND SENSITIVE (TEPCS) SPECIES FOUND ON THE SBNF

TEPCS species avoidance areas are shown as red in this mapbook. These areas may overlap with aquatic avoidance areas. Aquatic avoidance areas are waterways and are shown as blue on the maps. **Note: Only perennial waterways are mapped in this mapbook. Any stream, lake, meadow, etc. with water present at the time of the fire is an avoidance area.**

Table 1. Mapping Guidelines for Retardant Avoidance Areas on the SBNF*	
Buffer width	Location
Unarmored threespine stickleback	
600 feet	Shay Creek, MTRD
Mountain yellow-legged frog	
600 feet	All known occupied sites (City Creek Watershed, Day Canyon Watershed, Middle Fork Whitewater River Watershed, East Fork Barton Creek, Upper North Fork San Jacinto River Watershed, Hall Canyon Watershed, Fuller Mill Creek Watershed, Andreas Creek Watershed, Tahquitz Creek Watershed) and designated Critical Habitat. Buffer extends to any tributary upstream of occupied or designated habitat.
Quino checkerspot butterfly	
1 km	all known population sites
300 feet	designated Critical Habitat
Arroyo toad	
600 feet	all known sites and designated Critical Habitat
Southwestern willow flycatcher	
300 feet	all known sites and designated Critical Habitat
Least Bell's vireo	
300 feet	all known sites and designated Critical Habitat
San Bernardino kangaroo rat	
300 feet	all known sites and designated Critical Habitat
Endangered/Threatened plants	
300 feet	all known sites and designated Critical Habitat
Perennial Waterways	
300 feet	All waterways
<i>*All buffers are mapped accordingly in this mapbook</i>	

MAPBOOK LEGEND - RETARDANT AVOIDANCE AREAS



TEPCS AVOIDANCE AREA: Threatened, Endangered, Proposed, Candidate, or Sensitive (TEPCS) species avoidance areas may be used to avoid impacts on a) one or more federally listed threatened, endangered, or proposed plant or animal species or critical habitat where aerial application of fire retardant may affect habitat and/or populations; or b) any Forest Service terrestrial sensitive or candidate species where aerial application of fire retardant may result in a trend toward federal listing under ESA or a loss of viability on the planning unit. Buffer distances vary (see Table 1).



AQUATIC AVOIDANCE AREA: Waterways are mapped as aquatic avoidance areas. A waterway is defined as any body of water including lakes, rivers, streams, identified springs, and ponds whether or not they contain aquatic life. Waterways are buffered by 300 feet.

***Note:** Only perennial waterways are mapped as aquatic avoidance areas in this mapbook. Any stream, lake, meadow, etc. with water present at the time of the fire is an avoidance area.

***Note:** Many of the aquatic avoidance areas overlap with TEPCS avoidance areas some of which have a 600' buffer. See the mapped avoidance areas for buffer distance.

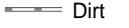
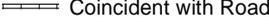
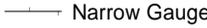
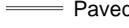
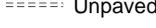
INSTRUCTIONS FOR USING THE SBNF RETARDANT AVOIDANCE MAPBOOK

- During initial and extended attack, determine what avoidance areas are in the vicinity. Identify intermittent waterways (unmapped in this mapbook) that may have water present and are thus considered avoidance areas.
- Ensure that the Incident Commander and Air Operations are aware of avoidance areas.
- If avoidance areas are present, request a Resource Advisor be assigned to the incident as soon as possible.
- Document retardant/foam applications (including ground-based spills) in avoidance areas (GPS points, photos, description of coverage and effects, date, time, etc.) and notify the Incident Commander and Resource Advisor as soon as possible. Forms for reporting mis-applications are available at the website below.

FOR ADDITIONAL RESOURCES

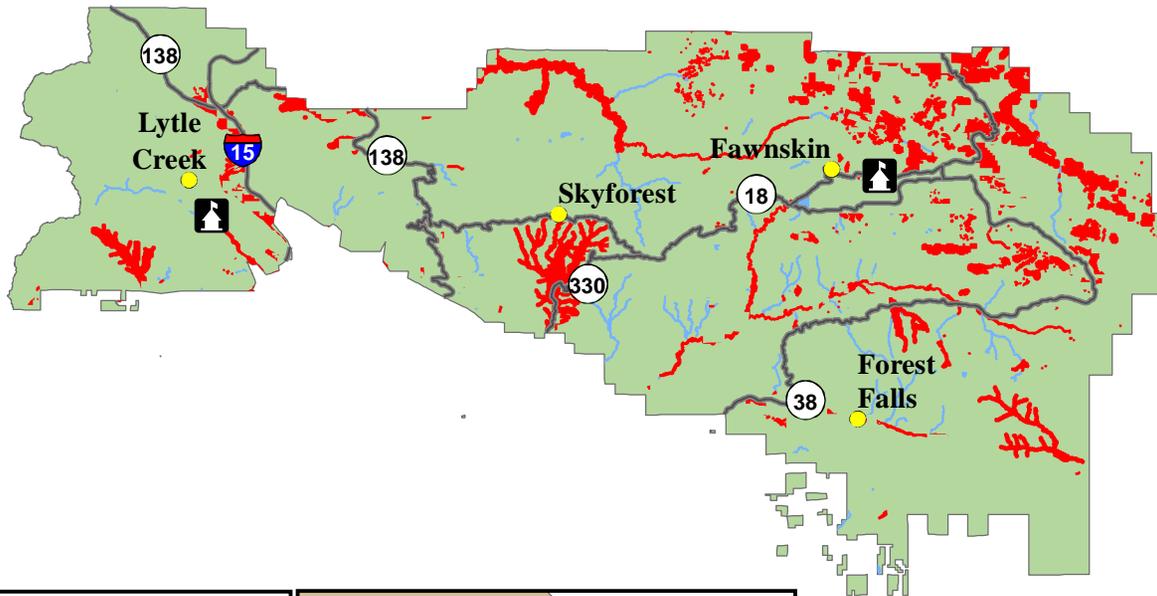
Visit the website: <https://www.fs.usda.gov/managing-land/fire/chemicals>. The website has the 2018 Implementation Guide, a Map Viewer that displays the nationwide avoidance areas on all Forest Service lands, and has the link for reporting misapplications.

USFS AERIAL FIRE RETARDANT AVOIDANCE

 Perennial Hydrologic Avoidance	 Trailhead	 Forest or Grassland
 TES Avoidance	 Winter Recreation Area	 FS Land - Other
 Interstate	 Campsite	 FS Spec Mgt/Rec Area
 U.S.	 Roadside Park	 Ranger District
 State	 Quarry or Open Pit Mine	National
 County	 Pit	 Boundary
 National Forest Route, suitable for passenger vehicles	 Prospect	 Park Service
 National Forest, suitable for high clearance vehicles	 Mineshaft	 Wilderness Area
 Highway w/Median	 Cave/Mine Tunnel Entrance/Adit	 Rec/Scenic Area
 Highway	 School	 Wild and Scenic River
Light Duty Roads	 House of Worship	 Federally Admin - Other
 Paved	 Cemetery or Grave	 Military
 Gravel	 Corral	 State
 Dirt	 Windmill or Wind Generator	 State/County Special Area
 Unimproved or 4WD	 Power Substation	 County/Alaska Borough
Trails	 Well/Drill Hole - Exclude Water	 Civil Township
 Nat Rec/Scenic/Historic	 Tanks/Tower - Small	 Incorporated City - Etc
 Trail/Track	 Sewage Disp/Water Filter	 International Buffer Zone
Railroads	 Tick - 4WD/ Approximate Location	 Tribal Land
 Tunnel - Entrance_Road/R.R.	 Abut - Footbridge/Rd Tunnel Ent	 Indian Res or Treaty - Old
 Coincident with Road	 Abutment - Bridge	 Tribal Allotment
 Narrow Gauge	 Lookout - Permanent	 Township/Range - Protracted
 Standard Gauge	 Lighthouse/Beacon, Located or Landmark Object	 Section Line - Protracted
 R.R. Station	 Lighthouse/Beacon w/ Cont Sta	 Gate, Barrier
 R.R. Turntable	 Horiz Control Station	 TollGate
Landing Strip	 Monument - Land Grant	 Power Transmission Line
 Paved	 Monument	 Ski Lift/Cableway/Conveyor
 Unpaved	 Drawbridge	 Telephone or Telegraph Line
 Helipad, Helispot	 Vert Control Station	 National Forest or Grassland
 Seaplane Anchorage	 Spot Elevation	 Non-FS Lands
 Seaplane Base	 Monument - U.S. Mineral/Location	 Built-Up Area
 Forest/Region HeadQtrs Office	 Cliff Dwelling	Elevation Contour
 Ranger District Office	 Ruins/Archaeologic Site	 Index
 Forest Service Facility	 Ruins/Archaeologic Site (outline)	 Intermediate
 Campground		 Depression Index
 Picnic Area		 Depression Intermediate

USFS Aerial Fire Retardant Avoidance

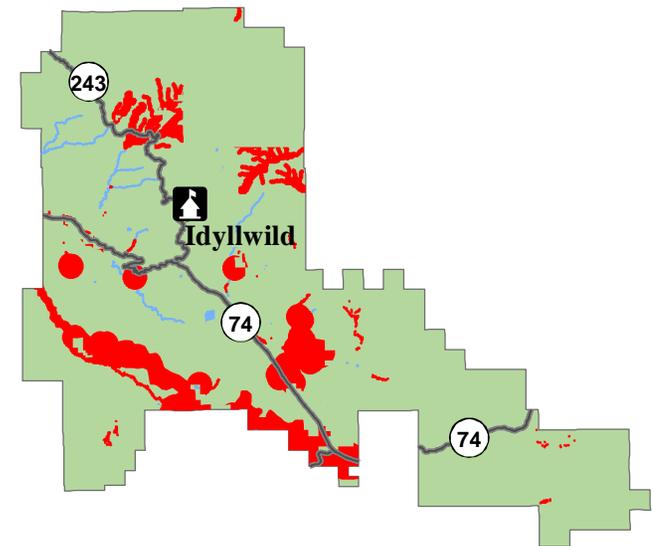
San Bernardino National Forest



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Legend	
	TES Avoidance
	Perennial Hydrologic Avoidance
	Highway/Interstate
	National Forest Boundary
	District Office
	Populated Place

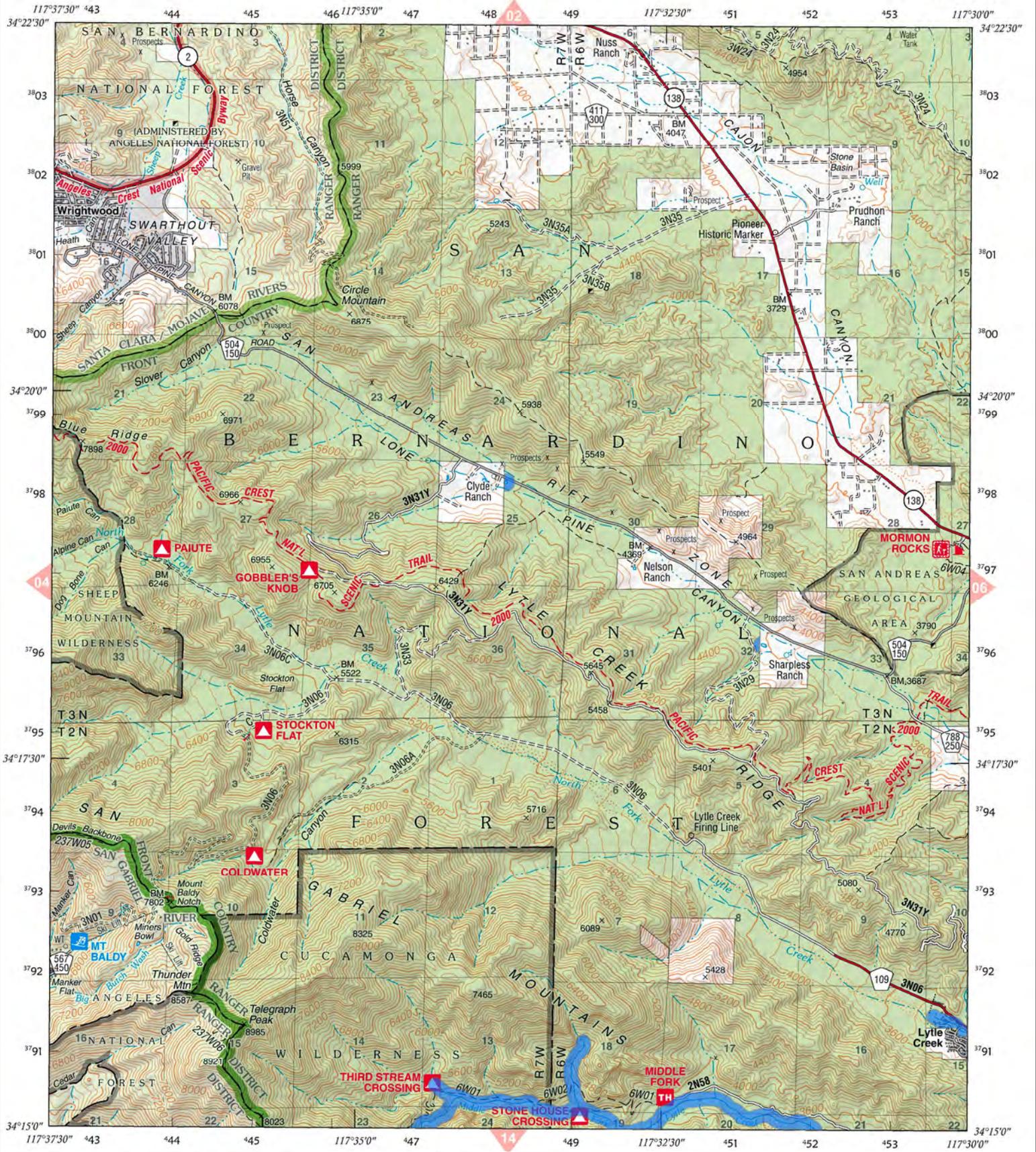


This map is for demonstration purposes only, and depicts retardant-specific avoidance areas for each national forest. For operational use, please refer to this forest's quad-based retardant avoidance products which also depict required hydrologic avoidance areas.

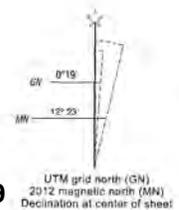
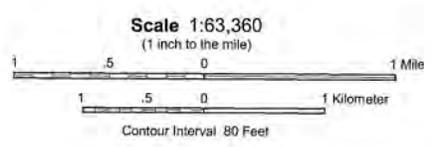


The following maps have been generated for all USGS 7.5" quadrangles covering the lands of the San Bernardino National Forest except for the following because no data were associated with the listed quadrangle:

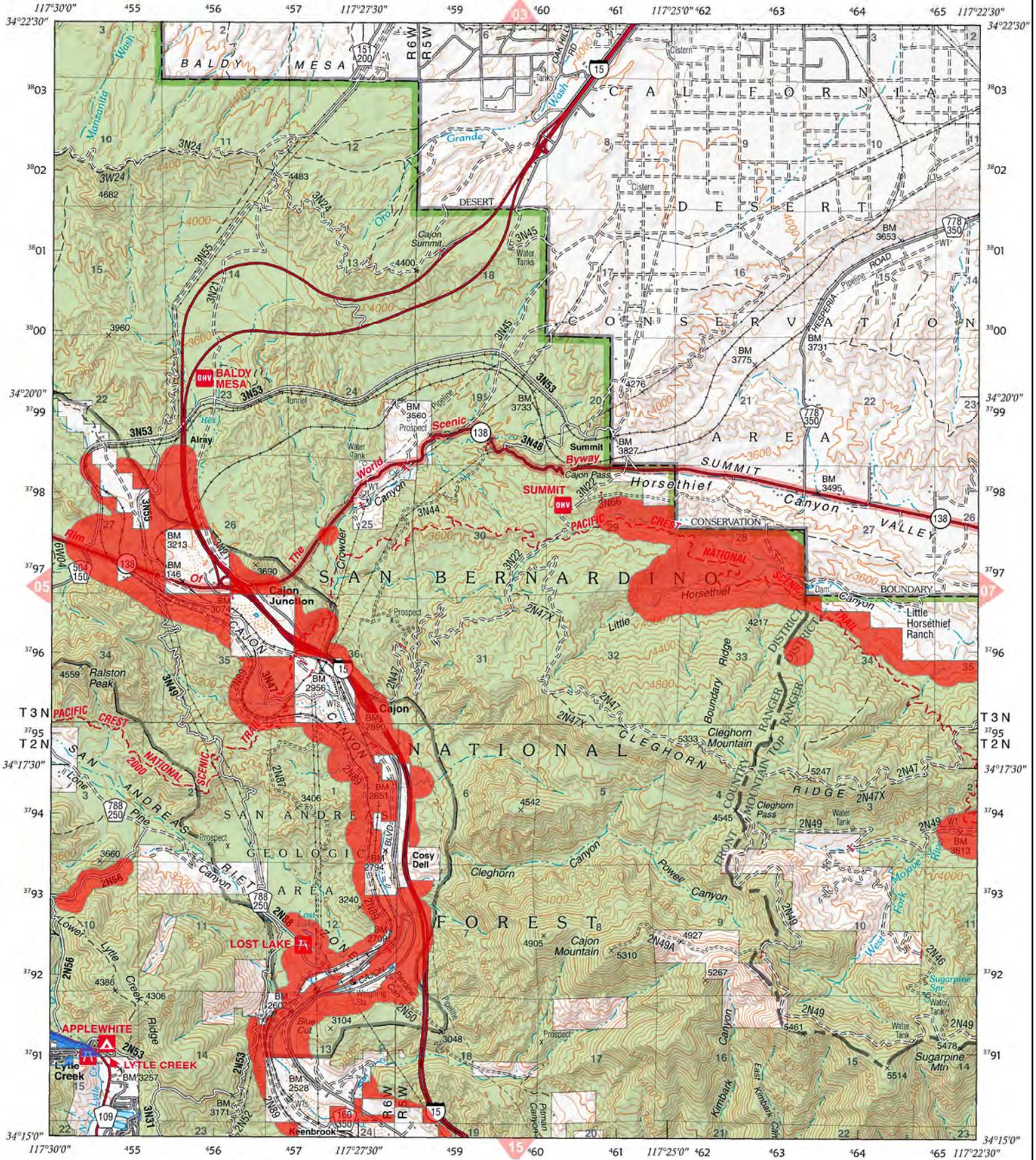
1. Mescal Creek (*Also see Angeles National Forest Aerial Retardant Avoidance Maps*)
2. Phelan
3. Baldy Mesa
4. Mount San Antonio (*Also see Angeles National Forest Aerial Retardant Avoidance Maps*)
28. Cabazon
36. Rancho Mirage
40. Martinez Mountain
41. Collins Valley



Mescal Creek	Phelan	Baldy Mesa
Mount San Antonio	Telegraph Peak	Cajon
Mount Baldy	Cucamonga Peak	Devore



Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83)
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).

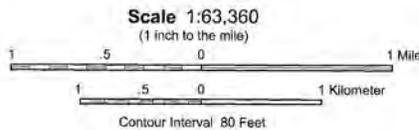


Revision by USDA Forest Service 2014

North American Datum of 1983 (NAD 83).

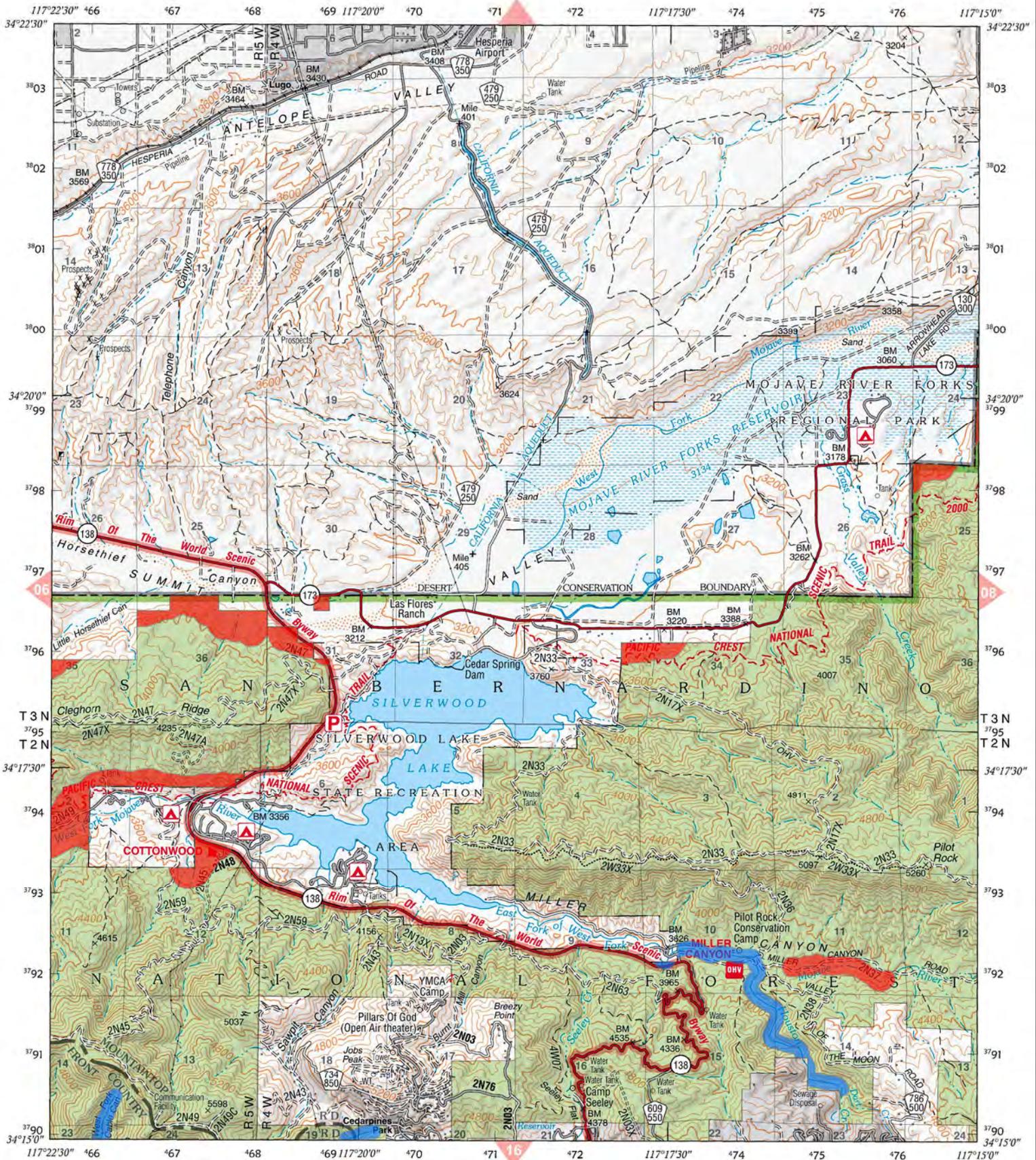
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).

UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet



Phelan	Baldy Mesa	Hesperia
Telegraph Peak	Cajon	Silverwood Lake
Cucamonga Peak	Devore	San Bernardino North

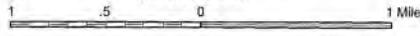
SBNF Aerial Retardant Avoidance 2019



Baldy Mesa	Hesperia	Apple Valley South
Cajon	Silverwood Lake	Lake Arrowhead
Devore	San Bernardino North	Harrison Mountain

Scale 1:63,360

(1 inch to the mile)



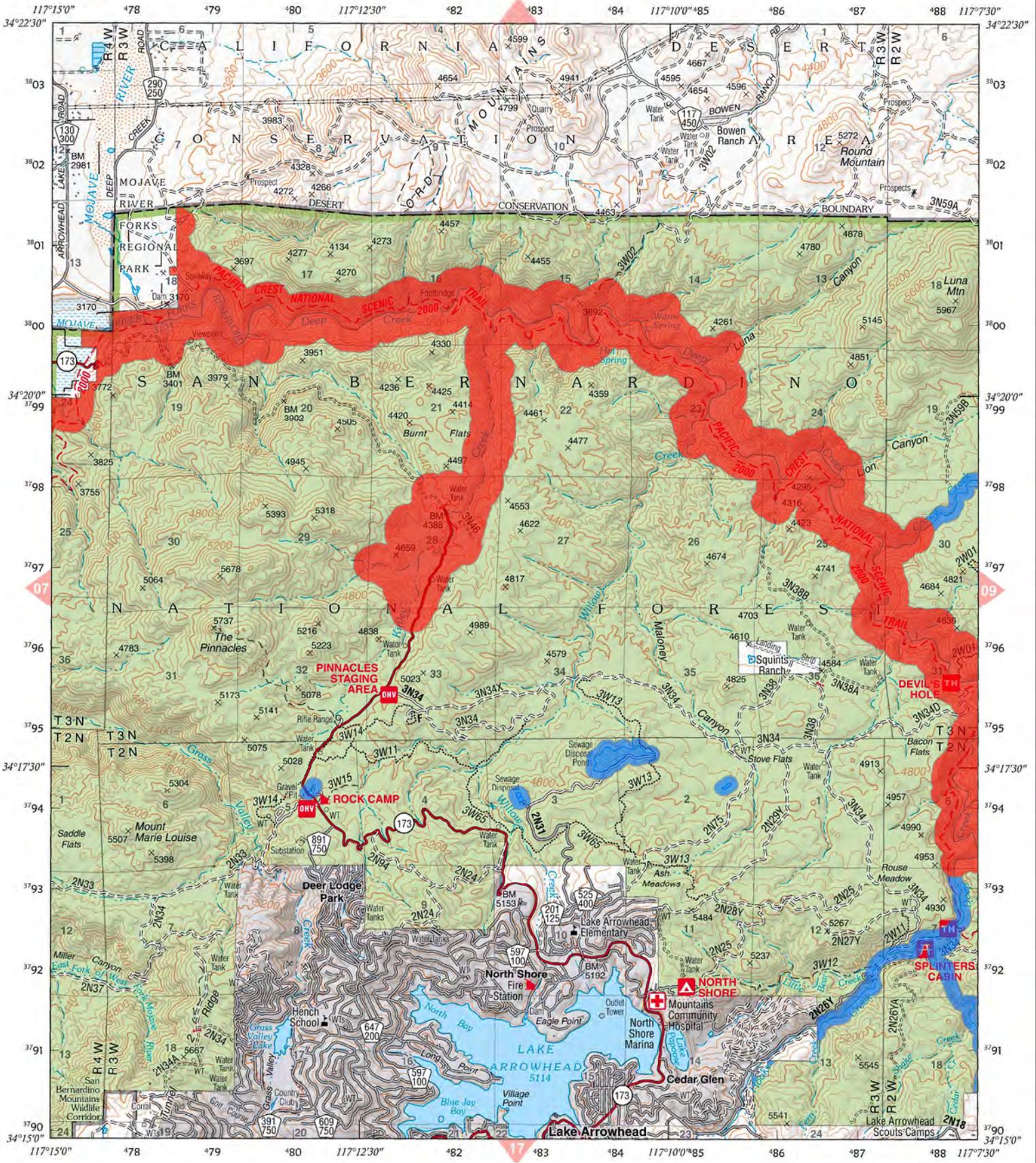
Contour Interval 80 Feet



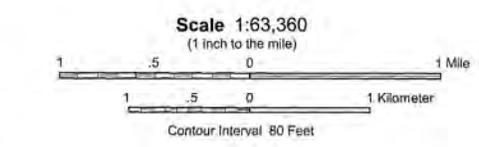
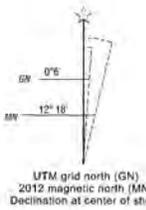
Revision by USDA Forest Service 2014

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Zone 5 (Lambert Conformal Conic).

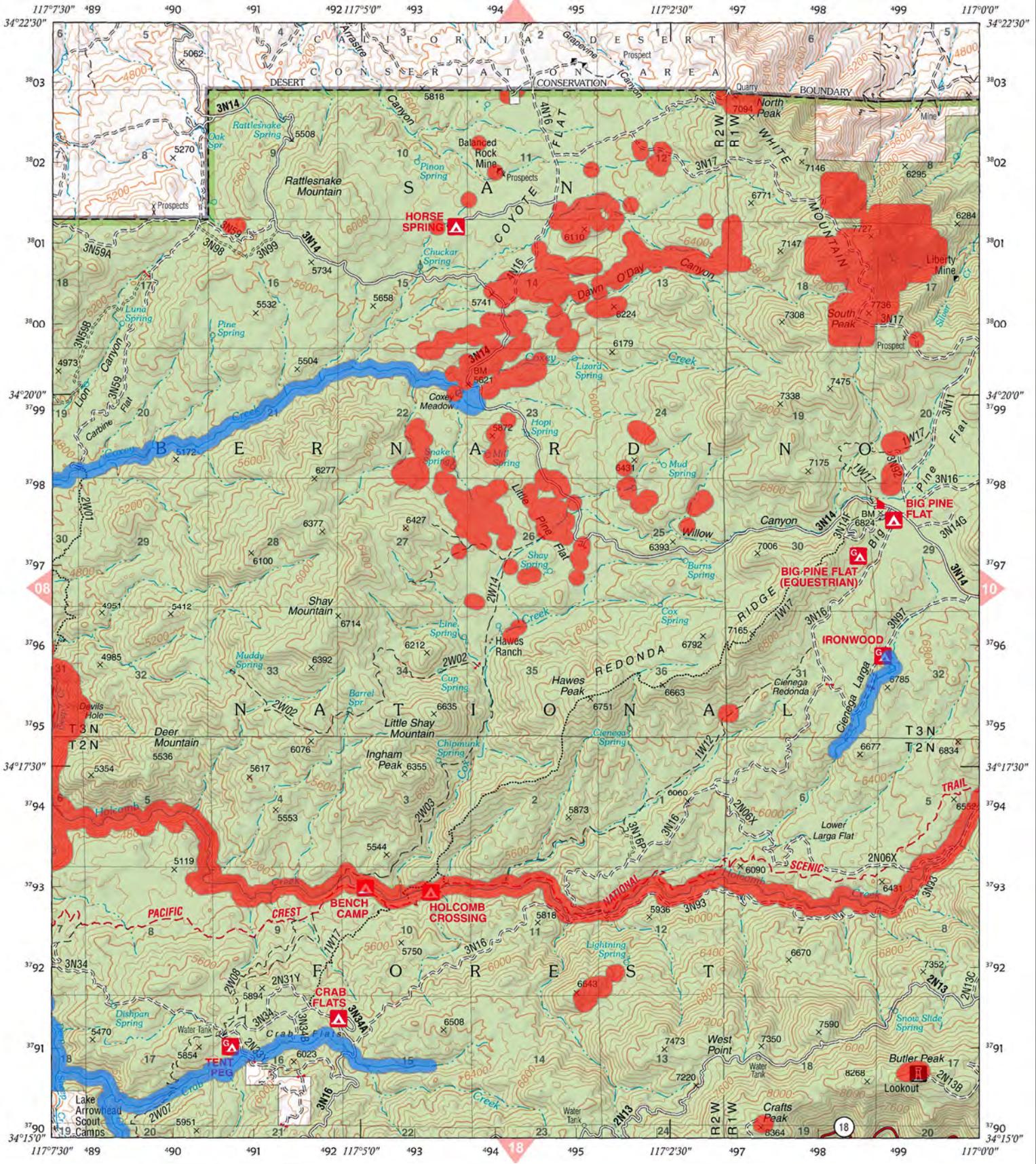


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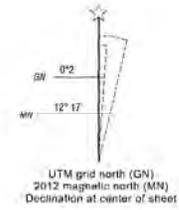
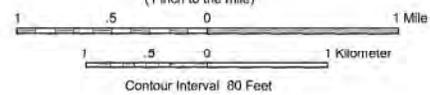
Hesperia	Apple Valley South	Fifteenmile Valley
Silverwood Lake	Lake Arrowhead	Butler Peak
San Bernardino North	Harrison Mountain	Keller Peak

SBNF Aerial Retardant Avoidance 2019

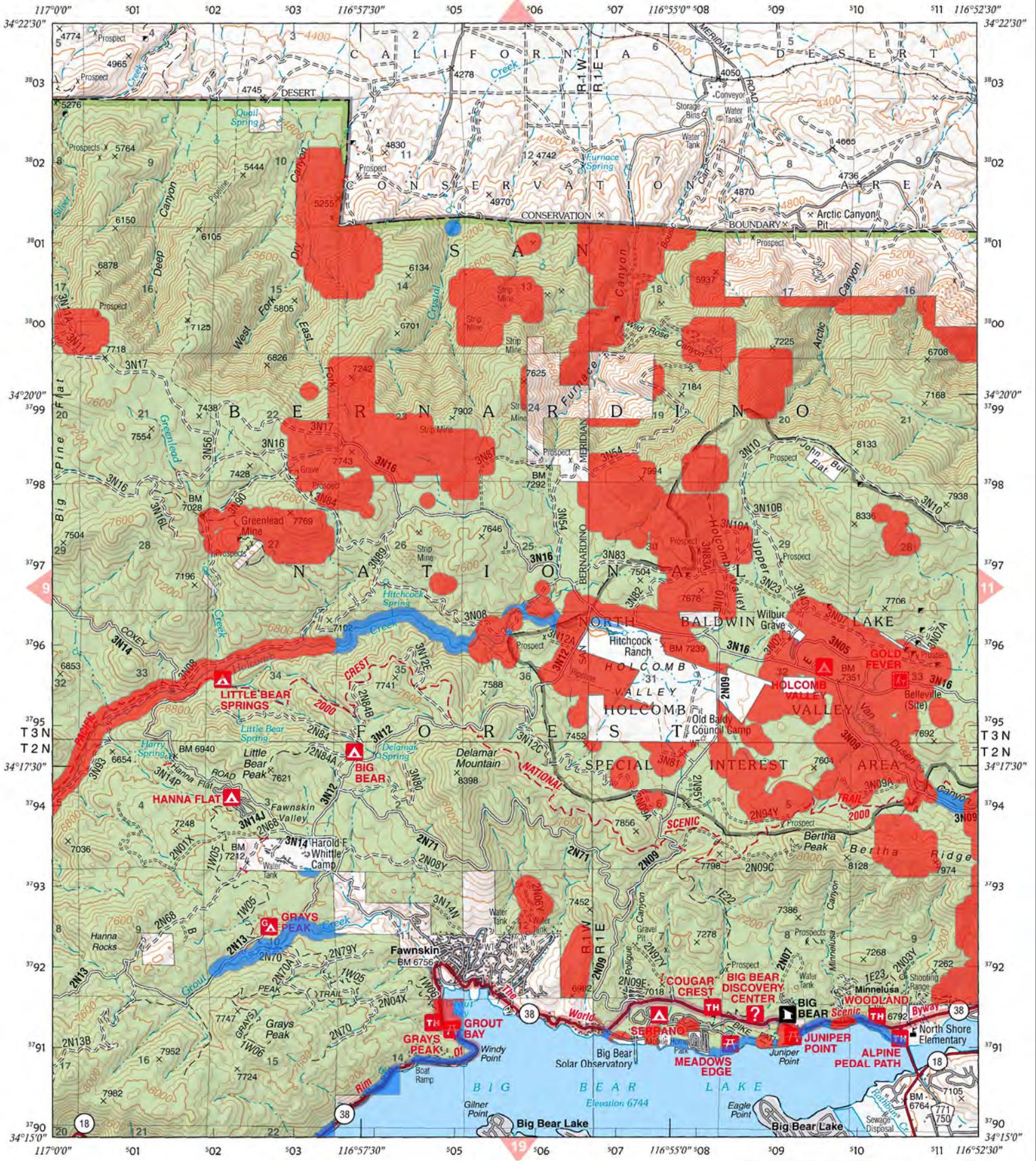


Apple Valley South	Filleenmile Valley	Lucerne Valley
Lake Arrowhead	Butler Peak	Fawnskin
Harrison Mountain	Keller Peak	Big Bear Lake

Scale 1:63,360
(1 inch to the mile)



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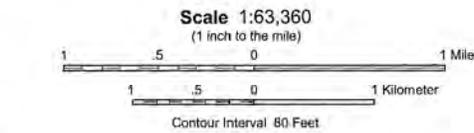


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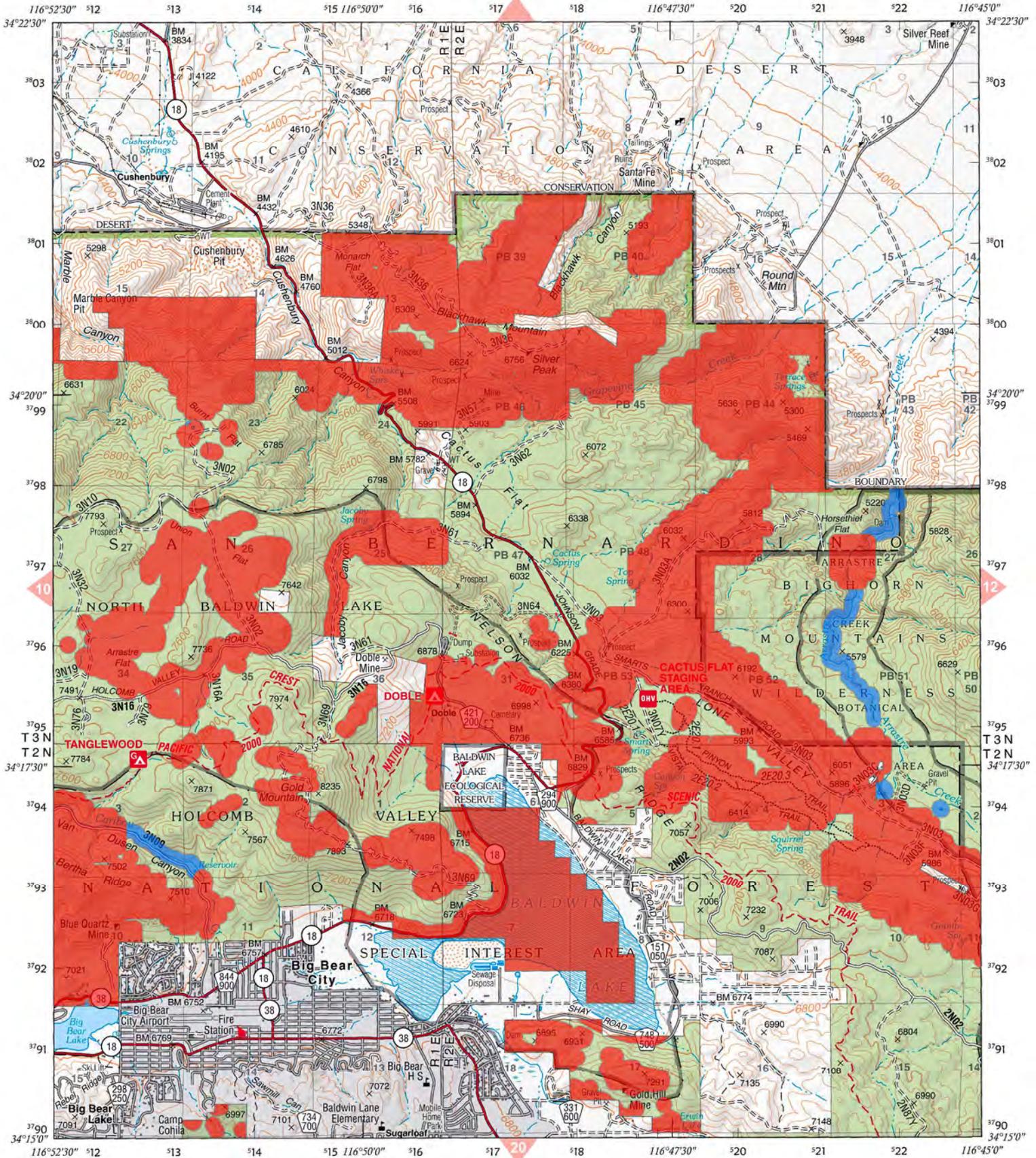
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Zone 5 (Lambert Conformal Conic).

UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet



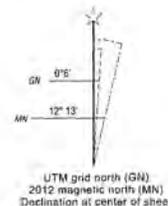
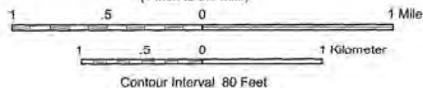
SBNF Aerial Retardant Avoidance 2019

Fifteenmile Valley	Lucerne Valley	Cougar Buttes
Butler Peak	Fawnskin	Big Bear City
Keller Peak	Big Bear Lake	Moonridge



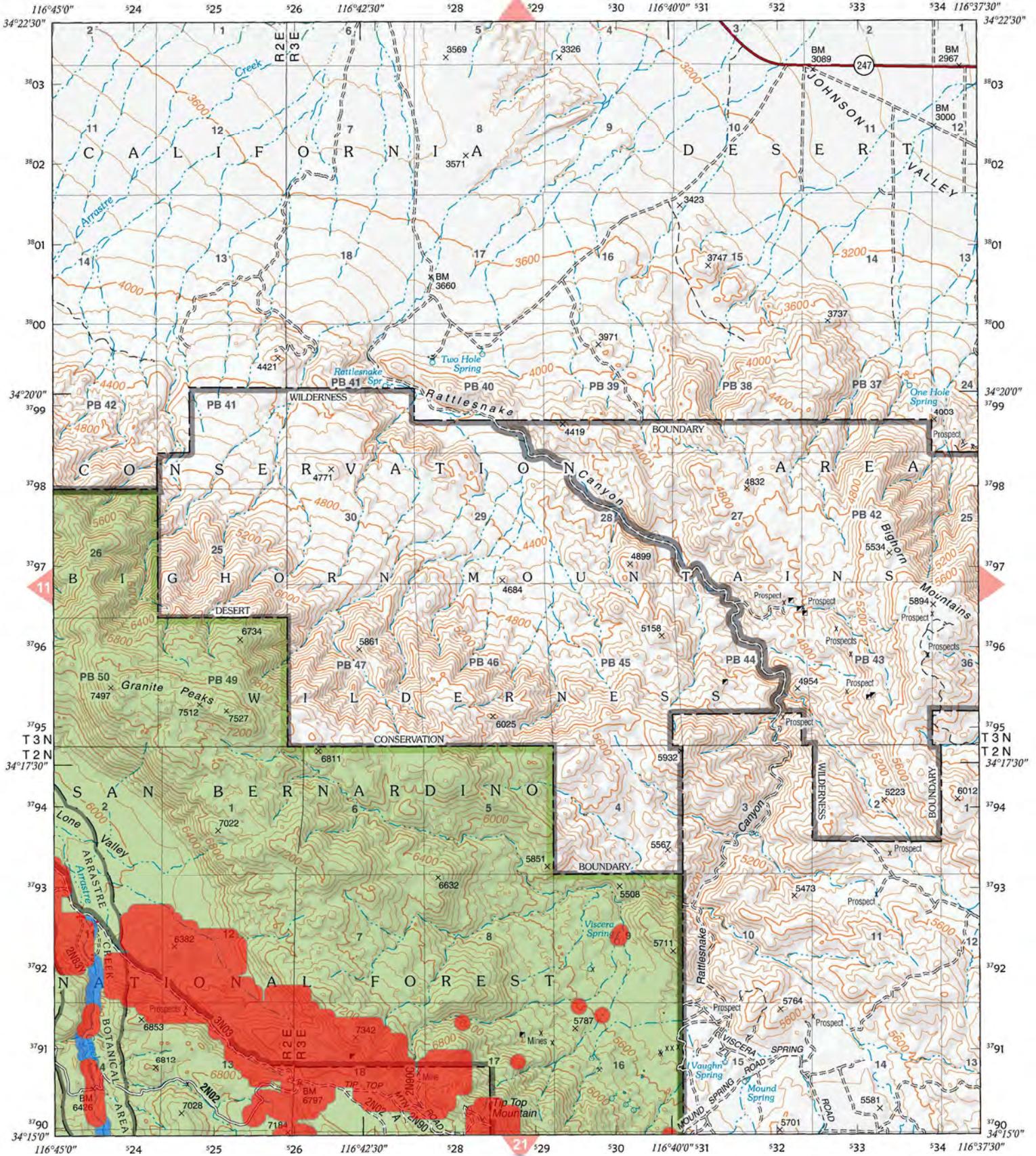
Lucerne Valley	Cougar Buttes	Old Woman Springs
Fawnskin	Big Bear City	Rattlesnake Canyon
Big Bear Lake	Moonridge	Onyx Peak

Scale 1:63,360
(1 inch to the mile)



Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).

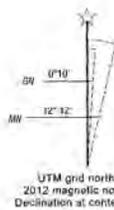
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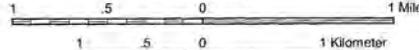
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Zone 5 (Lambert Conformal Conic).



UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

Scale 1:63,360

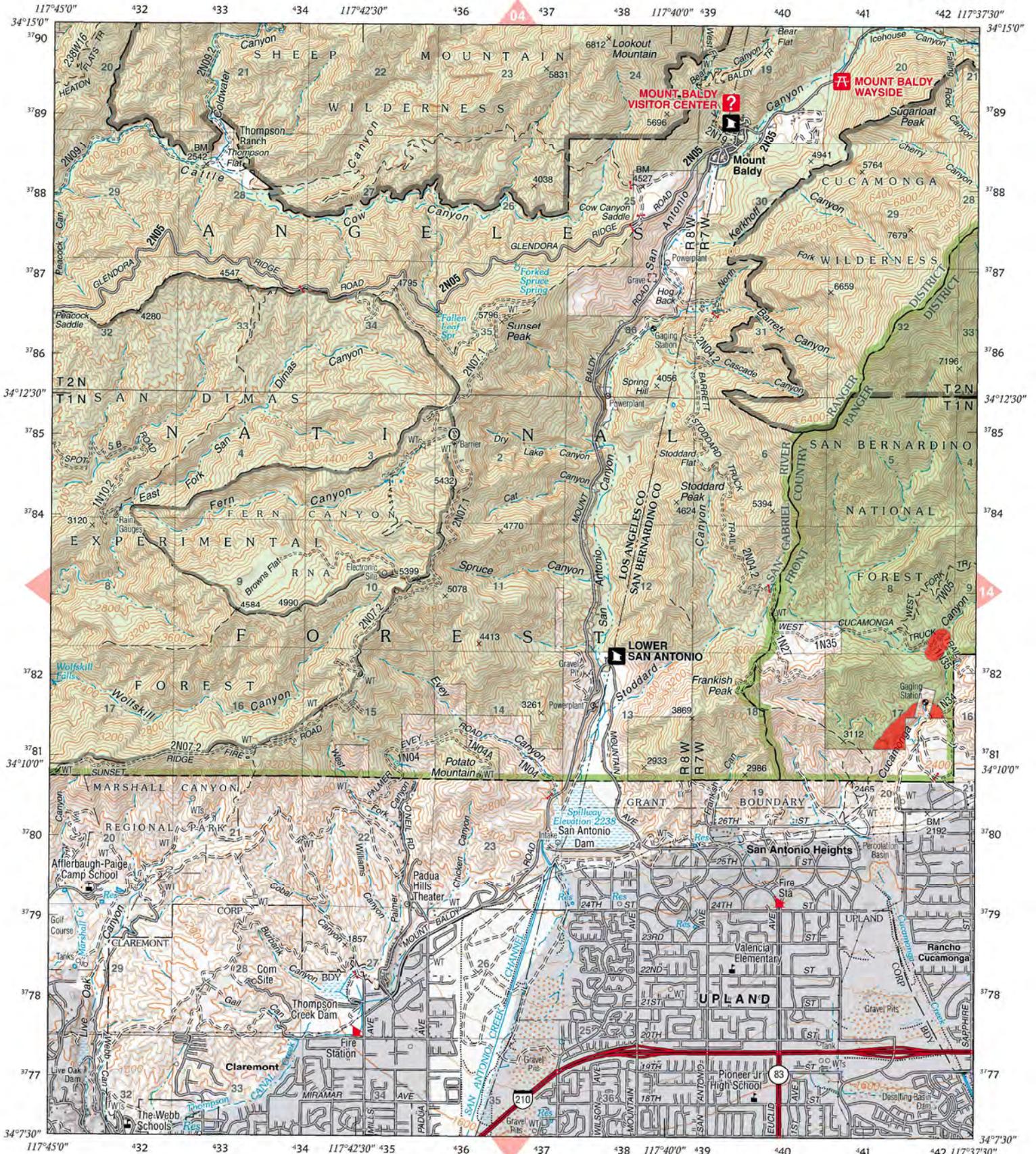
(1 inch to the mile)



Contour Interval 80 Feet

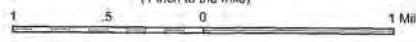
Cougar Buttes	Old Woman Springs	Melville Lake
Big Bear City	Rattlesnake Canyon	Bihorn Canyon
Moonridge	Onyx Peak	Rimrock

SBNF Aerial Retardant Avoidance 2019

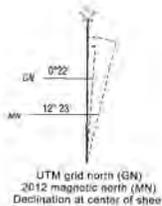


Crystal Lake	Mount San Antonio	Telegraph Peak
Glendora	Mount Baldy	Cucamonga Peak
San Dimas	Ontario	Guasti

Scale 1:63,360
(1 inch to the mile)

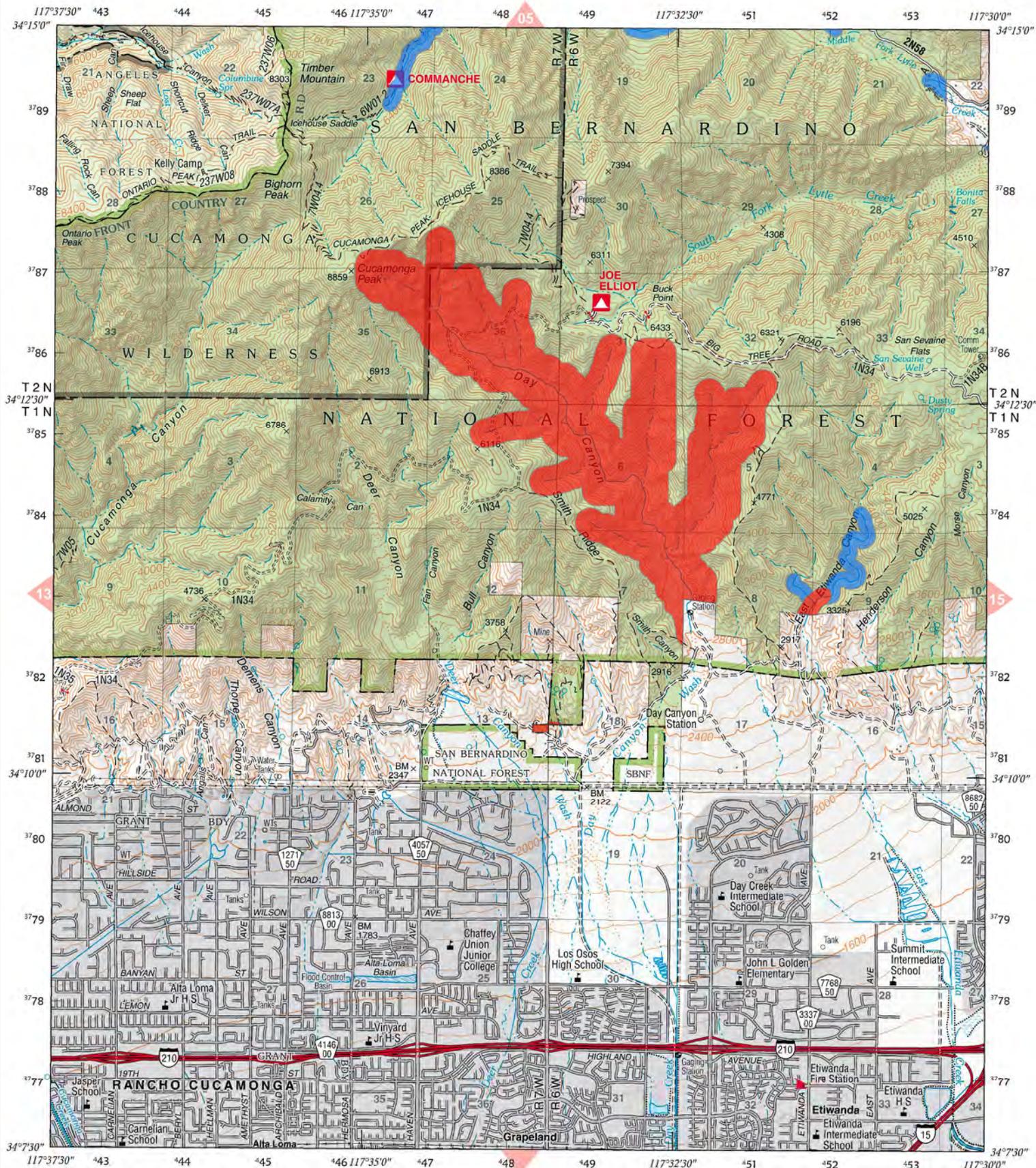


Contour Interval 80 Feet



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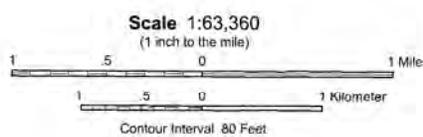


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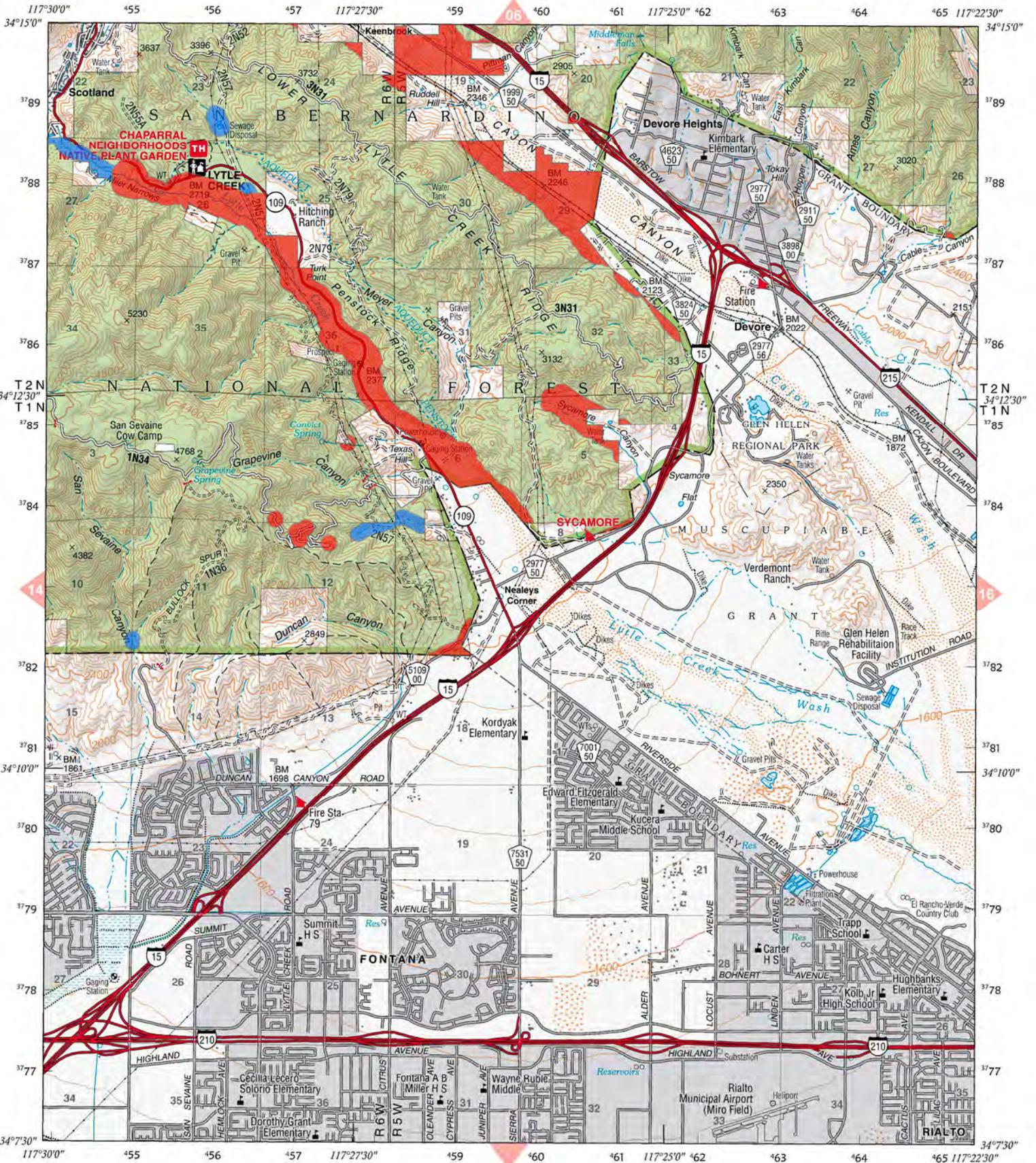
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UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet



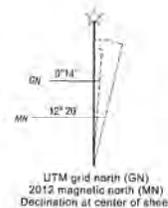
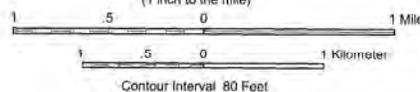
Mount San Antonio	Telegraph Peak	Cajon
Mount Baldy	Cucamonga Peak	Devore
Ontario	Guasti	Fontana

SBNF Aerial Retardant Avoidance 2019



Telegraph Peak	Cajon	Silverwood Lake
Cucamonga Peak	Devore	San Bernardino North
Guasti	Fontana	San Bernardino South

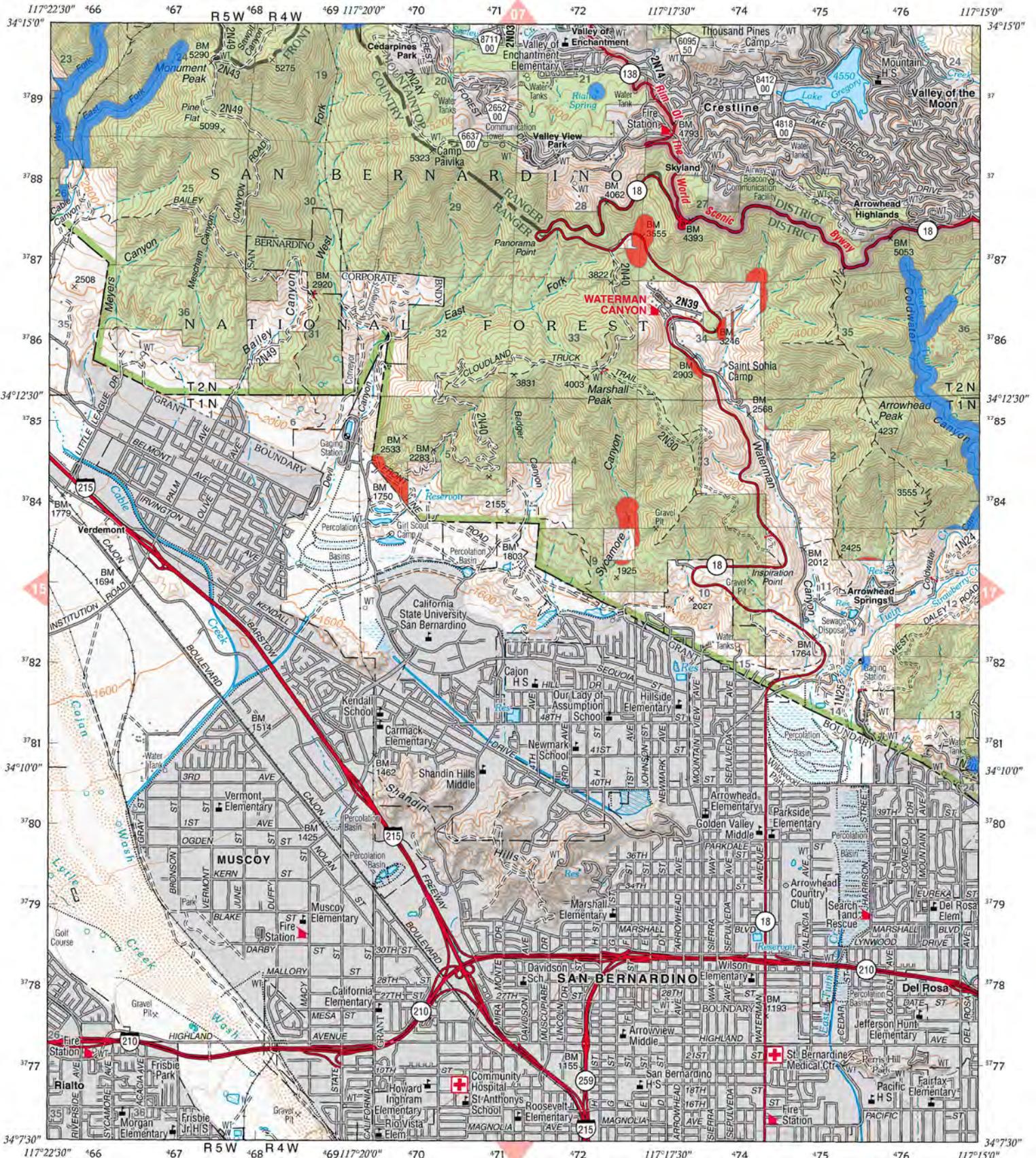
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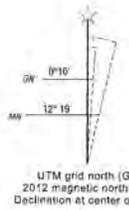
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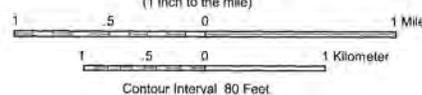
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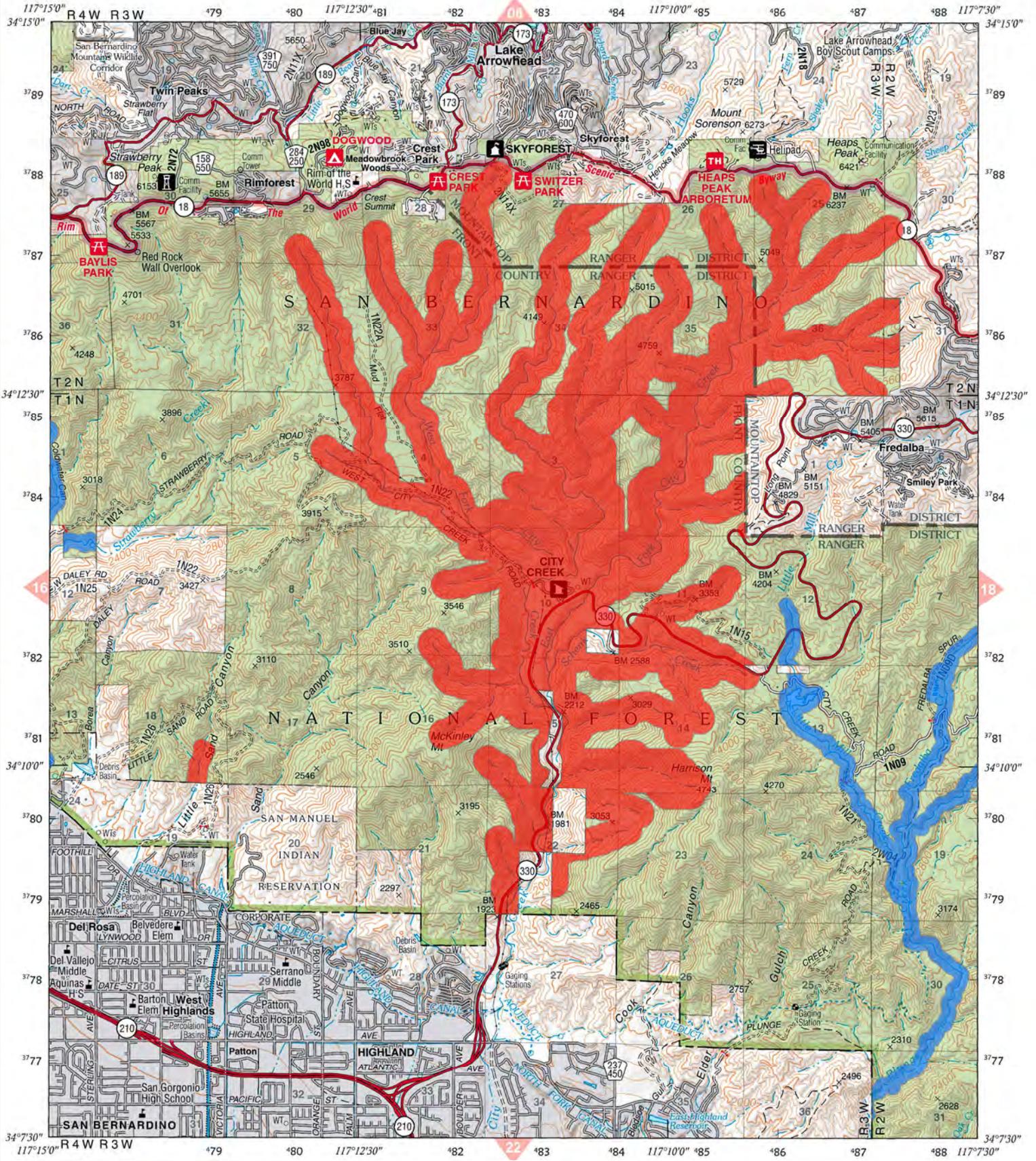


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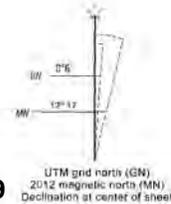
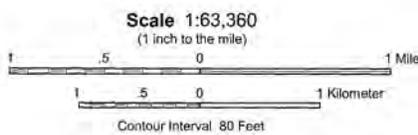


Cajon	Silverwood Lake	Lake Arrowhead
Devore	San Bernardino North	Harrison Mountain
Fontana	San Bernardino South	Redlands

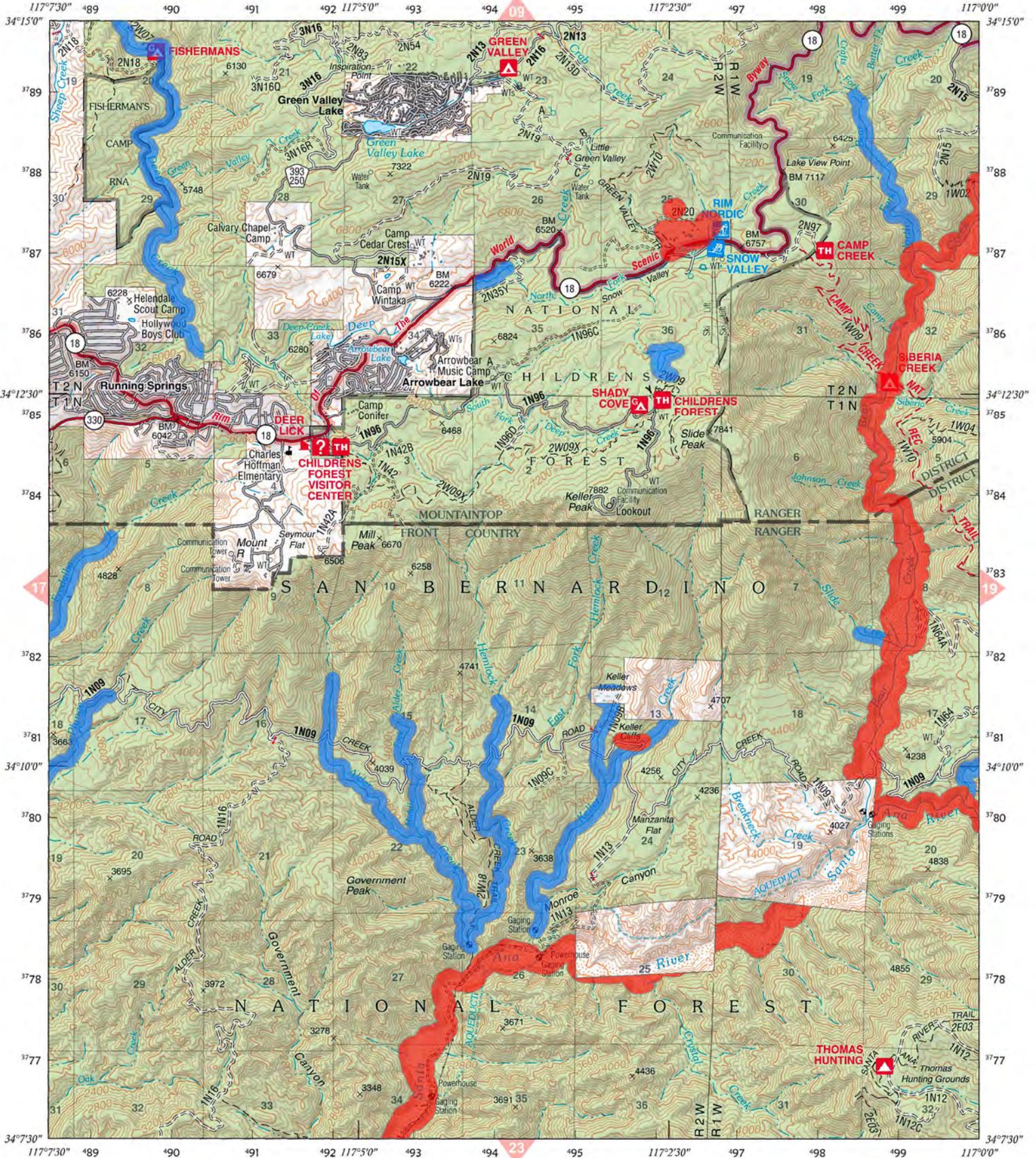
SBNF Aerial Retardant Avoidance 2019



Silverwood Lake	Lake Arrowhead	Butler Peak
San Bernardino North	Harrison Mountain	Keller Peak
San Bernardino South	Redlands	Yucaipa



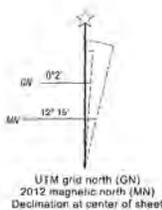
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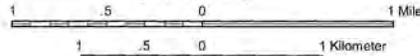
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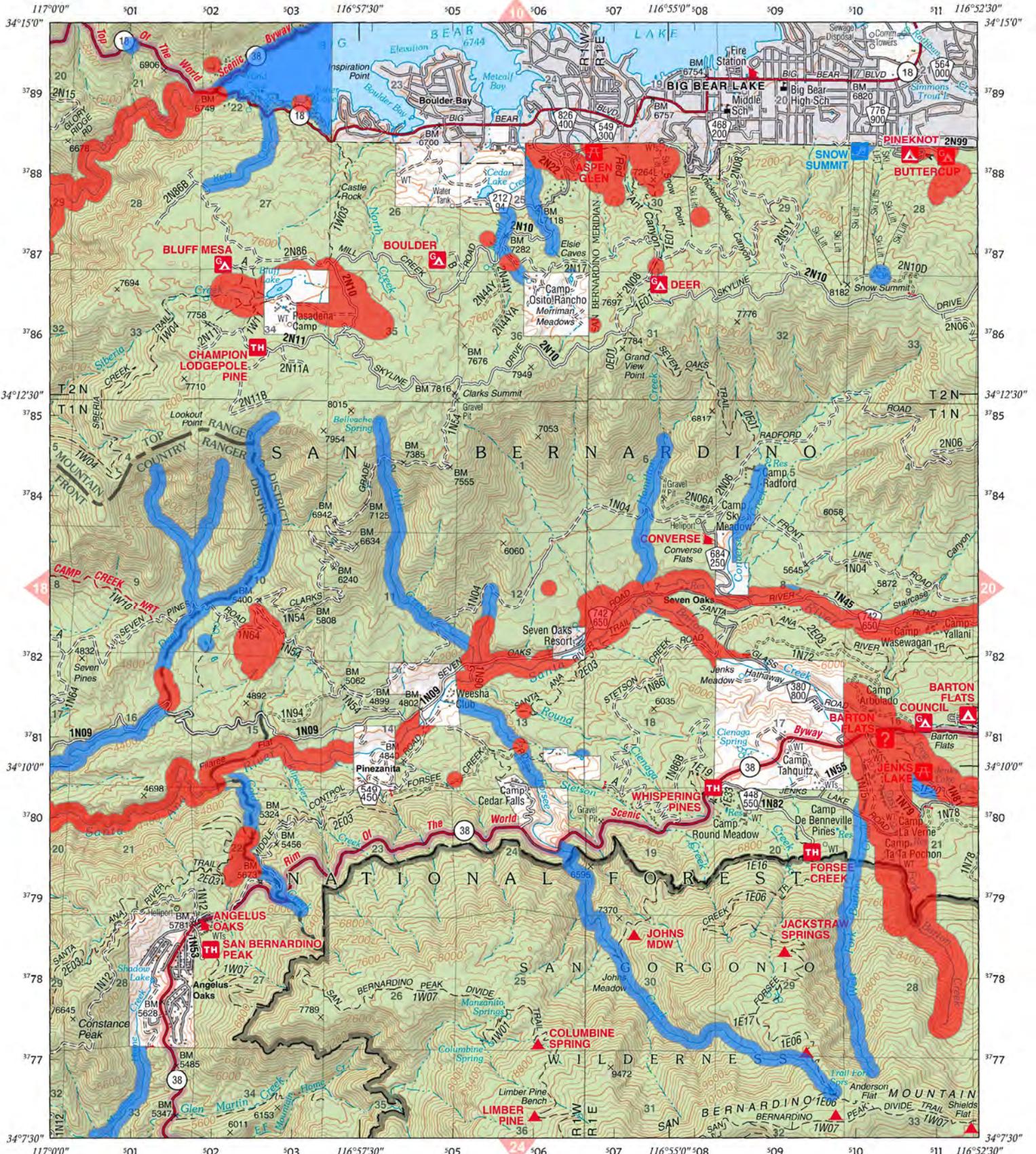
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Contour Interval 80 Feet

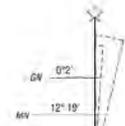
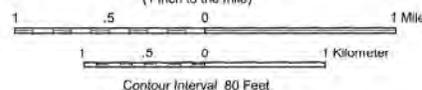
SBNF Aerial Retardant Avoidance 2019

Lake Arrowhead	Butler Peak	Fawnskin
Harrison Mountain	Keller Peak	Big Bear Lake
Redlands	Yucaipa	Forest Hills



Butler Peak	Fawnskin	Big Bear City
Keller Peak	Big Bear Lake	Moonridge
Yucaipa	Forest Hills	San Geronio Mountain

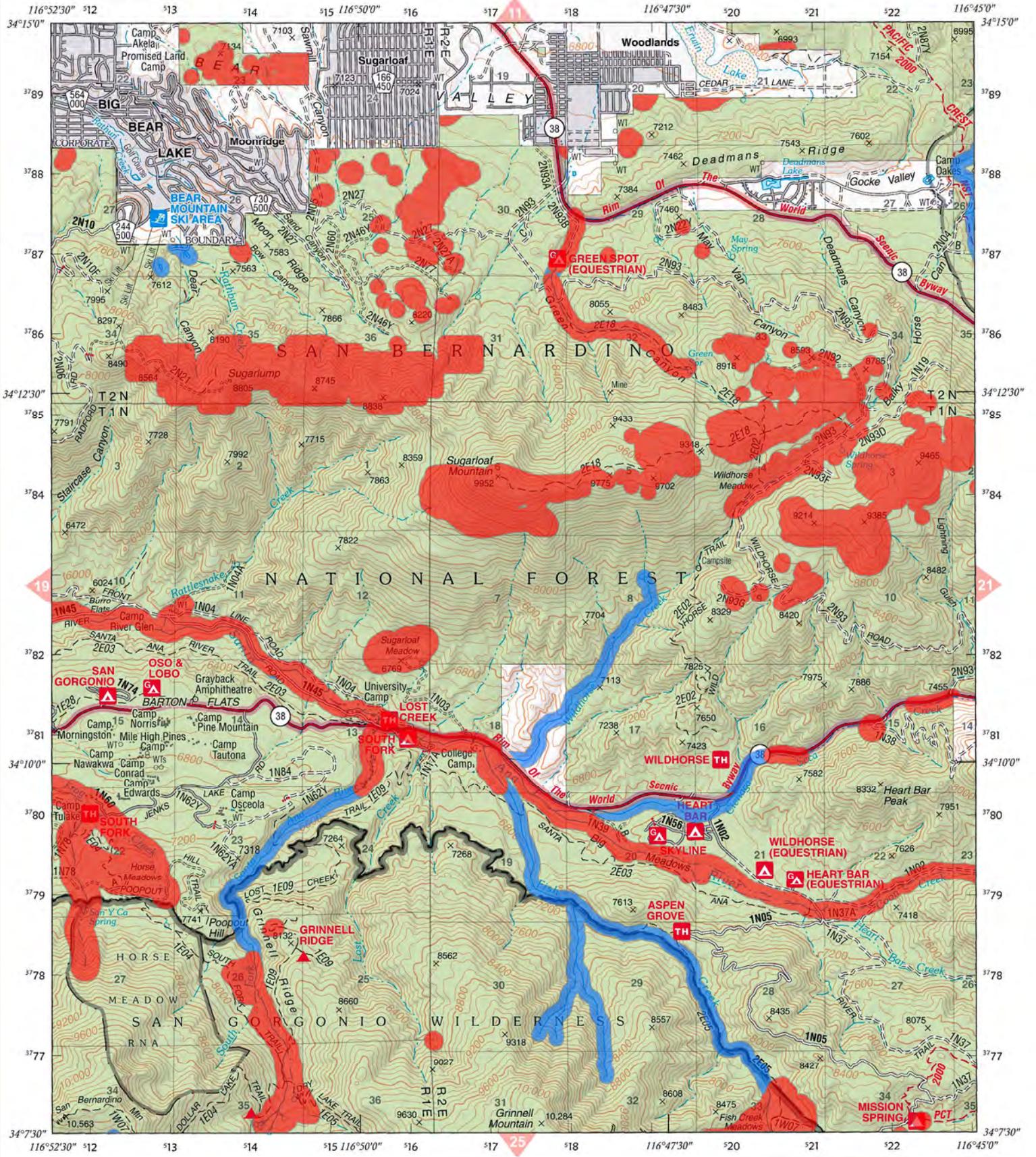
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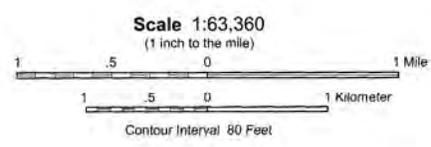
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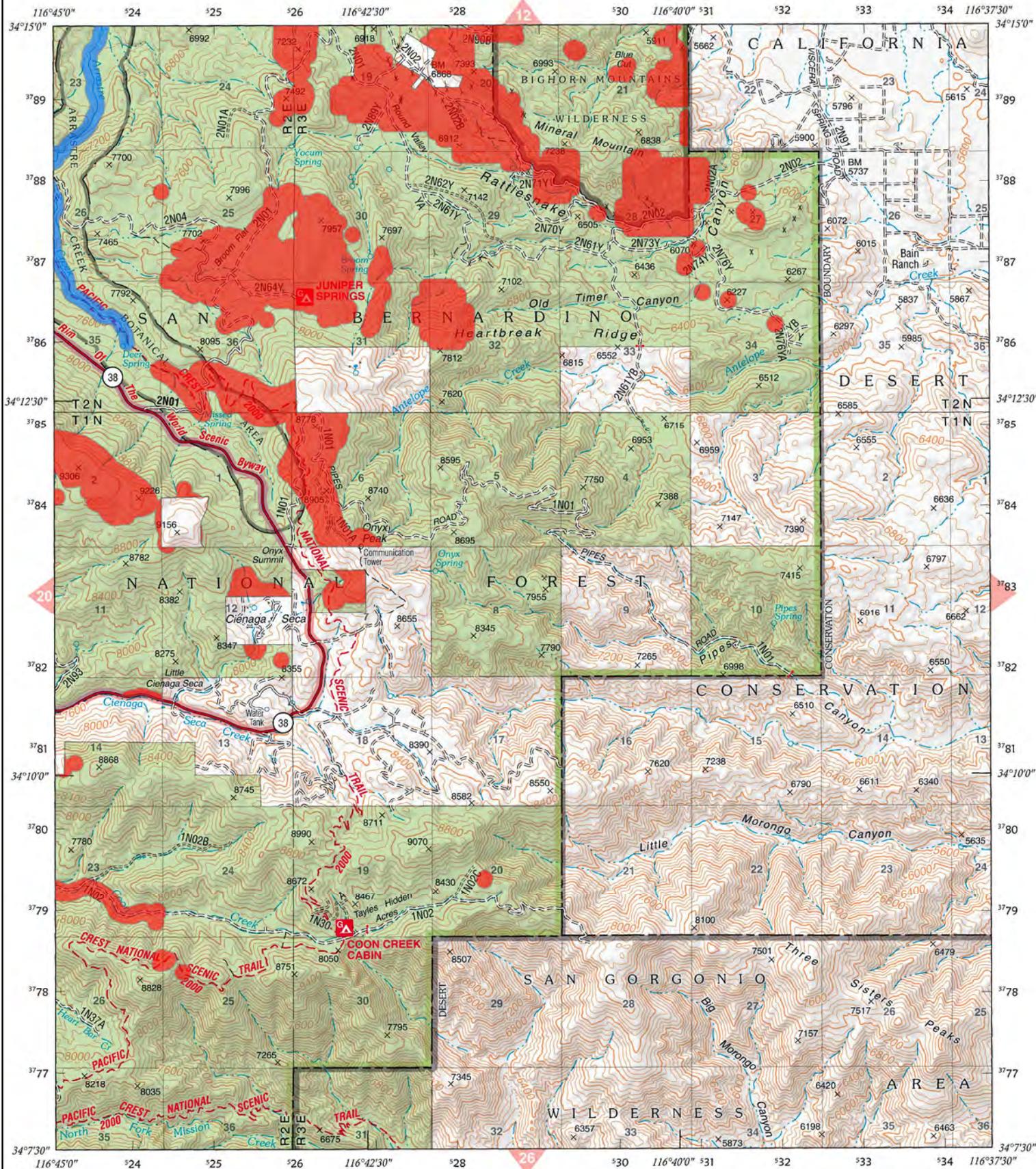
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UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

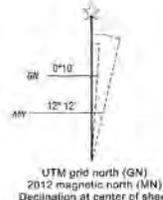
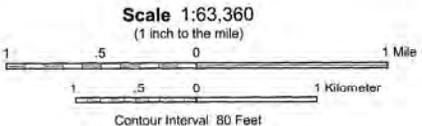


Fawnskin	Big Bear City	Rattlesnake Canyon
Big Bear Lake	Moonridge	Onyx Peak
Forest Hills	San Geronio Mountain	Catclaw Flat

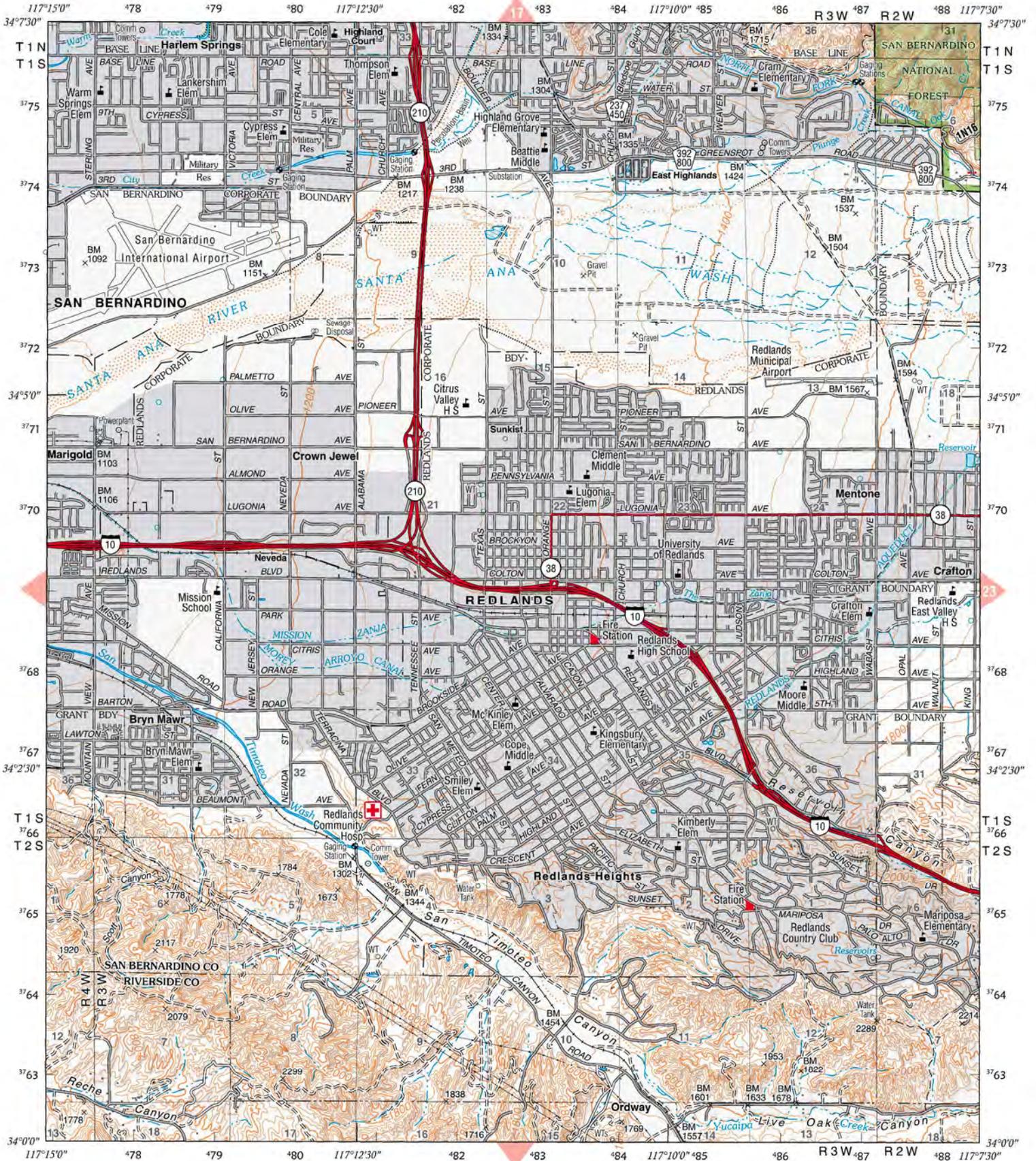
SBNF Aerial Retardant Avoidance 2019



Big Bear City	Rattlesnake Canyon	Bighorn Canyon
Moonridge	Onyx Peak	Rimrock
San Geronio Mountain	Calclaw Flat	Morongo Valley



Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).

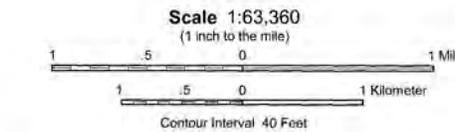


Revision by USDA Forest Service 2014

North American Datum of 1983
(NAD 83).

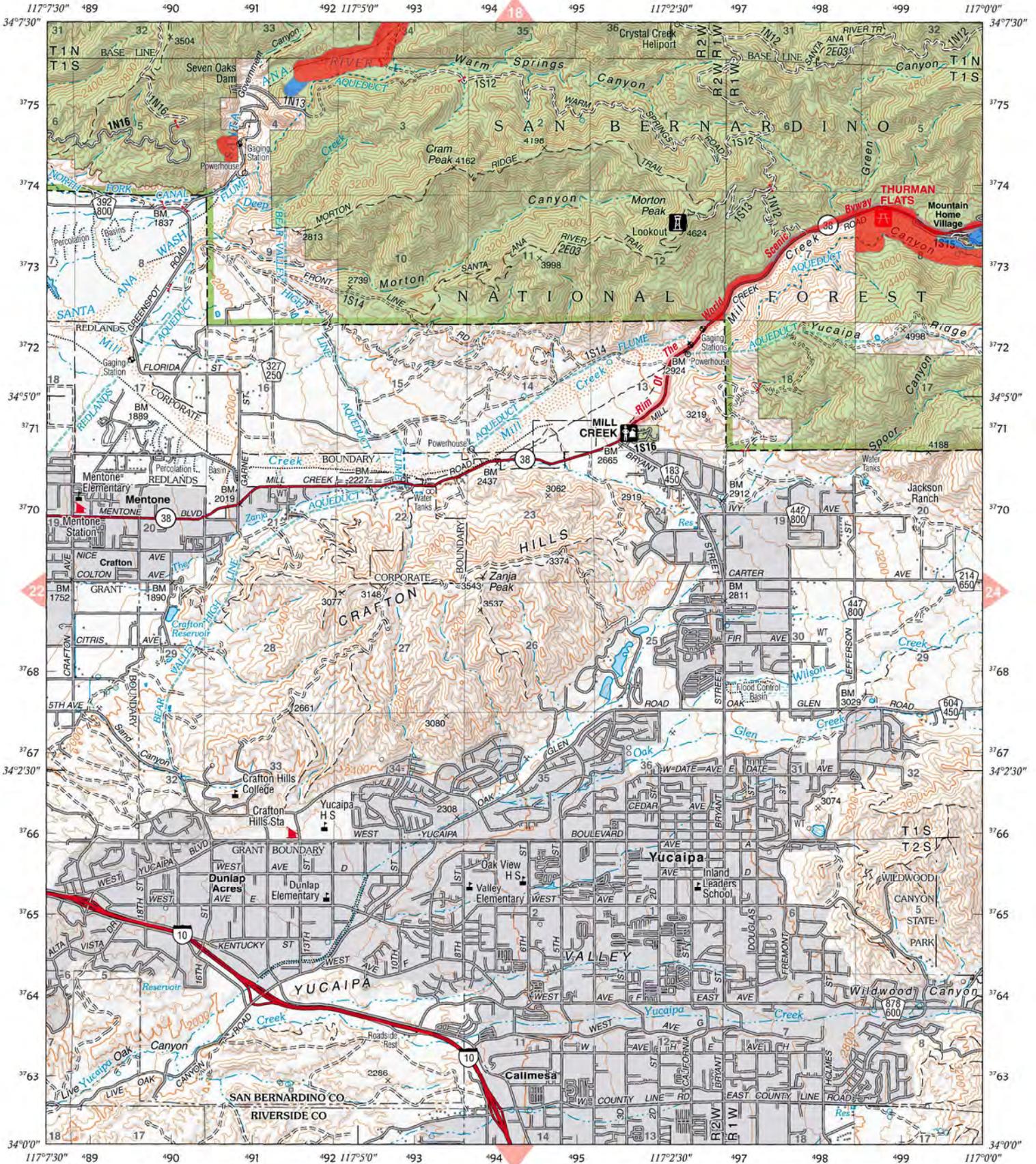
Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).

UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

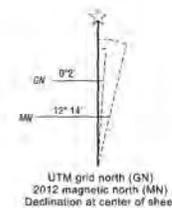
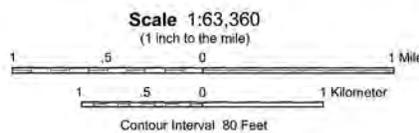


San Bernardino North	Harrison Mountain	Keller Peak
San Bernardino South	Redlands	Yucaipa
Riverside East	Sunnymead	El Cascal

SBNF Aerial Retardant Avoidance 2019

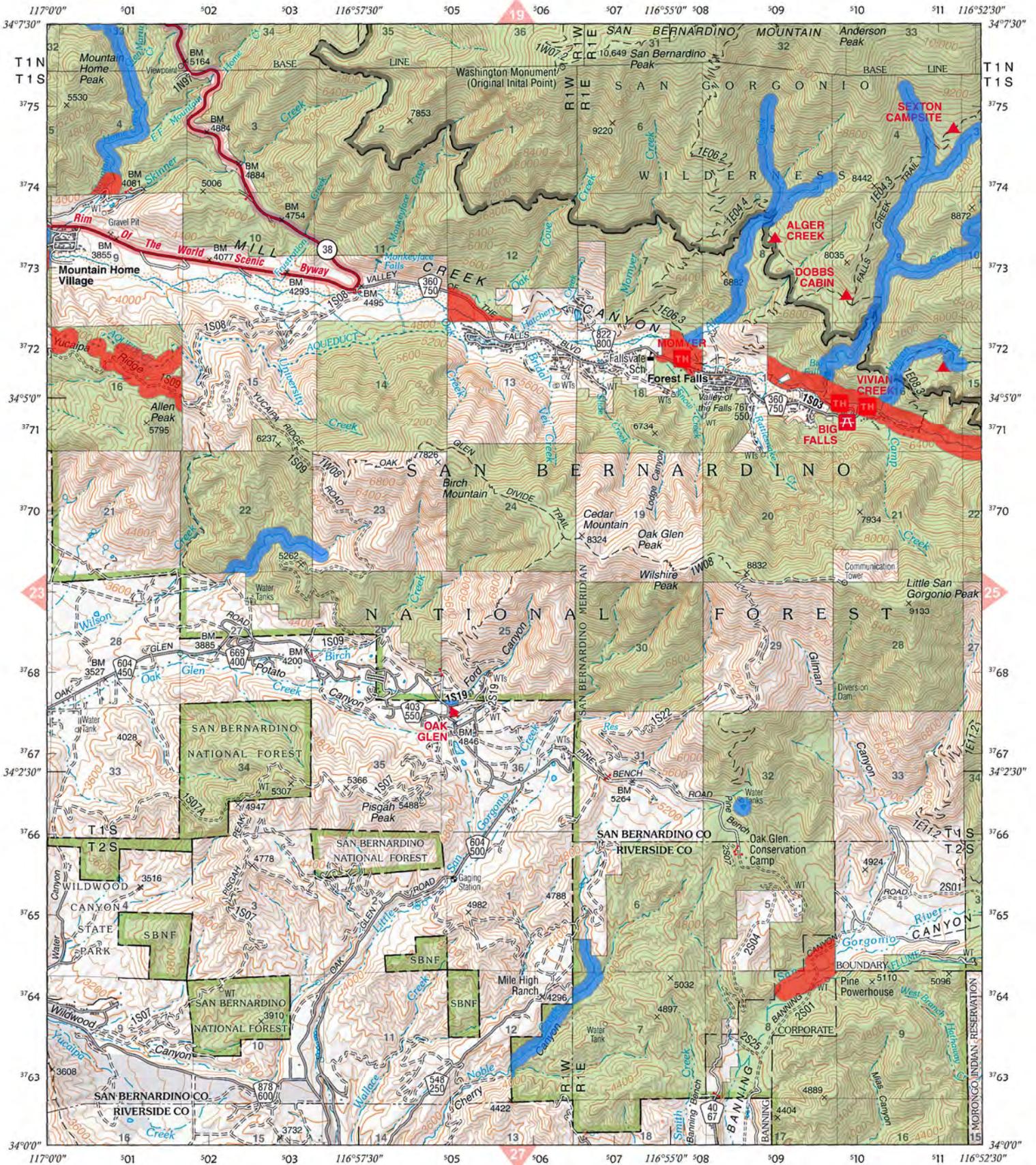


Harrison Mountain	Keller Peak	Big Bear Lake
Redlands	Yucaipa	Forest Hills
Sunnymead	El Casco	Beaumont

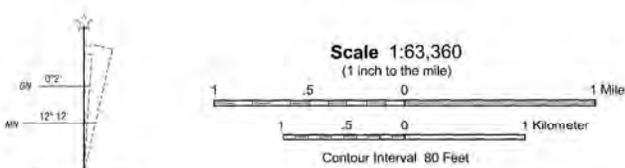


Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).

Projection: California State Plane, Zone 5 (Lambert Conformal Conic).



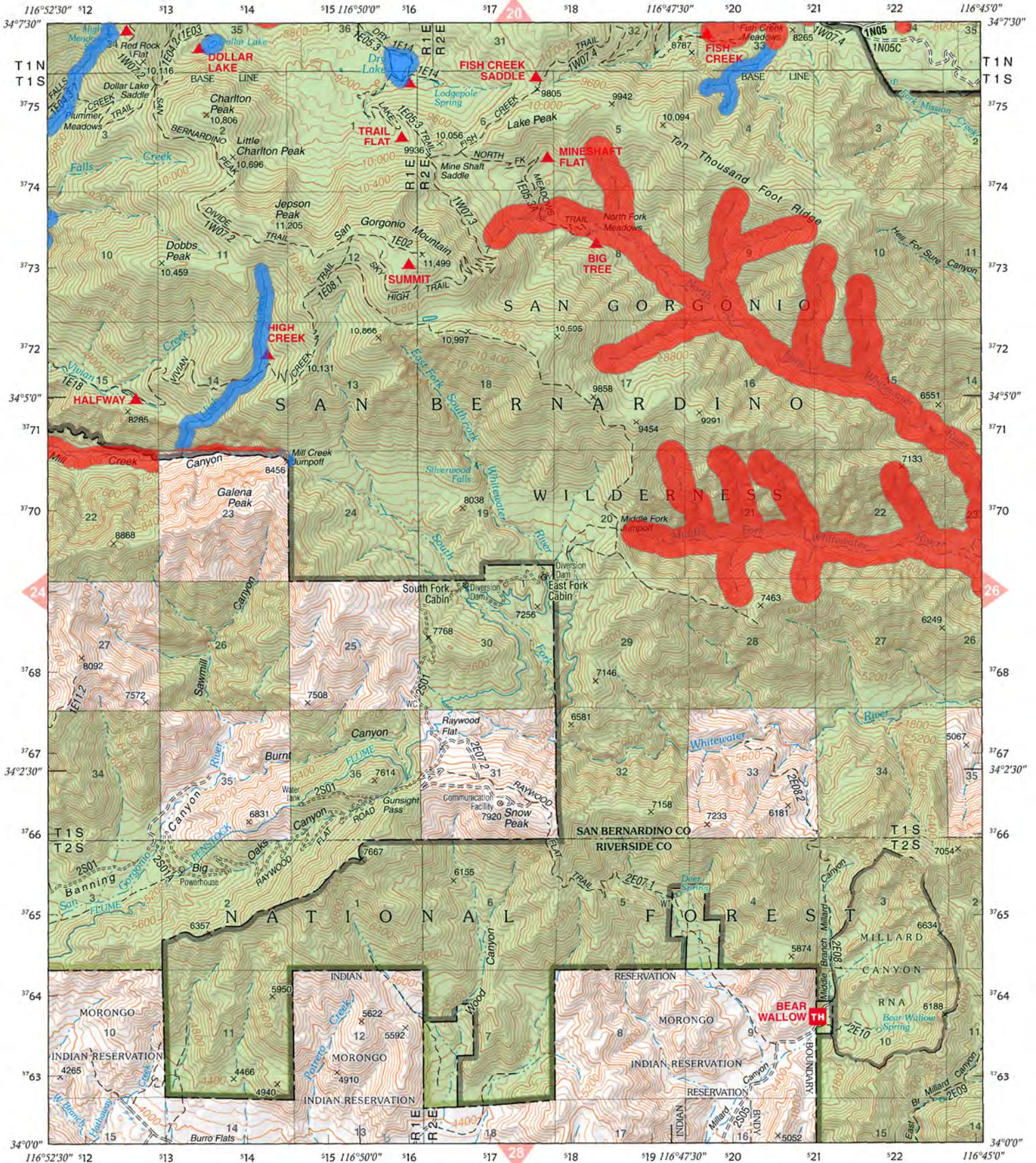
Revision by USDA Forest Service 2014
North American Datum of 1983
(NAD 83).
Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).



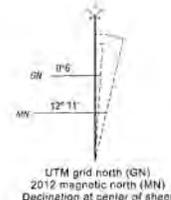
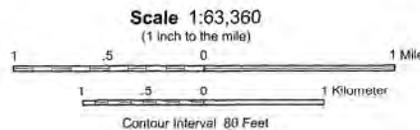
UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

SBNF Aerial Retardant Avoidance 2019

Keller Peak	Big Bear Lake	Moonridge
Yucalpa	Forest Falls	San Geronimo Mountain
El Casco	Beaumont	Cabazon

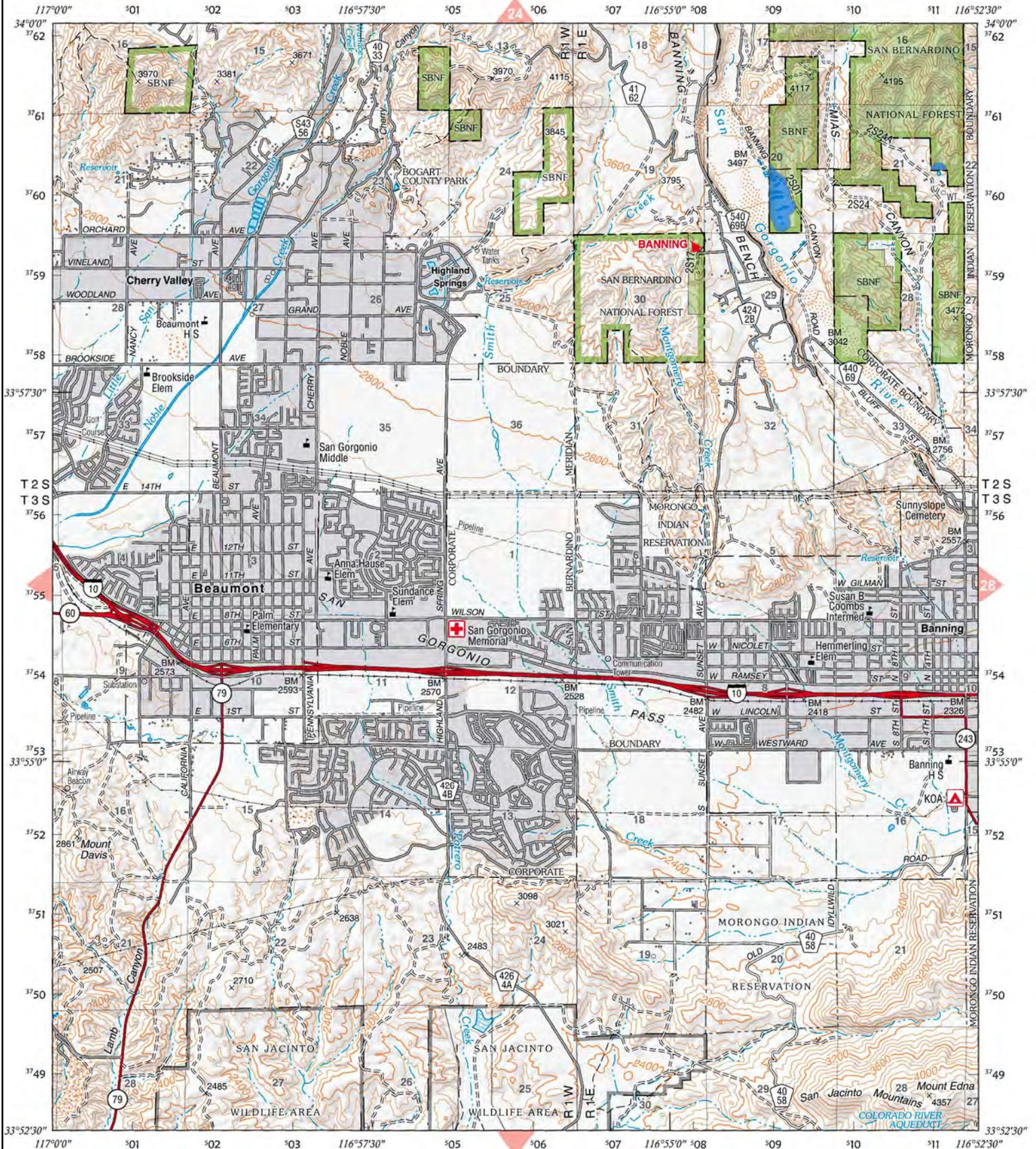


Big Bear Lake	Moonridge	Onyx Peak
Forest Hills	San Gorgonio Mountain	Catclaw Flat
Beaumont	Cabazon	White Water



Revision by USDA Forest Service 2014
North American Datum of 1983
(NAD 83).

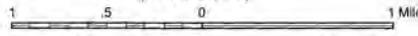
Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).



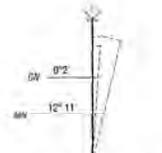
Yucaipa	Forest Hills	San Geronio Mountain
El Casco	Beaumont	Cabazon
Lakeview	San Jacinto	Lake Fulmor

Scale 1:63,360

(1 inch to the mile)



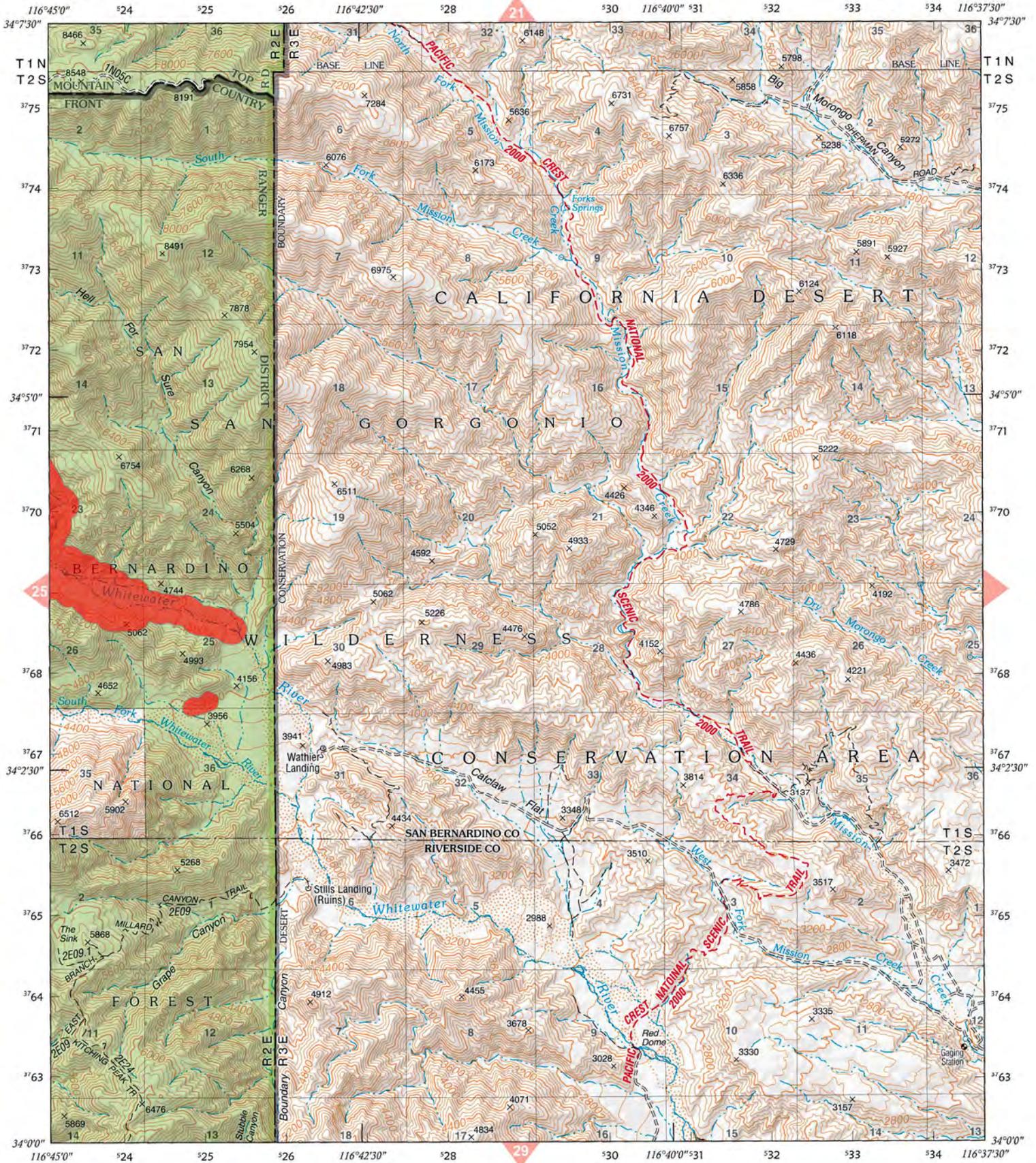
Contour Interval 80 Feet



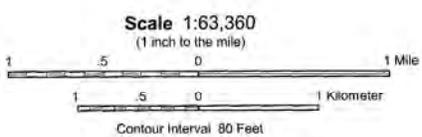
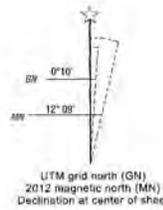
Revision by USDA Forest Service 2014

North American Datum of 1983 (NAD 83).

Projection: California State Plane, Zone 5 (Lambert Conformal Conic).

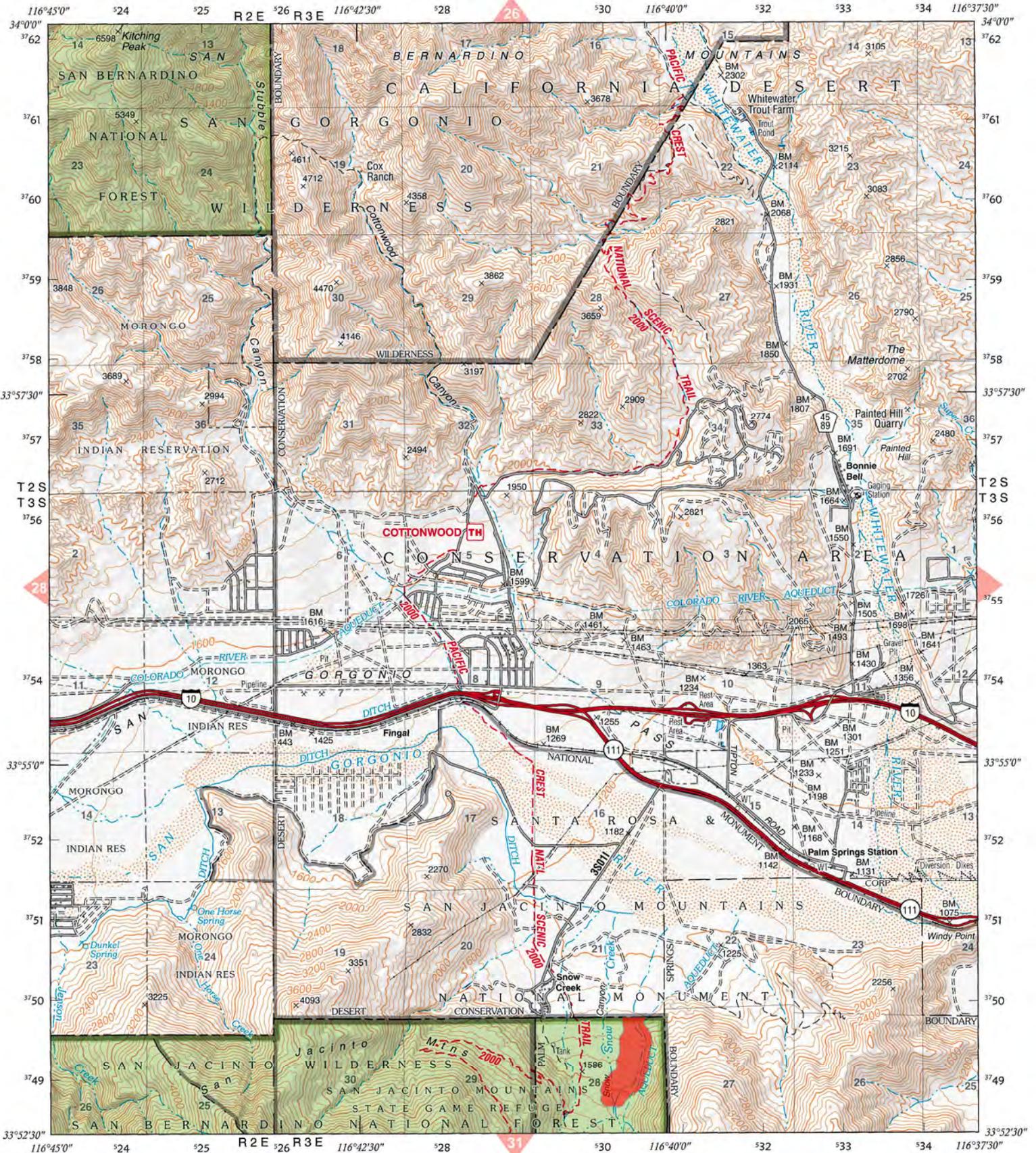


Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).

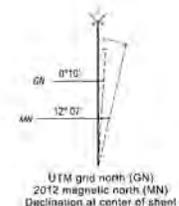
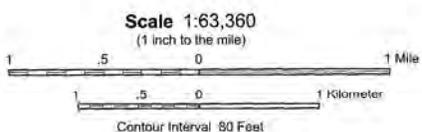


Moonridge	Onyx Peak	Rimrock
San Geronio Mountain	Catclaw Flat	Morongo Valley
Cabazon	White Water	Desert Hot Springs

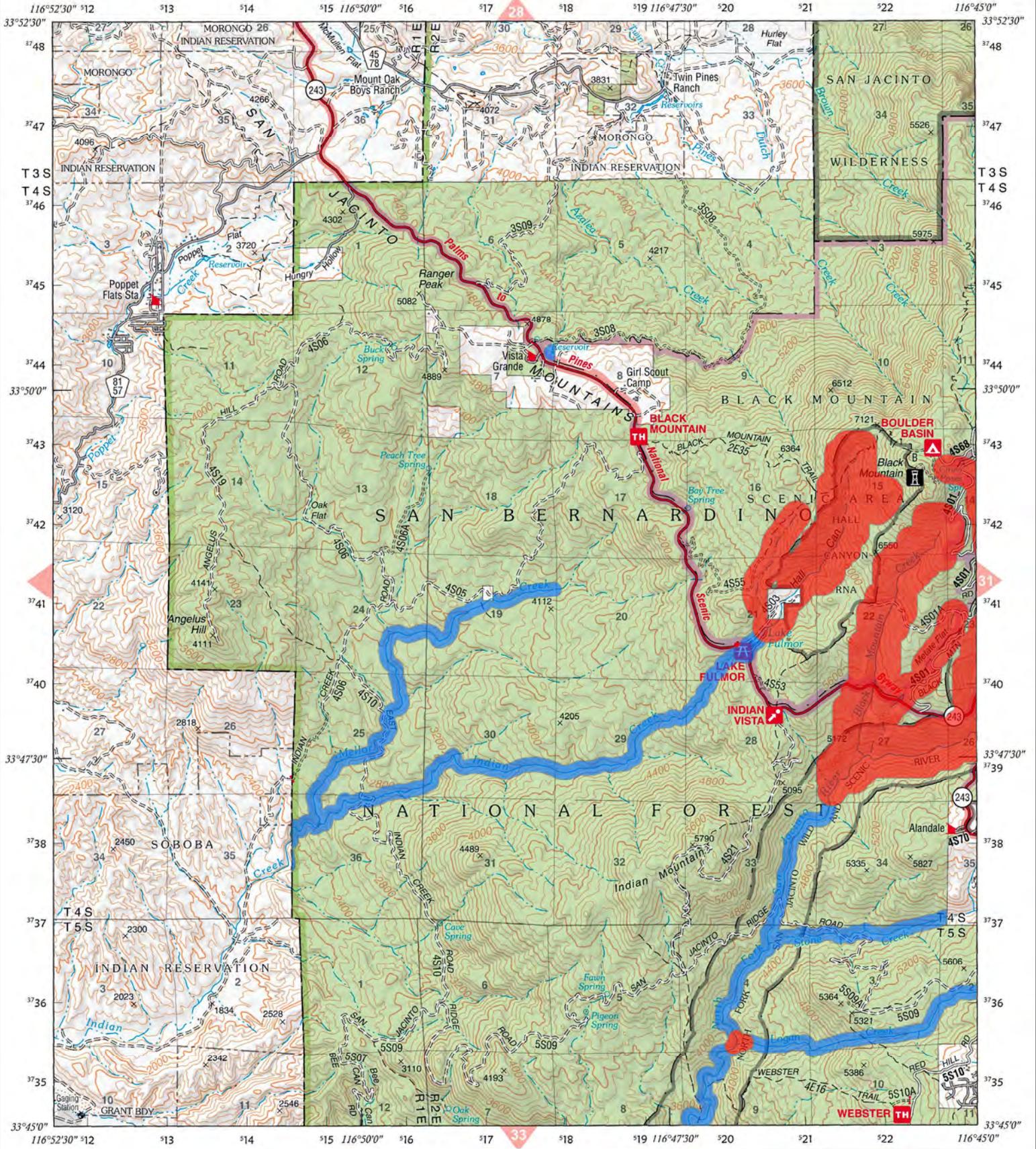
SBNF Aerial Retardant Avoidance 2019



San Geronimo Mountain	Catclaw Flat	Morongo Valley
Cabazon	White Water	Desert Hot Springs
Lake Fulmor	San Jacinto Peak	Palm Springs



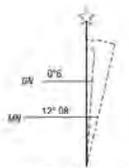
Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).



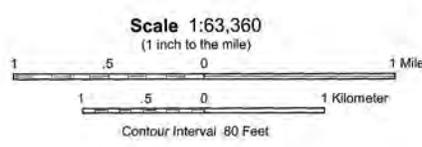
Revision by USDA Forest Service 2014

North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).

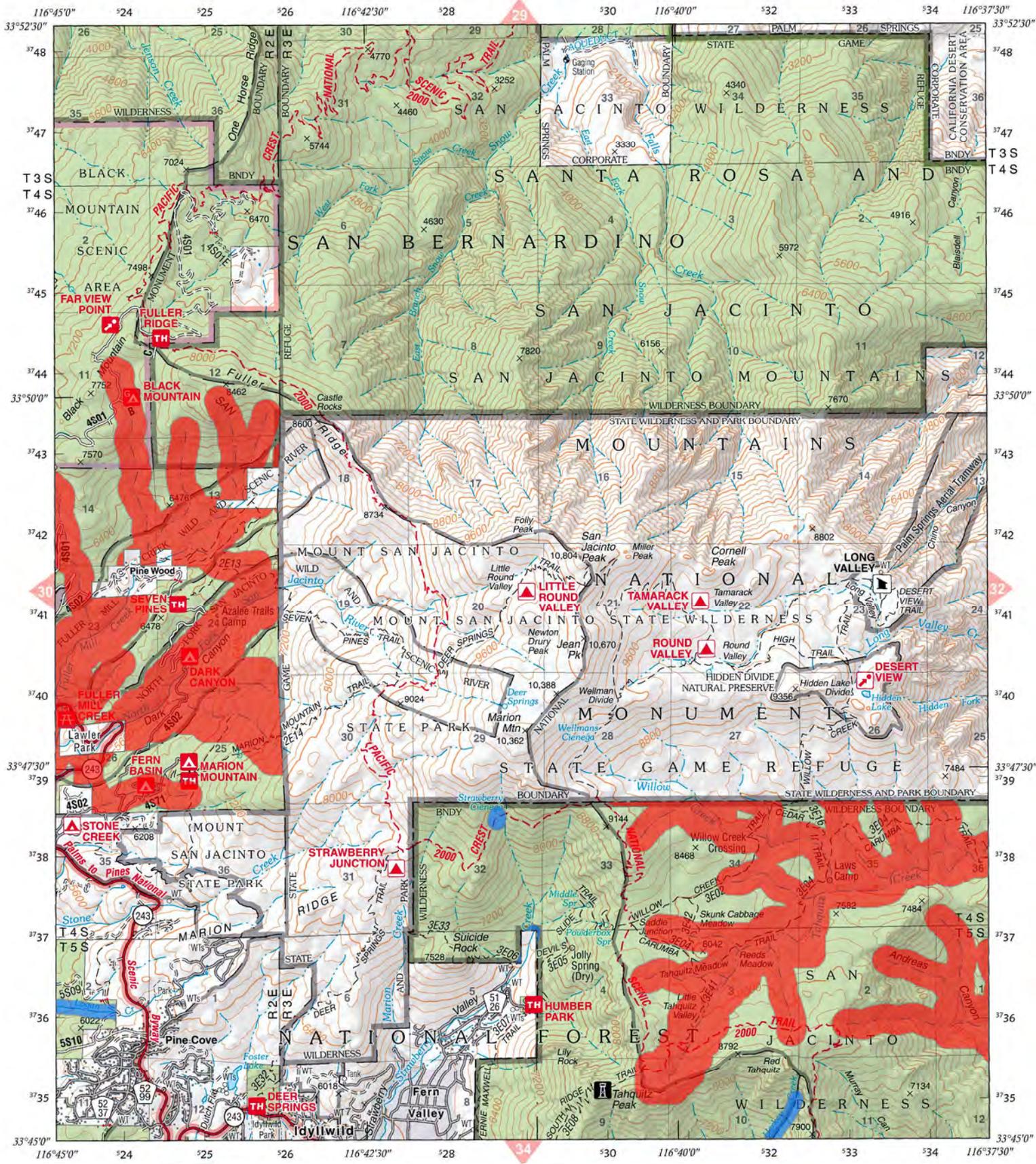


UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

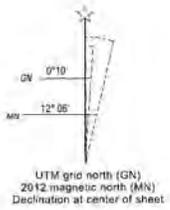
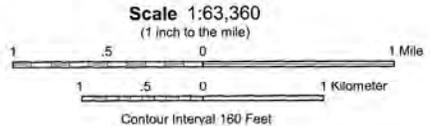


SBNF Aerial Retardant Avoidance 2019

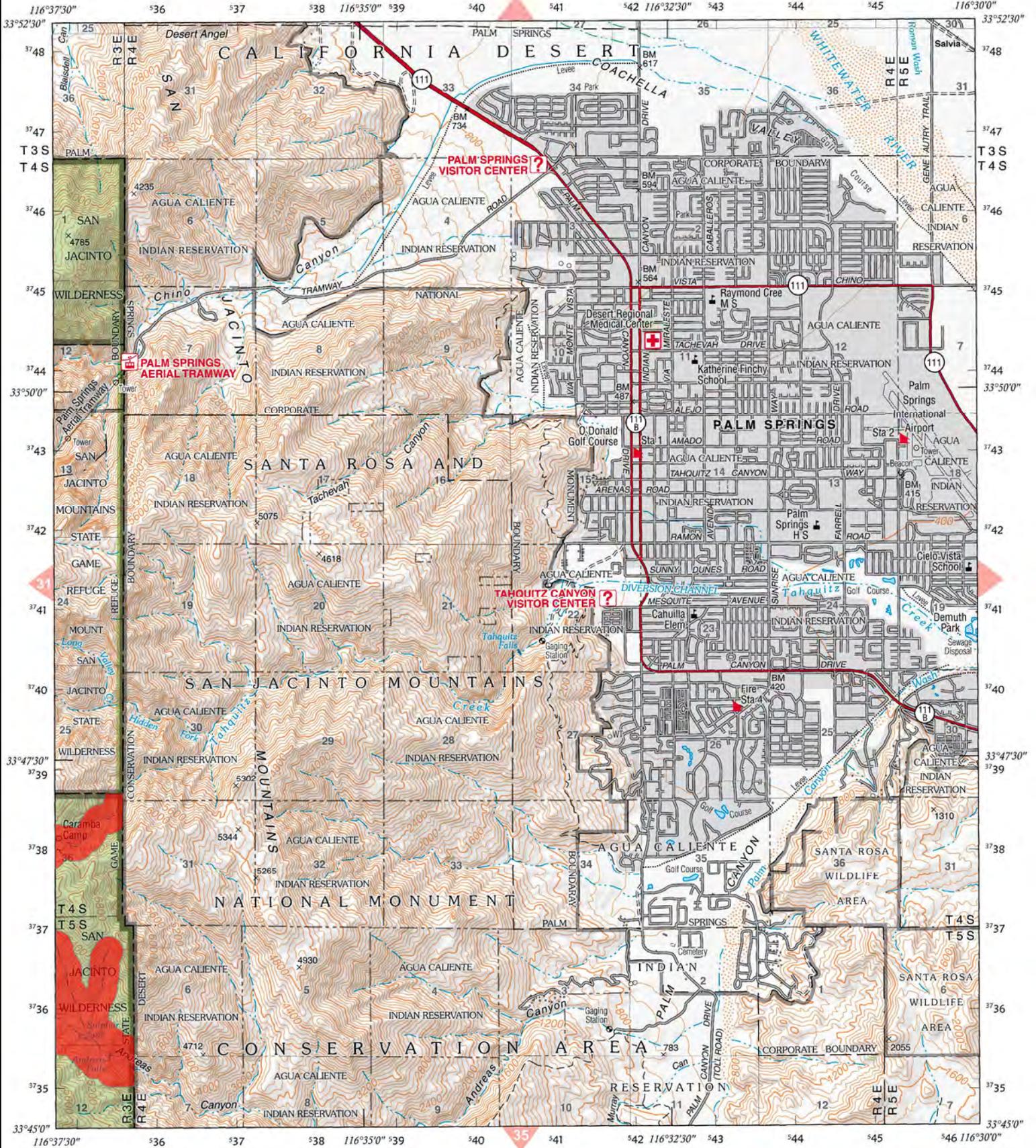
Beaumont	Cabazon	White Water
San Jacinto	Lake Fulmor	San Jacinto Peak
Hemet	Blackburn Canyon	Idyllwild



Cabazon	White Water	Desert Hot Springs
Lake Fulmor	San Jacinto Peak	Palm Springs
Blackburn Canyon	Idylwild	Palm View Peak



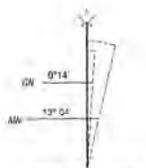
Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).



Revision by USDA Forest Service 2014

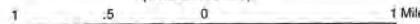
North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic)



UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

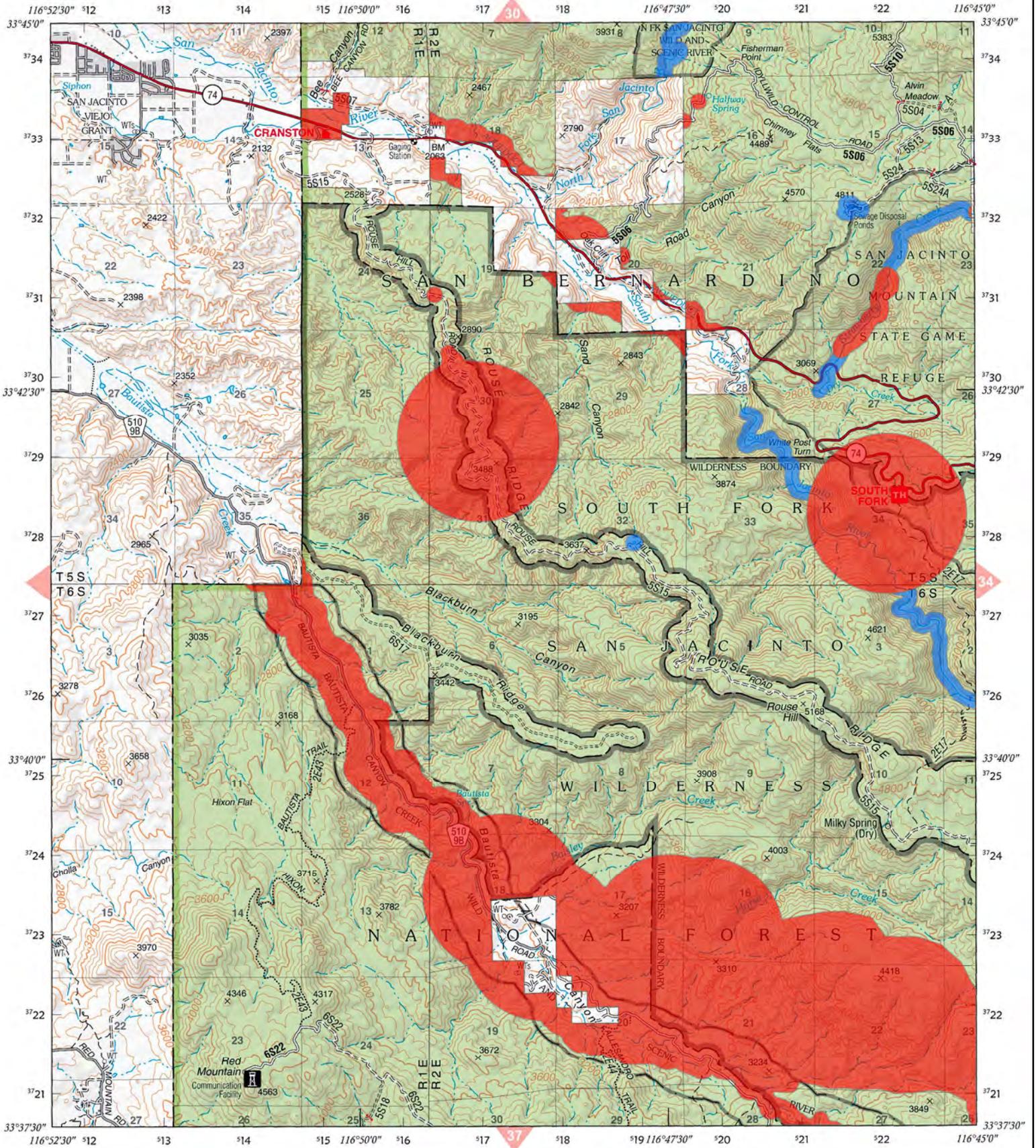
Scale 1:63,360
(1 inch to the mile)



Contour Interval 80 Feet

White Water	Desert Hot Springs	Seven Palms Valley
San Jacinto Peak	Palm Springs	Cathedral City
Idyllwild	Palm View Peak	Rancho Mirage

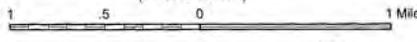
SBNF Aerial Retardant Avoidance 2019



San Jacinto	Lake Fulmor	San Jacinto Peak
Hemel	Blackburn Canyon	Idyllwild
Sage	Cahuilla Mountain	Anza

Scale 1:63,360

(1 inch to the mile)



Contour Interval 80 Feet

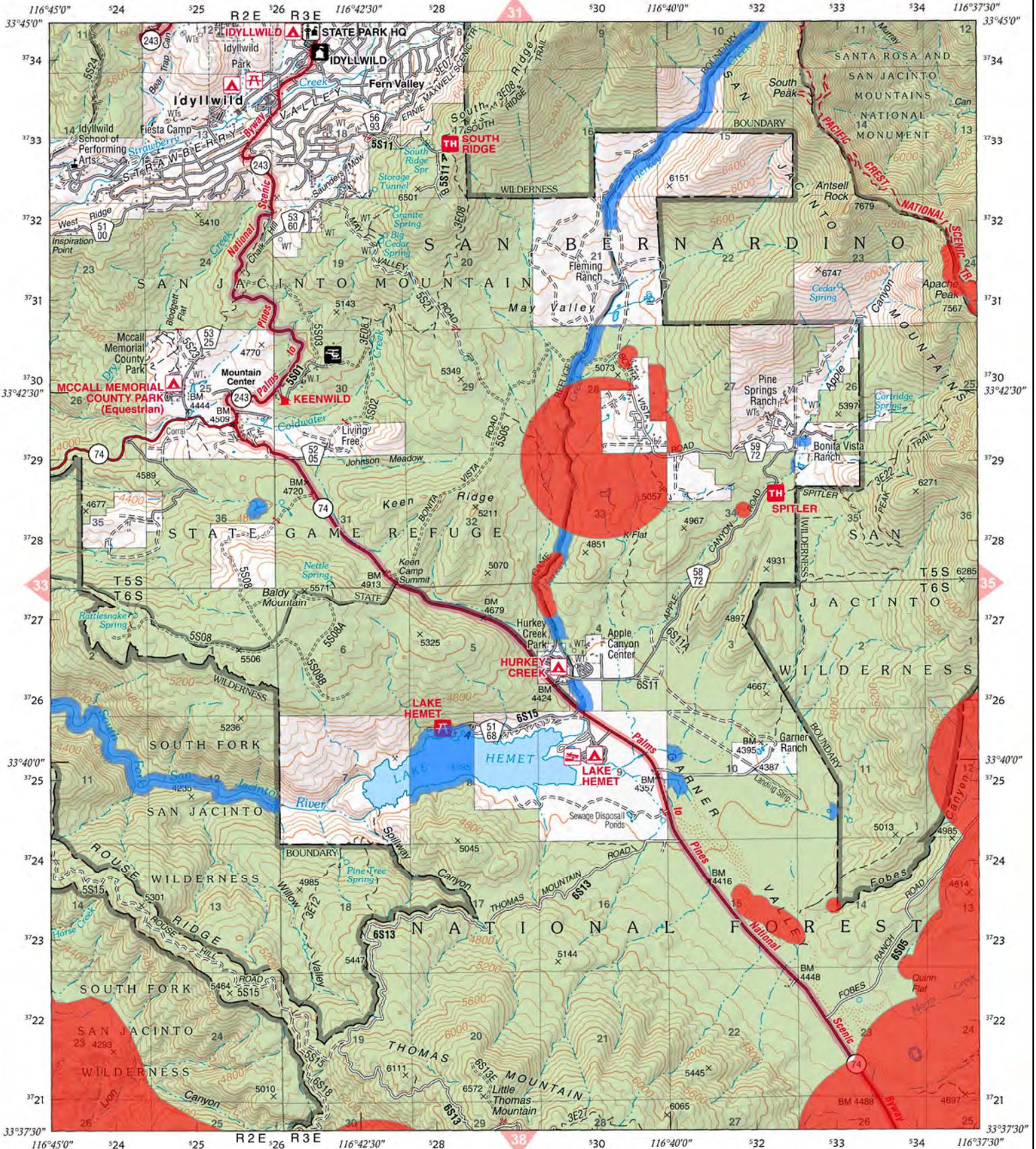


UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

Revision by USDA Forest Service 2014

North American Datum of 1983
(NAD 83).

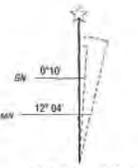
Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).



Revision by USDA Forest Service 2014

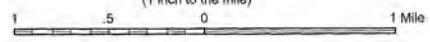
North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).



UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet

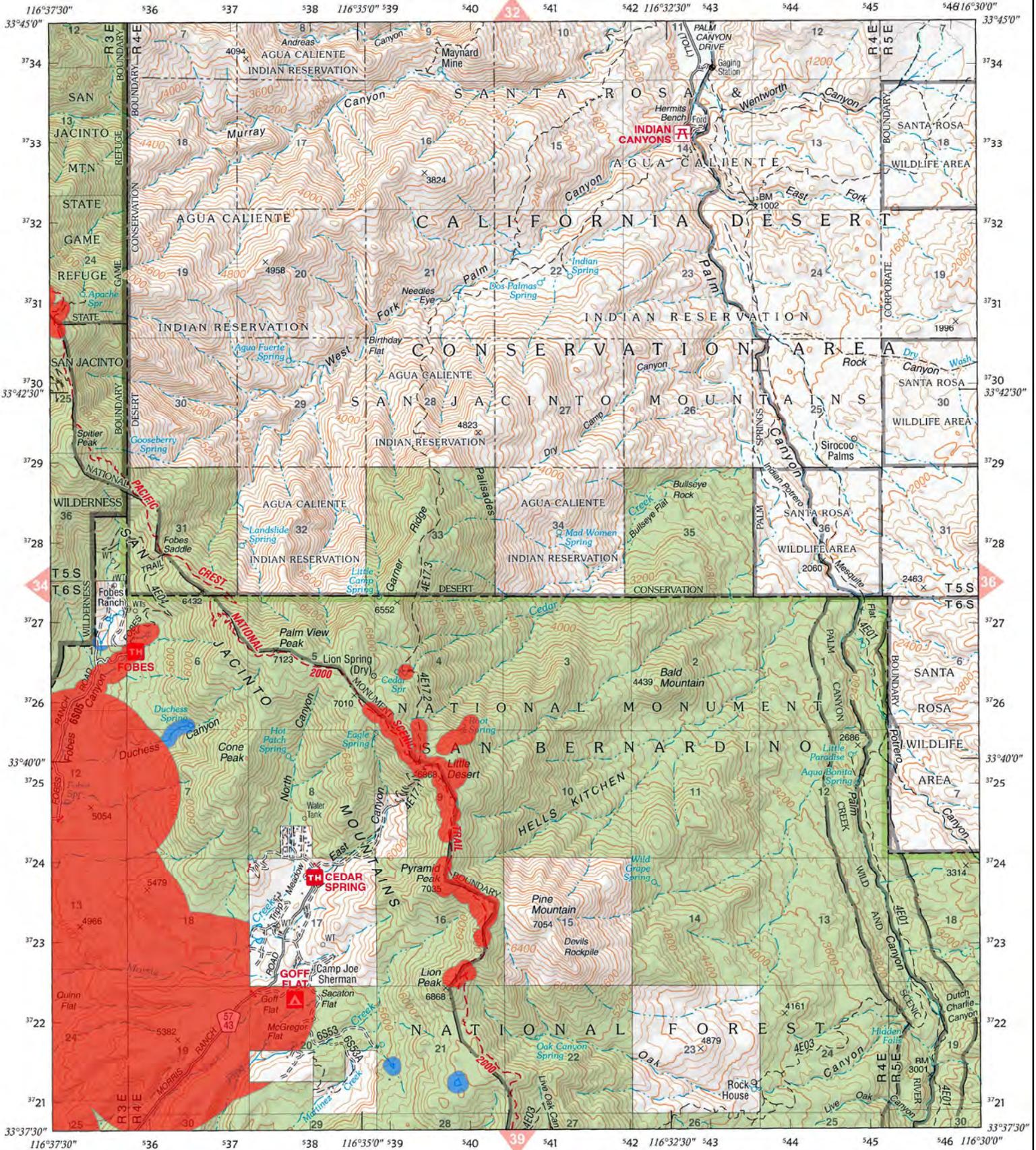
Scale 1:63,360
(1 inch to the mile)



Contour Interval 80 Feet

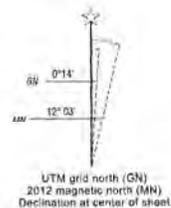
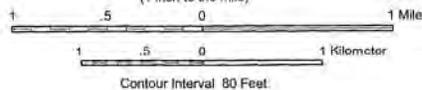
Lake Fulmor	San Jacinto Peak	Palm Springs
Blackburn Canyon	Idyllwild	Palm View Peak
Cahuilla Mountain	Anza	Butterfly Peak

SBNF Aerial Retardant Avoidance 2019



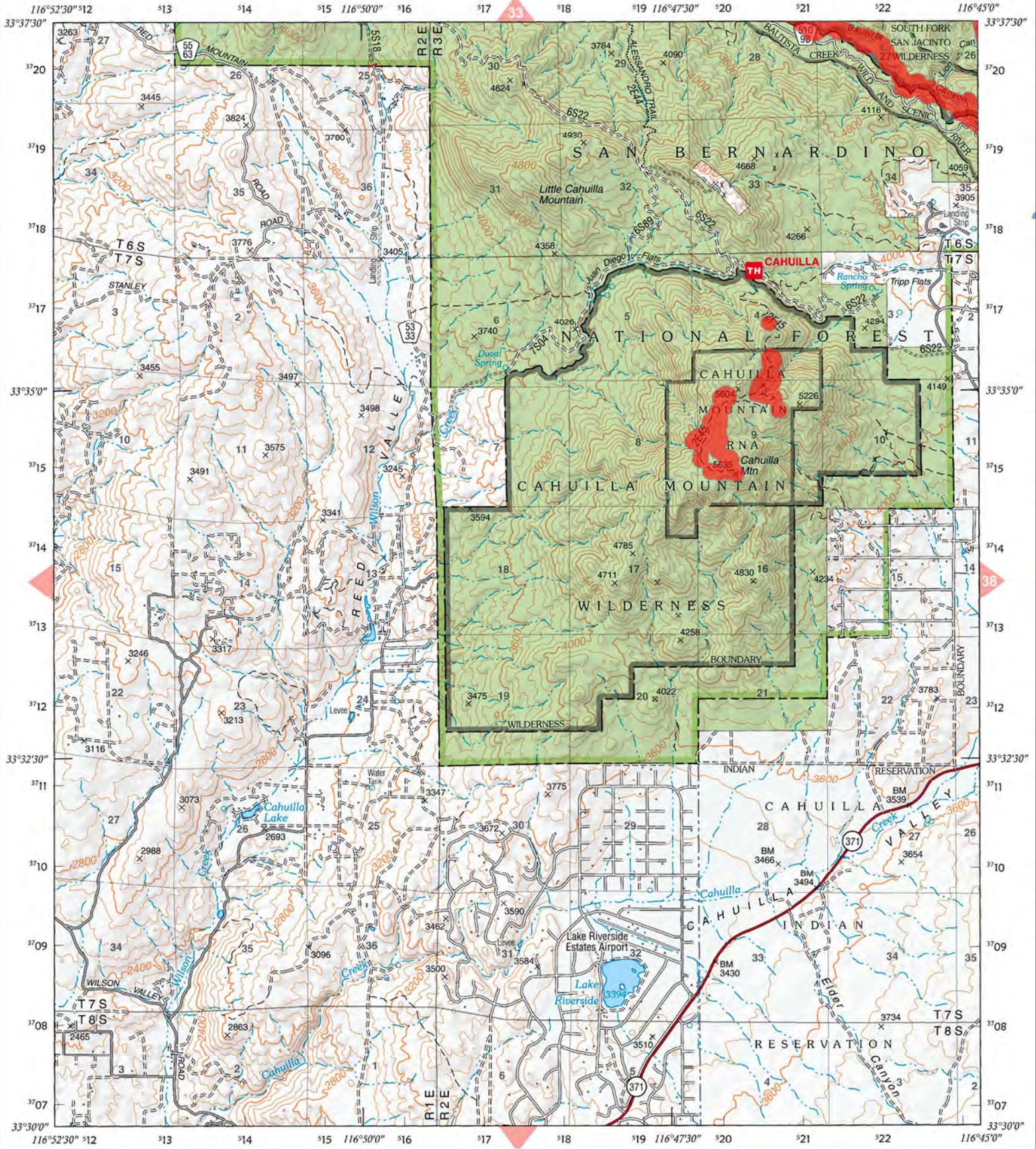
San Jacinto Peak	Palm Springs	Cathedral City
Idyllwild	Palm View Peak	Rancho Mirage
Anza	Butterfly Peak	Toro Peak

Scale 1:63,360
(1 inch to the mile)

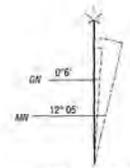
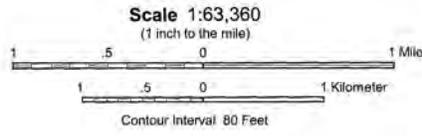


Revision by USDA Forest Service 2014
North American Datum of 1983 (NAD 83).

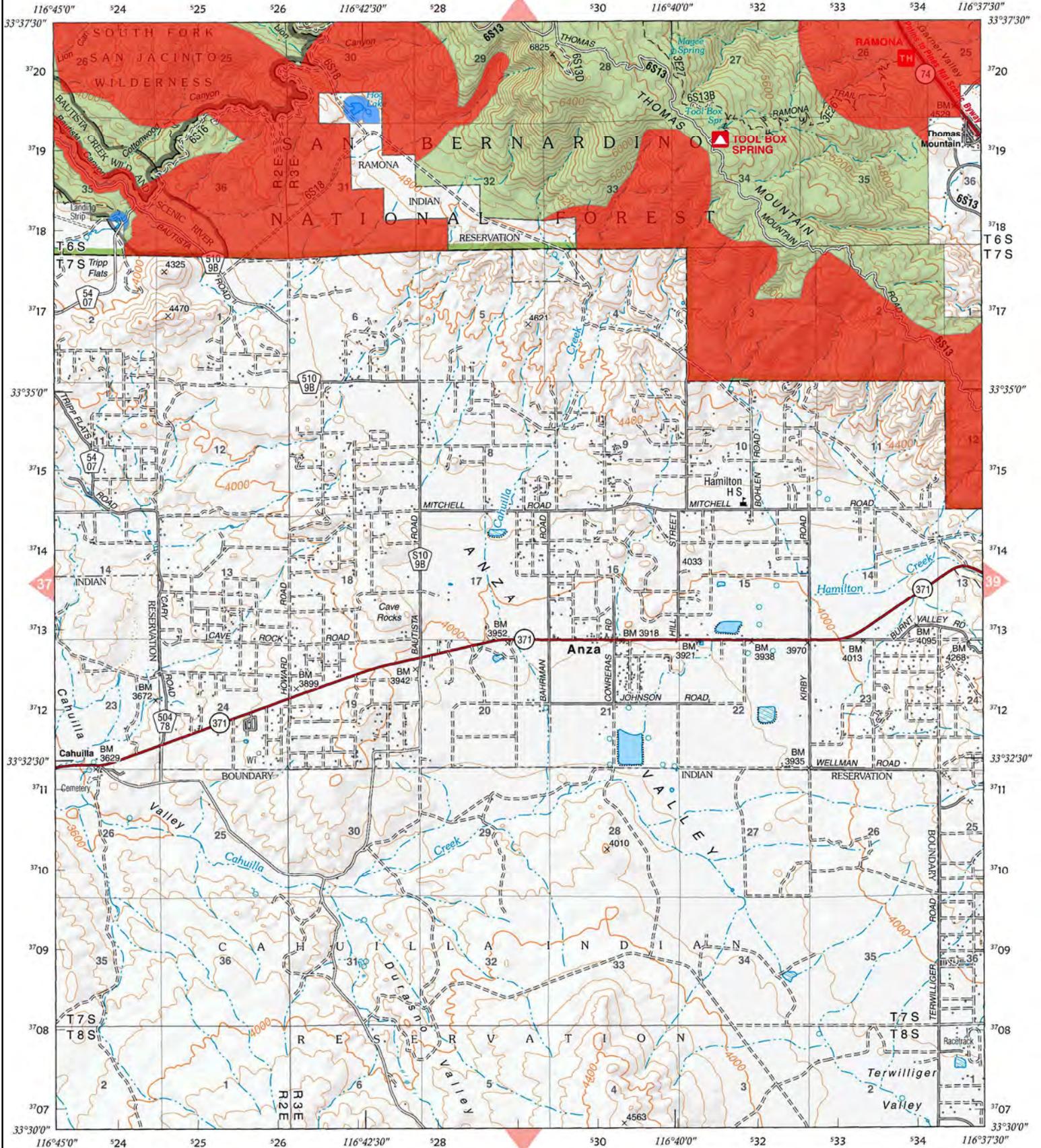
Projection: California State Plane, Zone 5 (Lambert Conformal Conic).



Hemet	Blackburn Canyon	Idyllwild
Sage	Cahulla Mountain	Anza
Vail Lake	Aguanga	Beauty Mountain



Revision by USDA Forest Service 2014
North American Datum of 1983
(NAD 83),
Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).



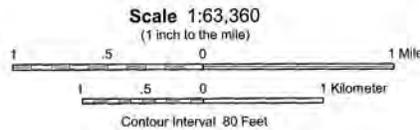
Revision by USDA Forest Service 2014

North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).

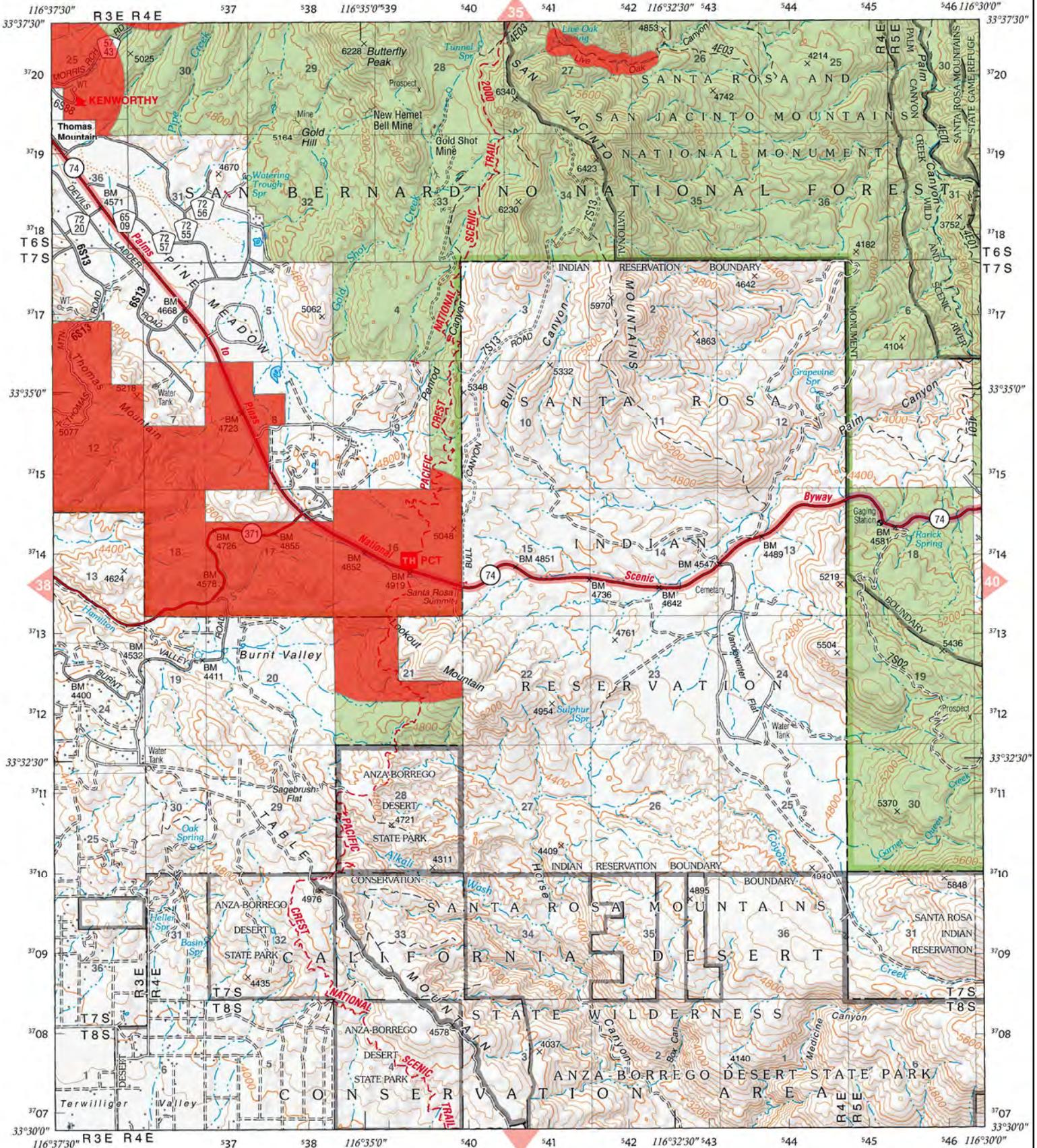


UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet:



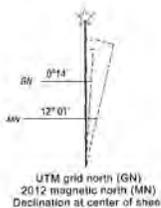
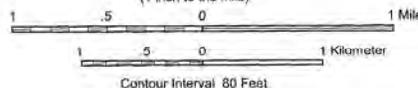
SBNF Aerial Retardant Avoidance 2019

Blackburn Canyon	Idyllwild	Palm View Peak
Cahuilla Mountain	Anza	Butterfly Peak
Aguanga	Beauty Mountain	Bucksnot Mountain



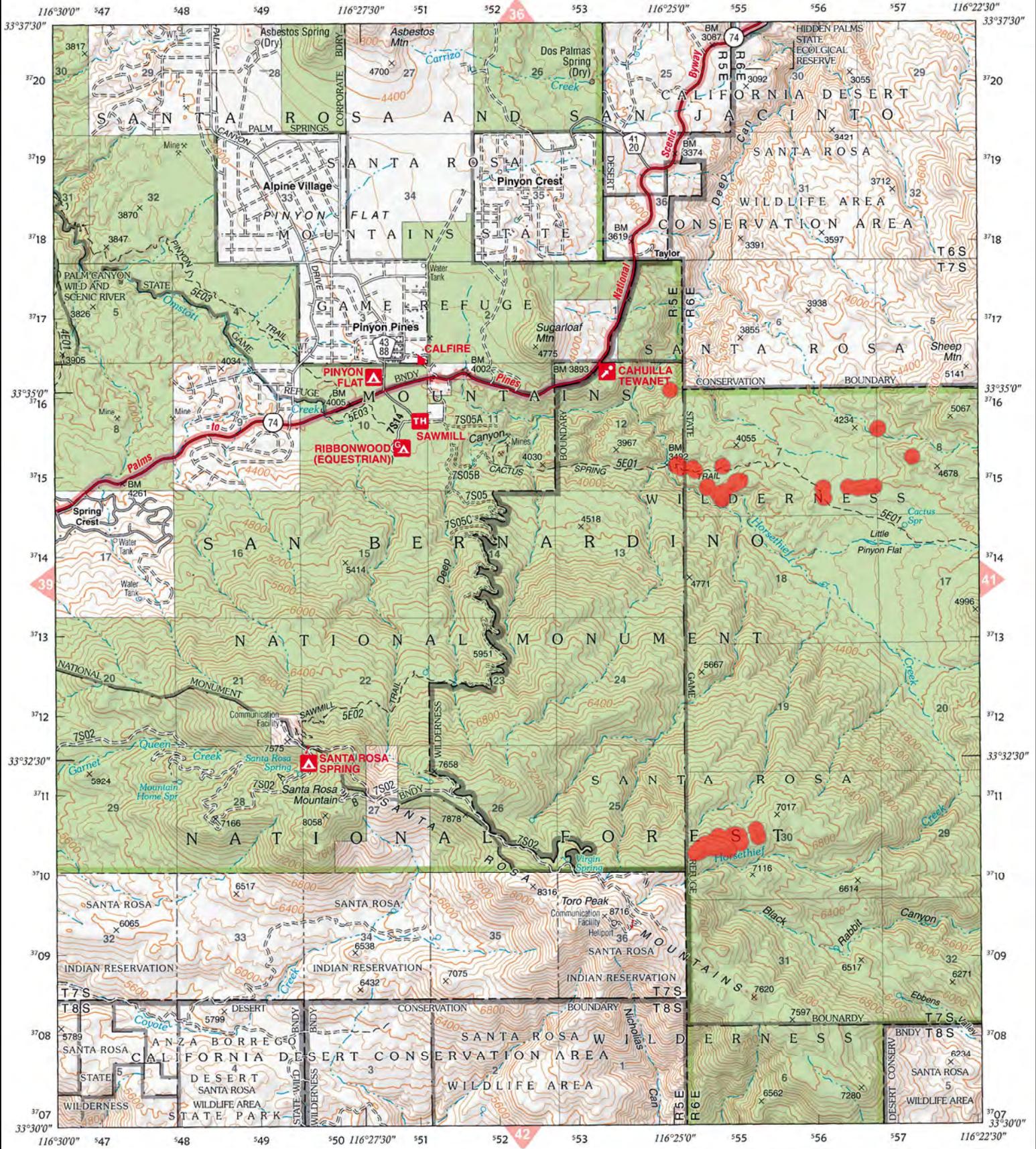
Idyllwild	Palm View Peak	Rancho Mirage
Anza	Butterfly Peak	Toro Peak
Beauty Mountain	Bucksnot Mountain	Collins Valley

Scale 1:63,360
(1 inch to the mile)



Revision by USDA Forest Service 2014
North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).

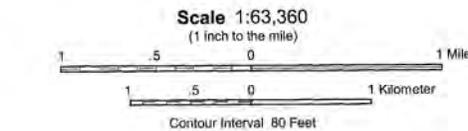


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North American Datum of 1983
(NAD 83).

Projection: California State Plane,
Zone 5 (Lambert Conformal Conic).

UTM grid north (GN)
2012 magnetic north (MN)
Declination at center of sheet



Palm View Peak	Rancho Mirage	La Quinta
Butterfly Peak	Toro Peak	Martinez Mountain
Bucksport Mountain	Collins Valley	Clark Lake NE

SBNF Aerial Retardant Avoidance 2019