## BOULDER OAKS PRESERVE Improvement Project

## FIRE SERVICES OPERATIONAL ASSESSMENT



Prepared for the Fire Marshal, San Diego County Fire Authority, by:

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## The Project

The Boulder Oaks Preserve is operated by the San Diego County Department of Parks and Recreation currently as open space. The proposed improvement project is intended to provide basic development to facilitate limited public use. The preserve includes approximately 2,1014 acres centered along the Iron Mountain ridgeline immediately east of the City of Poway and southwest of the community of Ramona. Primary access is provided via Wildwood Ranch Road/Foster Truck Trail, an access road leading west from Mussey Grade Road south of Ramona. The facility is wholly within unincorporated area of San Diego County. The proposed improvement plan will provide dispersed recreational access to the preserve via a reconstituted trail system and limited public parking on a day-use basis.

## Analysis Approach

Rohde and Associates has assigned three staff members to this project who have over 100 years of collective fire service experience in Southern California, including a nationally recognized wildfire behavior analyst. This team has developed this Fire Services Operational Review. References consulted during this review have included:
a. San Diego County CEQA and planning documents relative to the project
b. County of San Diego High/Very High Fire Severity Zone data.
c. San Diego County fuels and topographic mapping.
d. Potential Fire behavior data produced by BehavePlus, FlamMap, and LANDFIRE applications.
g. San Diego County Wildland-Urban Interface Fire Emergency Response Plans
h. Interview with San Diego County Fire Authority and Department of Parks and Recreation staff.

Two site inspections were performed by Rohde \& Associates consultants in analysis for this report in May of 2018 and February of 2020.

## Site Characteristics

According to the County of San Diego California Environmental Quality Act (CEQA) Mitigated Negative Declaration for the Boulder Oaks Preserve improvement project, The Preserve is in the central foothills of San Diego County where the topography consists of steep mountain uplands with ridgelines separated by numerous canyons,
ravines, and drainages. The western edge of the northern portion approaches the ridgeline that extends from Mt. Woodson to Iron Mountain. The valley of the west branch of San Vicente Creek lies along the Preserve's eastern boundary. The eastern portion of the Preserve includes a relatively flat valley characterized by grass and woodlands whereas the southern portion is characterized by an east-west trending valley surrounded by steep slopes. Elevations on the Preserve range from 2,400 feet above mean sea level along the ridge tops to approximately 1,300 feet at the northeastern corner along Mussey Grade Road.

The Preserve currently contains 14.5 miles of existing trails, footpaths and access roads, of which 6.7 miles would be retained; a pond; a ranger station; a ranger residence; a volunteer pad; a restroom facility; a barn; and associated ancillary structures, including water tanks used for fire suppression. In addition to the existing trails to be retained, the proposed project includes the addition of 7.2 miles of proposed trails, three staging areas (vehicle parking), a second volunteer pad, and the renovation of an existing restroom facility and associated septic system; the entrance and internal roads in the Preserve; replacement of the entrance gate; and new fencing, landscaping, and interpretive features such as signage, maps, and vegetative screening
The proposed Preserve improvement maintains existing structures on the site, adds 32 designated parking spaces, and while most retained trails are expected to be maintained in a drivable condition by 4WD service vehicles, trail access by vehicle will be restricted to official vehicle use only. Gates restrict drivable access, and old roads that allowed travel between the east and west sides of Iron Mountain are being discontinued. The principle use of the facility will be for day trail use. No overnight camping or open fires will be permitted in the Preserve.

Despite its proximity to developed areas, the Preserve is particularly rich with wildlife and is largely free of human impacts except for the legacy trail system and ranch structures reconfigured as the Preserve headquarters. Previous human use of the Preserve has been concentrated in the valley floor area near the current Ranger Station and was historically managed as a working ranch then later as a Salvation Army Camp before coming into County of San Diego ownership.

## Wildfire Risk

In the past, large fires have frequented the region, especially during Santa Ana wind extreme fire behavior conditions. The last large fire to visit the area was the 273,246 Cedar Fire in 2003. Nearly 100\% of the Preserve burned during the Cedar fire, although the area has recovered to mature fuel conditions since. The entire Preserve area is within designated Very High Fire Hazard Severity Zone by CAL FIRE and the County of San Diego. The Mussey Grade is recognized by local fire protection officers as a critical area of concern for wildfires given difficult terrain, past fire history, and Santa Ana wind alignment with topography.
The Cedar Fire was characterized by extremely rapid rates of spread from 6 to 9 MPH, extreme fire behavior including long-range spotting, high structure losses and loss of life. Strong and gusty Santa Ana winds drove the fire behavior. This is the
characteristic outcome of severe burning conditions during Santa Ana winds in the region and can be expected to reoccur during similar critical fuels and fire weather events in the future. Similar large loss fires occurred in the area during the 1956 Inaja Fire and the 2007 Witch Fire.

Boulder Oaks Preserve map


Figure 2
Project Vicinity Boulder Oaks Preserve Improvement Project - MND


More nominally, onshore wind days during summer months can also drive significant fire behavior, but with less dramatic outcomes than Santa Ana wind events. An example of this fire type was the 2016 Rock Fire which burned 35 acres in Mussey Canyon immediately east of the Preserve. Large fires may be expected in the Preserve area anytime weather and fuel conditions meet the following Large Fire Development criteria:

Large Fire Development Factors

| Temperature | 85 degrees plus |
| :--- | :--- |
| Relative Humidity | $<15 \%$ |
| Fuel Moisture | Seasonally dry or long-term drought |
| Critical Rates of Spread | Onshore winds $>2 \mathrm{MPH}$, <br> Offshore winds $>6 \mathrm{MPH}$ |
| Spotting | $.3 / 4$ mile |
| Flame Lengths | Average 10-12 feet in chaparral <br> Peak 30-60 feet in chaparral; |

The Preserve is vegetated by heavy mixed chaparral on most upper slopes and a chaparral-coastal sage scrub mix in lower slopes. More limited areas present grass lands and oak woodlands in lower elevation valley areas on both sides of the Iron

Mountain ridge. Slopes in the area are steep (in some cases exceeding 60\%) and from the east are topographically in alignment with historical San Ana wind patterns. This alignment will accentuate fire behavior during Santa Ana wind driven fires on these slopes. While some area topography in the valleys will support dozer line construction when necessary, higher slopes are rocky and present significant obstacles to mechanical fire suppression methods. Use of heavy equipment for fire line construction should only be used on consultation with resource advisors from San Diego County Parks. Fires occurring within the Preserve are likely to require a large commitment of hand crews to suppression activities. Chaparral and coastal sage scrub within the Preserve is well recovered from the 2003 Cedar Fire and is available in its current condition to support high intensity wildfire.

Chaparral dominated landscape adjacent to proposed north parking area


In the Final Specific Management Directives for Boulder Oaks Preserve (2008), Fire Management Section, reference is made to the notion that chaparral under 13 years of age resists burning. This in fact has been disproven by scientific study of burn patterns in Southern California chaparral fuels during Santa Ana winds (Keeley, Fotheringham, Zedler, et. al). Many examples exist of Santa Ana wind driven wildfire consuming 100\% of available fuels with high intensity regardless of age class. Recent wildfire occurrence during the 2018 Woolsey Fire in Los Angeles County demonstrated the complete consumption of significant fuel beds under 10 years of
age. The statement included in the Management Directives has been found to be truer of fires occurring without critical Santa Ana wind conditions. In any case, young age class of wildland fuels should not be considered as reliable for reduction of wildfire severity.
The primary risk to Preserve visitors may well be potential wildfire exposure. For this reason, Preserve staff will need to maintain vigilance for fire prevention measures, have a strong evacuation plan, and plan for temporary safe refuge of visitors and staff if escape is unavailable. In several recent cases in San Diego County, hikers have required evacuation by public safety helicopters from similar remote parks during wildfires. This included an August 2010 event near Lakeside at El Capitan Regional Park, and a second event near Mt. Woodson in 2018. Use of similar search and rescue techniques should be included in response planning, but backup plans should also be included for when weather, fire, visual flight rule, or availability conditions preclude use of aviation assets.
Structural risks from wildfire within the Preserve are limited to the original Preserve structures, consisting of an old barn, ranch homes, and related development near the pond at the current Preserve Headquarters. An inspection of that site identified good defensible space around these structures and opportunity for temporary safe refuge if evacuation is not possible during wildfire.

Proposed parking area equestrian staging next to existing ranger station


Existing barn near ranger station


Pond near ranger station


Structural development including the Wildwood Ranch and other private homes adjacent to the Preserve may have more limited defensible space and present wildfire exposure risks that could contribute to loss during wildfire.

## Fire Prevention Measures

San Diego County Parks has proposed a significant plan for fire prevention within the Preserve, including the following measures:
a. Resident rangers onsite
b. Key trails are planned to be maintained in drivable condition for emergency access
c. Parking will only be allowed in approved parking areas
d. Continued fuel modification along Wildwood Ranch Road/Foster TT
e. Fire warning signage and fire history messages in information kiosks
f. Prohibition of use of any open flame
g. Potential closure during adverse weather including Santa Ana winds
h. Development of a Preserve wildfire evacuation plan
i. The Department of Parks and Recreation intends to potentially engage CAL FIRE in vegetation management prescribed burning at some point in the future
j. The Department of Parks and Recreation intends to serve as resource advisors to CAL FIRE for wildfires occurring within Preserve boundaries.
k. The Department of Parks and Recreation stated a commitment in meetings with consultants to dispersed, low intensity usage, and cited examples of
intense visitor usage they wished to avoid.

Fuel modification along Wildwood Ranch Road


These prevention measures were assessed to be reasonable and adequate for reducing fire ignition risks from proposed public access to the Preserve. In addition to these measures, this report recommends the following additional measures be considered:

1. Maintenance of parking and staging areas as areas of temporary safe refuge during wildfire, including fuel modification of at least $50 \%$ of native vegetation and $80 \%$ of grass vegetation for 50 feet around all parking and staging areas. The intent of this measure is to provide opportunities for safe refuge when roads may be impassable due to wildfire movement
2. Pruning of ornamental vegetation near the Preserve Headquarters Ranger Station to ensure reduction of structural ignition potential during wildfire and maintenance of the site as a temporary safe refuge.
3. Parks outreach and cooperation with adjacent landowners to establish adequate fuel modification to protect structures. Consider allowance of trespass on park lands for fuel modification purposes when necessary
4. Consider outfitting of Parks pickup trucks with small fire pumps/tanks for action against incipient wildfires or extinguishment of illegal campfires.
5. Identification or development of potential "helispots" in remote areas where helicopters may land during emergency response.

## Camp Wildwood

An issue of concern exists for the access road leading into the public preserve and for a large youth camp traversed by that road. Wildwood Ranch Road crosses private property under use by the Church of Jesus Christ of Latter-day Saints (LDS or Mormon Church) as a high-use youth camp and recreational facility. This 61,25-acre camp facility is named Wildwood Ranch. The County's Preserve surrounds this property on three sides. The road leading through this property is also the primary access for the Preserve and becomes the Foster Truck Trail as it leaves Camp Wildwood. The road has been cleared of fuels for up to 30 feet on both sides to ensure adequacy of use as an escape route and for reduction of roadside ignition potential.

Wildwood Ranch is being re-purposed by the Mormon Church as a replacement alternative to the Church's participation in the Boy Scouts of America. The Church expects full and robust use of the camp on weekends and during the summer with up to 500 visitors at a time. The camp also has onsite-resident staff present year-round. The camp has expressed security and wildfire concerns for their property as a result of the proposed public opening of the Boulder Oaks Preserve. Currently, limited road signage directs the public through camp property to Preserve areas further south.

In order to ensure safety during wildfire, this report recommends a cooperative agreement be developed between the Mormon Church and San Diego Parks and Recreation that facilitates the maintenance of defensible space as necessary around Camp Wildwood structures and for Wildwood Ranch Road. This agreement should facilitate Park lands trespass where essential and necessary for maintenance of road and structural fuel breaks or safety zones for camper assembly. The camp has a prepared wildfire evacuation plan and should be notified when threatened by wildfire.

## Wildwood Camp contact: Camp Manager (760)788-3310

## Evacuations

Evacuation options are limited for the Boulder Oaks Preserve. Mussey Grade Road serves as the sole means of escape from the east access to the park. Escape from the park requires travel northbound on Wildwood Canyon Road/Foster TT, then north bound on Mussey Grade Road into the community of Ramona, a distance of 4.2 miles requiring 8-10 minutes under nominal conditions. The route requires travel through significant fuel beds and overhanging vegetation and offers opportunity for entrapment during wildfire burn over conditions.

For these reasons, it is imperative that evacuation of the Preserve be initiated early when threats are detected and ceased when an evacuation opportunity is compromised by fire movement. Once evacuation is ceased, remaining populations should seek safe refuge near the ranger station. It will be imperative that emergency responders search for entrapped populations near the ranger station and parking lots and deploy air and ground resources as appropriate to protect populations in place when necessary. See appendix A for an evacuation map for the region.

The SDCFA has determined that the addition of 32 vehicles from the Preserve's parking would insignificantly affect evacuation of the Mussey Grade area. This report concurs with this conclusion.

## Evacuation Triggers

Evacuation triggers for the Mussey Grade area have been stated in the San Diego County Wildland Urban Interface Fire Emergency Response Plan for the area (2018, see attached in appendix B). In that plan, fire locations and trajectories are identified that may pose risk to visitors to the Boulder Oaks Preserve.

The Preserve should be evacuated for any aggressive or major fire burning under Santa Ana wind conditions with high rates of spread, moving west of the San Diego River drainage east of the community of Ramona. For onshore wind conditions, any fire occurring on the east side of State Route 67 escaping initial attack should cause Preserve evacuation. Either Park staff, law enforcement, or fire agencies should make contact with Camp Wildwood to ensure effective protective actions are also being taken for camp populations.

Since travel on Mussey Grade Road may be dangerous during fire movement, Park staff should cease evacuation efforts and direct evacuating visitors to seek safe refuge near the Park Headquarters when a fire enters the West Branch of the San Vicente Creek drainage (the canyon Mussey Grade Road descends) until the fire passes and the road is confirmed safe for travel.

Evacuees leaving the Iron Mountain trail head parking lot on the west side of the Preserve should move either north or south on State Route 67 into developed areas, or west on Poway Road or Scripps-Poway Parkway into the City of Poway, in a direction that best reduces exposure to fire movement to safety.

## Assessment of Fire Services

Structural fire and emergency medical services are provided to unincorporated County area by the San Diego County Fire Authority (SDCFA). Rohde \& Associates has been retained by the San Diego County Fire Authority to conduct an operational review of the proposal. Wildland fire protection is provided by the California Department of Forestry and Fire Protection (CAL FIRE), San Diego Unit. CAL FIRE also provides contract services to staff and operate both the San Diego County Fire Authority and the Ramona Fire Department.

CAL FIRE operates four fire stations within the greater Ramona area that will serve the primary eastern access to Boulder Oaks Preserve. One of the stations, \#86 is a State wildland mission fire station. Two of the fire stations are operated under a cooperative municipal fire protection agreement with the Ramona Municipal Water District, fire stations \#80 and \#82. A third fire station \#85 is operated by the SDCFA.

Fire Services response agreements within the County facilitate the response of the closest resource to all requests for service, regardless of jurisdiction. The four fire facilities proximal to the primary Preserve entrance include:

EAST SIDE/MAIN ACCESS TO PRESERVE

| Fire Station | Location | Resources | Distance to <br> Boulder Oaks <br> Preserve Hq. |
| :--- | :--- | :--- | :--- |
| Ramona Fire <br> Station 82 | 3410 Dye Rd., <br> Ramona | Type 1 PM engine | 4.2 miles/ <br> 8 minutes |
| CAL FIRE <br> Fire Station 86 | 16310 SR 67 <br> Ramona, CA | Type 3 engine | 6.3 miles/ <br> 10 minutes |
| Ramona Fire <br> Station 80 | 829 San Vicente <br> Rd. Ramona | Type 1 PM engine <br> Medic Ambulance <br> Chief Officer | 7.6 miles/ <br> 14 minutes |
| SDCFA <br> Fire Station 85 | 25858 SR78, <br> Ramona | yype 1 PM engine <br> Type 1 WT | 15.2 miles/ <br> 24 minutes |

Consideration must also be provided for response to a single but actively used Iron Mountain trail head located west of the preserve near the intersection of State Route 67 and Poway Road. The distance from this trailhead to the summit of Iron Mountain is 6 miles. Service to this site can best be provided as follows:

WEST SIDE OF PRESERVE

| Fire Station | Location | Resources | Distance to Iron Mountain Trailhead |
| :---: | :---: | :---: | :---: |
| CAL FIRE <br> Fire Station 86 | $\begin{aligned} & 16310 \text { SR } 67 \\ & \text { Ramona, CA } \end{aligned}$ | Type 3 engine | 3.1 miles/ 6 minutes |
| City of Poway Fire Station1 | 13050 Community Road, Poway | Type 1 PM engine Chief Officer | 5.1 miles/ 10 minutes |
| Ramona Fire Station 82 | 3410 Dye Rd., Ramona | Type 1 PM engine | 6.3 miles/ 12 minutes |
| Ramona Fire Station 80 | 829 San Vicente Rd. Ramona | Type 1 PM engine Medic Ambulance | 9.7 miles/ 19 minutes |

## Response Time Analysis

In consideration of response times, it is important to compare response performance in the Boulder Oaks Preserve area with the SDCFA jurisdictional response standard. That standard includes the following criteria:

The SDCFA response standard:

| Response Type | Urban/Suburban Area | Rural Area |
| :--- | :---: | :---: |
| First Due Unit <br> on-scene | 5 min. | 10 min. |
| Full First Alarm <br> on-scene | 19 min. | 30 min. |
| Truck first due <br> (where available) | 8 min. | 16 min. |
| First Alarm- Structure Fire Response (all areas): <br> 4 engines, 1 truck (if available), 1 medic unit, 1 chief officer. Add <br> 2 water tenders for rural areas |  |  |

Response time is measured by the standard in terms of actual travel time, the time from which an emergency vehicle starts its response until the time that it arrives onscene.

In analysis of the standard against response times to the preserve, main access points on both the east and west sides of the preserve are met by the existing fire services deployment under the rural standard. The rural standard is the appropriate deployment model for the preserve area given its development characteristics. Response deeper into backcountry areas may take longer to accomplish and may also require the additional use of helicopter resources to provide adequate response times. Fire and rescue helicopters are operated by the County of San Diego with advanced hoist rescue capabilities. These assets are based within 20 minutes flight time of the preserve at Gillespie Airfield in El Cajon. Nearest Truck Company service responds from Poway FD Truck 3, 6 miles from the Iron Mtn. Trail Head, and 15 miles from Preserve HQ.

Landscape near the ranger station off Foster Truck Trail


In addition to initial response, CAL FIRE maintains a robust inventory of wildland fire resources within San Diego County that would serve the Boulder Oaks Preserve during wildfire occurrence. This additional resource includes 3 dozers, 12 hand crews from 4 fire camps, two air tankers, 2 medium helicopters, and air-attack command aircraft. Additional wildfire resources are also available under aid agreements with the USDA-Forest Service- Cleveland National Forest, San Diego Gas and Electric, and other agencies. The nearest Air Attack base in Ramona, the base location for all State aircraft, maintains a flight response time to the area of under 5 minutes.

Radio and cell phone reception in the area of the Preserve is limited due to terrain. Fire Service VHF and 800 Mhz . radios and cellular phone service may both experience compromised coverage in the Preserve area. County Park Rangers have the ability to directly communicate with fire services via the County's 800 MhZ RCS system.

## Fire Service Analysis

Fire services analysis for the Boulder Oaks preserve concludes that the region maintains robust initial fire and rescue and wildland fire resources that can provide rapid and effective fire and rescue response to the Boulder Oaks Preserve. The planned new use of the preserve suggests a statistically insignificant increase in regional call volume, although response to back country medical aids is expected to occur with rates like those experienced at other similar dispersed backcountry recreational areas in the region. Such facilities incumber occasional backcountry rescues for injured or sick facility visitors, usually occurring during weekend periods in reasonable weather. Potential wildfire ignition risk due to increased human presence may elevate slightly due to the limited public access proposed, but this risk should also be effectively mitigated by proposed fire prevention measures, although this risk cannot be completely eliminated. However, insignificant impact to fire service capability is anticipated from the proposed land use.

## Summary of Findings

1. The proposed park use allows for daytime use only, with no open flame allowed. These practices significantly restrict risks that contribute to wildfire ignition potential.
2. The San Diego County Department of Parks and Recreation intends to establish signage, evacuation plans, and ranger residence onsite as mitigations to wildfire occurrence.
3. Significant fire behavior potential exists from fuels within the Preserve and past fire history suggests aggressive, high intensity wildfire may reoccur periodically.
4. A need exists for identification and preparation of visitor areas of temporary safe refuge for when wildfires may obstruct limited evacuation routes. These should include the Preserve Headquarters area and all three proposed parking/staging areas.
5. The relationship with Camp Wildwood presents special areas of concern, and agreement is needed with the Mormon Church (operators) to ensure defensible space, fire ignition risk reduction, roadway access and related cooperative interest issues are appropriately addressed.
6. San Diego County Parks and Recreation staff should consider criteria that will cause Preserve closure to public access when wildfire risk conditions are extreme.
7. Maintenance of roadside fuels management along Wildwood Ranch Road/ Foster Truck Trail will be important to evacuation access and ignition risk reduction for the Preserve
8. The proposed Preserve use does not present a statistically significant increase in demand for regional fire services. Fire agencies are equipped and ready to provide for service demands presented by the proposed use.
9. The proposed fire safety mitigations and restrictions stated by San Diego County Department of Parks and Recreation in the Mitigated Negative Declaration are expected to significantly mitigate the additional risk posed by new public use of the Preserve.

## References

1. CEQA Initial Study, Boulder Oaks Improvement Project, County of San Diego, Sept. 12, 2019
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7. Fire Resources and Assessment Program (FRAP), State of California, Department of Forestry and Fire Protection (CAL FIRE), online resource, frap.fire.ca.gov/
8. Wildland-Urban Interface Fire Emergency Response Plans, San Diego

County Fire Chiefs Association, Mussey Grade Plan, Ramona West Plan, and Ramona South Plan, May 2018
9. After-Action Review of the Woolsey Fire Incident, County of Los Angeles, by Citygate Associates LLC, November 2019

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Appendix A:
Wildland-Urban Interface Fire Emergency Response Plan-

Mussey Grade








