DESIGNING THE WILDLAND URBAN INTERFACE:

NATURE-BASED SOLUTIONS FOR WILDFIRE MITIGATION AND EQUITABLE LAND ACCESS WITHIN A POST FIRE LOS ANGELES

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INSTRUCTOR - MEG RUSHING COFFEE

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PROJECT STATEMENT

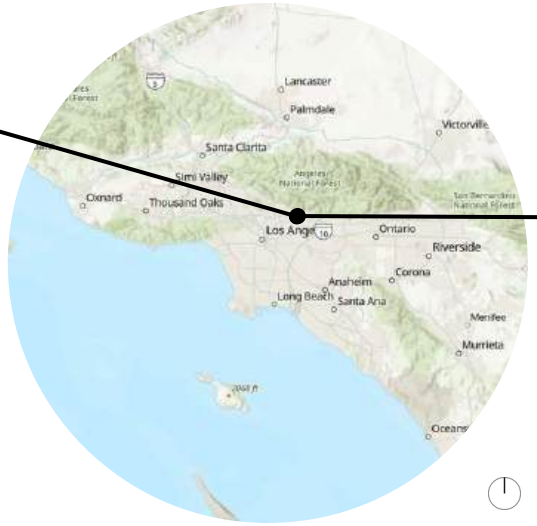
A significant blind spot exists in land use and community planning regarding wildfire risk mitigation. Current strategies focus either on individual homes or broader ecological fire dynamics, neglecting the community scale where risk is rapidly rising. This project explores the Wildland-Urban Interface (WUI) as a key area for design inquiry. Focusing on nature-based solutions, this project examines and reimagines the recently burned Eaton Canyon Natural Area as a recreational greenbelt and wildfire buffer zone. Serving as a multifunctional design model for mitigating and managing wildfire risk on the WUI and other urban areas.

Additionally, the greenbelt concept promotes equitable land access, fosters community connectivity, supports habitat restoration, and offers recreational and educational opportunities. This integrative approach positions landscape architecture as a key discipline in addressing the multidimensional challenges posed by wildfires at the community scale.

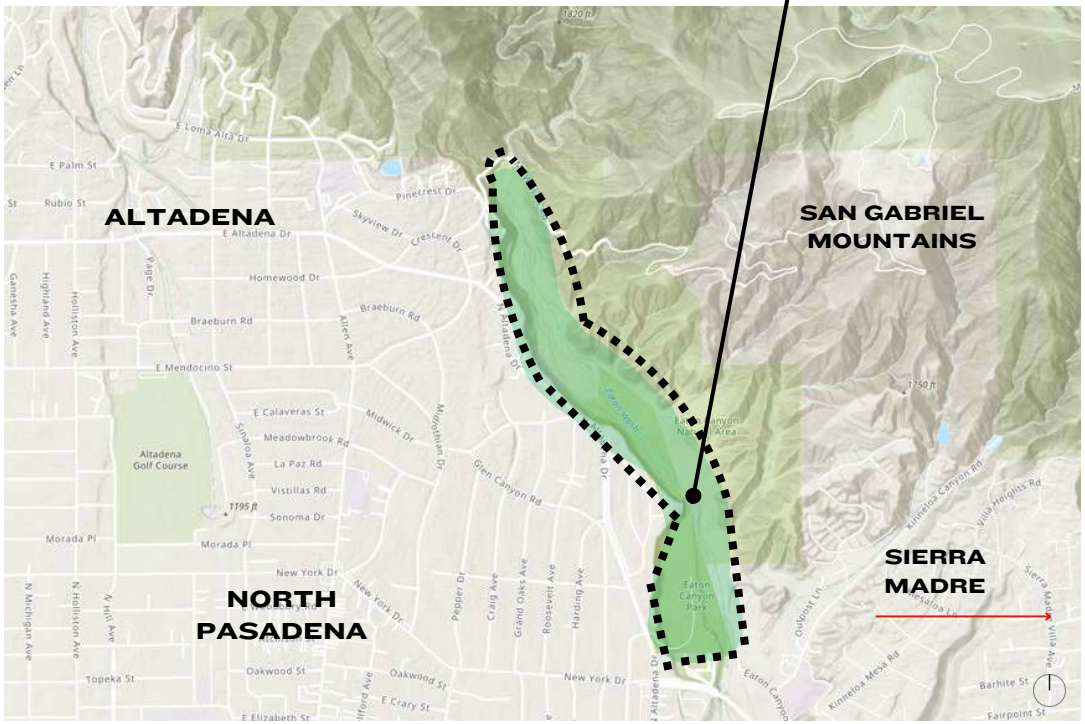
INTRODUCTION

PROJECT LOCATION EATON CANYON NATURAL AREA AND NATURE CENTER

CALIFORNIA, USA



LOS ANGELES COUNTY



PROJECT SITE:
EATON CANYON NATURAL AREA AND NATURE CENTER

Eaton Canyon Natural Area is a 198-acre nature preserve and park located in Pasadena, California, at the base of the San Gabriel Mountains. The park features a variety of hiking and equestrian trails, picnic areas, a nature center, and diverse wildlife. It is managed by the Los Angeles County Department of Parks and Recreation. Eaton Canyon offers several hiking trails, including the popular Eaton Canyon Trail, which leads to the scenic Eaton Canyon Falls. The trails vary in difficulty and length, with some providing significant elevation gain. In addition to hiking, the area also features equestrian trails and a staging area for horseback riding. The Eaton Canyon Nature Center presents exhibits on local wildlife and plants, showcases live animals, and has classrooms, an auditorium, and a gift shop. The preserve is home to a variety of animals, including birds, reptiles, and black bears. Its geological features include seasonal streams, rocks, and minerals, while the area is enriched with native plants and natural habitats. The lower two-thirds of Eaton Canyon are accessible and managed by Los Angeles County, while the upper section can be reached via a toll road bridge.

LIMIT OF WORK

PROJECT SITE

PROJECT LOCATION EATON CANYON NATURAL AREA AND NATURE CENTER

ENTRY SIGNAGE


TRAILS AND VEGETATION


NATURAL AREA

FIRE ECOLOGY TRAIL HEAD


NATURE CENTER


WATERFALL DESTINATION

EATON CANYON NATURAL AREA


EATON CANYON WASH

EATON CANYON HISTORY

Eaton Canyon Natural Area: A Journey Through Time (7000 BCE – 2025 CE)

Prehistoric & Indigenous Era (7000 BCE – 1700s)

- 7000 BCE: Earliest human presence in the San Gabriel Mountains region.
- Tongva People: The Tongva establish the village of Puntitavjatngna near Eaton Canyon, utilizing its freshwater resources for sustenance.

Spanish & Mexican Period (1771 – 1848)

- 1771: Founding of Mission San Gabriel Arcángel; many Tongva are relocated, and their village structures decline.
- Spanish settlers refer to the canyon as “El Precipicio” due to its steep gorges.

American Settlement & Development (1848 – 1930s)

- 1865: Judge Benjamin Eaton purchases land and constructs the Fair Oaks Ranch House; he utilizes canyon water for irrigation, notably for grape cultivation.
- 1891: Construction of the Mount Wilson Toll Road begins, enhancing access to the San Gabriel Mountains.
- 1930s: Pasadena designates parts of Eaton Canyon as a bird and game sanctuary, reflecting early conservation efforts.

Conservation & Public Access (1950 – 1990S)

- 1950: Mary Beatrice Fox sells 108 acres of Eaton Canyon to Los Angeles County for park development.
- 1963: The first Nature Center is established, promoting environmental education.
- 1993: The Kinneloa Fire devastateD the area, destroying the Nature Center and numerous homes.

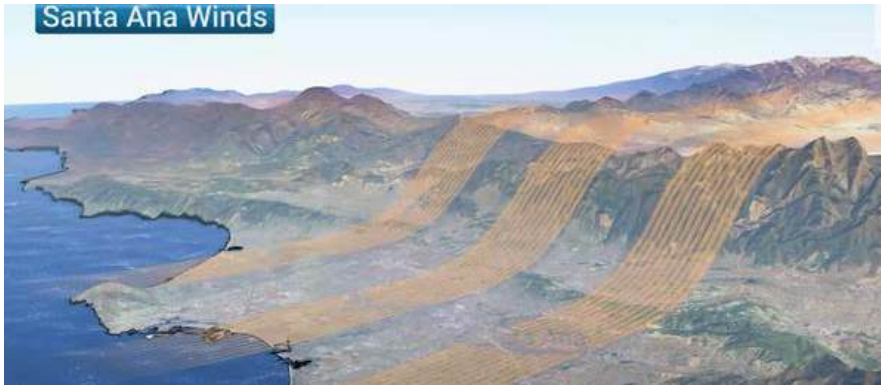
Modern Challenges & Restoration (1998 – 2025)

- 1998: Reconstruction of the Eaton Canyon Nature Center is completed following the 1993 fire.
- 2014: Due to safety concerns, the U.S. Forest Service closes access to the upper falls trail.
- 2022: A 1-acre parcel overlooking the canyon is returned to the Tongva tribe, marking a significant moment in indigenous land reclamation.
- January 2025: The Eaton Fire ravages the area, destroying the Nature Center once again and causing widespread ecological damage.

PROJECT JUSTIFICATION

In January 2025, the Los Angeles area experienced a significant and detrimental impact from a series of catastrophic wildfires, namely the Palisades Fire and the Eaton Fire. These firestorms, exacerbated by the strong Santa Ana winds and prolonged drought conditions, emerged as some of the most destructive occurrences in the region's recorded history, resulting in extensive damage to adjacent communities. The intensity of the Santa Ana winds, which exceeded 100 MPH in certain areas, further aggravated the situation by facilitating the spread of embers into densely populated urban environments, thereby igniting spot fires. The wildfires led to the destruction of over 16,000 structures, encompassing both residential and commercial properties, and resulted in 29 fatalities. The Eaton Fire, in particular, consumed more than 14,000 acres of land. The economic and property damage incurred was substantial, displacing thousands of residents and leading to significant financial losses. *These catastrophic events serve to underscore the escalating threat of wildfires in Southern California, highlighting the urgent need for comprehensive strategies to manage and mitigate the impacts of such natural disasters on urban areas.

MAP OF WILDFIRE LOCATIONS JANUARY 2025

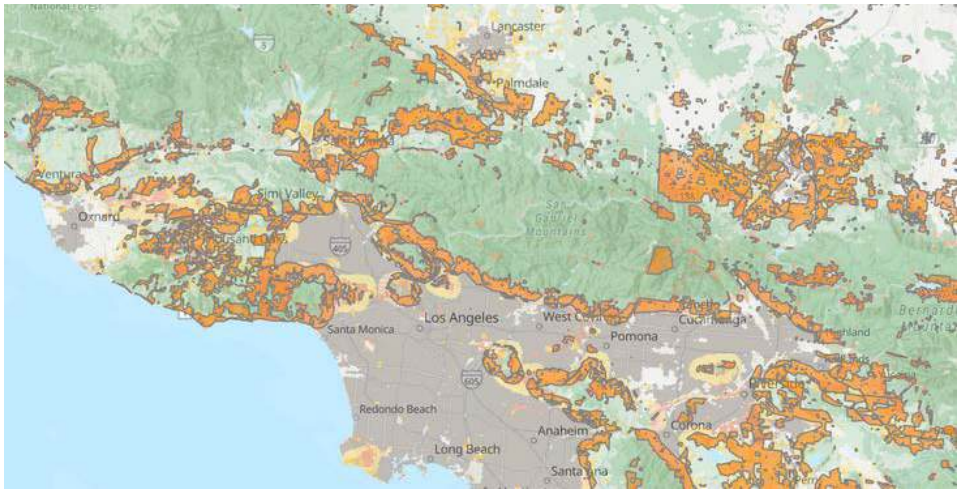


SANTA ANA WINDS COMING OVER SAN GABRIEL MOUNTAIN RANGE

LOOKING NORTH TOWARD SAN GABRIEL MOUNTAINS DURING EATON WILDFIRE

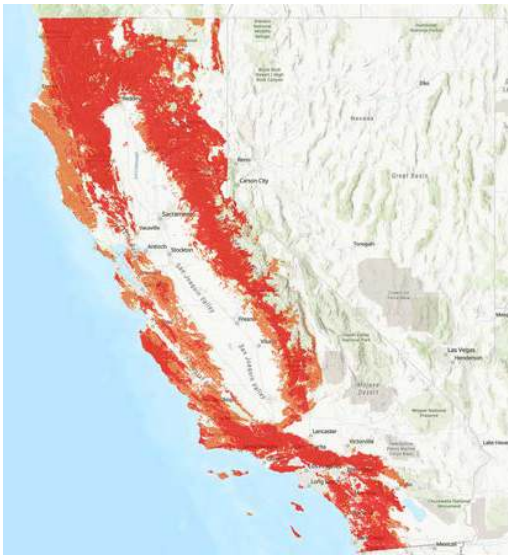
PROJECT JUSTIFICATION

COMPARING THE WUI FOOTPRINT TO THE 2025 FIRE HAZARD SEVERITY ZONE YOU CAN NOTE HOW RISK DIRECTLY CORRALATES TO THE WILDLAND URBAN INTERFACE.

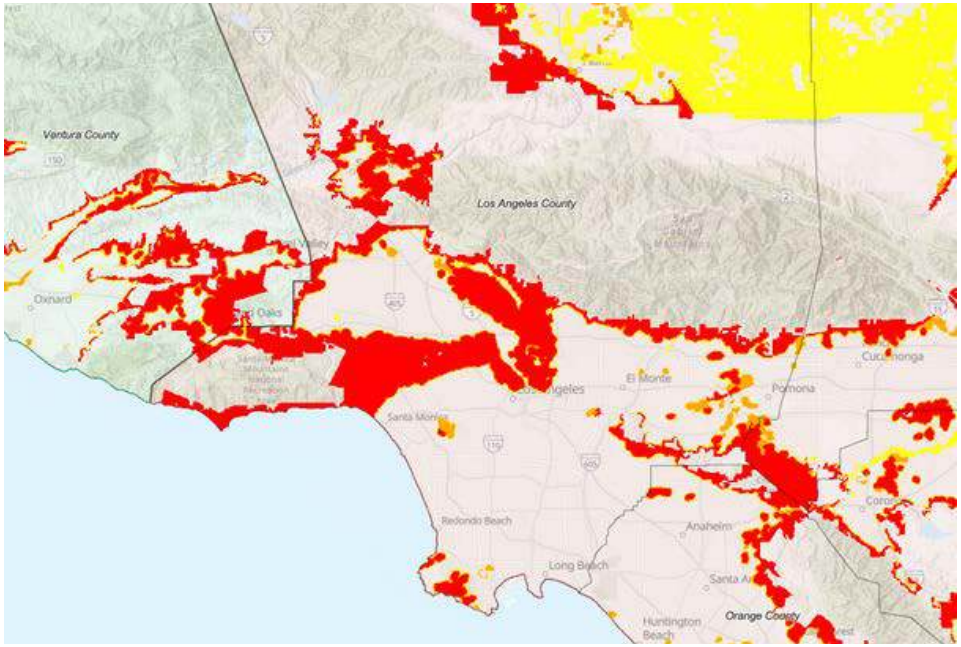


2025 WILDLAND URBAN INTERFACE - LOS ANGELES COUNTY

EXAMPLE OF SPATIAL RELATIONSHIPS BETWEEN THE URBAN CONTEXT, THE WILDLAND URBAN INTERFACE, AND WILD LANDS. THE TRANSITION SPACE OF THE WUI PROVIDES AN INTERESTING OPPORTUNITY FOR DESIGN INQUIRY AND LAND BASED SOLUTIONS TO WILDFIRE AND CLIMATE CHANGE RISKS. HOW CAN WE IMROVE THE CONTEXT AND RELATIONSHIPS OF THESE EDGES?



AS OF 2025 40% OF CALIFORNIA'S FOOTPRINT IS DESIGNATED AS HIGH FIRE RISK



2025 FIRE HAZARD SEVERITY ZONE MAP - LOS ANGELES COUNTY

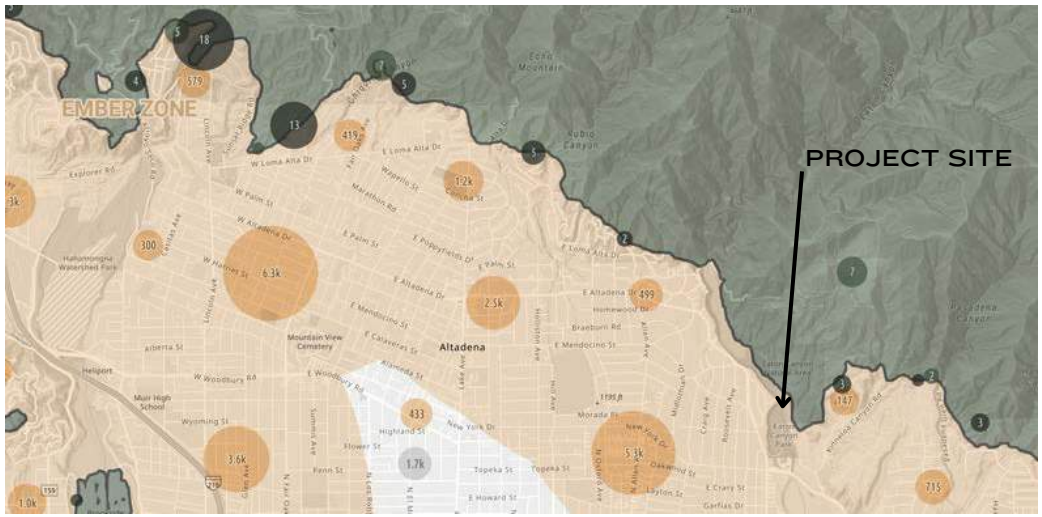
The magnitude of the devastation proves the critical need for comprehensive preparedness and preventive strategies. These fires predominantly occurred within the wildland-urban interface (WUI), an area characterized by the intersection of residential developments and wildland regions. *Approximately 40% of California's land is classified as high fire risk, placing over 10 million residents in these vulnerable zones and climbing.

As climate change increasingly affects the frequency, intensity, and extent of wildfires, it is expected that suburban expansion into high fire-risk areas over the next 50 years will elevate the exposure of communities to wildfires, potentially leading to catastrophic outcomes. In urban environments, traditional fire resilience strategies often depend on non-nature-based methods. While these approaches are essential for ensuring public safety, they may not effectively address the underlying land-use and planning issues.

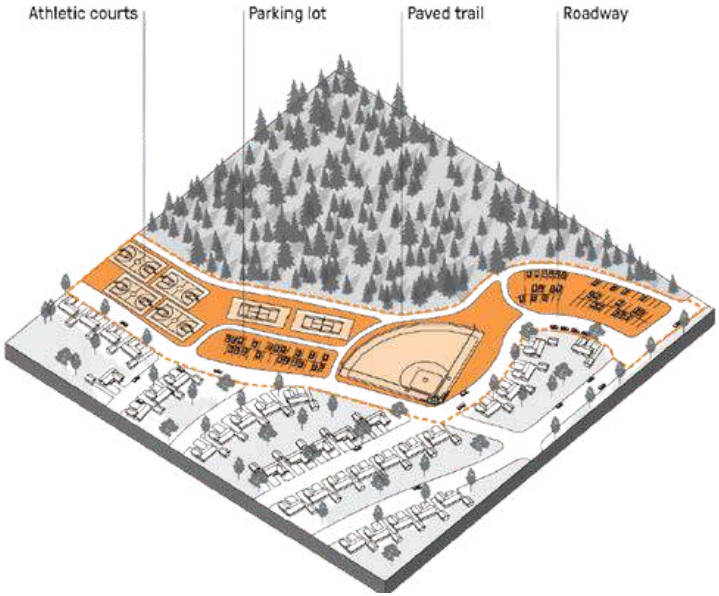
PROJECT JUSTIFICATION

Investigating nature-based, community-scale solutions along the wildland-urban interface aimed at improving fire resilience can be an effective long-term strategy to protect urban communities. *Establishing strategically positioned open green spaces along the WUI represents a viable land-based solution. For example, in the context of wind-driven fire, flames spread in two primary ways: through the expanding fire perimeter and by embers carried by the wind. When embers travel downwind from high wildfire-risk zones, urban areas become increasingly vulnerable to fire damage. Careful management of natural buffer zones and greenbelts can act as ember catchers, helping to reduce the spread of fire by disrupting the path of wind-blown embers.

NUMBER OF STRUCTURES IN COMPARISION TO EMBER CAST - FEMA

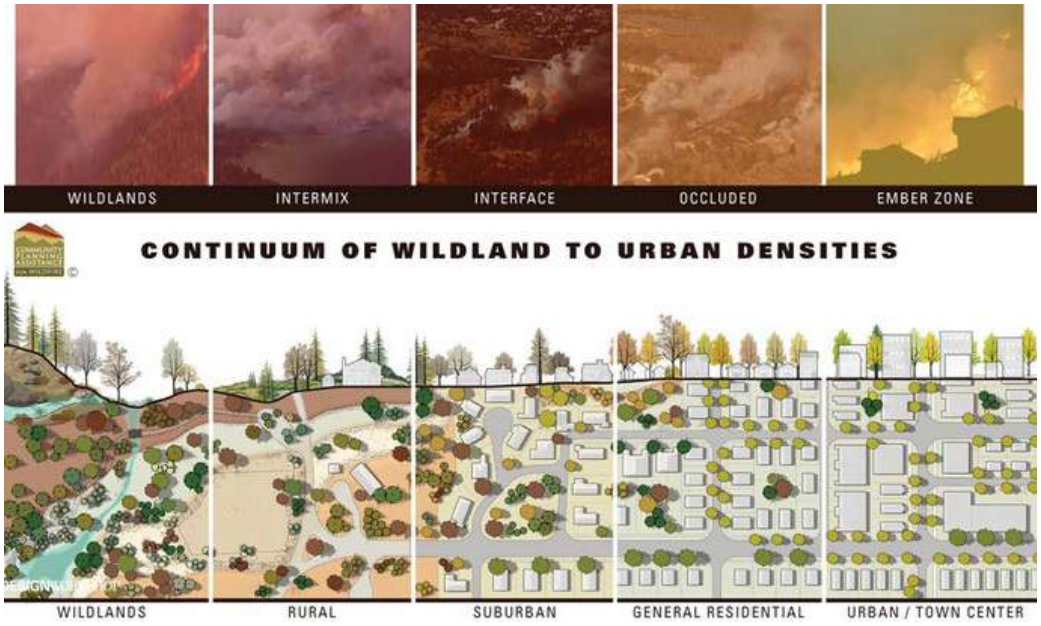


COMMUNITY SCALE BUFFER ZONE



EXAMPLE OF A GREEN BELT BUFFER ZONE WITHIN THE WILD LAND URBAN INTERFACE, PROVIDING PROGRAMING AND PROTECTING ADJACENT COMMUNITIES.
SOURCE: SWA- PLAYBOOK FOR THE PYROCENE

THE WILDLAND-URBAN INTERFACE EXISTS ALONG A CONTINUUM OF WILDLAND TO URBAN DENSITIES. DIFFERENT WUI TYPES CAN BE CORRELATED TO DEVELOPMENT PATTERNS THAT TRANSITION ACROSS ZONES.
SOURCE: COMMUNITY PLANNING ASSISTANCE FOR WILDFIRE.



PROJECT JUSTIFICATION

GREENBELT OPENSPACE HELPS TO MITIGATE FUELS AND SLOW FIRE BEFORE REACHIING DEVELOPED COMMMUNITIES. SOURCE: GREEN BELT ALLIANCE

AGRICULTUAL AREAS CAN PROVIDE LEGITATMENT BUFFER SPACE FROM WILDLANDS. SOURCE: GREEN BELT ALLIANCE

These buffers, which are defined as open spaces located between potential wildfire sources and densely populated urban areas, can help *reduce fuel loads and protect communities from fires igniting in wildland areas. Greenbelts/buffers also serve as crucial staging and assembly areas for first responders and community members during a disaster. In addition to their role in wildfire mitigation, multi-beneficial green buffer zones can enhance equitable land access, promote community connectivity, support habitat restoration, and provide spaces for recreation and environmental education. Agricultural lands adjacent to urban communities can enhance the effectiveness of these buffer zones as well.

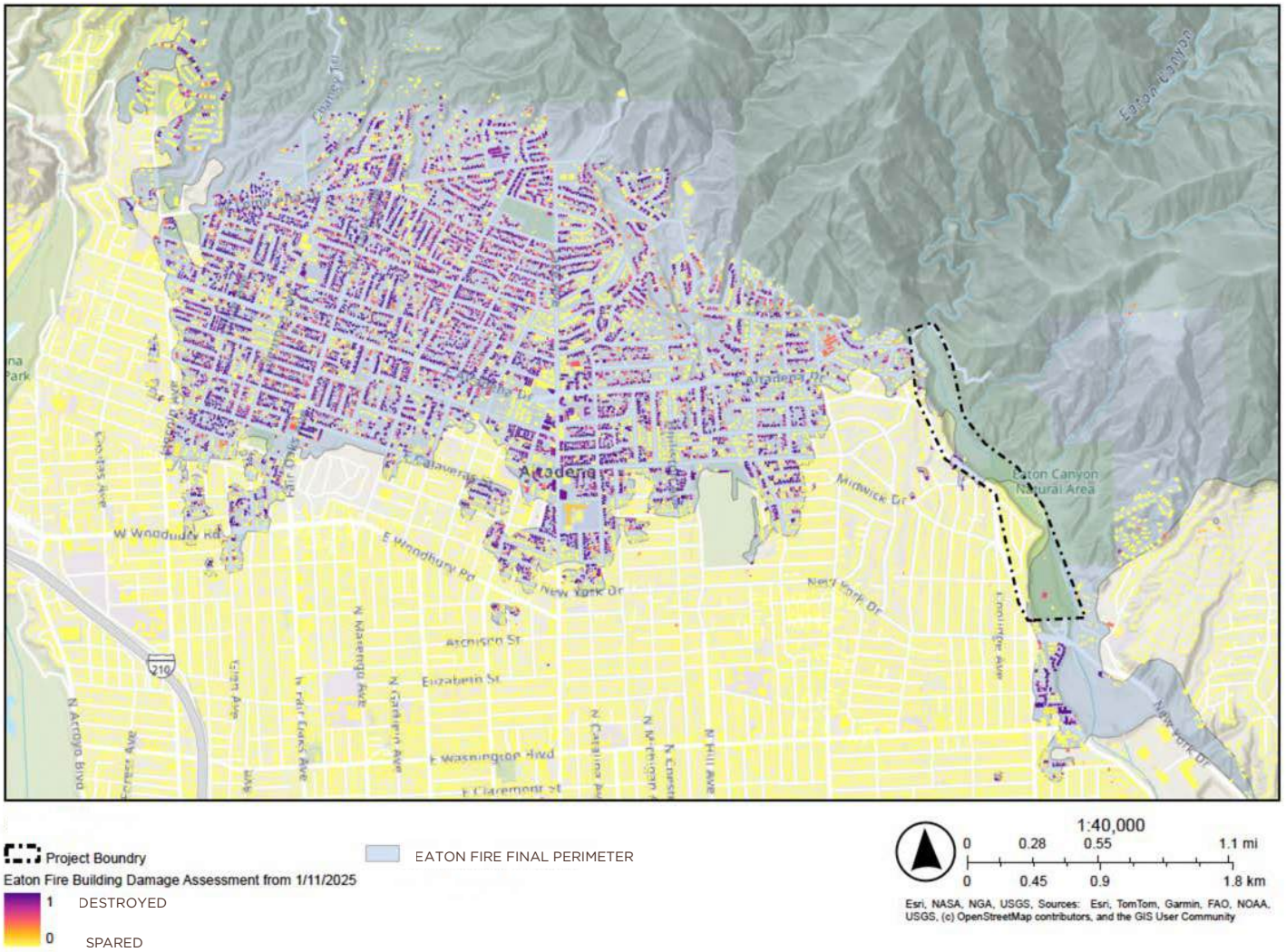
FAMILY ENJOYS OPEN SPACE PRESERVE AT FOOT HILL PARK IN SONOMA COUNTY. SOURCE: GREENBELT ALLIANCE

RECREATIONAL ACTIVITIES IN A GREENBELT IN OWENSBORO KENTUCKY. SOURCE: LIVING OWENSBORO

PROJECT JUSTIFICATION

EATON CANYON NATUAL AREA AS A GREENBELT BUFFER

An examination of the topography, location and land use of the surrounding Eaton Canyon Natural Area, post January 2025 firestorms, illustrates that its configuration creates a successful natural wildfire buffer zone between the foothills and neighboring communities. While the immediate area experienced some damage during the 2025 firestorms, the connected community remained comparatively unharmed relative to adjacent neighborhoods without a transitional buffer zone. Although post fire restoration efforts will be necessary in the Eaton Canyon Natural Area, the current condition of the preserve can be strategically redesigned, utilized and enhanced to redefine land-use practice, fire mitigation and accessible green space along the WUI. Establishing a new model for implementing greenbelts and bufferzones in similar high risk severity zones.

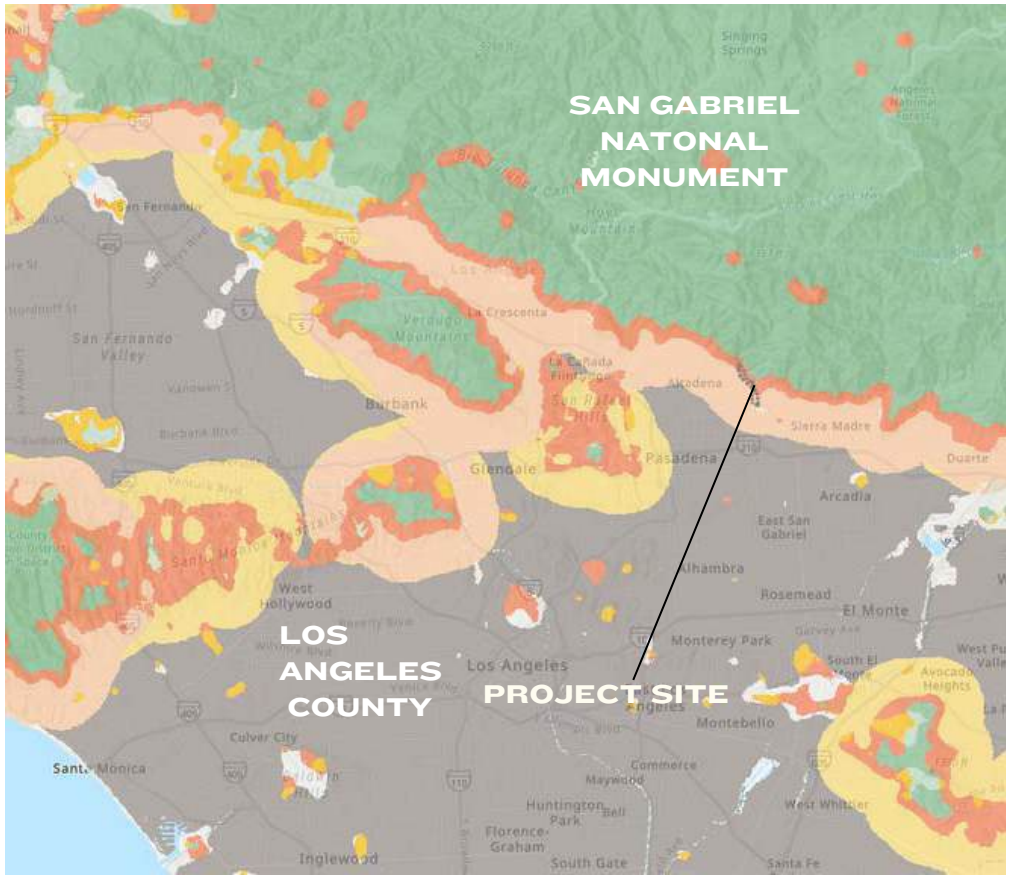


PROJECT SITE: Eaton Canyon Natural Area
LOCATION: North Pasadena, California
SIZE: 198 acres
OWNERSHIP: Los Angeles County Department of Parks and Recreation
PARCEL / APN NUMBER:
EXISTING BUILDINGS / YEAR BUILT: None / Nature Center Destroyed in Eaton Fire
ZONING: Open Space Preserve

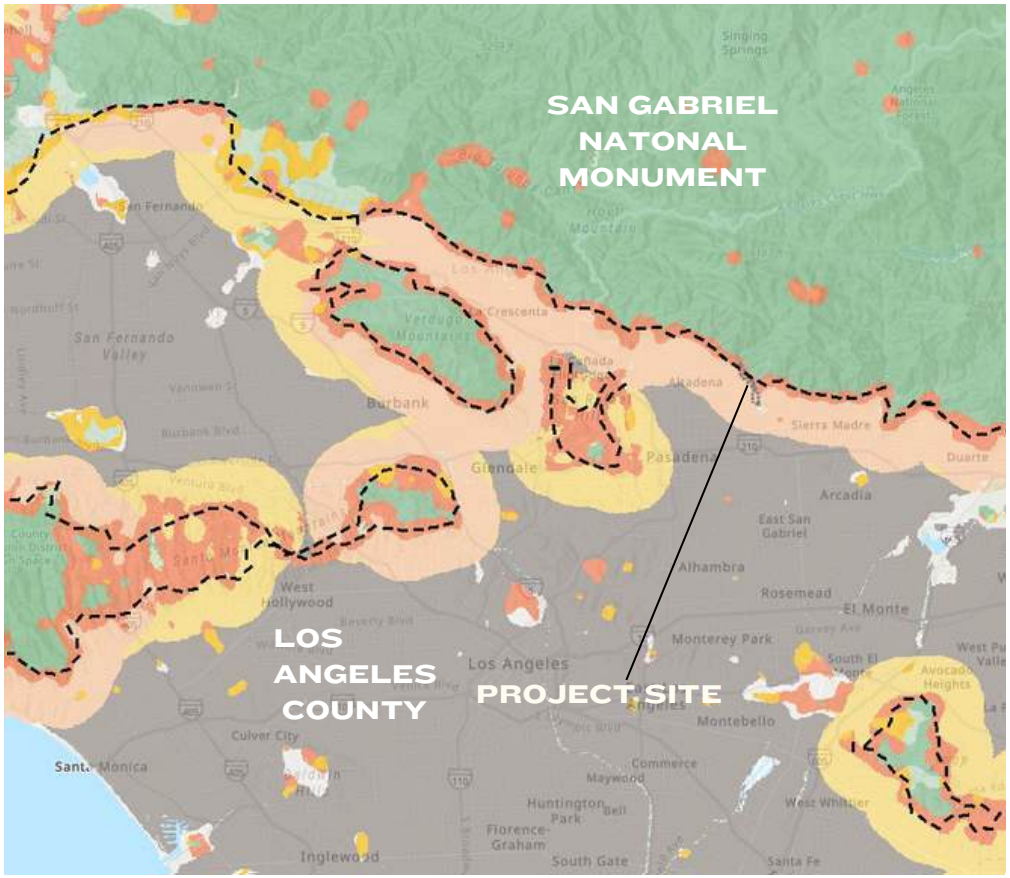
JURISDICTION AND AGENCIES: Los Angeles, California, Los Angeles County, Calfire, Fire Station #66, Mountains and Recreation Conservation Authority, Los Angeles County Department of Parks and Recreation

RELATIONSHIP OF THE WILD LAND URBAN INTERFACE AND POTENTIAL GREENBELT

LOCATION OF WUI IN LOS ANGELES COUNTY



LOCATION OF POTETNTIAL ONGOING GREENBELTS



Global Wildland-Urban Interface

- WUI intermix of buildings with forest, shrub, or wetland
- WUI interface of buildings with forest, shrub, or wetland
- WUI intermix of buildings and grasslands
- WUI interface of buildings and grasslands
- Non-WUI forest, shrub, or wetland
- Non-WUI grasslands
- Non-WUI urban area

POTENTIAL ONOGOING GREEN BELT LOCATION

KEY TAKE AWAY

- WILDLAND URBAN INTERFACE INTERMIX ZOONE IS AN IDEAL LOCATION FOR AN ONGOING MULTIPURPOSE- RECREATIONAL GREENBELT/WILDFIRE BUFFER

BENIFITS

- URBAN WILDFIRE PROTECT
- EQUITABLE LAND ACCESS - GATE WAY TO NATURAL AREAS

PROJECT JUSTIFICATION

FURTHER JUSTIFICATION

- We can and should assume that areas within the Wildland-Urban Interface (WUI) are likely to burn again. Eaton Canyon Natural Area has a history of wildfires, having burned once in 1993, which destroyed the original nature center, and again in 2009 at the northern tip of the canyon. Studying these past events could provide valuable insights into how and why Eaton Canyon successfully functioned as a buffer zone during the 2025 wildfires. And how that knowledge can be applied elsewhere.

- This project presents an opportunity to reimagine the park with the understanding that it will likely experience future fires. This realization can influence design strategies, material choices, and site programming. What does it mean to create a temporary structures that fulfill its purpose while minimizing financial loss in the event of a wildfire? How should programming and placement change under these assumptions? Is there a safer way to approach programming?

- The limit of work for this project has been extended to the northernmost edge of the canyon, outside of the boundaries of the natural area. Expanding the work area provides the opportunity to reimagine Eaton Canyon Natural Area as a connective greenbelt to the adjacent communities and to explore the types of recreational activities that can occur at this scale.

- Strategic placement of vegetation, windbreaks, and planting islands can improve upon the existing conditions of the natural area.
- Greenbelts and buffer zones can do more than protect from wildfire and provide recreational opportunities. They can also provide a safe distance for co-existence with wildlife.

- The opportunity to explore unseen wildfire defense infrastructure to improve holistic function, such as embedded water systems and beyond.

- Altogether, the aforementioned study can create a model for wildfire greenbelts in other communities.

CASE STUDIES

CASE STUDY 2019 KINCADE FIRE AND FOOT HILL REGIONAL PARK

DESCRIPTION OF FIRE EVENT:

Sonoma County's longstanding land-use policies prioritize the preservation of open space and the prevention of urban sprawl. This was evident during the 2019 Kincade fire, when Foothill Regional Park played a crucial role in creating a natural wildfire buffer that protected the town of Windsor from the advancing flames. The Kincade wildfire was ignited by failing Pacific Gas & Electric (PG&E) power transmission towers, underscoring the importance of effective fire management. Windsor benefited from its proximity to regional parks and designated open lands, which formed a vital defensive perimeter. Foothill Regional Park provided essential greenbelt areas that allowed firefighters to position equipment, establish backfires, and create fuel breaks, successfully containing the wildfire with no reported loss of life. The Foothill Estates subdivision, with about 150 homes, was directly in the fire's path, but the adjacent 211-acre park served as a protective buffer, enabling efficient firefighting operations. Furthermore, the fire was more easily contained to the northeast due to undeveloped land merging into community separators and agricultural areas outside the Urban Growth Boundary, which helped protect the Elsbree subdivision. Windsor's proximity to Shiloh Regional Park further bolstered firefighting efforts, with firefighters using the park to create fire lines and igniting backfires to halt the fire's spread. This situation highlights the critical role of land-use policies and regional parks in safeguarding communities from wildfire threats.

KEYTAKE AWAY:

The existence of a regional park adjacent to the town, located within a county characterized by well-defined land-use policies aimed at safeguarding open spaces and curtailing urban sprawl, established an effective buffer against wildfires. This strategic planning enabled firefighters to deploy strike teams in advance, thereby enhancing their capacity to mitigate the wildfire's spread into residential areas and, consequently, to protect lives.

WILDLAND BUFFER BETWEEN FOOT HILL REGIONAL PRESERVE AND SHILOH REGIONAL PARK PROVIDED A NATURAL WILDFIRE BUFFER AND SAFE SPACE FOR FIRST RESPONDERS TO FIGHT THE 2019 KINCADE FIRE, SAVING THE TOWN OF WINDSOR

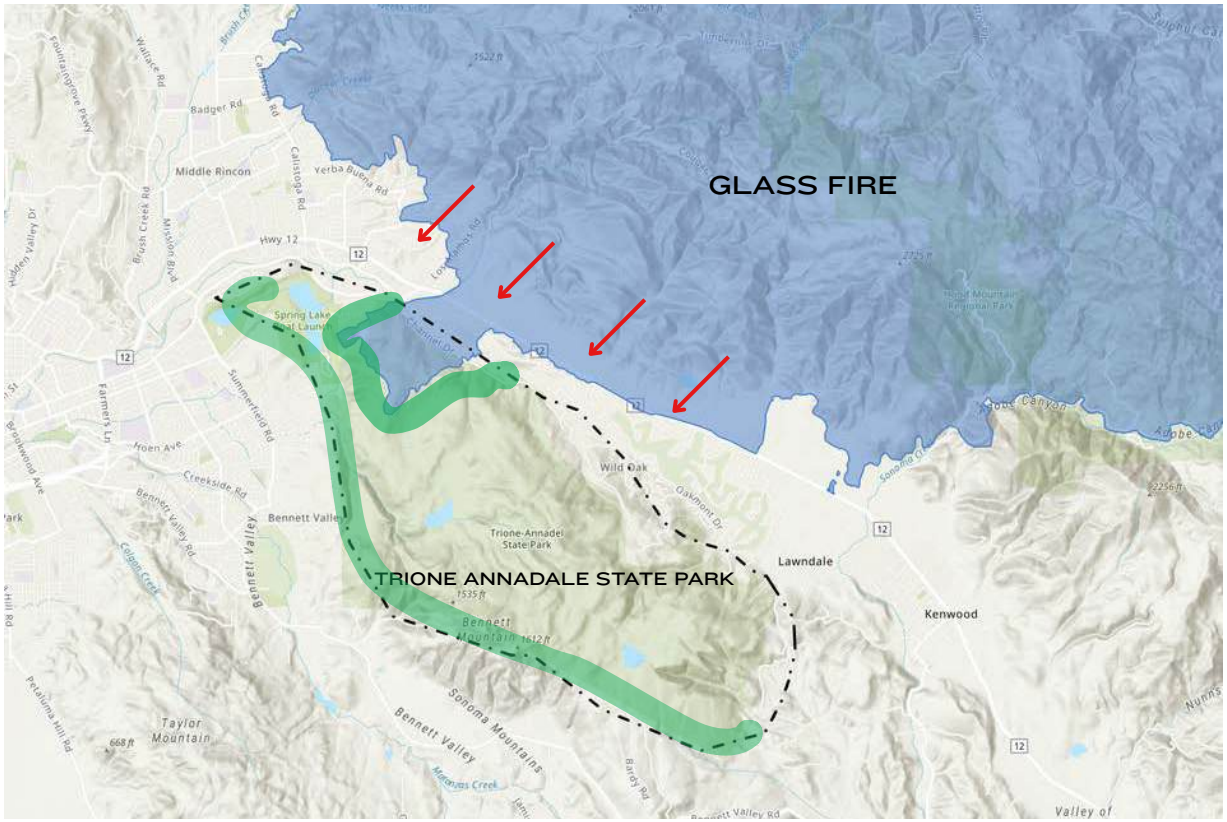
FIRE FIGHTERS USE VINEYARDS AS FUEL BREAKS AND RESPONSE ZONES IN THE 2019 KINCADE FIRE

FIRE FIGHTERS STAGING AT FOOTHILL REGIONAL PARK

FOOT REGIONAL PARK, OPEN SPACE AND TRAILS

FOOTHILL REGIONAL PARK AND TOWN OF WINDSOR POST 2019 KINCADE FIRE

CASE STUDY 2020 GLASS FIRE AND TRIONE-ANNADEL STATE PARK



TRAIL SYSTEMS, OPEN SPACES AND ACCESS ROADS WITHIN TRIONE ANNADALE STATE PARK PROVIDED A SAFE SPACE TO STOP THE FIRE SPREAD AND PROTECT ADJACENT NEIGHBORHOODS AND ASSETS

DESCRIPTION OF FIRE EVENT:

SIN AUGUST 2020, THE GLASS FIRE SIGNIFICANTLY IMPACTED SONOMA AND NAPA COUNTIES, RESULTING IN THE DESTRUCTION OF 600 HOMES. THE POTENTIAL FOR WIDESPREAD DEVASTATION WAS MARKEDLY MITIGATED BY THE STRATEGIC ACCESS THAT FIREFIGHTERS HAD TO THE EXISTING OPEN SPACES AND TRAIL NETWORKS WITHIN TRIONE-ANNADEL STATE PARK, ENCOMPASSING APPROXIMATELY 5,000 ACRES. THE ESTABLISHED TRAILS AND FIRE ROADS WITHIN THIS PARK PLAYED AN INSTRUMENTAL ROLE IN REDUCING THE LOSS OF LIFE AND PROPERTY, ULTIMATELY LEADING TO THE FORTUNATE OUTCOME OF NO REPORTED FATALITIES DURING THIS INCIDENT. THE WILDFIRE ORIGINATED IN NAPA VALLEY, WHERE IT WAS PROPELLED EASTWARD BY STRONG WINDS, EFFECTIVELY TRAVERSING THE MAYACAMAS RANGE AND ADVANCING INTO THE URBAN AREAS OF SANTA ROSA AND SONOMA VALLEY. THE BLAZE CAUSED EXTENSIVE DAMAGE AS IT ENTERED RESIDENTIAL NEIGHBORHOOD. AS THE FIRE PROGRESSED, IT CROSSED HIGHWAY 12 AND POSED A SIGNIFICANT THREAT TO THE OAKMONT COMMUNITY, WHICH COMPRISES APPROXIMATELY 5,000 HOMES SITUATED AT THE PERIPHERY OF SANTA ROSA, ADJACENT TO TRIONE-ANNADEL STATE PARK. THE STATE PARKS DESIGN AND EXISTING CONDITIONS ENABLED FIREFIGHTERS TO EFFECTIVELY UTILIZE THE EXTENSIVE NETWORK OF TRAILS AND FIRE ROADS WITHIN THE PARK FOR CRUCIAL FIRE SUPPRESSION ACTIVITIES. THEY EXECUTED CONTROLLED BURNS, CLEARED COMBUSTIBLE VEGETATION TO ESTABLISH FUEL BREAKS, AND STRATEGICALLY POSITIONED FIRE TRUCKS AND OTHER EQUIPMENT TO CONTAIN AND DIMINISH THE FIRE'S MOMENTUM.

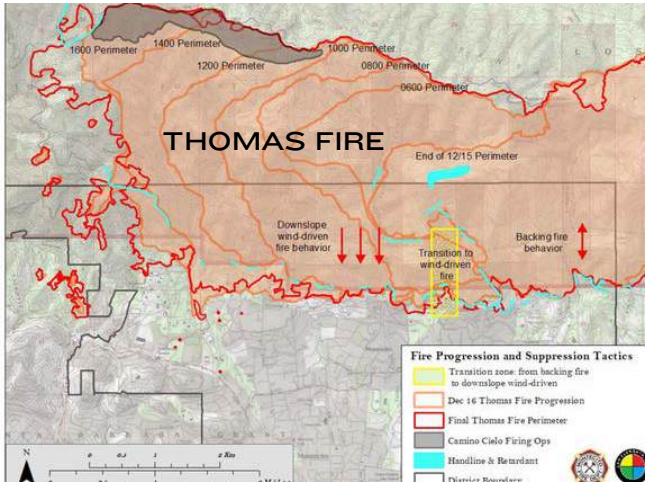
KEYTAKE AWAY: THE HIKING AND BIKING TRAILS, ALONG WITH FIRE ROADS IN THE STATE PARK NEXT TO A SENIOR COMMUNITY, GAVE FIREFIGHTERS VITAL ACCESS TO A NATURAL WILDFIRE BUFFER. THIS ENABLED THEM TO EFFECTIVELY STOP THE WILDFIRE FROM SPREADING INTO THE CITY AND PROTECT LIVES. LAND MANAGEMENT CAN PLAY A KEY ROLE.

FIRE FIGHTERS USE CONTROLLED BURNS IN OPEN SPACES AT TRIONE ANNADALE STATE PARK DURING THE 2020 GLASS FIRE

OPEN AREAS ALLOWED FIRST RESPONDERS A SAFE SPACE TO STOP THE FIRES SPREAD AND SPARE ADJACENT NEIGHBORHOODS.

TRIONE-ANNADALE STATEPARK TRAILS AND OPENSPACES

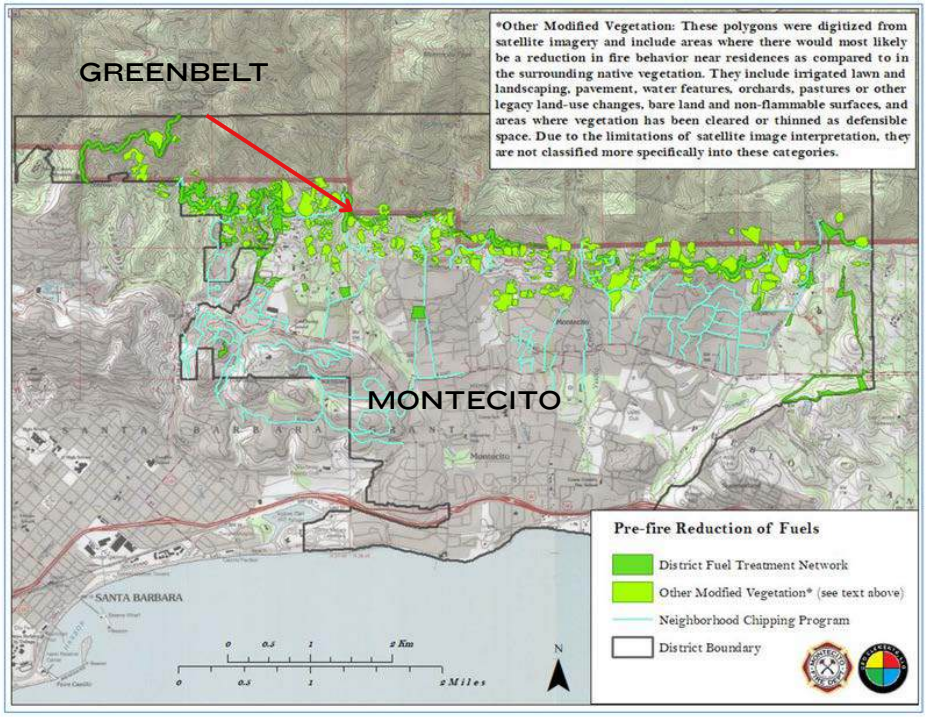
CASE STUDY 2018 THOMAS FIRE AND ORGANIZED FUEL BREAKS/GREEN BELTS IN THE SANTA YNEZ MOUNTAINS



PERIMETER OF 2018 THOMAS FIRE / SANTA YNEZ

DESCRIPTION OF FIRE EVENT:

THE THOMAS FIRE WAS A SIGNIFICANT WILDFIRE IN DECEMBER 2017 THAT AFFECTED VENTURA AND SANTA BARBARA COUNTIES, BURNING APPROXIMATELY 281,893 ACRES BEFORE BEING FULLY CONTAINED ON JANUARY 12, 2018. THIS EVENT HIGHLIGHTS THE IMPORTANCE OF PROACTIVE MEASURES TAKEN BY THE DISTRICT OVER THE PREVIOUS TWO DECADES, WHICH PLAYED A CRUCIAL ROLE IN DEFENDING THE COMMUNITY. SINCE ITS ESTABLISHMENT IN 1994, THE DISTRICT HAS IMPLEMENTED VARIOUS PROGRAMS TO ENHANCE WILDFIRE PREPAREDNESS, INCLUDING THE MONTECITO COMMUNITY WILDFIRE PROTECTION PLAN (CWPP), THE READY! SET! GO! PLAN, THE FIRE DANGER RATING SYSTEM, AND THE REVERSE 911 EMERGENCY NOTIFICATION SYSTEM. THESE INITIATIVES SIGNIFICANTLY MITIGATED THE WILDFIRE'S IMPACT. A KEY FINDING FROM THE THOMAS FIRE RESPONSE WAS THAT THE DISTRICT'S PREDICTIVE FUEL TREATMENTS AND GREEN BUFFER BREAKS ON PUBLIC AND PRIVATE LANDS PRESERVED LIVES AND PROPERTY, ESTABLISHING A GREENBELT THAT SLOWED THE FIRE'S PROGRESS AND PROVIDED ACCESS FOR EMERGENCY RESPONDERS. FIRE MODELS SUGGESTED A RISK OF LOSING HUNDREDS OF STRUCTURES; HOWEVER, THE DISTRICT'S INVESTMENTS SAVED MANY HOMES AND PREVENTED MILLIONS IN POTENTIAL DAMAGE. EFFORTS TO CREATE DEFENSIBLE SPACE AND CLEAR ROADSIDE VEGETATION ENABLED SAFER ACCESS FOR FIREFIGHTING EQUIPMENT. ULTIMATELY, THE PREPARATION ALLOWED FOR EFFECTIVE FIRELINE CONSTRUCTION, SECURING THE PERIMETER AND PREVENTING FURTHER SPREAD INTO DEVELOPED AREAS.



ESTABLISHED FUEL BREAKS CREATE GREEN BELT THE SLOWS FIRE PROGRESS BEFORE REACHING DEVELOPED COMMUNITIES

KEYTAKE AWAY: EFFECTIVE STRATEGIC LONG-TERM PLANNING AND INVESTMENT IN LAND-BASED SOLUTIONS CAN SIGNIFICANTLY REDUCE WILDFIRE RISK AND PROTECT COMMUNITIES. BY CONSIDERING THESE EVENTS OVER A LONGER TIMELINE AND AT A LARGER SCALE, WE CAN BETTER PLAN, ANTICIPATE CHALLENGES, AND PREPARE FOR FUTURE INCIDENTS. INCLUDING THESE DISCUSSIONS AT BOTH THE COMMUNITY AND MUNICIPAL LEVELS IS ESSENTIAL FOR EDUCATING COMMUNITY MEMBERS AND URBAN PLANNERS.

FUEL BREAKS IN THE SANTA YNEZ MOUNTAINS ABOVE MONTICEITO, SANTA BARBRA

FIRE FIGHTERS ON SANTA YNEZ MOUNTAINS

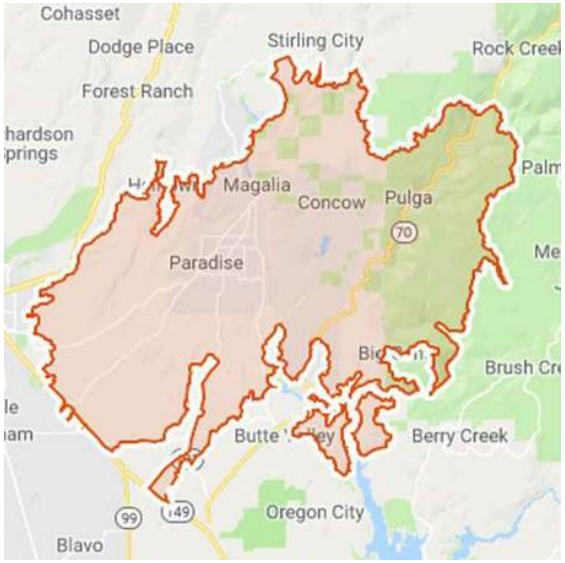
CASE STUDY- FUTURE THINKING CURRENT PLANNING RESPONSES TO WILDFIRE

2018 CAMP FIRE - PARADISE RESPONSE

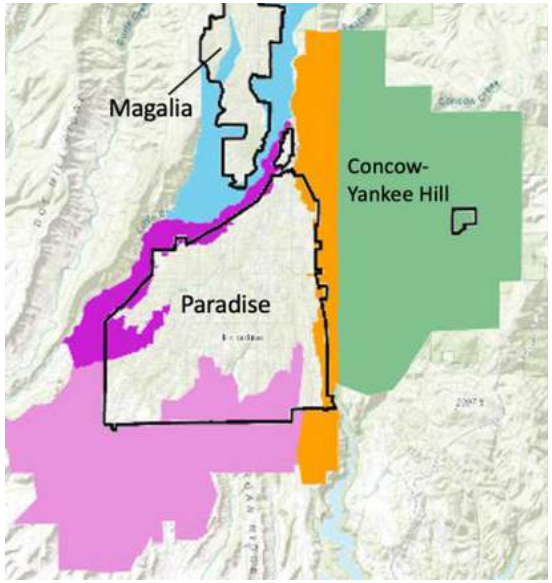
THE 2018 CAMP FIRE IN NORTHERN CALIFORNIA'S BUTTE COUNTY BECAME THE DEADLIEST AND MOST DESTRUCTIVE WILDFIRE IN CALIFORNIA HISTORY, IGNITING ON NOVEMBER 8 WHEN A PG&E TRANSMISSION LINE FAILED. WITHIN 12 HOURS, PARADISE WAS DEVASTATED, RESULTING IN 85 FATALITIES AND THE DESTRUCTION OF OVER 19,000 BUILDINGS, INCLUDING MANY HOMES. IN RESPONSE TO THIS TRAGEDY, DAN EFSEAFF, THE DISTRICT MANAGER OF THE PARADISE RECREATION AND PARK DISTRICT (PRPD), PROPOSED A BOLD PLAN TO CREATE A RING OF PUBLIC PARKLAND AROUND THE REBUILT COMMUNITY. A RESTORATION ECOLOGIST, EFSEAFF BELIEVES THAT GIVING NATURE SPACE CAN STRENGTHEN INFRASTRUCTURE, ALLOWING WILDFIRES TO BURN MORE SLOWLY AND ENABLING BETTER COMMUNITY PROTECTION. THIS BUFFER WOULD NOT ONLY HELP CONTROL FUTURE FIRES BUT ALSO PROVIDE HABITATS FOR WILDLIFE AND RECREATIONAL SPACES FOR RESIDENTS. IT COULD SERVE AS AN EVACUATION ROUTE AND A STAGING AREA FOR FIREFIGHTERS, OR EVEN AS A REFUGE FOR THOSE UNABLE TO ESCAPE. IN 2019, PRPD JOINED FORCES WITH THE NATURE CONSERVANCY AND THE CONSERVATION BIOLOGY INSTITUTE TO EXPLORE THIS IDEA FURTHER. A RECENT SURVEY FOUND THAT NEARLY 70% OF PARADISE RESIDENTS SUPPORT THE INITIATIVE, VIEWING IT AS A CHANCE TO REBUILD WITH SAFETY AND ECOLOGY IN MIND. TO ENCOURAGE LANDOWNERS TO DONATE, PRPD IS OFFERING INCENTIVES LIKE RELOCATION ASSISTANCE AND LOWER HOME INSURANCE PREMIUMS WHILE ACTIVELY SECURING FUNDING TO REALIZE THIS VISION.

2018 CAMP FIRE - PARADISE RESPONSE

AFTER THE WILDFIRES IN 2017, THE SONOMA COUNTY AGRICULTURAL PRESERVATION AND OPEN SPACE DISTRICT HAS BEEN WORKING TO SECURE CONSERVATION EASEMENTS AND ACQUIRE BURNED LANDS WITHIN THE WILDLAND-URBAN INTERFACE (WUI). THESE INITIATIVES AIM TO RESTORE ECOSYSTEMS AND REDUCE FIRE HAZARDS. MORE THAN 1,000 ACRES IN THE MARK WEST CREEK WATERSHED, HEAVILY IMPACTED BY THE TUBBS FIRE, HAVE BEEN PROTECTED FOR A FUTURE REGIONAL PARK. THIS LAND WAS GATHERED FROM VARIOUS OWNERS, AND DEVELOPMENT RIGHTS WERE REMOVED OR LIMITED. SOME PROPERTY OWNERS CHOSE NOT TO REBUILD AFTER THE WILDFIRES, OPTING INSTEAD TO CONSERVE THEIR LAND AND TRANSFER IT TO THE OPEN SPACE DISTRICT FOR THE PARK. THIS AREA INCLUDES VITAL RESOURCES LIKE A TWO-MILE STRETCH OF MARK WEST CREEK, ALONG WITH RIPARIAN ZONES, GRASSLANDS, AND WOODLANDS. REDUCING THE NUMBER OF HOMES AND RESIDENTS WILL LOWER WILDFIRE RISKS AND ALLOW THE LAND TO BE MANAGED IN A MORE NATURAL WAY, MINIMIZING FUTURE WILDFIRE DESTRUCTION. ADDITIONALLY, THE OPEN SPACE DISTRICT IS PROPOSING A ONE-MILE GREENBELT BUFFER AROUND THE NINE CITIES AND SOME UNINCORPORATED COMMUNITIES TO HELP REDUCE WILDFIRE RISK. THIS GREENBELT WAS OUTLINED IN THE VITAL LANDS INITIATIVE ADOPTED IN EARLY 2021. THE NEXT STEP IS TO ANALYZE THESE LANDS TO DETERMINE OWNERSHIP, ZONING, AND CONDITIONS TO ENSURE EFFECTIVE MANAGEMENT AND PRESERVATION.



FOOTPRINT OF 2018 CAMP FIRE IN PARADISE, CALIFORNIA

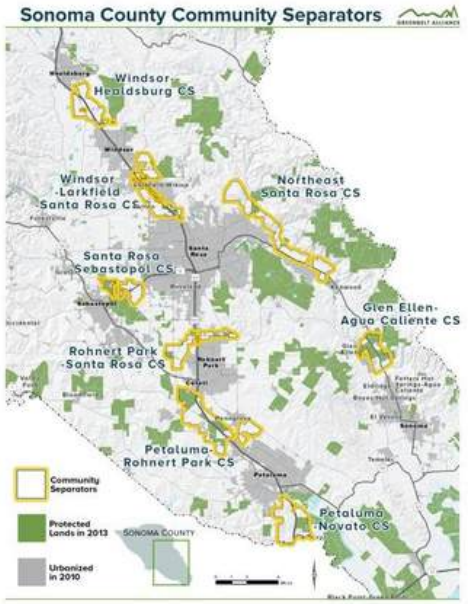


PROPOSED BUFFER ZONES SURROUNDING PARADISE, CALIFORNIA AS OF 2025.

KEY TAKE AWAY: NON PROFIT ORGANIZATIONS, CITY AGENCIES, AND CONSERVATION GROUPS ARE ACTIVELY CONSIDERING GREENBELT AND BUFFER ZONES AS LAND BASED SOLUTION TO WILDFIRE RISK. CONTINUED EFFORTS WILL MAKE FOR MORE VISABILITY ON THIS SOLUTION AND IN TURN MORE FUNDING TO REALIZE THESE SPACES.

- Paradise Urban Areas for Analysis
- Inner Eastern Buffer
- Butte Creek Buffer
- Magalia Buffer
- Outer Eastern Buffer
- Southern Foothills Buffer

PROPOSED SONOMA COUNTY - I MILE BUFFER ZONE SURROUND CITIES THROUGHOUT THE COUNTY



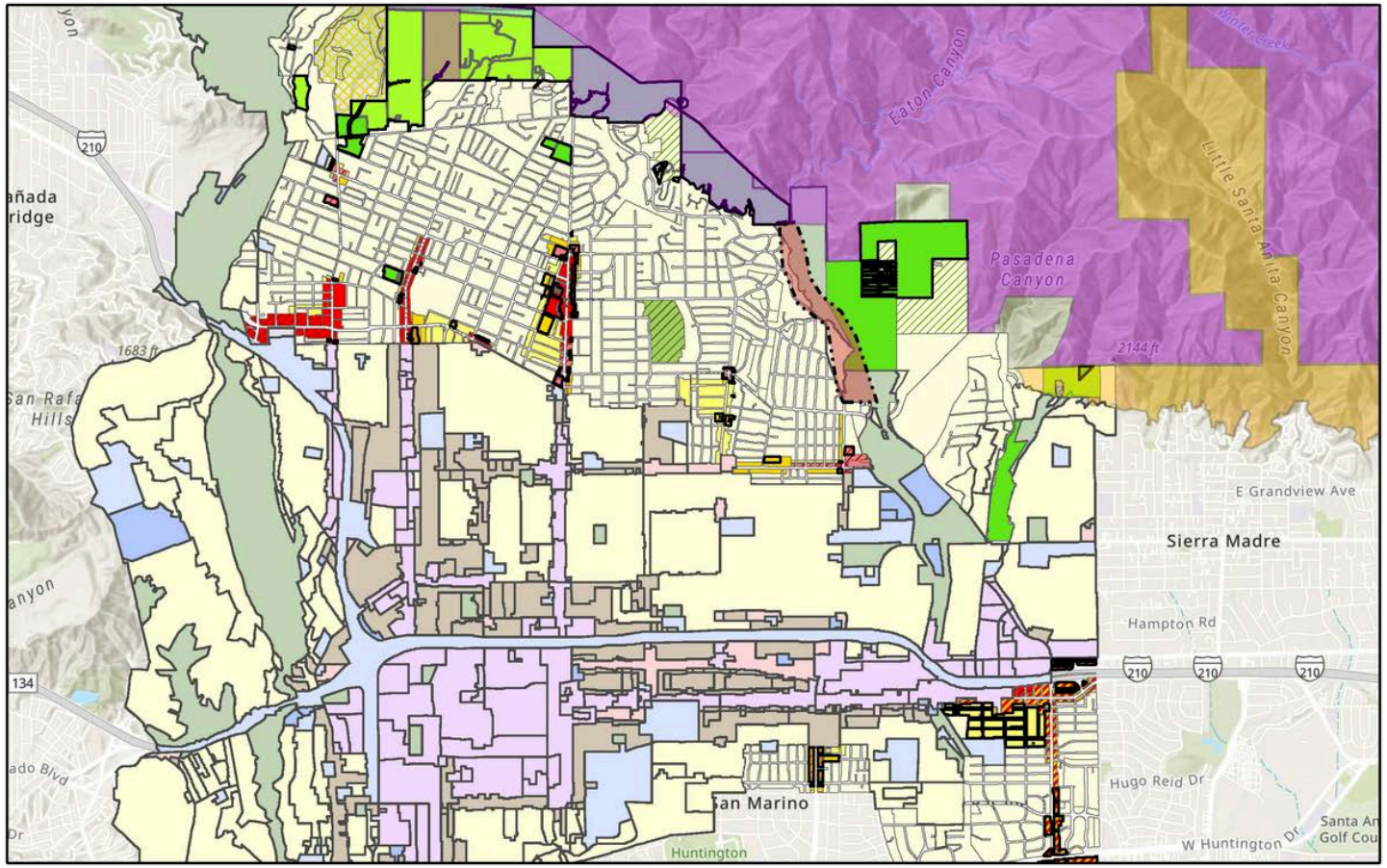
THE COMMUNITY SEPARATORS PROTECTION ORDINANCE SEEKS TO PROTECT CERTAIN PORTIONS OF SONOMA COUNTY FROM SPRAWL FOR THE NEXT 20 YEARS.

SITE ANALYSIS

SITE ANALYSIS - REGIONAL ZONING

KEY TAKE AWAYS:

The Eaton Canyon Natural Area is bordered by a large single-family residential area, providing residents with direct access to the park on foot, by bike, or by car. There are few planned parks in the vicinity. Additionally, the park is surrounded by significant open space to the north, as well as the San Gabriel National Monument Expansion. Most of the Altadena area is residential, with some commercial development located in the town center.



National Monument Expansion
National Recreation Area
Project Boundry
Proposed Zoning Change Area Boundary
Proposed Zoning Change
A-1 - Light Agriculture
R-A - Residential Agricultural
R-1 - Single-Family Residence
R-2 - Two-Family Residence
R-3 - Limited Density Multiple Residence
R-4 - Limited Density Multiple Residence
R-5 - High Density Multiple Residence
RPD - Residential Planned Development
MXD - Mixed Use Development
C-1 - Restricted Business
C-2 - Neighborhood Busines
C-3 - General Commercial
C-M - Commercial Manufacturing
CPD - Commercial Planned Development
R-R - Resort and Recreation
O-S - Open Space

W - Watershed
Zoning Districts
Single-Family Residential
Multi-Family Residential
Commercial
Industry
Public, Semi-Public
Planned Development
Open Space
Specific Plan
Zoning
Single-Family Residential
Multi-Family Residential
Commercial
Industry
Public, Semi-
Planned
Open Space
Specific Plan
World_Hillsh

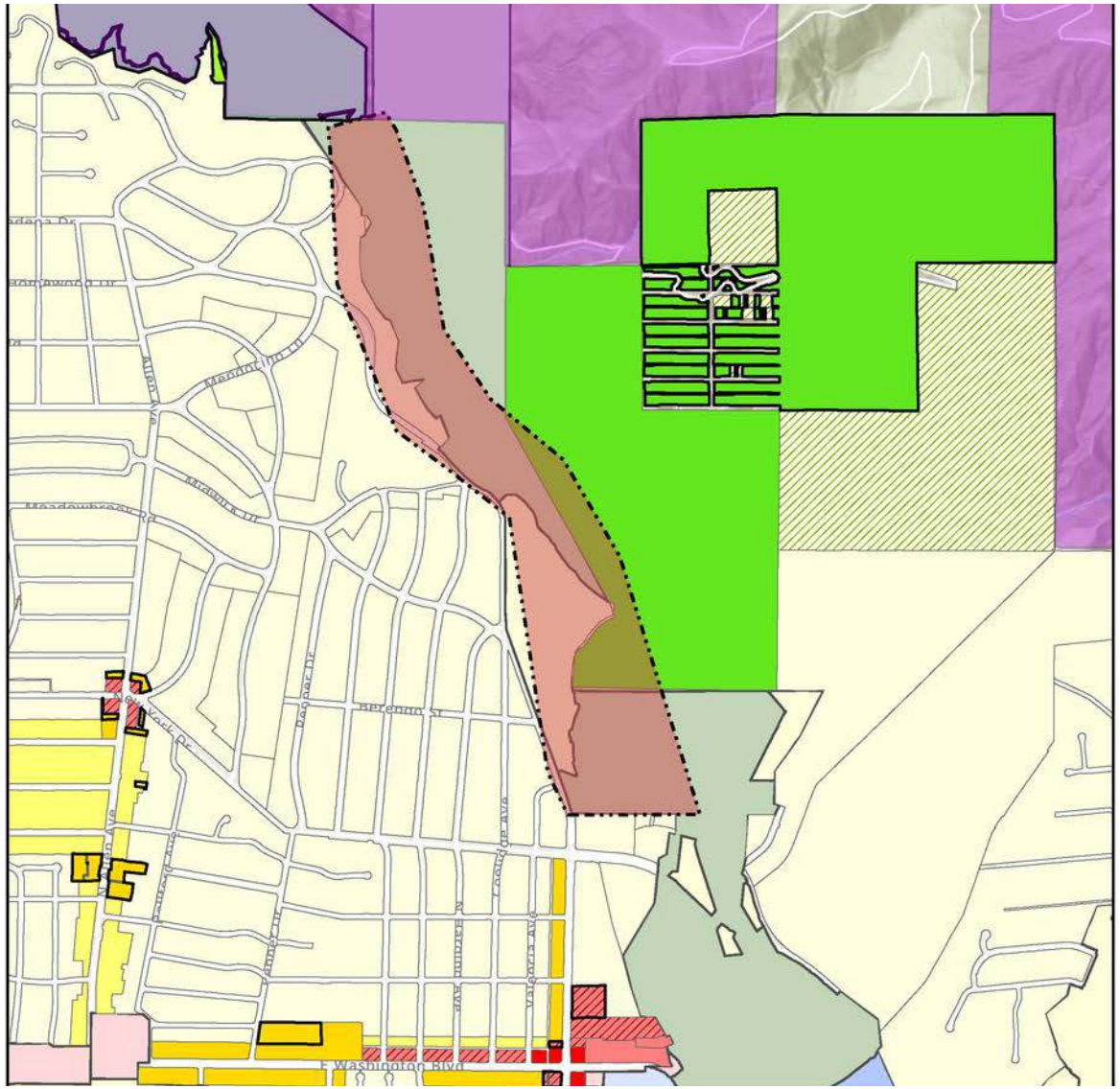
1:72,224
0 0.5 1 2 mi
0 0.75 1.5 3 km

Esri, NASA, NGA, USGS, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

SITE ANALYSIS - SITE ZONING

KEY TAKE AWAYS:

The Eaton Canyon Natural Area is located next to the San Gabriel National Monument and surrounding open space areas. To the west, it is bordered by residential developments. Just south of the area, there is ongoing construction for the Eaton Wash and Dam. Additionally, several multifamily complexes are situated within a 15-minute walk from the park's southern entrance.



1:20,000

0 0.13 0.25 0.5 mi

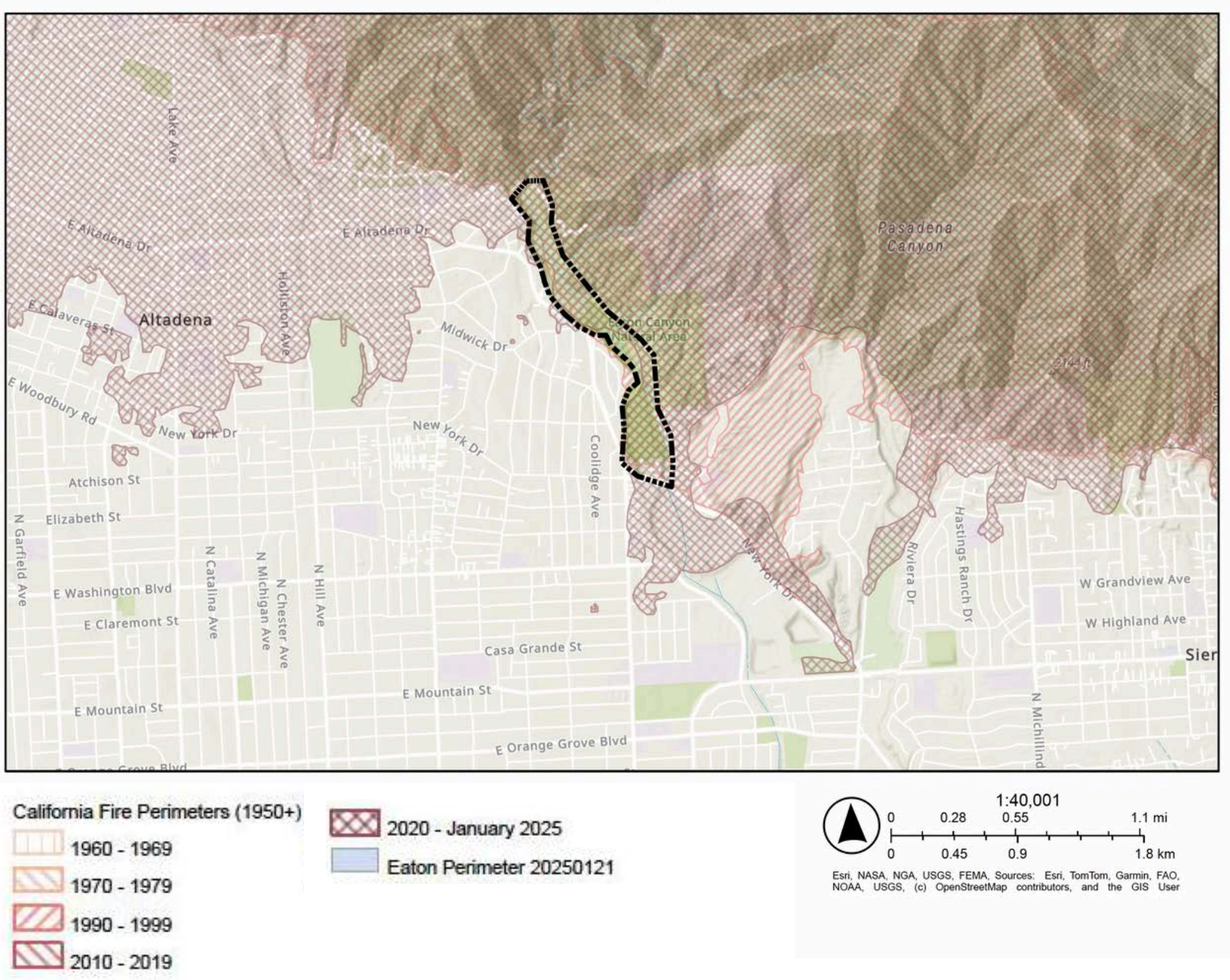
0 0.23 0.45 0.9 km

Esri, NASA, NGA, USGS, FEMA, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, (c) OpenStreetMap contributors, and the GIS User Community

HISTORICAL FIRE ANALYSIS - EATON CANYON NATURAL AREA

KEY TAKEAWAYS:

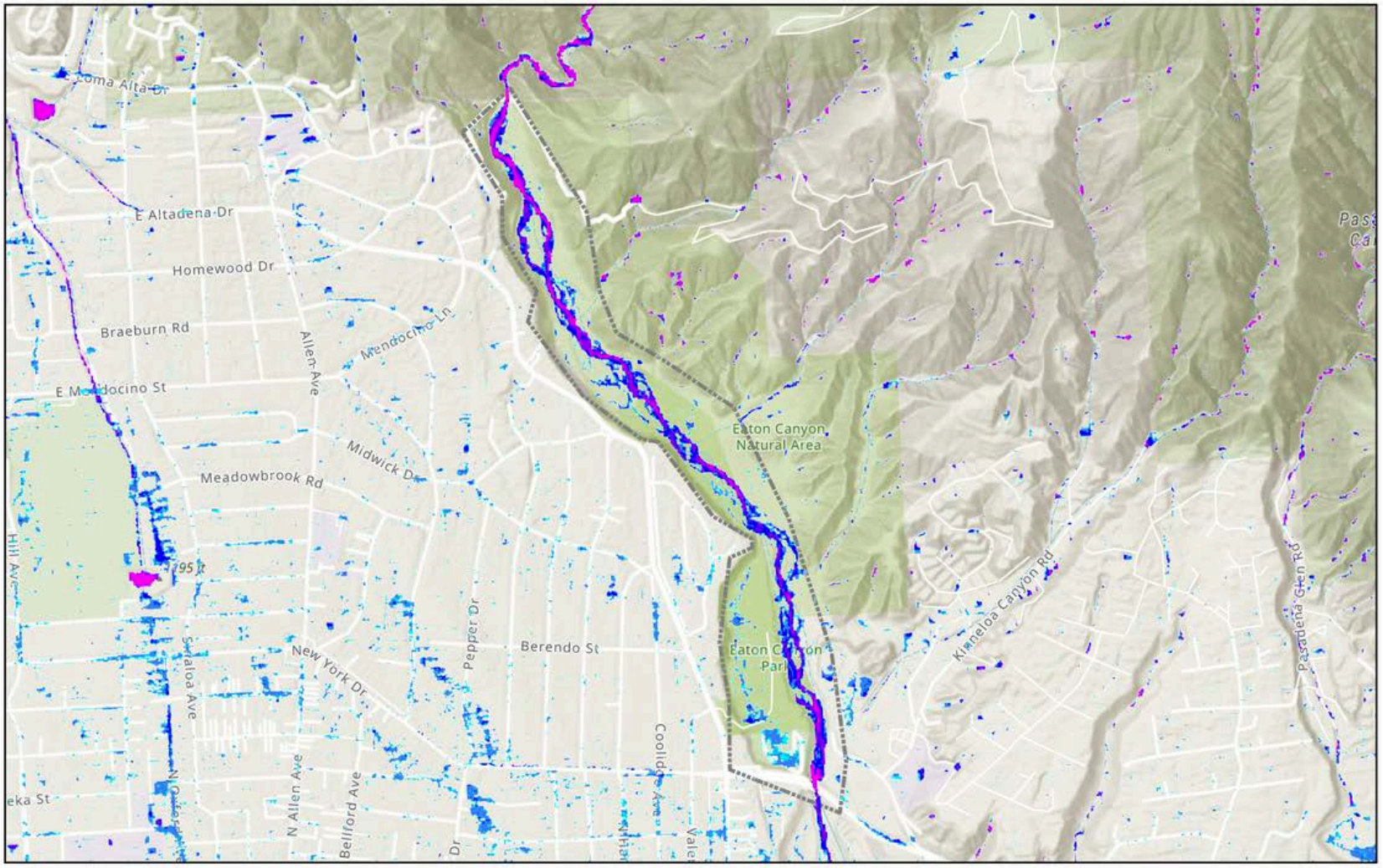
- Eaton Canyon Natural Area has a long history of significant wildfires.
- These recurring fires highlight the ongoing challenges of fire management in the region.
- The most recent fire occurred in January 2025, demonstrating the area's continued vulnerability.
- Other major fire events occurred in 1979, 1993, and 2009.



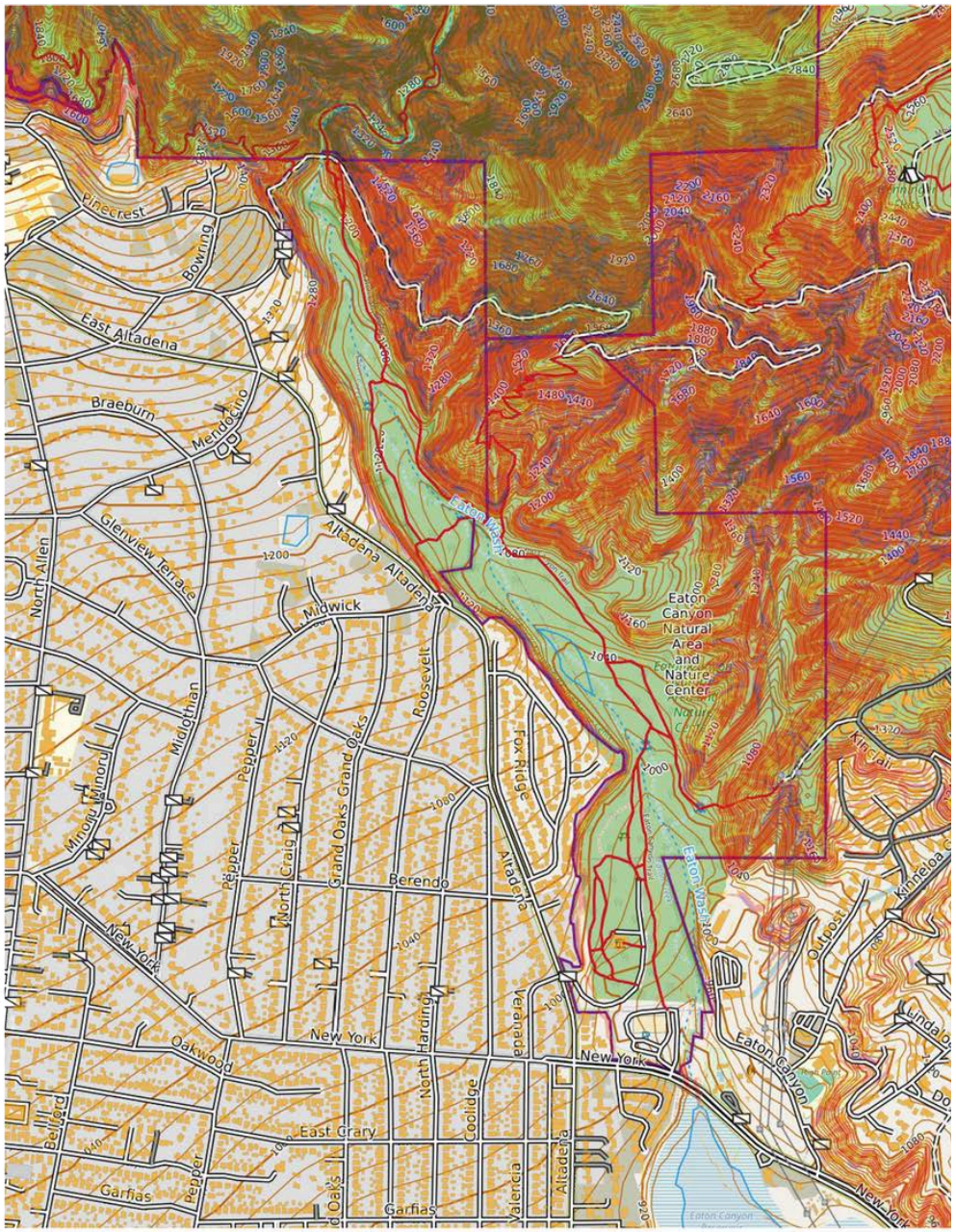
FLOOD ANALYSIS - ENVIRONMENTAL - EATON CANYON NATURAL AREA

KEY TAKEAWAYS:

- During significant rainfall, the arroyo's central water flow can reach heights of approx. 3 feet.
- The northern and southern sections of the arroyo can exceed 4 feet.
- Specific areas of the plateau and equestrian center can flood to ankle or knee height during significant rain events.



SITE ANALYSIS - SLOPE - TOPOGRAPHY



1" = 1000 FT - CONTOURS INTERVALS 10 FEET

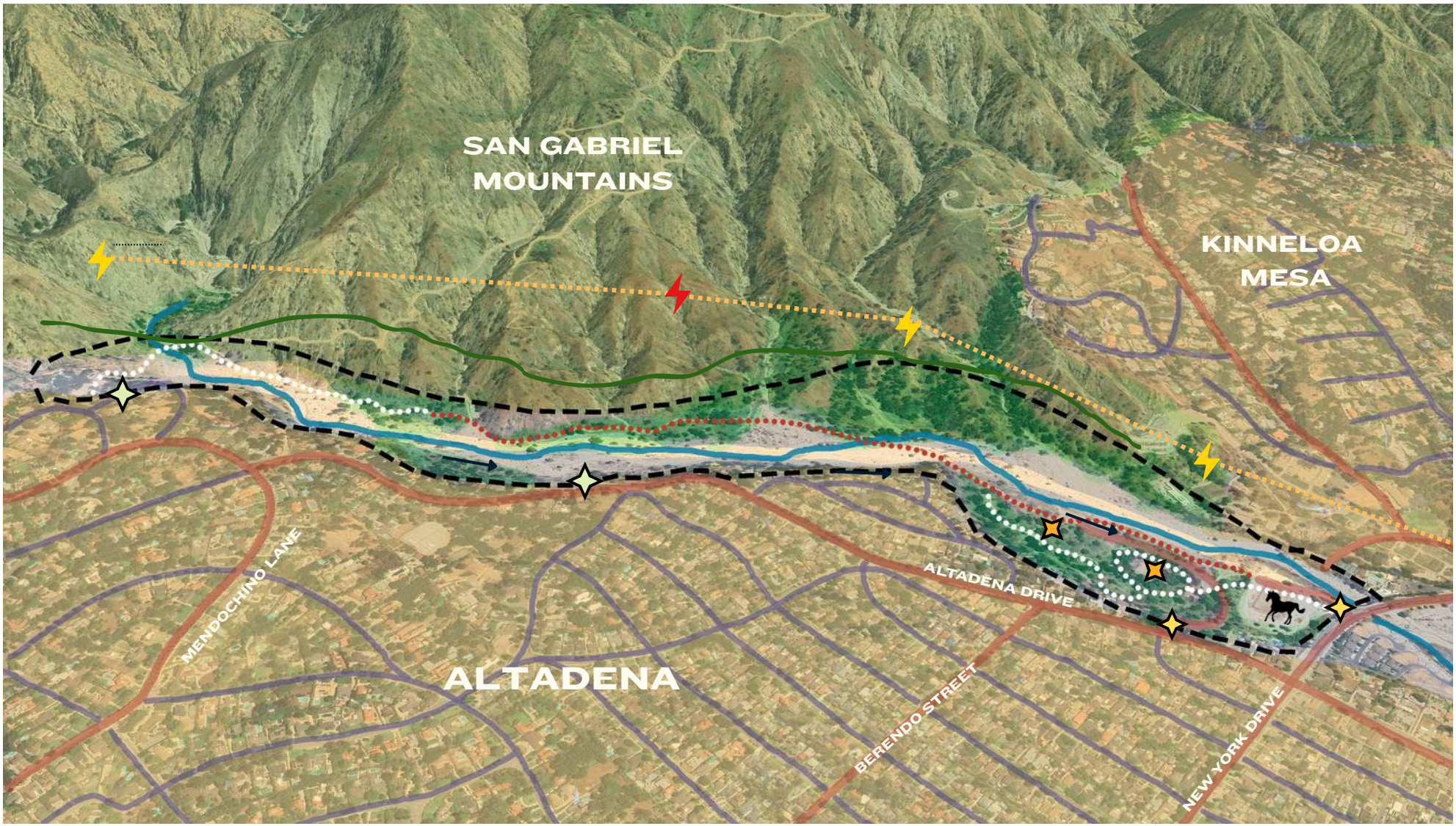
Terrain - Slope Map

- Flat (0°)
- Nearly level (1°)
- Gently level (2°)
- Gently sloping (3° - 5°)
- Strongly sloping (6° - 10°)
- Gently steep (11° - 15°)
- Moderately Steep (16° - 20°)
- Steep (21° - 30°)
- Very steep (31° - 90°)

KEY TAKE AWAYS:

The Eaton Canyon Natural Area is bordered by steep topography and is adjacent to the San Gabriel National Monument. This terrain can increase the risk of mudslides during severe weather conditions. While the central part of the site, where the wash is located, is relatively flat, the edges on the west side, near residential developments, begin to slope steeply again. Overall, the site has a strong to moderate slope.

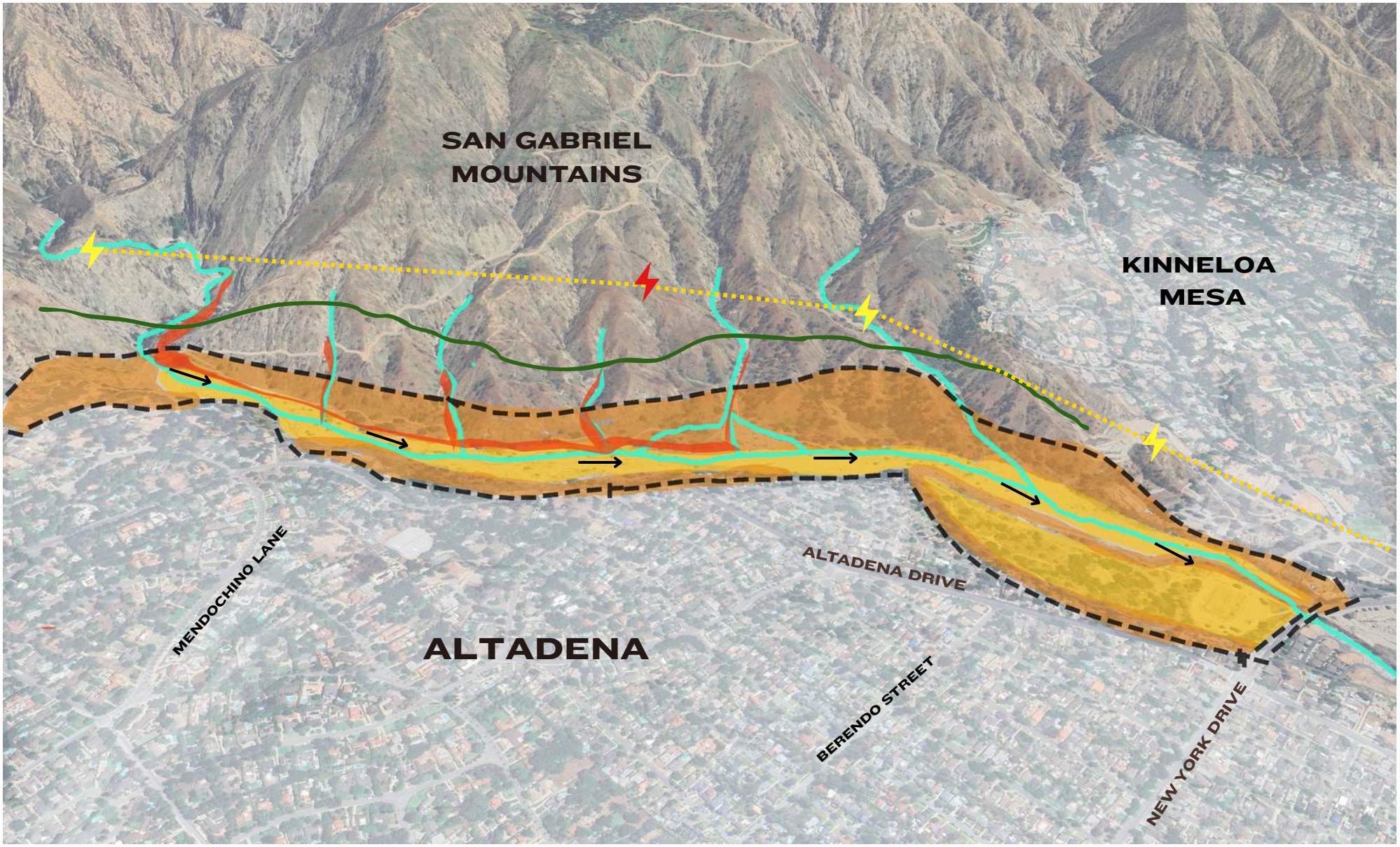
POST FIRE ANALYSIS - CONTEXT - EATON CANYON NATURAL AREA



LEGEND

- PROJECT BOUNDRY - ECNA
- DAMAGED TRAIL
- UNDAMAGED TRAIL
- LOW POINT
- RIDGE LINE
- MAIN VEHICULAR
- SECONDARY VEHICULAR
- NATURAL VEGETATION
- RESIDENTIAL - SINGLE FAMILY
- ARROYO DAMAGE
- BURNED NATURE CENTER
- MAIN VEHICULAR ENTRANCE
- SECONDARY PEDESTRIAN ACCESS
- EXISTING EQUESTRIAN CENTER
- POWERLINES
- ARROYO FLOW DIRECTION
- POWER PYLONS
- POWER PYLON / EATON FIRE IGNITION POINT

POST FIRE ANALYSIS - ENVIRONMENTAL - EATON CANYON NATURAL AREA

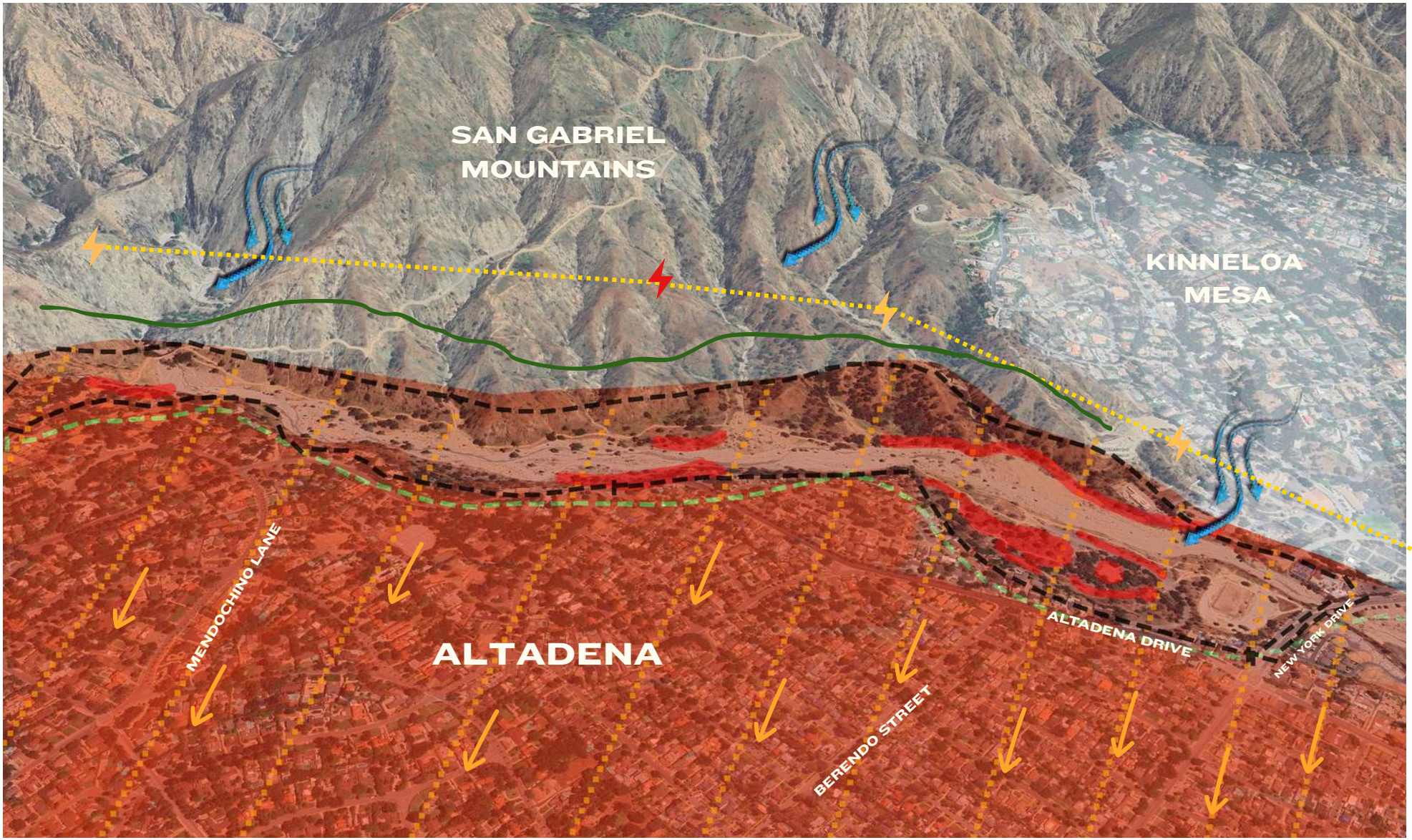


LEGEND

- WATERFLOW
- SLOPED AREA
- FLAT AREA
- MUDSLIDE AREA
- DRAINAGE DIRECTION
- RIDGE LINE
- POWERLINES
- POWER PYLONS
- POWER PYLON / EATON FIRE IGNITION POINT

0' 1500'

POST-FIRE ANALYSIS - ENVIRONMENTAL - EATON CANYON NATURAL AREA

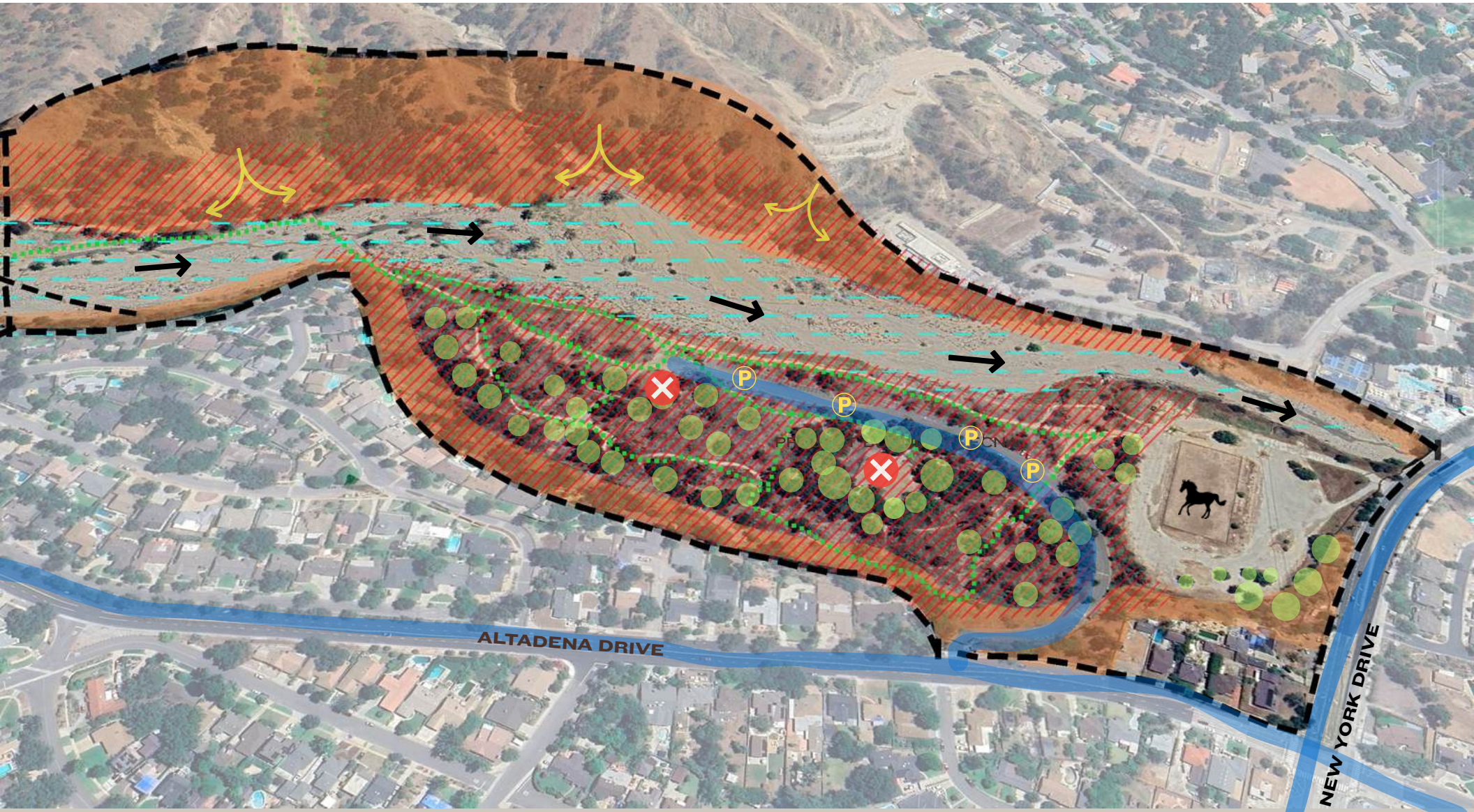


LEGEND

- EATON WASH
- BURNED AREA
- EMBER CAST ZONE
- RIDGE LINE
- PROJECT BOUNDRY - ECNA
- WUI BOUNDRY
- EMBER CAST DIRECTION
- POWERLINES
- WIND DIRECTION DURING SANTA ANA WIND EVENT
- POWER PYLONS
- POWER PYLON / EATON FIRE IGNITION POINT

0' 1500'

POST FIRE ANALYSIS - ECNA PLATEAU AREA



POST FIRE ANALYSIS - ECNA PLATEAU AREA

PHOTO LOCATION KEY - ECNA PLATEAU

The plateau and upper canyon experienced extensive fire damage. Trails and vegetation were damaged. Subsequent winter storms compounded these impacts through flash flooding and debris flows, accelerating slope and trail erosion. The native oak trees sustained through the fire storm.

LOOKING NORTH ACROSS THE PLATEAU

LOOKING SOUTH ACROSS THE NATURE CENTER AREA

RING OF SURVIVING OAKS AROUND THE DESTROYED NATURE CENTER

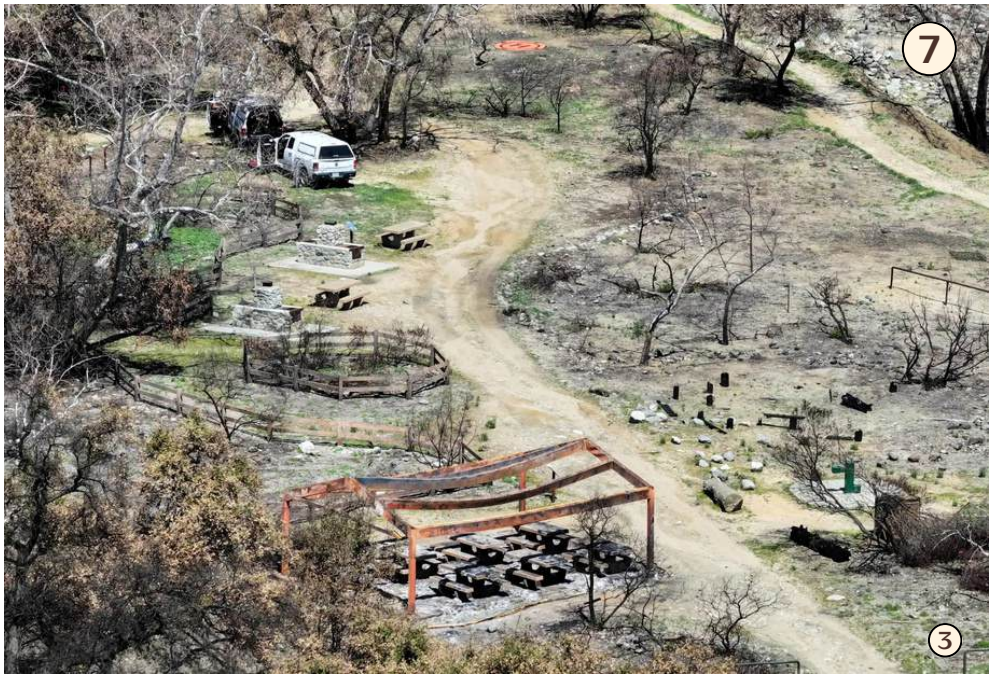
ARROYO AREA WHERE THE WASH AND THE WEST TRAIL CONNECT

POST FIRE ANALYSIS - ECNA PLATEAU AREA

PHOTO LOCATION KEY - ECNA PLATEAU

TRAIL ENTRY AT NORTH WEST EDGE OF PLATEAU AREA

OVERHEAD OF NATURE CENTER DAMAGE



PICNIC AREA / SHELTER

EATON CANYON NATURAL AREA – PLANTS

OAK WOODLAND

Quercus agrifolia

Quercus lobata

Quercus douglasii

RIPARIAN PLANTS

Platanus racemosa

Populus fremontii

Salix spp.

RIPARIAN PLANTS

Artemisia douglasiana

Rosa californica

Vitis girdiana

CHAPARRAL AND COASTAL SAGE SCRUB

Artemisia californica

Salvia mellifera

Salvia apiana

CHAPARRAL AND COASTAL SAGE SCRUB

Eriogonum fasciculatum

Heteromeles arbutifolia

Malosma laurina

Adenostoma fasciculatum

Encelia californica

Ceanothus leucodermis

Baccharis pilularis

GRASSES & GROUNDCOVER

Stipa pulchra

Muhlenbergia rigens

Eschscholzia californica

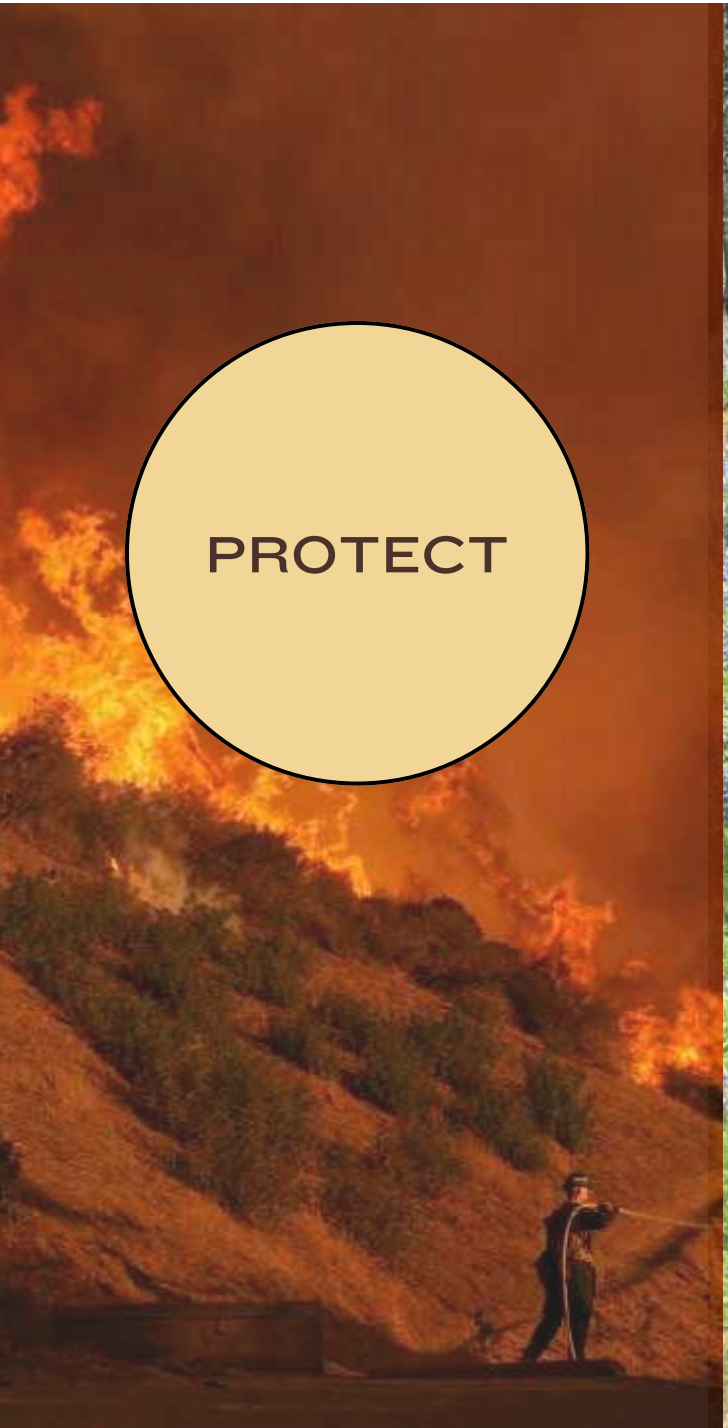
Lupinus spp.

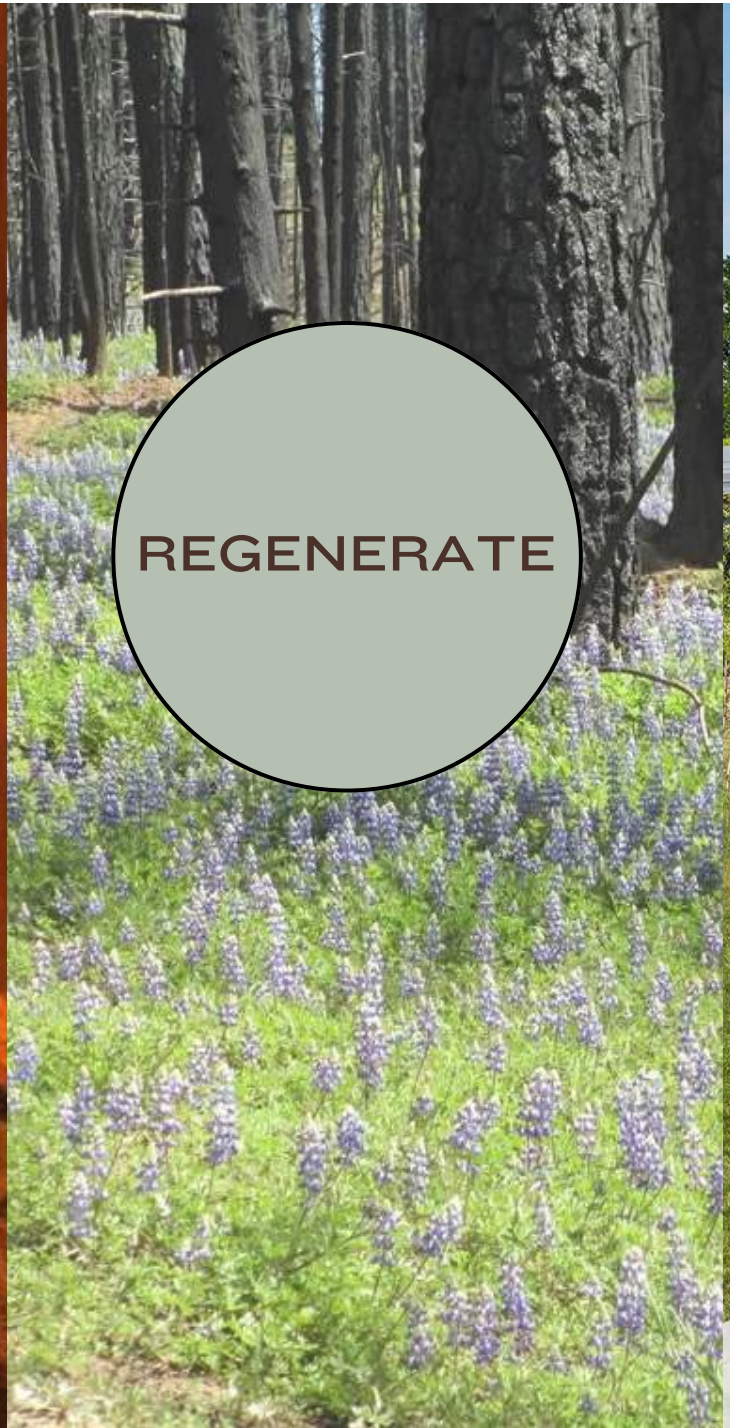
Diplacus aurantiacus

GOALS AND OBJECTIVES

PROJET GOALS

EATON CANYON CAN BECOME A MODEL FOR A GREENBELT / WILDFIRE BUFFER THAT PROTECTS DENSE URBAN AREAS, PROVIDES EQUITABLE LAND ACCESS TO RESIDENTS, WHILE CONNECTING ANGELENOS TO NATURE AND ADJACENT COMMUNITIES.





GOALS AND OBJECTIVES

PROTECT




OBJECTIVES	METHODS
SHIELD DENSE URBAN AREAS	FIRE BREAKS DEFENSIBLE SPACE OFFSETS WINDBREAKS AGRICULTURAL BUFFER
PREVENT THE SPREAD OF FIRE	FIRE RESILIENT MATERIALS LIVESTOCK GRAZING - FUEL MANAGEMENT FUEL AND WIND BREAKS EMBEDDED WATER SYSTEMS
EMERGENCY REPONSE SYSTEMS	WATER COLLECTION ENVIRONMENTAL SENSORS COMMUNITY RESPONSE PLAN DOUBLE DUTY TRAILS

EVALUATING PROTECTIVE METHODS FOR URBAN WILDFIRE RESISTANCE

CRITERIA

SUITABILITY FOR SITE - VIABILITY AND PERFORMANCE
COST - LABOR, MATERIALS, AND MAINTENANCE
LIFESPAN - LONGEVITY OF MATERIAL ON SITE

ECOLOGICAL BENEFIT - ASSISTANCE IN ECOLOGICAL REGENERATION
WILDFIRE DEFENSE - ABILITY TO DETER OR STOP WILDFIRE SPREAD

MAIN METHODS

SCALE

HIGH
MEDIUM
LOW
NONE

RESOURCES:
PLAYBOOK FOR THE PYROCENE,
SWA JONAH SUSSKIND

DESIGN BY FIRE
EMILY SCHLIVKMAND
BRETT MILLIGAN

ANIMAL GRAZING

BENEFITS:
- *REDUCES FUEL*
- *SLOWS FIRE*
- *NATURAL BREAKS*
- *SUPPORTS ECOLOGY*
- *EDUCATIONAL USE*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *SHEEP*
- *GOATS*
- *CATTLE*

CONTROLLED BURNS

BENEFITS:
- *REDUCE WILDFIRE RISK*
- *CLEAR EXCESS VEGETATION*
- *LOWER FUEL LOADS*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *PILE*
- *UNDERSTORY*
- *BACKBURNING*
- *STRIPHEAD*

DOUBLE DUTY TRAILS

BENEFITS:
- *EMERGENCY ACCESS*
- *FUEL BREAK*
- *RECREATIONAL USES*
- *UTILITY CORRIDOR*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

THINNING VEGETATION

BENEFITS:
- *REDUCES FUEL*
- *SLOWS FIRE*
- *CREATES DEFENSIBLE SPACE*
- *PROTECTS PEOPLE AND HOMES*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *MECANICAL*
- *HAND*
- *LADDER*
- *SELECTIVE*

DEFENSIBLE SPACE OFFSETS

BENEFITS:
- *SEPARATES BUILDINGS FROM VEGETATION*
- *REDUCES FIRE RISK*
- *SLOWS WILDFIRE SPREAD*
- *AIDS FIREFIGHTER ACCESS*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

CRITERIA:
- *0–5 FEET*
- *5–30 FEET*
- *30–100+*
- *ACCESS ZONES*

COMMUNITY REFUGE AREA

BENEFITS:
- *SAFE SHELTER D*
- *CLEARED OF FLAMMABLES*
- *SHIELDS FROM HEAT AND SMOKE*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *COMMUNITY CENTERS*
- *SHADE PAVILLIONS*
- *SPORTS COURT*
- *IRRIGATED LAWN*

WINDBREAKS

BENEFITS:
- *DISRUPT WIND, SLOW WILDFIRE*
- *REDUCE EMBER TRAVEL*
- *SHIELD HOMES AND INFRASTRUCTURE*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *VEGETATIVE*
- *STRUCTURAL*
- *AGRICULTURAL*
- *SHELTERBELT*

FIREBREAKS

BENEFITS:
- *REMOVE VEGETATION*
- *CREATE FUEL GAPS*
- *SLOW OR STOP WILDFIRES*
- *PROVIDE SPACE FOR DEFENSE*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *NATURAL*
- *MECHANICAL*
- *ROADS AND TRAILS*
- *GRAZING AREAS*
- *CONROLLED BURN AREAS*

FIRE RESISTANT PLANTS

BENEFITS:
- *BURN LESS EASILY*
- *SLOW WILDFIRE SPREAD*
- *REDUCE HEAT*
- *CREATE NATURAL BUFFERS*

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

TYPES:
- *MANZANITA*
- *LEMONADE BERRY*
- *CACTI*
- *SUCCULENTS*
- *NATIVE OAKS*
- *MANY MORE!*

EVALUATING PROTECTIVE METHODS FOR URBAN WILDFIRE RESISTANCE

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EMERGENCY WATER SYSTEMS

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- FIRST RESPONDER ACCESS
- HELP SLOW WILDFIRES
- PROTECT STRUCTURES

TYPES:
- WATERTANKS
- EMBEDDED SYSTEM
- HYDRANTS
- IRRIGATION
- RESIVIORS
- CISTERNS

CANOPY CLEARANCE

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- REDUCES FIRE CLIMBING INTO TREE CROWNS
- SLOWS FIRE SPREAD AND INTENSITY
- PROTECTS NEARBY STRUCTURES

TYPES:
- VERTICAL SPACING
- CROWN THINNING
- CROWN RAISING
- UNDERSTORY
- LADDER FUEL
- CANOPY SEPERATION

ARGRICULTURE AS FUEL BREAK

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- SLOW WILDFIRE SPREAD
- SUPPORT FIREFIGHTER ACCESS
- PROTECT NEARBY AREAS

TYPES:
- VINEYARD
- ORCHARD
- IRRIGATED PASTURES
- COVER CROPS

EMERGENCY ROADS - TURNAROUNDS

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- PROVIDE SAFE ACCESS
- SUPPORT EVACUATIONS
- HELP SLOW WILDFIRE SPREAD

TYPES:
- EASEMENT ACCESS
- TURN AROUND LOOP
- HAMMERHEAD
- DUAL PURPOSE

FIRE-RESILIENT MATERIALS

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- RESIST IGNITION AND HEAT DAMAGE

TYPES:
- METAL ROOFING
- FIBER CEMENT SIDING
- STUCCO
- TEMPERED GLASS WINDOWS
- EMBER-RESISTANT VENTS
- MASONRY WALLS
- FIRE-RATED DOORS
- IGNITION-RESISTANT MATERIALS

ENVIRONMENTAL SENSORS

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- DETECT EARLY WILDFIRE SIGNS
- PROVIDE REAL-TIME DATA FOR QUICK RESPONSE

TYPES:
- SMOKE
- HEAT
- INFARED CAMERAS
- AIR QUALITY
- WIND
- EMEDDED POWER

SITE STRUCTURES

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- REDUCES HEAT AND WIND EXPOSURE
- LOWERS RISK FROM UPHILL FIRE SPREAD

TYPES:
- SLOPE SETBACKS
- CLUSTER DEVELOPMENT
- LOWER RIDGELINES

FLOODING CHANNELS

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- ACT AS FIREBREAKS
- SLOW FIRE SPREAD
- AID FIRE SUPPRESSION

TYPES:
- IRRIGATION
- SEDIMENT
- RIP-RAP
- SWALE
- WASH

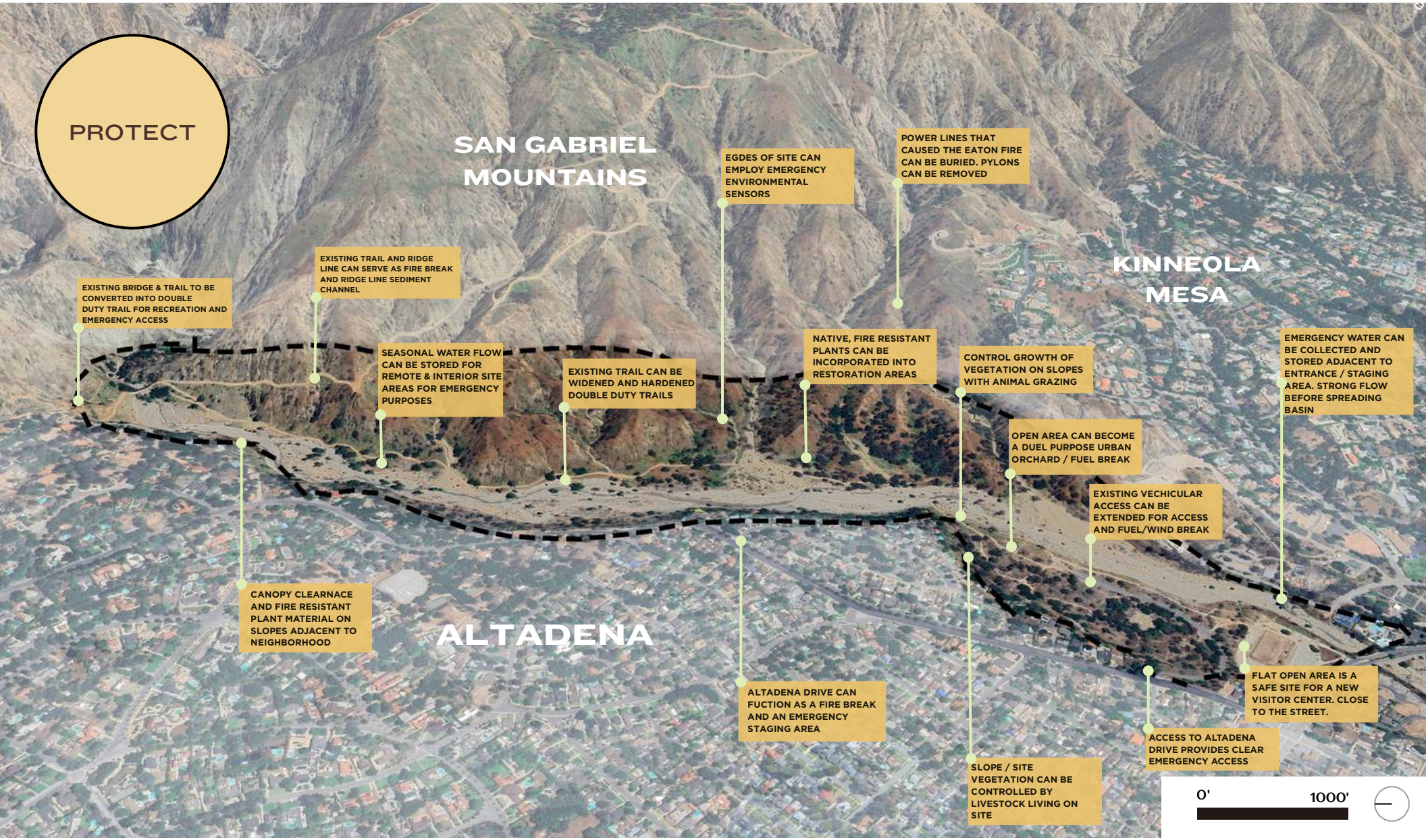
RETREAT AND RELOCATE

SUITABILITY FOR SITE
COST
LIFESPAN
ECOLOGICAL BENEFIT
WILDFIRE DEFENSE

BENEFITS:
- ENCOURAGES LEAVING FIRE-RISK ZONES
- LOWERS RISK TO LIVES AND PROPERTY

TYPES:
- BUYOUT
- LANDSWAP
- GRANTS
- CONSERVATION EASEMENTS

PROTECT - OPPORTUNITIES FOR LAND BASED WILDFIRE PROTECTION METHODS @ ECNA



ANIMAL GRAZING

WIND BREAKS

FIRE BREAKS

FIRE RESISTANT PLANTS

EMERGENCY WATER SYSTEMS

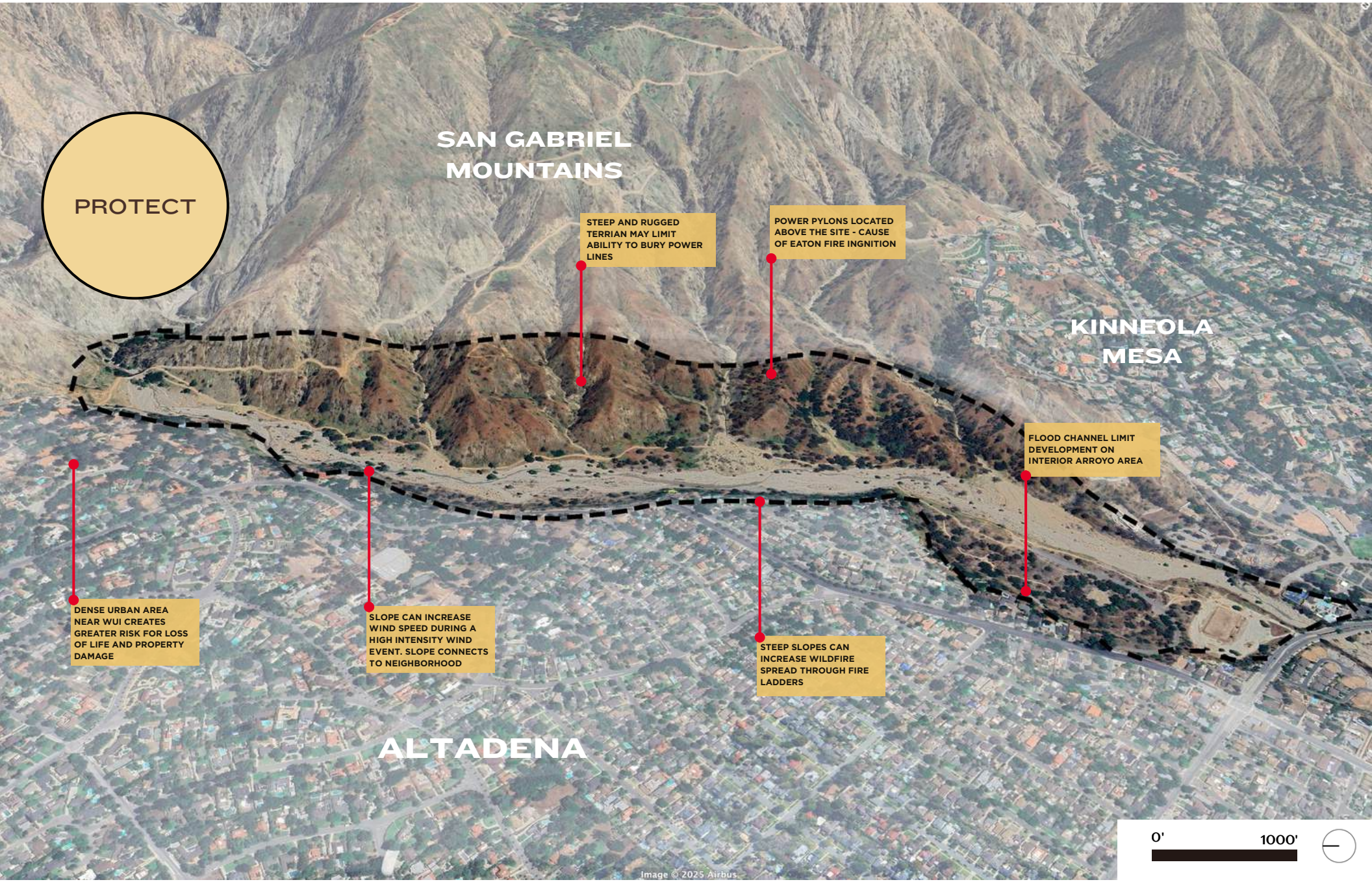
EMERGENCY ROADS TURNAROUNDS

DOUBLE DUTY TRAILS

FIRE RESISTANT MATERIALS

FIRE RESISTANT MATERIALS

PROTECT - CONSTRAINTS FOR LAND BASED WILDFIRE PROTECTION METHODS AT ECNA



GOALS AND OBJECTIVES

REGENERATE







OBJECTIVES	METHODS
REHABILITATE THE ARROYO	EROSION CONTROL BIOTECHNICAL SOLUTIONS FORM / SLOPE / BERM CREATION SEDIMENT REMOVAL /DISPLACEMENT ROCK WEIRS / CHECK DAMS
FOSTER LOCAL ECOLOGY	NATIVE PLANTING HABITAT CREATION WATERFLOW MANAGEMENT STEWARDSHIP PROGRAMS
REPAIR PUBLIC PROGRAMMING	TRAIL / AMENITIES RESTORATION ORGANIZATION PARTNERSHIPS PUBLIC HEARINGS FIRE AND HORTICULTURAL DEMONSTRATION GARDENS

REGENERATE - OPPORTUNITIES AND CONSTRAINTS FOR ECNA - ENTIRE SITE

OPPORTUNITIES

CONTRAINTS

REGENERATE - OPPORTUNITIES AND CONSTRAINTS FOR ENCA - PLATEAU

OPPORTUNITIES

CONTRAINTS

0' 500'

GOALS AND OBJECTIVES

CONNECT






OBJECTIVES	METHODS
FOSTER COMMUNITY	EDUCATIONAL PROGRAMS AND EVENTS NATURE AND COMMUNITY CENTER RECONSTRUCTION INDIGENOUS STEWARDSHIP PARTNERSHIPS
EDUCATE	INDIGENOUS HISTORY PROGRAMS HORTICULTURE CLASSES FIRE ECOLOGY AND PREVENTION COURSES
PHYSICAL LINKAGES	RECREATIONAL TRAILS NEIGHBORHOOD ENTRANCES ARROYO BRIDGE CONNECTION TO SAN GABRIEL NATIONAL MONUMENT

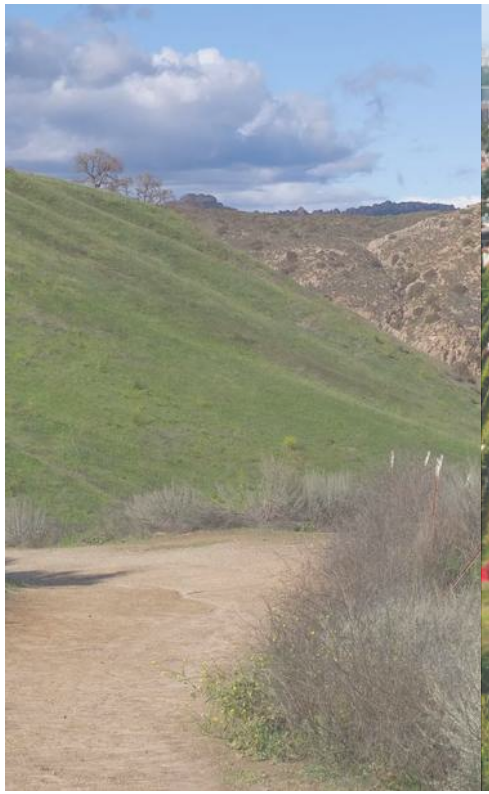
CONNECT - RECREATIONAL USES / EQUITABLE LAND ACCESS FOR THE ECNA GREENBELT

OPEN SPACES FOR RESPITE AND EDUCATION

URBAN AGRICULTURE FOR IMPROVED ACCESS TO FRESH, LOCAL FOOD

WILDLAND ADJACENCIES FOR NEIGHBORHOOD ACCESS TO NATURAL AREAS

HIKING, BIKING, HORSEBACK RIDING TRAILS FOR EXERCISE AND RECREATION



CONNECT - OPPORTUNITIES AND CONSTRAINTS FOR ECNA - ENTIRE SITE

0' 1000'

OPPORTUNITIES

CONTRAINTS

CONNECT - OPPORTUNITIES AND CONSTRAINTS FOR ECNA - PLATEAU

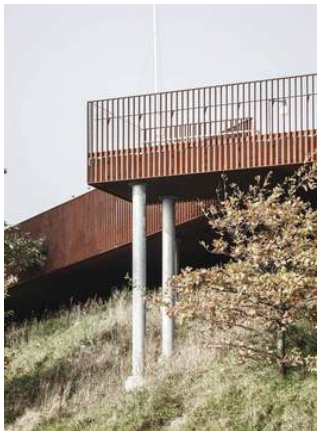
OPPORTUNITIES

CONTRAINTS

0' 500'

PROGRAM

FIRE SAFE NATURE CENTER - 7,600 SF



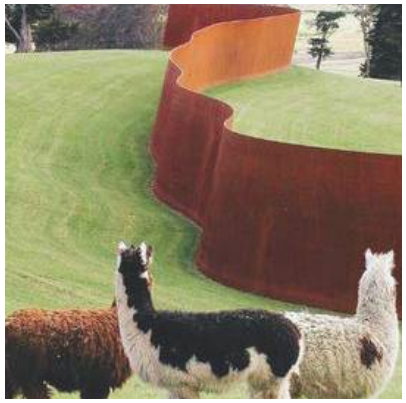
CORTEN LOOK OUTS - 400 SF

CORTEN FOOTBRIDGES

RECREATIONAL DAY USE

HIKING TRAILS - THROUGHOUT

CORTEN SHADED WALKWAYS



LAND ART - THROUGHOUT

URBAN ORCHARD -1.5 ACRES

OUTDOOR CLASSROOM - 900 SF

BIKE PATHS - THROUGHOUT

LIVESTOCK GRAZING - 4000 SF - 200 PER

ADA ACCESSIBLE CIRCULATION

PROGRAM

OPEN SPACES

FIRE DEMONSTRATION GARDEN - 3000 SF

WORKSHOPS AND COMMUNITY EVENTS

FIRE MAINTENANCE

CORTEN WILDLIFE TOWER

POST FIRE MEMORY GARDEN - 3000 SF

COMMUNITY CENTER / EVENT SPACE - 10,000 SF

INDIGENOUS STEWARDSHIP PROGRAMS

WATER COLLECTION AND RESERVIORS

EQUINE CENTER AND THERAPY

NATIVE RESTORATION AND ECOLOGY PROGRAMS

DESIGN DEVELOPMENT

USERS AND STAKE HOLDERS

AGENCIES

- EATON CANYON NATURAL AREA
- LOS ANGELES COUNTY
- DEPARTMENT OF PARKS AND RECREATION
- CITY OF ALTADENA
- CITY OF PASADENA
- SAN GABRIEL NATIONAL MONUMENT
- TONGVA TARAXAT PAXAAVXA CONSERVANCY

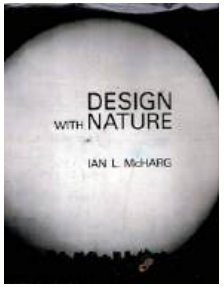
HUMANS

- ALTADENA RESIDENTS
- PASADENA RESIDENTS
- EDUCATORS
- NATURALISTS
- RECREATIONALISTS
- STUDENTS
- ECOLOGISTS AND CONSERVATIONISTS

NON-HUMANS

- MIGRATORY BIRDS
- FISH
- REPTILES
- AMPHIBIANS
- MAMMALS
- NATIVE CHAPPARAL
- NATIVE SAGE SCRUB
- NATIVE TREES

DESIGN METHODOLOGY



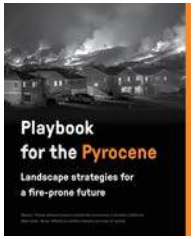
DESIGN WITH NATURE

The way we inhabit and transform the earth is most effective when it is approached with thoughtful planning that respects both ecological principles and the unique character of the landscape. MacHarg argued that this mindful design allows our cities, industries, and agricultural practices to sidestep significant natural hazards while also fostering true regeneration. At a deeper level, he believed that by aligning ourselves with the powerful forces and natural rhythms of the landscape, communities could cultivate a richer sense of identity and belonging. Nature is a vast, interconnected system that is constantly evolving. While humans have gained considerable scientific and cultural insights into this complexity, our understanding remains incomplete. We see terrestrial nature, or "the landscape," as both a dynamic ecosystem and a cultural framework.

DESIGN BY FIRE:
RESISTANCE – CO-CREATION –RETREAT

Design by Fire: Resistance Co-Creation Retreat- refers to a framework for managing the challenges posed by human-altered wildfires. This framework encompasses three main approaches:

1. Resistance: This approach focuses on combating the forces of fire and landscape change. It often involves techniques such as building fire-resistant structures and implementing fire suppression measures.
2. Co-Creation: This method emphasizes collaboration with fire and other natural processes to create resilient landscapes. It advocates for a more adaptive approach, recognizing that landscapes are dynamic and constantly evolving.
3. Retreat: This approach involves intentionally withdrawing from areas at high risk of fire. It can include measures like incentivized relocation and the implementation of development limitations.

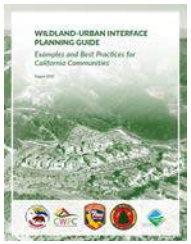


PLAYBOOK FOR THE PYROCENE

Historically, wildfire planning has focused on two main areas: enhancing individual properties and large-scale fire management. The “Playbook for the Pyrocene” offers a new approach by promoting community-based solutions, integrating insights from ecology, fire science, forestry, land use planning, emergency management, and indigenous stewardship. The book includes six key guidelines and 20 practical strategies to reduce wildfire risk at the community level, presented in an engaging illustrated guide for a general audience. Additionally, an appendix provides a wealth of relevant guidelines and research to support these strategies, making it a comprehensive resource for communities seeking to improve their wildfire preparedness.

FORM AND FABRIC

The "form and fabric" methodology in architecture and landscape design is a holistic approach that emphasizes the interplay between individual elements (forms) and the overall structure (fabric) of a space. This method highlights the relationships among different components, showcasing how they work together to create a unified and meaningful environment. In the realm of landscape architecture, this methodology fosters innovative visual and spatial thinking, enabling designers to understand and articulate how diverse elements coalesce to form a harmonious and cohesive design.



WILDLAND INTERFACE PLANNING GUIDE

The Wildland-Urban Interface (WUI) Planning Guide serves as a crucial resource for local agencies in California, offering strategies to effectively manage and reduce wildfire risks in vulnerable areas. This guide not only outlines actionable plans and regulatory frameworks but also presents nine engaging case studies that highlight successful practices. These examples offer valuable insights and potential solutions that other communities can adopt to enhance their resilience against wildfires. Additionally, the guide complements the Fire Hazard Planning Technical Advisory, enriching the toolkit available for communities facing these challenges.entation of development limitations.

DESIGN METAPHOR - FIRE FOLLOWERS
CYCLES OF REGENERATION THROUGH DISRUPTION

MATILIJA SEED HEAD

FIRE FOLLOWERS - SEROTINOUS FLOWERS

In fire-prone environments, some seeds have evolved adaptations to germinate in response to environmental cues, such as heat and smoke, to break dormancy and initiate germination.

The Matilija poppy—
bold, delicate, and ghost-white like smoke—
rises from the charred ground after wildfire,
its golden center glowing like an ember of hope.
It is a serotinous flower, holding its potential until fire cracks it open.
In this, it becomes more than a plant—it becomes a promise.
A reminder that from scorched earth, beauty can rise.
Matilija poppy dares us to imagine regeneration through disruption.
Like its petals unfolding from ash, we too can open to the future—
-one not built on fear of change, but on the courage to transform.
A bloom that trusts the burn...
and teaches us to see the lush world waiting just beyond the fire.

MATILIJA POPPY GROWS BACK POST EATON FIRE

SEEDS OF THE MATILIJA POPPY

ROMENYA COULTERI – MATILIJA POPPY

DESIGN METAPHOR- FIRE FOLLOWERS - REGENERATION THROUGH DISRUPTION

BEFORE

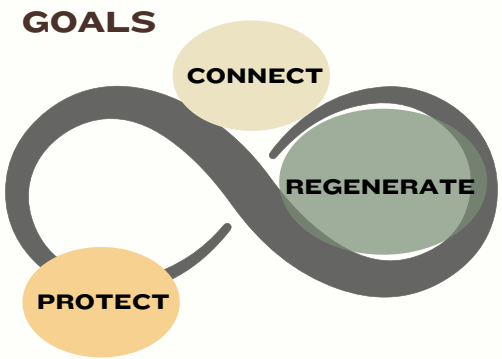
At dawn's embrace
Eaton Canyon sprawls like a tapestry,
Its ribs of sandstone cradle swathes of sage scrub and buckwheat,
while silver threads of the arroyo weave through a quilt of native growth
The San Gabriel Mountains stretch wide
casting long shadows that cool the chaparral
where lizards flicker across sun-warmed stones
cactus blooms catch the morning's soft glow
a refuge
a habitat
shaped by the hands of time
A place for wandering
witnessing,
where nature stands resolute and unconfined
at our backdoor
We come to connect
to marvel
to tend to what has endured
through seasons of drought, flood, and wind.
The land remembers, and we, listen

AFTER

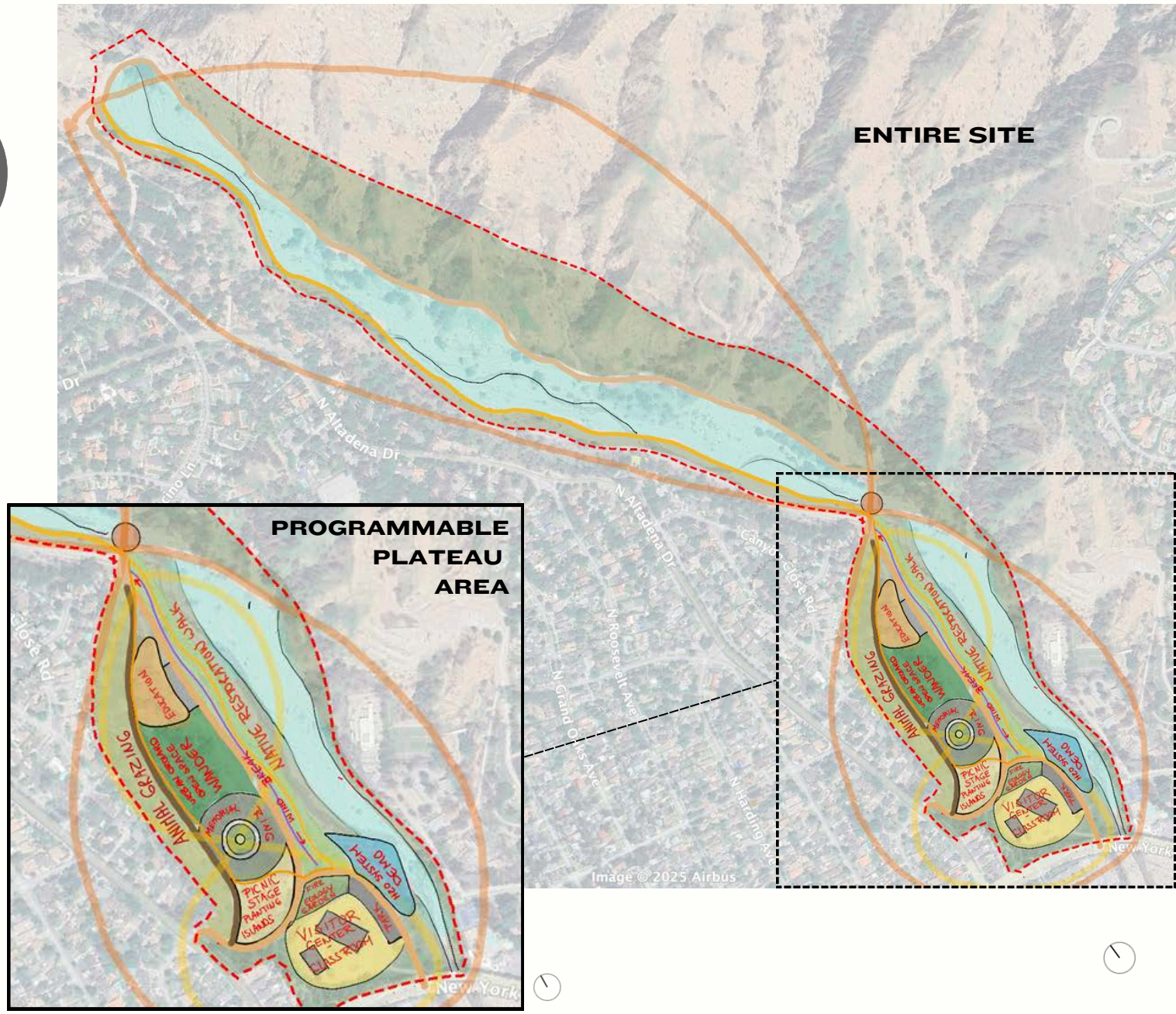
Then— heat swells, winds rise,
and ...
ignition.
Flames rush the canyon,
an inheritance aflame in the age of the pyrocene
breaks the fire's dance, shielding beyond
a scoring tide, redrawing the canyon in ash and scars
The cycle turns anew
From charred soil, resilience
not just in what takes root,
but in our hands, extended toward the wild.
The answers pulse within the land—
the sage scrub that embraces flames,
the buckwheat that holds the earth,
the deep-rooted systems that temper the burn.
We plant not merely for beauty
but to summon strength.
We create swathes,
stitching breaks into the landscape
We reimagine
habitat is defense,
the trail is classroom,
stewardship is strategy.
The canyon...
a refuge and a response
a beacon of regeneration
a lesson in the evolution of ecology
a call to protect through profound connection
along with the fire came the future
germinating beneath our feet

CONCEPT DEVELOPMENT

DESIGN METAPHOR - FIRE FOLLOWERS
CYCLES OF REGENERATION THROUGH DISRUPTION



KEY CONCEPTS:
MEMORY, HEARTH, SUCCESSION, CYCLE, FOLLOWING, NODE, TRANSITION, RECURRENCE, FLOW, RENEWAL, REBIRTH, TRANSFORMATION, CONTINUUM



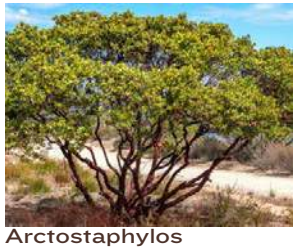
MATERIAL INSPIRATION

MATERIALS - FIRE RESILIENT PLANTS

POST FIRE RESPONSE KEY: RESPROUTER SEEEDER FIRE FOLLOWER EROSION CONTROL

ASSSUMING THE CANYON WILL BURN AGAIN THIS PROJECT SELECTS A RANGE OF PLANTS THAT THRIVE AND REPELL IN A MODERN FIRE REGIME

Quercus agrifolia



Arctostaphylos manzanita Parry

Heteromeles arbutifolia

Malosma laurina

Rhus ovata

Rhus integrifolia

Phacelia cicutaria

Romneya Coulteri

Eriodictyon californicum

Acmispon glaber

Acourtia microcephala

Cryptantha intermedia

Antirrhinum coulterianum

Cercocarpus betuloides

Eriogonum fasciculatum

Ceanothus leucodermus

Salvia apiana

Salvia mellifera

Emmenanthe penduliflora

Diplacus aurantiacus

Fremontodendron californicum

Venegasia carpesioides

Artemisia californica

Malacothamnus fasciculatus

MATERIALS - FIRE RESILIENT PLANTS

POST FIRE RESPONSE KEY: RESPROUTER SEEEDER FIRE FOLLOWER EROSION CONTROL

ASSSUMING THE CANYON WILL BURN AGAIN THIS PROJECT SELECTS A RANGE OF PLANTS THAT THRIVE AND REPELL IN A MODERN FIRE REGIME

Ribes speciosum

Hesperoyucca whipplei

Adenostoma fasciculatum

Lathyrus vestitus

Pseudognaphalium californicum

Dichelostemma capitatum

Calystegia macrostegia

Lupinus succulentus

Nasella pulchra

Centaurium venustum

Umbellularia californica

Agave americana

Opuntia vaseyi

Cirsium occidentale

Frangula californica

Achillea millefolium

Baccharis pilularis

Cercis occidentalis

MATERIALS - FIRE RESISTANT BUILDING MATERIALS

ASSUMING THE CANYON WILL BURN AGAIN THIS PROJECT SELECTS A RANGE FIRE RESISLIENT BUILDING MATERIALS.


BRICK


CONCRETE


STONE


STEEL


GYPSUM


ADOBE


CORTEN


MINERAL WOOL


RAMMED EARTH

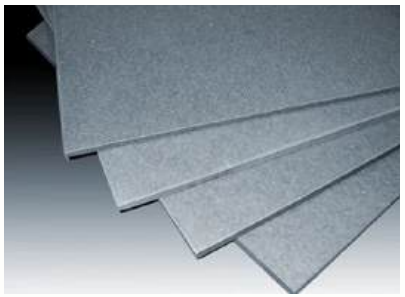

DUAL PANED GLASS

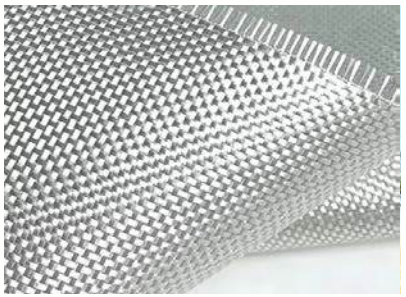

CMU


STUCCO


DECORATIVE BOULDERS

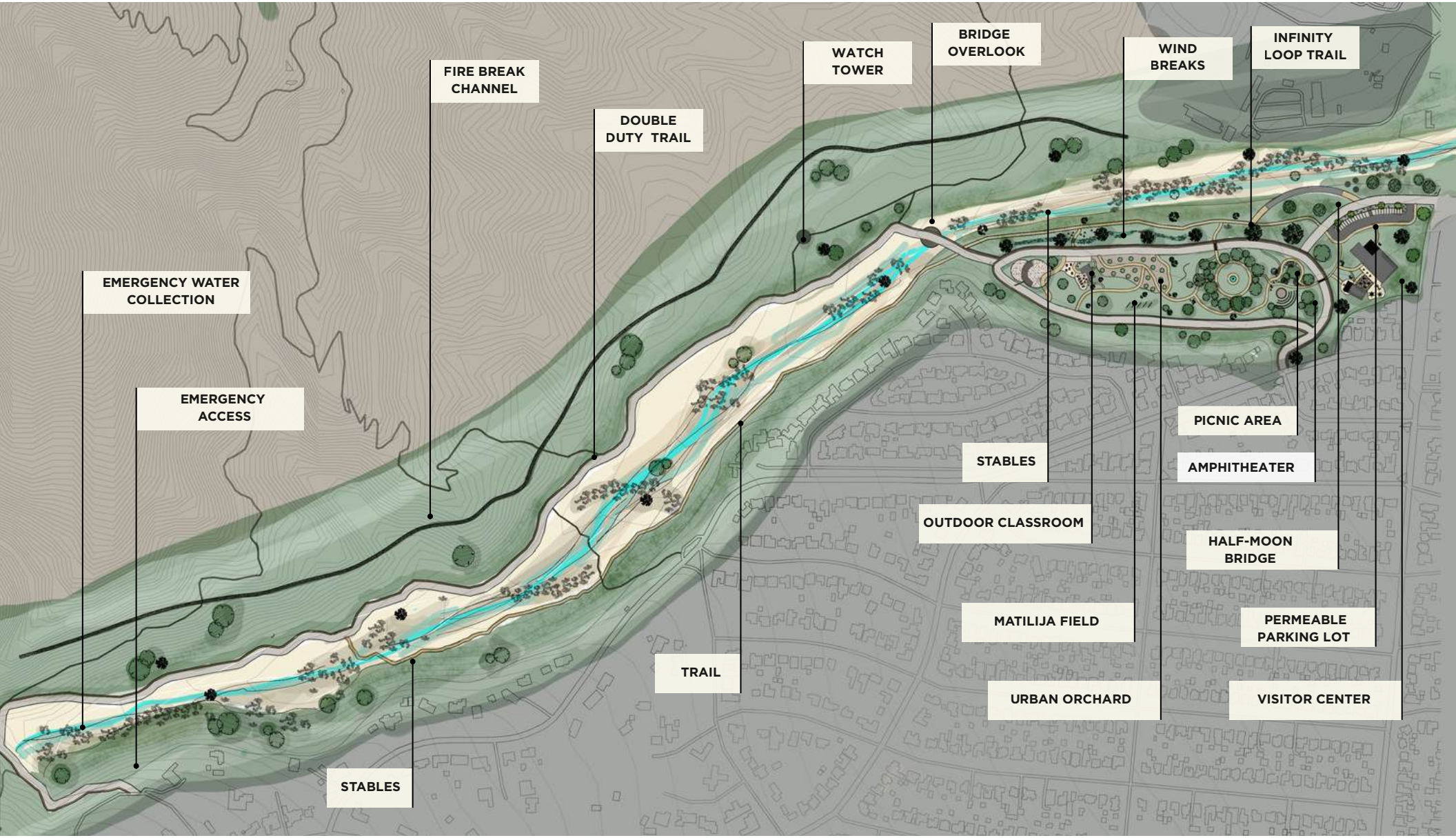

AGGREGATES


CEMENT BOARD

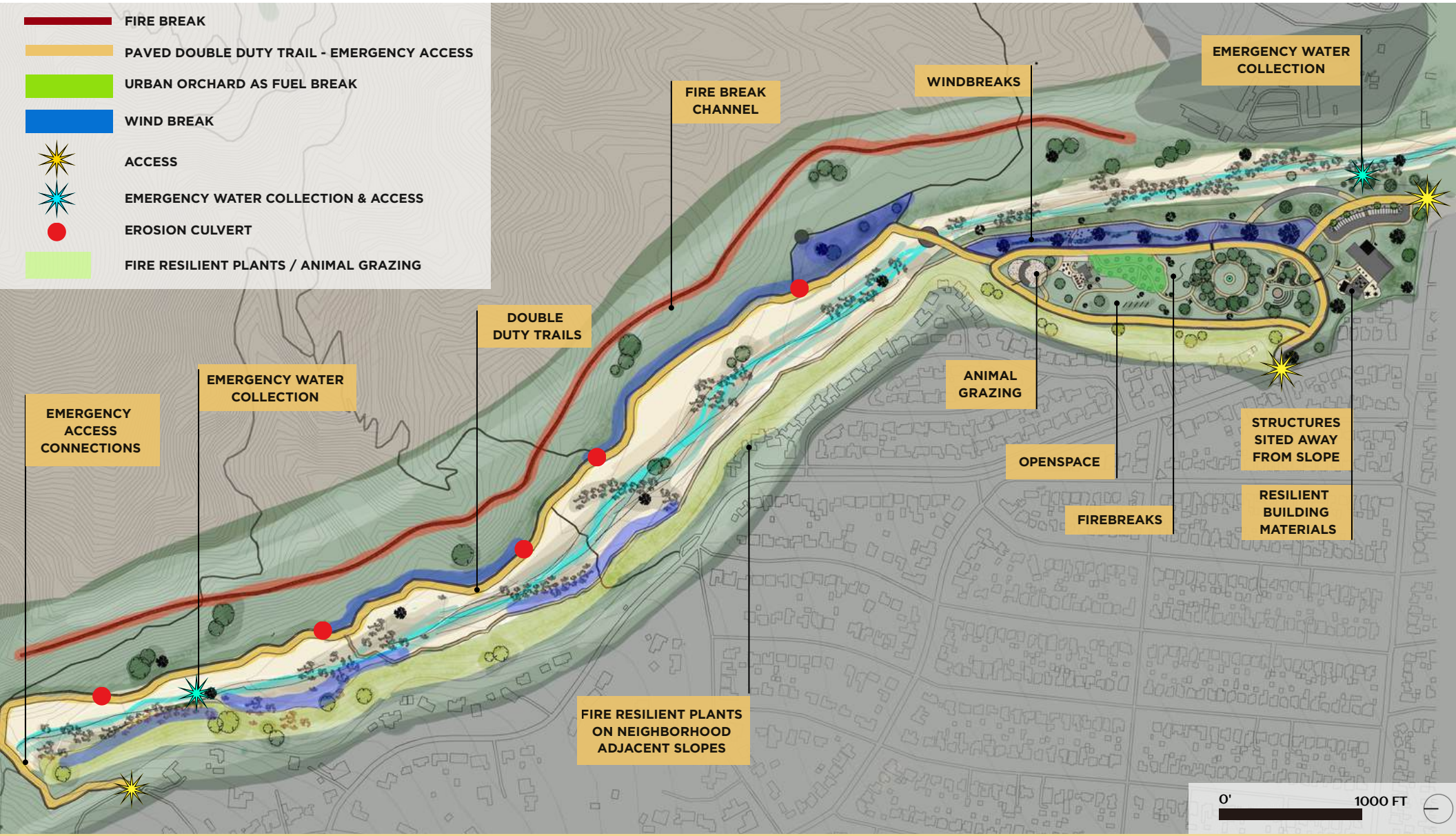

FIBERGLASS

MASTER PLAN

MASTER PLAN - OVERALL SITE



MAIN PROTECTION METHODS ACROSS SITE




ANIMAL GRAZING


WIND BREAKS


FIRE BREAKS


FIRE RESISTANT PLANTS


EMERGENCY WATER SYSTEMS


EMERGENCY ROADS TURNAROUNDS

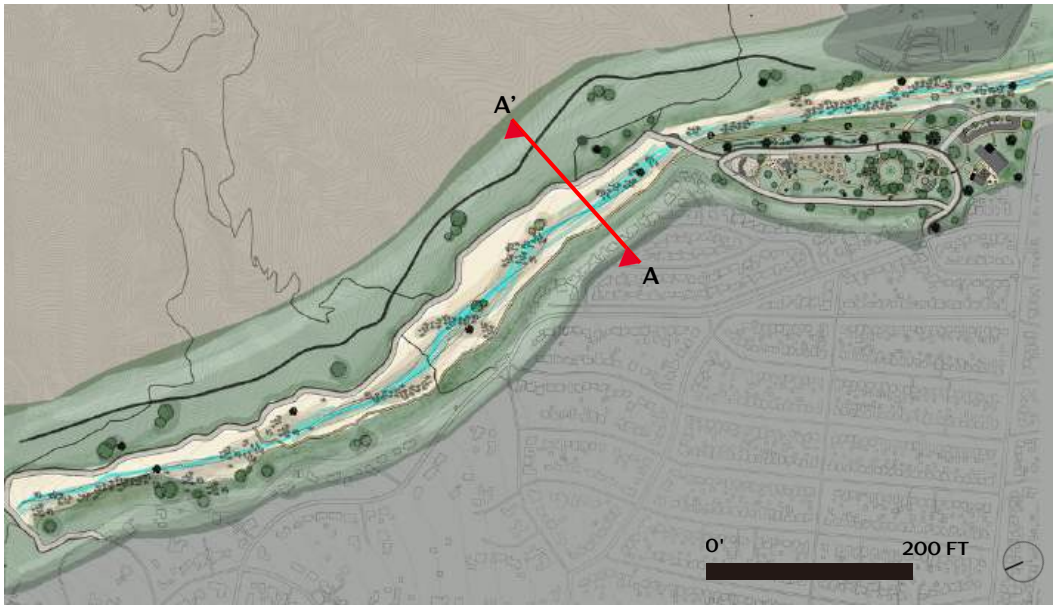

DOUBLE DUTY TRAILS


FIRE RESISTANT MATERIALS

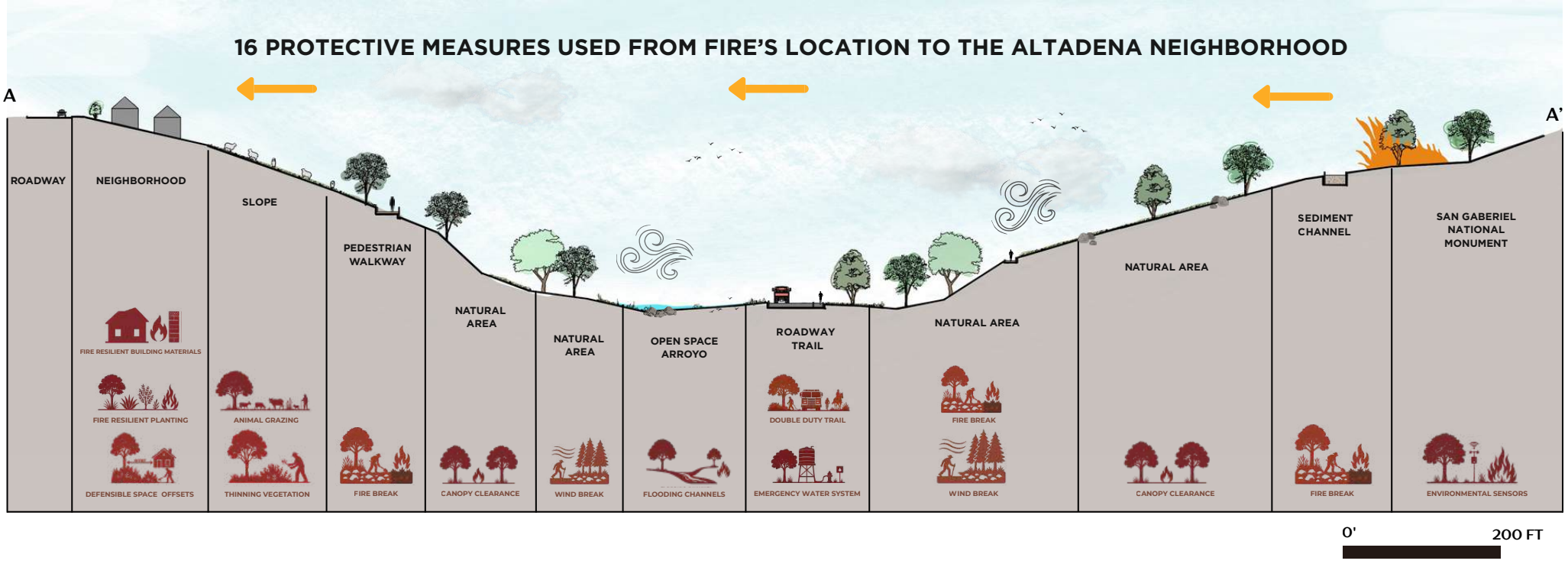

SITE STRUCTURES FROM SLOPES

DETAIL OF PROTECTION METHODS - UPPER ARROYO

KEY MAP



SECTION THROUGH UPPER ARROYO AREA

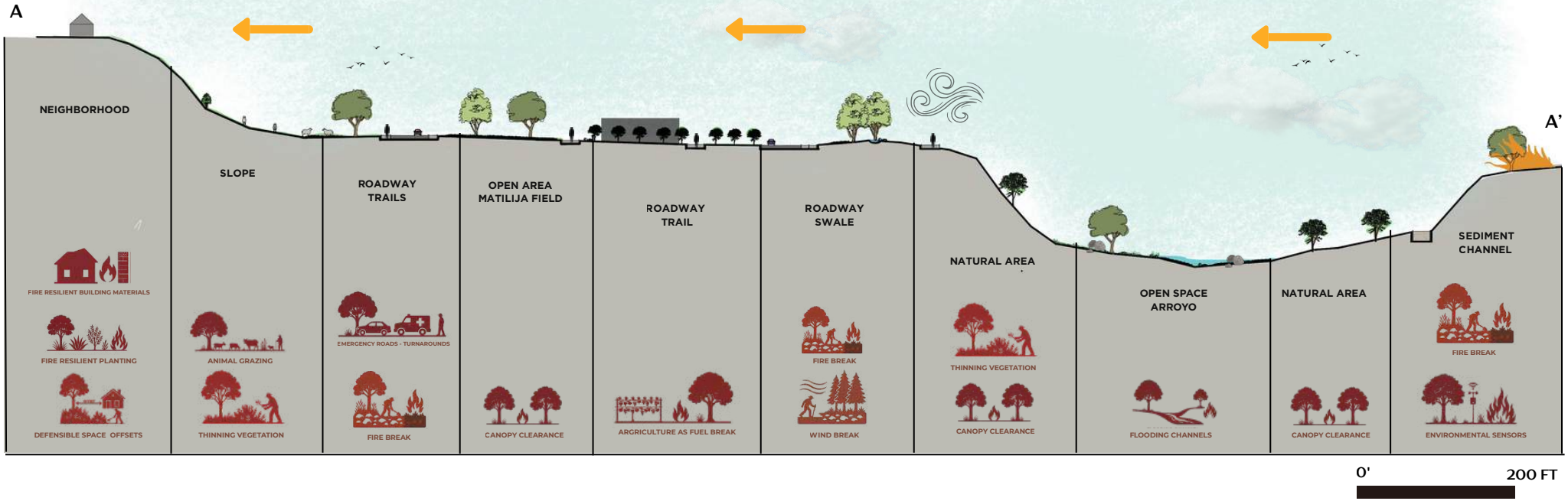


DETAIL OF PROTECTION METHODS - PLATEAU

KEY MAP

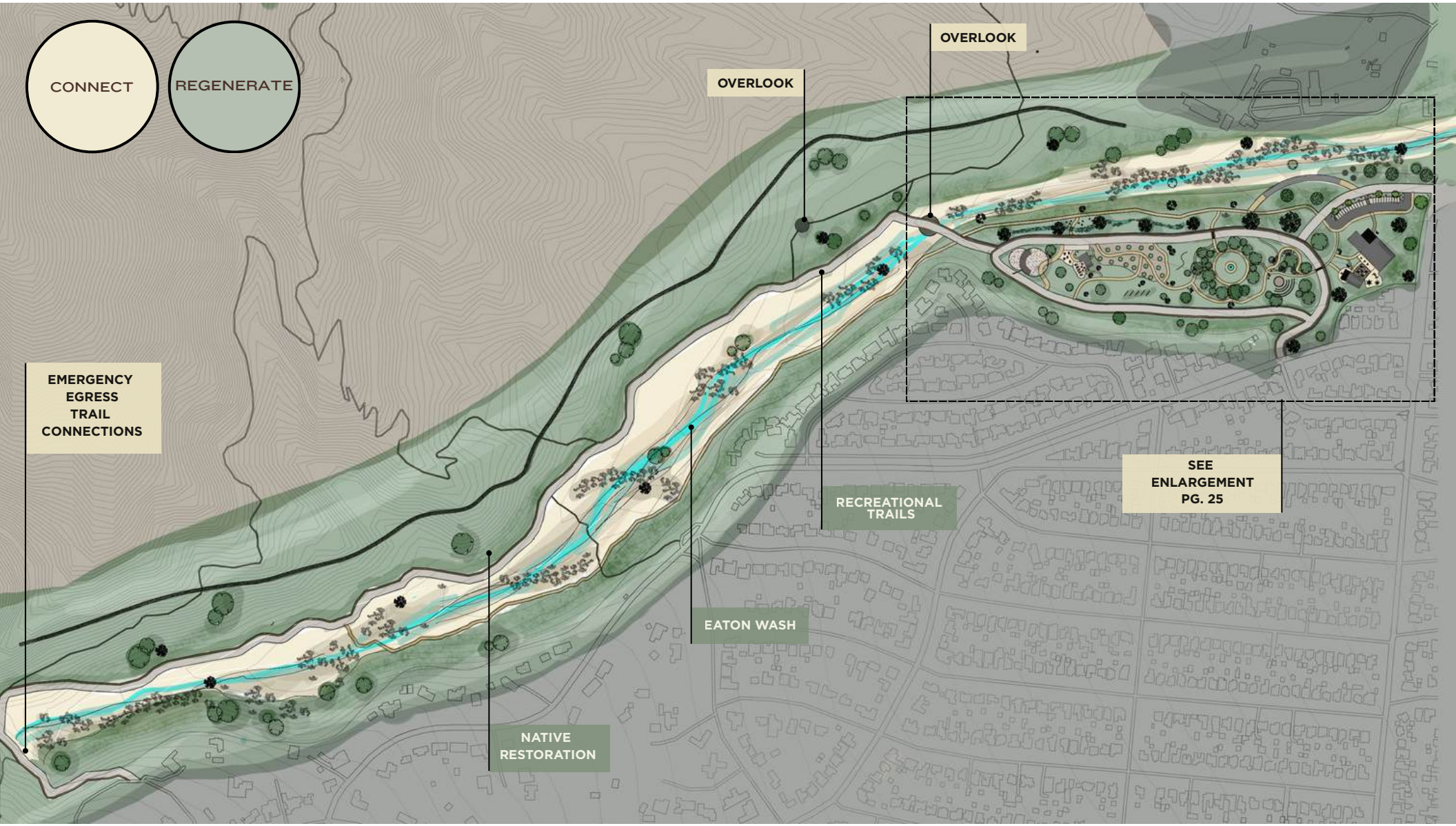
SECTION THROUGH UPPER ARROYO AREA

17 PROTECTIVE MEASURES USED FROM FIRE'S LOCATION TO THE ALTADENA NEIGHBORHOOD

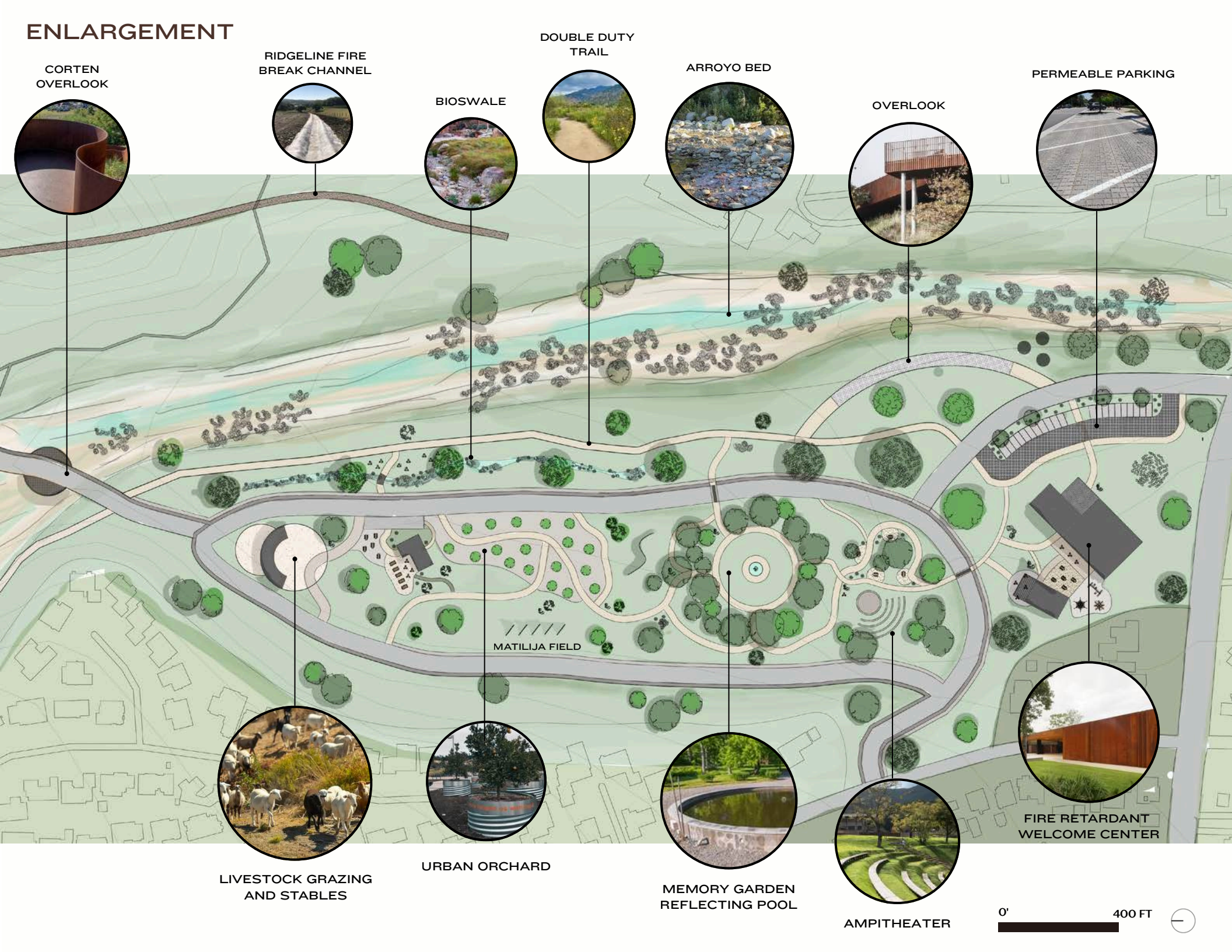


OVER ALL SITE PLAN

GOALS



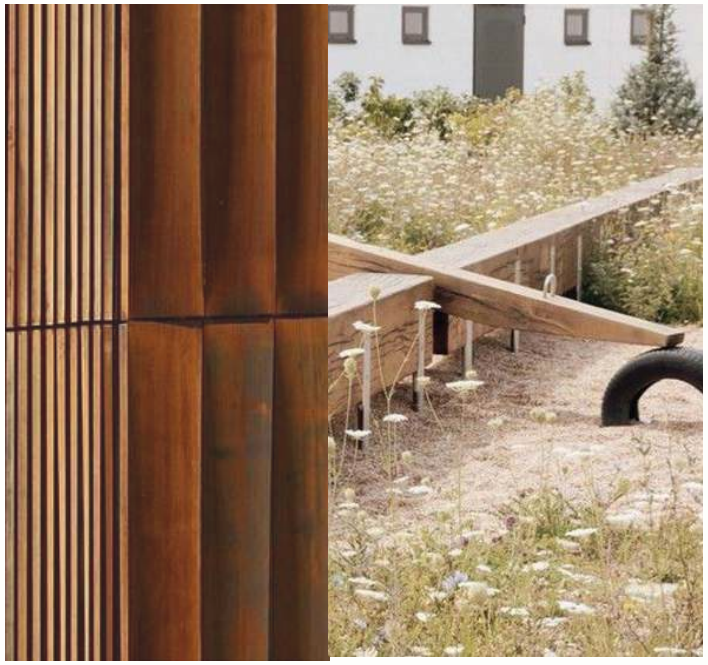
ENLARGEMENT



VISITOR CENTER

0' 200 FT

VISITOR CENTER, PERMEABLE PARKING LOT, NATURAL PLAYGROUND



INSPIRATION

NATURAL PLAYGROUND NEAR VISITOR CENTER

MEMORY GARDEN

MEMORY GARDEN @ PREVIOUS NATURECENTER SITE

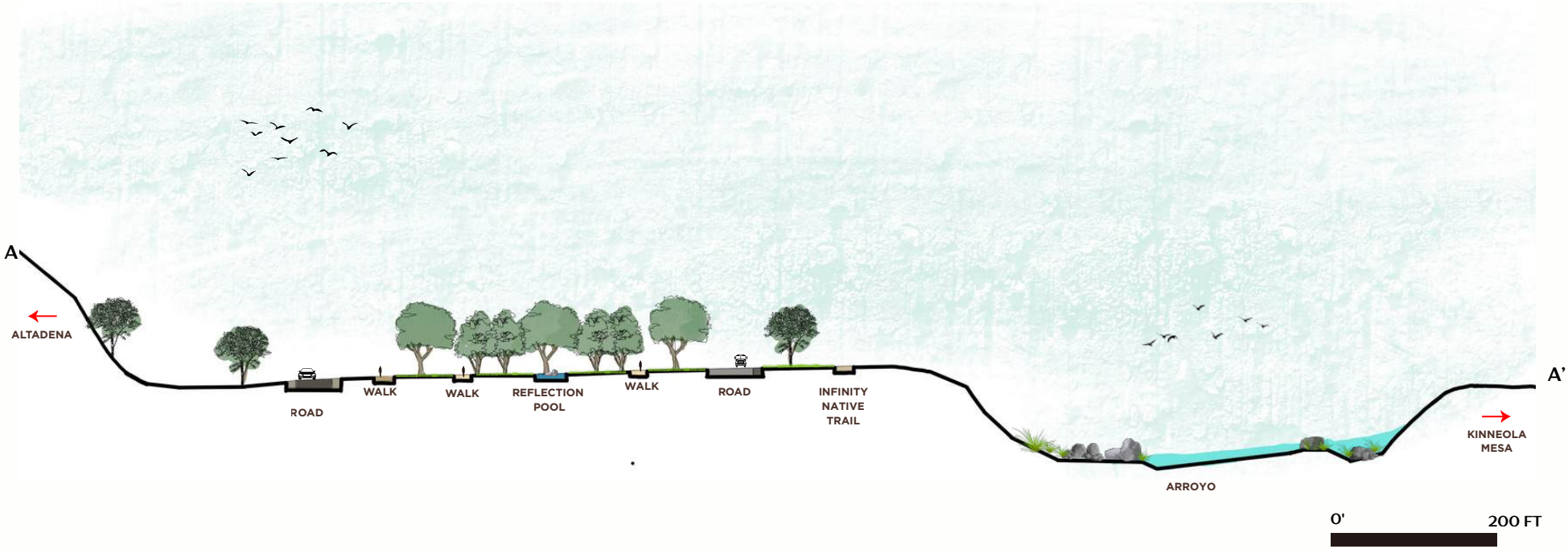
0' 200 FT

MEMORY GARDEN @ PREVIOUS NATURECENTER SITE

INSPIRATION

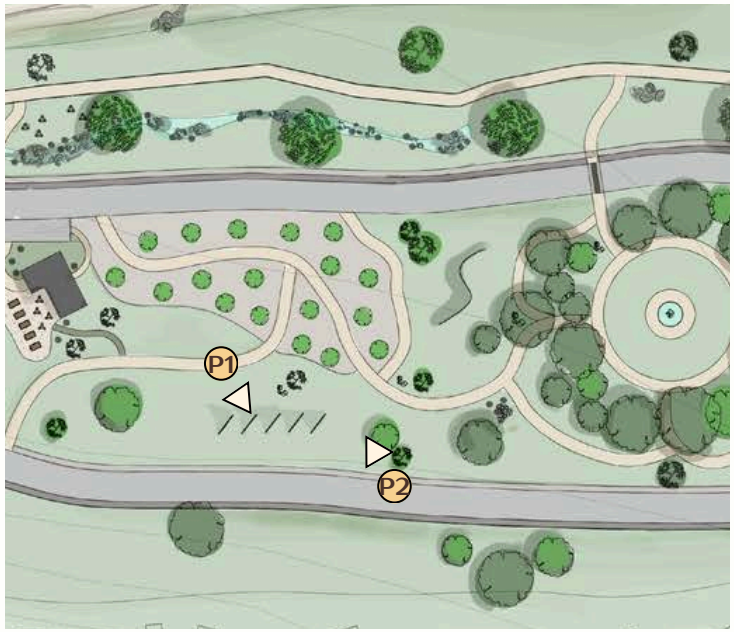
MEMORY GARDEN - SECTION

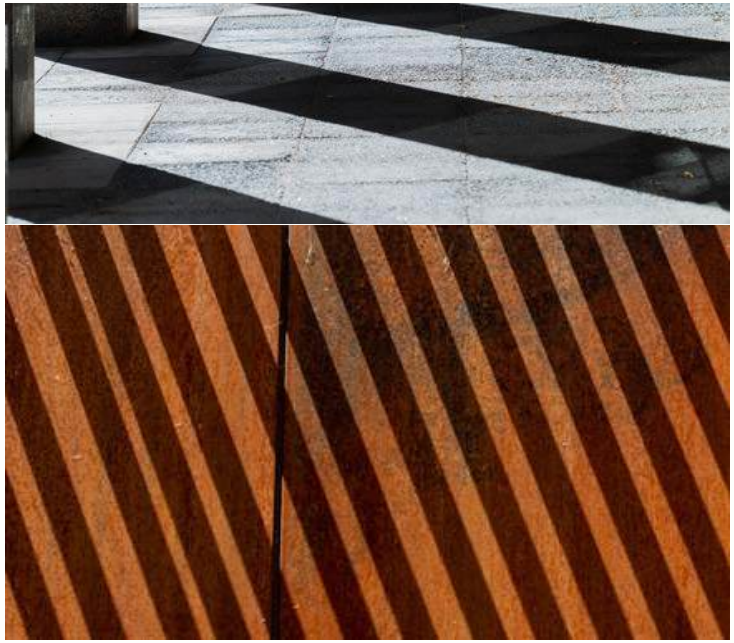
MEMORY GARDEN AND ARROYO



EXISTING RING OF OAK TREES THAT SURVIVED THE FIRE AND SURROUNDED THE OLD NATURE CENTER

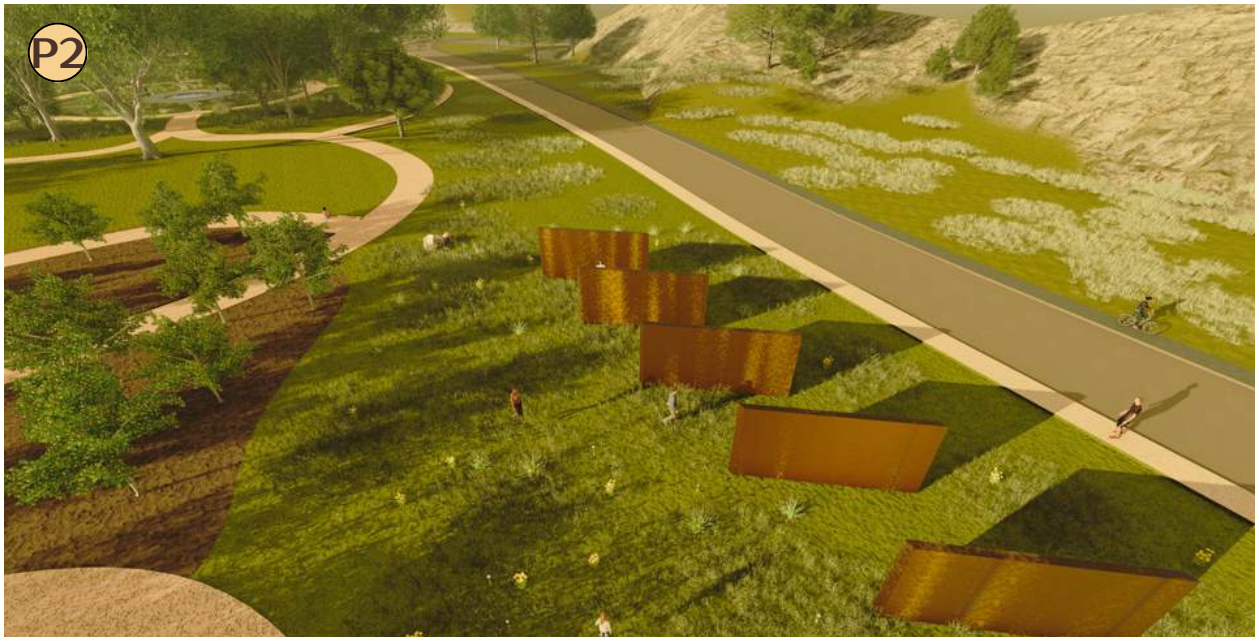
SUCCESSION / FIRE FOLLOWERS SCULPTURE





INSPIRATION

FIRE FOLLOWERS / SUCCESSION SCULPTURE - SUN TO SHADOW



FIRE FOLLOWERS / SUCCESSION SCULPTURE - SUN TO SHADOW

DOUBLE DUTY TRAIL - PERSPECTIVE AND SECTION

0' 200 FT

DOUBLE DUTY TRAIL - EMERGENCY AND RECREATIONAL ACCESS

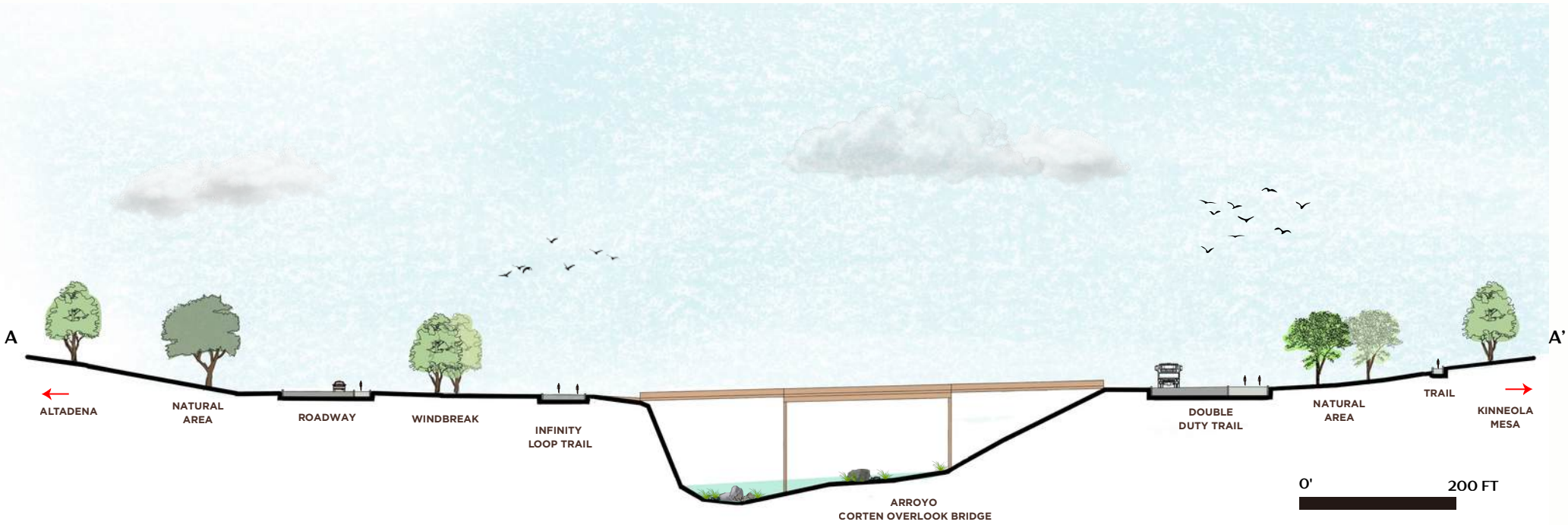
DOUBLE DUTY TRAIL - EMERGENCY AND RECREATIONAL ACCESS

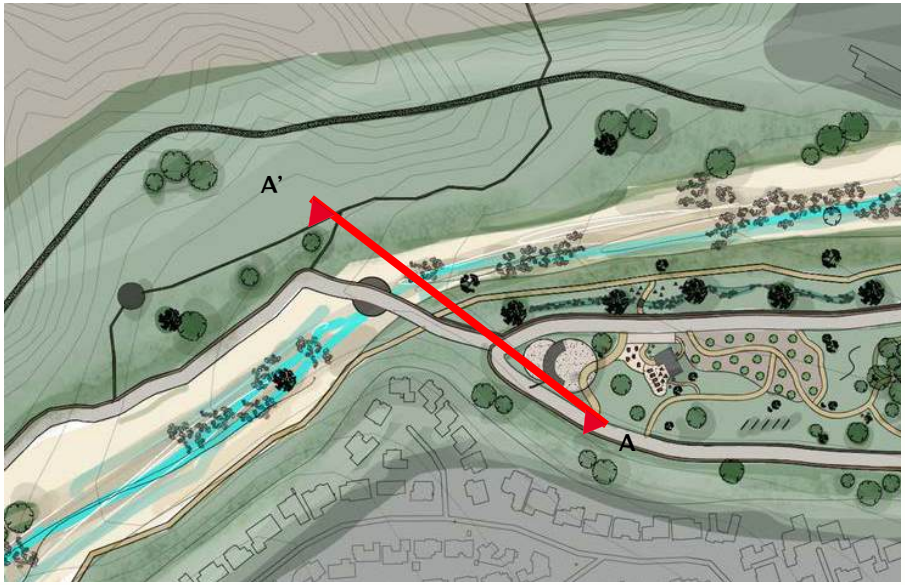
BRIDGE / OVERLOOK- PERSPECTIVES

ARROYO BRIDGE AND OVERLOOK

ARROYO BRIDGE AND OVERLOOK

BRIDGE AND OVERLOOK - SECTION





LIVESTOCK AND STABLES - PERSPECTIVE

STABLES AND ENCLOSRE FOR ONSITE SHEEP AND HORSES

STABLES AND ENCLOSRE FOR ONSITE SHEEP AND HORSES

ANIMAL GRAZING

0' 200 FT

ANIMAL GRAZING ON SLOPE TO MAINTIAN FUEL

EDIBLE GARDEN AND CLASSROOM

OUTDOOR CLASSROOM - EDIBLES AND URBAN ORCHARD

0' 200 FT

URBAN ORCHARD - PERSPECTIVE AND SECTION

0' 200 FT

DOUBLE DUTY TRAIL - EMERGENCY AND RECREATIONAL ACCESS

DOUBLE DUTY TRAIL - EMERGENCY AND RECREATIONAL ACCESS

CONCLUSION / EVALUATION

PROTECT

- **8** LAND-BASED PROTECTION METHODS ON-SITE
- **6** TECHNOLOGY-BASED PROTECTION METHODS ON-SITE
- FIRE ECOLOGY AND PREPAREDNESS EDUCATION
- **7000 FT** OF FUEL BREAKS ACROSS THE SITE
- **2000 FT** OF WIND BREAKS ACROSS THE SITE
- **3 NEW** EMERGENCY VEHICULAR ACCESS POINTS
- **4 NEW** PEDESTRIAN ACCESS POINTS
- **250,000 GALLONS** OF EMERGENCY WATER STORAGE
- **2 MILES** OF DOUBLE DUTY TRAIL / ROADWAY SYSTEMS
- **42 FIRE RESILIENT PLANTS** USED ACROSS THE SITE
- **OVER 16 FIRE RESILIENT BUILDING MATERIALS** USED ACROSS THE SITE
- **26 ACRES** OF LIVESTOCK GRAZING / VEGETATION MANAGEMENT

REGENERATE

- **200 ACRES** OF NATIVE HABITAT RESTORATION
- **OVER 42 NATIVE FIRE RESILIENT** PLANTS USED
- **3 ARROYO EROSION CONTROL** MEASURES USED
- HABITAT RESTORATION FOR NEARLY **300 NATIVE ANIMALS** WHO CALL EATON CANYON HOME

CONNECT

- **7 NEW ACCESS POINTS** FOR VEHICULAR AND PEDESTRIAN & ACCESS
- **2 NEW MAIN ENTRY POINTS** ON THE NORTH AND SOUTH END OF THE SITE
- **2 MILES OF ADA ACCESSIBLE T**RAILS ACROSS THE SITE
- PARKING CAPACITY FOR 250 CARS
- **SERVES 45,0000** RESIDENTS IN A 2 MILES RADIUS
- **13,000 SF** OF COMMUNITY USE SPACES
- **NUMEROUS ECOLOGY AND HORTICULTURE PROGRAMS** INTRODUCED
- **INDENIOUS STEWARDSHIP PROGRAMS AND PARTNERSHIPS**
- **OVER 2 MILES OF RECREATIONAL TRAILS**
- EATON GREENBELT **CONNECTS 20,000 RESIDENTS IN LA CAÑADA FLINTRIDGE, 2000 RESIDENTS IN KINNELOA MESA, AND 11,000 IN SEIRRA MADRE.**

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