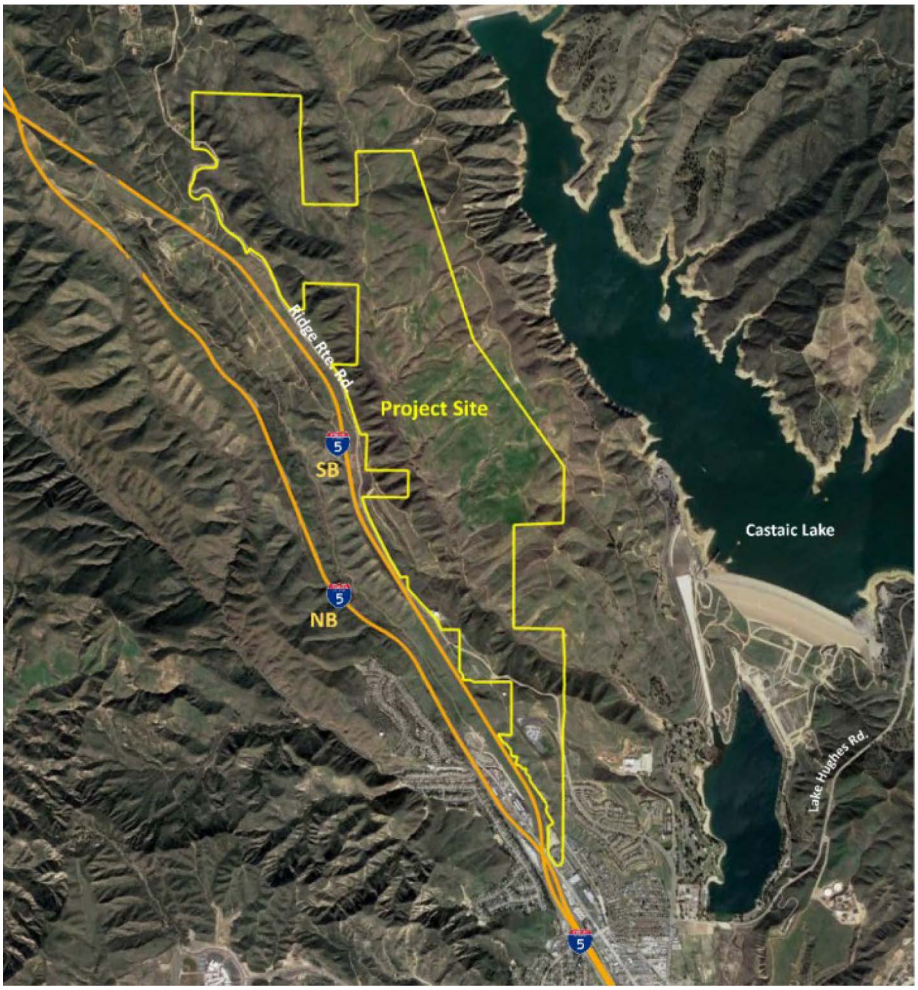
# Wildland Fire Risk Report
# NorthLake Project
# Addendum #1

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Included in the assessment of exacerbation of wildfire risk (CEQA Guidelines section 15126.2(a)) is the increased wildfire risk from increased human habitation in a wildlife-urban interface as recognized in the recent case, *People of the State of California Ex Rel. Rob Bonta, Attorney General v. County of Lake & Lotusland Investment Holdings, Inc. (Case No. A165677; "Lotusland"))*. The following analysis assesses the additional risk from the proposed new project population at the project site and concludes that while the project increases the general potential for human-ignited wildfires, that risk is less than significant based on regulatory compliance, project design and mitigation measures.

It is important to first quantify the increased risk that may be caused by development in areas which have not been previously developed. This needs to be done by describing the "additional wildfire risk factors as compared to existing conditions" that the project would "introduce" to the area. Specific studies for the project site region on this subject are not readily available, however, more regional, national and international findings are available on the general subject.

Bringing in new residents to the largely undeveloped project site increases the risk of human-caused wildfire over the existing baseline risk. This is a well-established fact. **Humans cause nearly 90% of wildfires in the United States according to the latest report from the Congressional Research Service in its report on Wildfire Statistic data June 1, 2023. These fires are primarily from discarded cigarettes, unattended campfires, burning debris, or through equipment malfunctions.**

As noted in the publication, *Conservation Threats Due to Human-Caused Increases in Fire Frequency in Mediterranean-Climate Ecosystems, by* Alexandra D. Syphard, et. Al (May 2009) which indicated that "*human ignitions increase with population density*":

> *The association of people with the spatial distribution of fire occurrence is likely due to the fact that humans now cause the majority of ignitions in all five Mediterranean-climate regions (Bond & van Wilgen 1996), and human ignitions are likely to occur close to roads and human infrastructure (e.g., Yang et al. 2007; Syphard et al. 2008). Nevertheless, our results also showed that fire occurrence consistently peaked where population densities were intermediate, which suggests that fire patterns in Mediterranean-climate regions are related to the spatial arrangement between people, urban development, and fuel. When population density is lowest, human ignitions are also low but increase with population density. Nevertheless, there appears to be a threshold above which fire occurrence declines, possibly due to less open space and fuel fragmentation caused by urban development or other land-use change. Fire-suppression resources also tend to be concentrated near urban areas (Calkin et al. 2005), and intermediate-density housing when located within wildland vegetation is classified as the wildland–urban interface (WUI) in the United States and given special fire-management considerations (Radeloff et al. 2005).*
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> **Conservation Threats Due to Human-Caused Increases in Fire Frequency in Mediterranean-Climate Ecosystems**, Alexandra D. Syphard, Volker C. Radeloff, Todd J. Hawbaker, Susan I. Stewart, First published: 15 May 2009, **https://doi.org/10.1111/j.1523-1739.2009.01223**

There is no doubt that that increased human habitation in a wildlife-urban interface increases the fire risk from human activities such as arson, children playing with fire, debris-burning; increased vehicular traffic, increased fire risk from sparks, catalytic converters, and smoking/discarded smoking materials and accidental fires. The development itself introduces residences within the site creating a wildland-urban interface that increases the general potential for human-ignited wildfires. All of these factors could expose project occupants to pollutant concentrations from wildfire or the uncontrolled spread of wildfire near or into the development footprint.

The probability of increased ignitions cannot be ignored. However, the reality is that while more opportunities for fires will exist, factors associated with the changes in the wildland fuels and topography will have an offsetting effect.

> *Studies in California show that area burned and number of fires are highest when population and housing densities are intermediate (Keeley 2005; Syphard et al. 2007). Fires initially increase with population and housing density and then decline where a threshold density is reached. There are several interrelated reasons for this. Ninety-five percent of California's fires are human caused; therefore, anthropogenic ignitions are lower in areas with low population density. As population and housing densities increase, fuels are still abundant and contiguous enough to carry fire, and the number and frequency of fires increase (Syphard et al. 2007). As population density increases further and an area is developed, wildland fuel is reduced and fragmented and fire-suppression resources are concentrated, resulting in lower fire frequencies at high population densities. Finally, even if fire frequency remains stable, fires may cluster in certain areas (e.g., human settlements) or land-cover types (Nunes et al. 2005; Forsyth & van Wilgen 2008), resulting in high fire frequency in localized areas.* Syphard, A. D., Radeloff, V. C., Hawbaker, T. J., & Stewart, S. I. (2009). Conservation threats due to human-caused increases in fire frequency in Mediterranean-climate ecosystems. Conservation Biology, 23(3), 758–769.

A study out of Texas (Effects of changing development patterns and ignition locations within Central Texas, Mobley, W, (Feb 2019)) indicated the ignition gradient along lateral development could lower ignition probabilities when the new development areas were nearest to the previous urban development, while outlying development patterns in the wildland had higher probabilities.

This builds on the concept that, at a point of development density, wildland fuels are reduced/eliminated or fragmented to a point where fire suppression effort are more effective. This higher level of development also has a greater concentration of emergency services resources to aid the protective actions needed to bring the incident to a close.

**Wildland fires are primarily from discarded cigarettes, unattended campfires, burning debris, or through equipment malfunctions.** Restricting smoking in hazardous areas coupled with roadside protection zones will be greatly beneficial to reducing the impacts of smoking materials within the project site. Campfires will not be allowed in the project site nor will solid fuel appliances or open flame devices which do not have spark arrestors in accordance with the Fire Code and local ordinance requirements. Burning of debris will not be allowed within the project site and will be enforced by the project site HOA in addition to the local law enforcement and fire agencies. While it is impossible to stop all of the equipment malfunctions, it is possible

to reduce the impact of equipment failure by regulation of the type and nature of equipment used in or near the wildland interface. Internal combustion engines are required to have spark arrestors under the current fire code, but compliance is a matter of operational orientation. The common areas of the project site will be under the jurisdiction of the HOA and as such, it can and will hold those doing working in the interface, especially the fuel modification zones, accountable for wildland fire safety practices in accordance with Calfire/Local Fire agency and NFPA (Nation Fire Protection Association) standards.

A study out of Canada summed the relationship of population to increased wildland fire ignitions up very well:

> *The prevalence of human-caused wildfires near population centers and in interface areas* is not just a Canadian phenomenon, but *has been observed all over the world. However, the relationship between human population density and wildland fire is complex and has been shown to be non-linear in many regions across the world because population centers can offer both sources of ignition and enhanced protection from wildland fire spread owing to increased suppression activity (Bistinas et al. 2013; Price and Bradstock 2014).*
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> *In such cases, the incidence of wild land fire ignitions increases with population density up to a local threshold, then decreases. In their research, they found that population centers of all sizes were associated with individual clusters, which further supports the notion that the relationships between human-caused wildfires and population density are non-linear and involve other factors.*
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> Human- and lightning-caused wildland fire ignition clusters in British Columbia, Canada
> Sean C. P. Coogan A * , Olivia Aftergood A and Mike D. Flannigan B., International Journal of Wildland Fire 1043-1055 https://doi.org/10.1071/WF21177 Published: 11 October 2022

The total number of structures in or near the WUI (Wildland Urban Interface) have increased significantly over the past few decades. If the probability of ignition was increased in a linear manner by the increase in population, it could be assumed that the number of wildland fires would have increased over the same period as well. The opposite has occurred. According the CalFire database (https://www.frontlinewildfire.com/wildfire-news-and-resources/california-wildfires-history-statistics/), the number of wildland fires is trending down over the past 37 years (Figure 1).

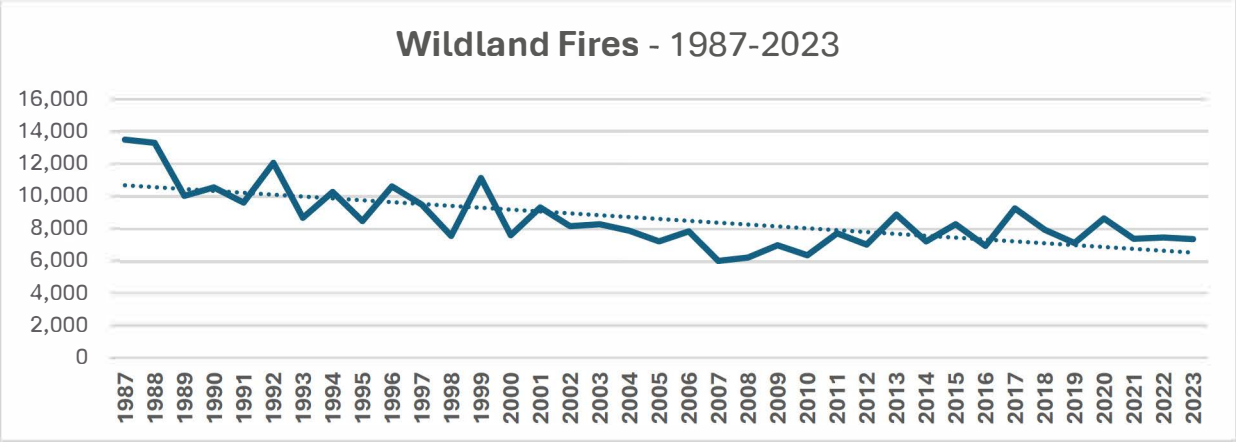


*Figure 1 – California Wildland Fires 1987 to 2023*

While it is impossible to isolate the WUI factor within the myriad of issues which drive the number of wildland fires in a year, it is possible to say that the inclusion of a large amount of new residential population into the WUI over this period has not produced a significant increase in the number of wildland fires. Correlation is not causation, and this is not presented as proof, but the correlation is one factor to consider.

The impacts to the community are from large wildland fires (100 acres or more) are sustained in many ways. First and foremost is the direct threat of the flames and smoke damaging or destroying structures, property and putting lives at risk. Secondary to that are air and water pollution during and after the fire event. Also potential for flooding and earth movement from the loss of vegetation and other stabilizing aspects of the environment. Each of these impacts has multiple precautions or mitigations that can and do lessen the impact or in many cases eliminate the impacts entirely.

These include:

a) Fuel break and fire breaks in the wildland
b) Fuel modification zones in the wildland interface
c) Defensible space around structures
d) Hardening of structures to be more resistive to wildland fires (Chapter 7A of the Building Code and/or Section R337 of the Residential Code
e) Roadside clearance to create buffers between the roadway and native wildland fuels
f) Use of prescribed fire for fuels reductions
g) Design of the community roadways to include multiple paths of travel for ingress/egress and evacuation
h) Undergrounding of critical infrastructure to make it more resistant to wildland fire impacts (electrical transmission, water supply storage and distribution, wastewater infrastructure, traffic control systems, and petroleum storage and distribution)
i) Protection of emergency medical system components
j) Preplanned evacuation zones and routes
k) Back up systems for continuity of government and provision of emergency services.
l) Public education on wildland hazards, mitigation and improvements (Ready Set Go, Know Your Way, EDITH (exit drills in the home))
m) Annual inspections of interface, at-risk locations and equipment needed to provide essential services
n) Community information and communications system
o) Emergency Alert Systems
p) Community sponsored Clean Up days
q) Firewise Community certification.

Mitigation measures are "feasible changes in any or all activities involved in the project in order to substantially lessen or avoid significant effects on the environment." (Guidelines, § 15041, subd. (a).)

The CEQA Guidelines define "mitigation" to include:

Avoiding /minimizing the impact

Preventing/reducing potential adverse impacts by protection of values at risk by elimination or suppression of impacts

Reducing or eliminating the impact by preservation, intrinsic design and maintenance operations,

Offsetting/ Countering impacts with features, resources or programs

Intrinsic Safety is a method for ensuring safety by removing or lowering the causes of danger to a level where the risk is significantly reduced; whereas Functional Safety is reducing risks to an acceptable level to ensure safety by changing the form and function of the hazard interface. Both are necessary to achieve the required protection against wildland fires.

The project's design (or mitigation measures) alleviates the stated risks as follows:

Avoidance by:

- Prohibiting smoking in wildland and wildland interface
- Banning solid fuel outfire fires within the community without spark arrestor and only in approved devices.
- Limiting access to vulnerable open space

Minimization/Prevention/ Reduction by providing:

- Fuel Breaks and Fire Breaks which reduce fire intensity and forward progress in the direction of the community
- Undergrounding of utilities, pump stations, switch gear to make them less impacted by wildfires
- Annual inspections for wildland interface (common areas) to insure readiness
- Defensible space inspections to educate and inform homeowners on what can be accomplished to make the structure more resistant to wildland fires
- Community cleanup programs (ongoing) to assist in removing wildland fuels from the interface and the community as a whole
- Back up of critical infrastructure (water, communications, traffic control, electrical) to ensure that they are functional when needed
- Fuel modification zones which slow or stop the forward progression of the wildland fire
- Defensible space which eliminates or greater reduces the fire pathways between the native fuels and the ignition zone around the structure
- Roadside clearance zones which increase the utility of the roads for evacuation while reducing the impact of possible ignition sources by reducing fuels near the roads by creating a buffer area
- New fire suppression resources which are closer/faster to the incident in order to intercede before the fire reaches a point where it exceeds the local resources and become a large wildland fire
- Hardened structures to wildland fire impacts through physical construction, distance and configuration of items on or near the structure which might ignite

- Placement of structures relative to the potential wildland fires to reduce or eliminate the possible ignition of the structure or the vegetation around it

Compensation/Offsetting risk by:

- Increased detection of ignition which result in actions which limit the size and scope of the fire with early intervention by citizens or emergency personnel
- Rapid suppression capabilities (as opposed to longer responses to areas without immediate access)
- Fire prevention and public education programs to reduce, eliminate and prevent wildland fires by changing behavior and practice which could elevate the risk of a wildland fire or its impacts
- Community information and communication systems to keep residents informed and aware of risks, actions needed and increases the ability to plan for future actions such as evacuation prior to being in harm's way
- Preplanned evacuation areas/routes which are known to residents to insure that, if evacuation is needed, it can be completed quickly and in the most efficient and effective manner

**Conclusion**

The California Governor's Wildland Strike Forse (2014) said it succinctly:

> *California has made progress in developing and adopting stringent wildland building codes. Since 2008, new construction in California's wildlands must use ember-resistant building materials. For homes built before the 2008 standards, CAL FIRE is working to develop a list of low-cost retrofit steps homeowners can take. In addition, the Office of the State Fire Marshal (OSFM) maintains an advisory committee of fire and building officials that continuously considers building code updates to improve fire safety. Most recently, OSFM advanced building code changes including sealing of garage door gaps, sealing skylights and safety improvements to outbuildings.*
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> *Developing new housing in Very High Fire Hazard Severity Zones presents challenges. Since 2015, CAL FIRE has assisted local governments in land use planning. CAL FIRE is working to identify subdivisions at significant fire risk without secondary evacuation routes and to make recommendations to improve access.*
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> *Homeowners are encouraged to actively maintain defensible space, which is defined as a minimum 100-foot area around a home. Maintenance is an ongoing task. California inspected more than 217,600 homes for defensible space compliance in 2017-2018 alone.*
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> *It is critical that roads and other infrastructure be more fire defensible and evacuation ready for the populations in the WUI. All levels of government must establish clear contingency plans with local communities to identify and create temporary refuge areas and shelter-in-place procedures to help fire evacuees survive when unable to escape a wildfire.*

Wildfires and Climate Change: California's Energy Future., A report from Governor Newsom's Strike Force April 12, 2019

All of the issues addressed above are or will be included in the new development areas by the approved design, ordinance, statute or regulation. As such, the increased wildfire risk from human-ignited wildfire is less than significant.