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Wildlife ecology and management

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Wildfires in Southern California

Introduction

There are few places in the world that are as diverse as the region of Southern California. Along its coastline you find a mild Mediterranean climate with palm trees and tropic flowers. Further inland dry shrubland or chaparral. The several large mountains in this region provide subalpine and alpine biomes with broadleaf forests and conifer forests, and east of these mountains you find desert. To many people this area is the paradise on Earth, where you can go skiing in the mountains and just hours later be surfing in the ocean, and with very much sunshine and little rain. However many people calling this area their home have also had to witness the wildfires that are a common occurrence to this area. It is easy to see what negative impact the fires have on the human population in Southern California. Houses and businesses that are burnt to the ground cause great emotional and economical losses, not to mention the risk of losing one's life in the fire. If we look past the human suffering caused by the fires there is one important question to ask. What are the effects of the frequent wildfires on the Southern California vegetation?



Summary

There is no official geographical definition of Southern California. In the following analysis we will apply the most commonly used definition which includes the southern border as Mexico, the western border as the Pacific Ocean, the eastern border the Colorado and Mojave deserts and finally the northern border as the Tehachapi Mountains. It seems as if there are at least a few wildfires every fall in Southern California. Many of them are results of arson or campfires getting out of hand. However even if the origin of many of these fires can be linked to human activity, research shows that there were frequent wildfires long before any people settled on this land. In fact many of the species present in the chaparral have through evolution developed resilience to fires and some even have become dependent on the fires for their survival (Crimmins, Miller et al; Zedler).

Adenostoma fasciculatum

Many plants have dormant seed banks that need the heat from the fire to release the seeds. Two examples are Lotus scoparius and Helianthemum scoparium which are shrubs common in the chaparral, and which are very short-lived and germinate mainly after a fire. If there are no fires or not frequent enough fires these species are facing local extinction (Borchert and Odion; Zedler).

Adenostoma fasciculatum is the most abundant species of the chaparral in Southern California and generally germinates after a fire, even though it has the ability to do so without a fire but on a much smaller scale. This would most likely not lead to extinction in the absence of fire but could reduce the numbers drastically leading to a noticeable change in the overall vegetation of the area. On the other hand if the fires are too frequent it could face the problem of immaturity risk. This means that the next fire would occur before the plant had been able to re-establish itself and the plant would therefore die without a seed bank for future generation (Borchert and Odion; Zedler).

Even though many plants in this region are dependent on the fire, they cannot survive a fire with incredible intensity and heat. When the time between fires increases the vegetation has more time to grow which will mean more fuel for the fire when it does occur. One would think the obvious logic would be that more fuel means higher intensity and higher temperature. Even though many researchers have come to that conclusion there are also some who oppose that theory. One study investigating the relationship between the fuel and the fire concluded that the age of the fuel had very little effect on the fire intensity (Johnson, Keeley et al).

The same study claims that fire weather conditions play a more important role than the time between fires and that the severity of the fires are much due to the climate change more than the build-up of biomass.

The chaparral is the largest biome in Southern California but as mentioned before, there are several more present. On higher altitudes one can find broadleaf forests and conifer forests. In these forests there has been an increase in both frequency and severity of fires in recent time. The severity of the fires in the forest cannot fairly be blamed on the fire suppression since the frequency here has increased. According to the research this change is mainly due to the change in climate. The severity of the forest fires cause problems such "as post-fire erosion, stream sedimentation, nutrient cycling, carbon sequestration and natural forest regeneration processes" (Crimmins, Miller et al).

Conclusion

The four research papers I reviewed all took the current fire management in consideration. Three out of the four stated that the suppression of fires cause negative impact on the vegetation. This because increased time between the fires allows the biomass to grow which fuels the fires to higher intensity levels. It seems to me as though there always will be a struggle between the human protection and what is best for the wildlife. Most of the fire protection and management in Southern California are focused more on the chaparral than on the forest areas. Since the chaparral has a higher abundance of species resilient to fires than the forests do, it seems like it would be better to focus the management towards the forest. This however is very unlikely to happen since the human safety comes before the protection of the ecosystem. To me it seems like frequent fires in smaller capacity would be best in order to keep the current species of the area. A further question to ask oneself would be if it is possible to keep the vegetation unchanged with or without fire management. With the climate change constantly increasing the length of the fire season and with an increasing human population it seems like not much can keep the fire patterns to what they once were. Something which might inevitably lead to a change in the biome and the individual species' fate.

Work cited

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