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California Air Resources Board
1001 I Street
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Re: Comments to California 2030 Natural and Working Lands Climate Change Implementation Plan Concept Paper

This letter is in response to the *California 2030 Natural and Working Lands Climate Change Implementation Plan – Concept Paper (NWL Plan)* and scoping meeting held in Sacramento on May 18, 2018.

The ongoing work of the California Air Resources Board, Natural Resources Agency and Department of Food & Agriculture to develop and implement the NWL Plan will help the State meet its goals for climate change and also promote land resilience. Although the San Diego River Conservancy (Conservancy) was included as an implementing agency for 4 proposed management activities (Land Protection, Soil Conservation on Cultivated Lands, Riparian Restoration and Urban Forest Expansion), to maximize regional potential, the Conservancy should be an implementing agency for:

- Management Practices on Forest Lands – Understory Clearing
- Management Practices on Forest Lands – Forest Area Expansion/ reforestation
- Ecological Restoration – Mountain Meadow Restoration
- Ecological Restoration – Oak Woodland Restoration

The Conservancy requests reconsideration for inclusion in those additional categories listed above because more funding is needed to address dead, dying, diseased and/ or infested trees, remove non-native plants that have converted land, and re-establish meadows, forests and oak woodlands to improve forest system health and prevent severe wildfires.

Introduction

In San Diego, mild temperatures and precipitation promote abundant vegetation growth, however; in the summer, biomass accumulates, dries out and creates fuel. When fuel load is ignited, large areas of valuable habitat burn. Factors like climate change, drought, human activity, high winds and urban sprawl contribute to California's growing fire-prone landscape.

The catastrophic Cedar Fire in 2003 burned 273,246 acres (over 13% of San Diego County) in total, destroying 2,820 buildings, killing 15 people and ***decimating approximately 209,118 acres (75%) of the San Diego River watershed*** which resulted in $1.3 billion in damages. It is the second largest wildfire in California history behind the 2017 Thomas Fire (281,893 acres). The Cedar Fire scorched habitat in the middle and upper watershed of the San Diego River including public land owned by State Parks (Cuyamaca Rancho State Park and Anza-Borrego Desert State Park), Cleveland National Forest, Native American Indian reservations, City of San Diego and San Diego County, City of Santee, and Poway.

The following maps illustrate vegetation mortality following the Cedar Fire (Figure 1), the footprint of the fire with an overlay of San Diego River watershed (Figure 2) and jurisdictions located within the watershed (Figure 3).

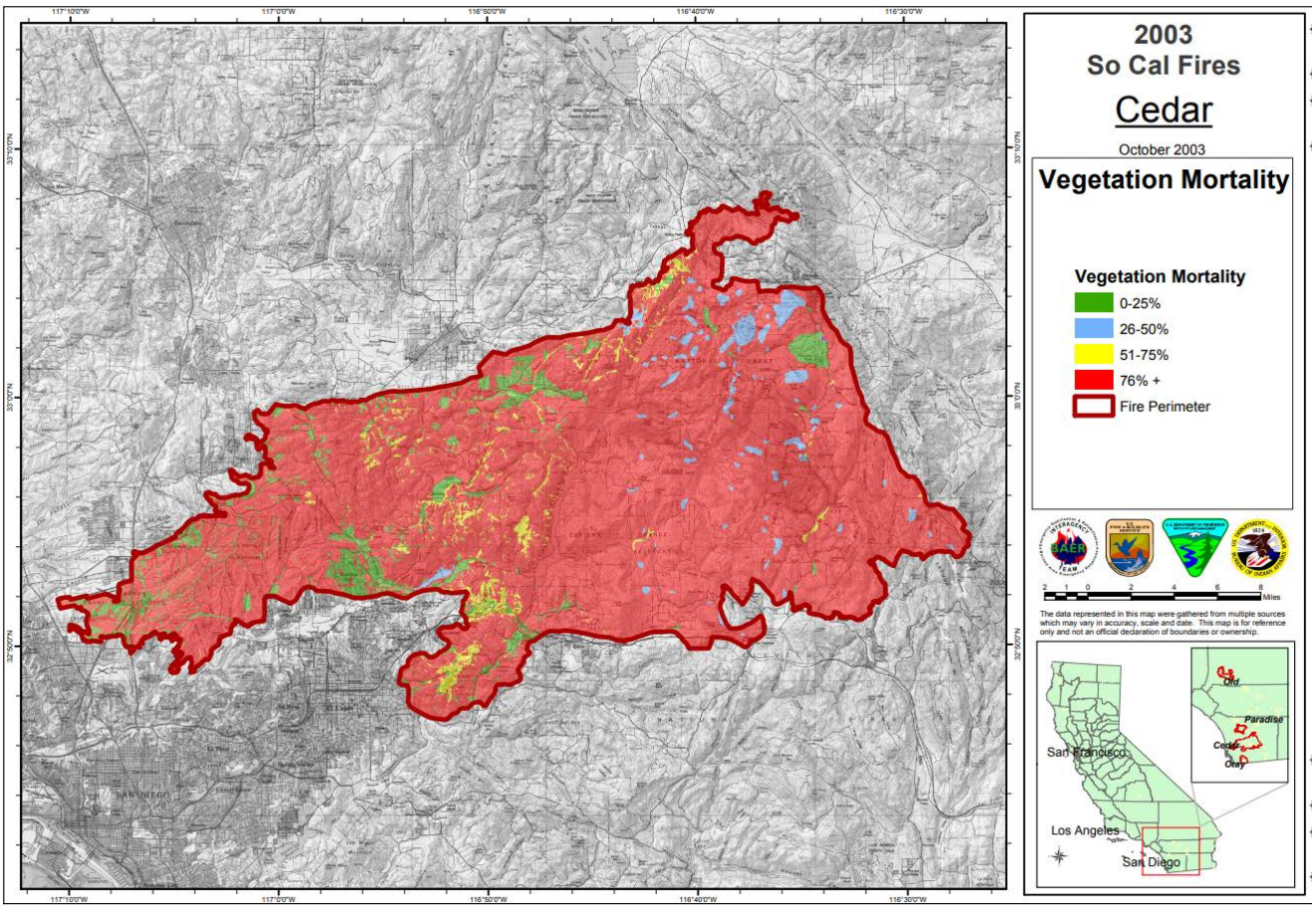
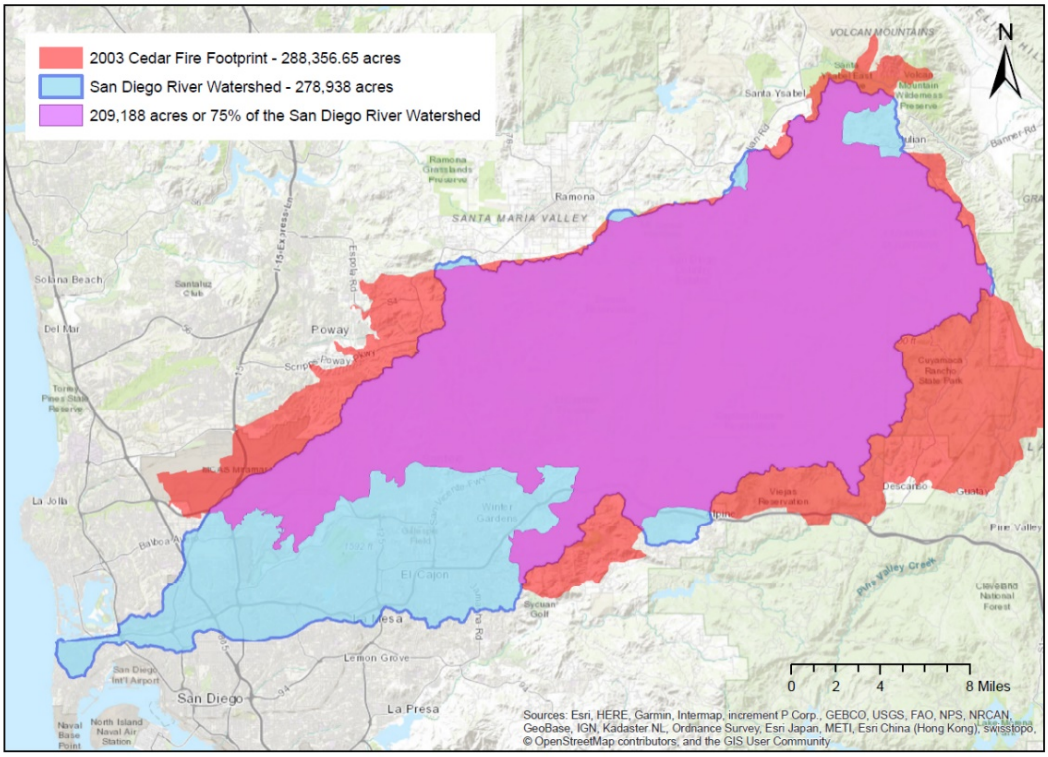


Figure 1. The greatest damage, in excess of 90%, of the total drainage area in each habitat was to Mixed Conifer Forest, Oak Woodlands, Freshwater Marsh's/Mountain Meadows/Vernal Pools, Chaparral, and Coastal Sage Scrubs. This sensitive habitat includes open space, wildlife corridors and waterways impacted by the Cedar Fire which are still recovering.



San Diego River Conservancy. June 14, 2018. Data from archiveDRP, 3/31/2017. USGS GeoMAC, USGS, USFS.

Figure 2. As of 2018, the Cedar Fire is the second most destructive wildfire on record in California.

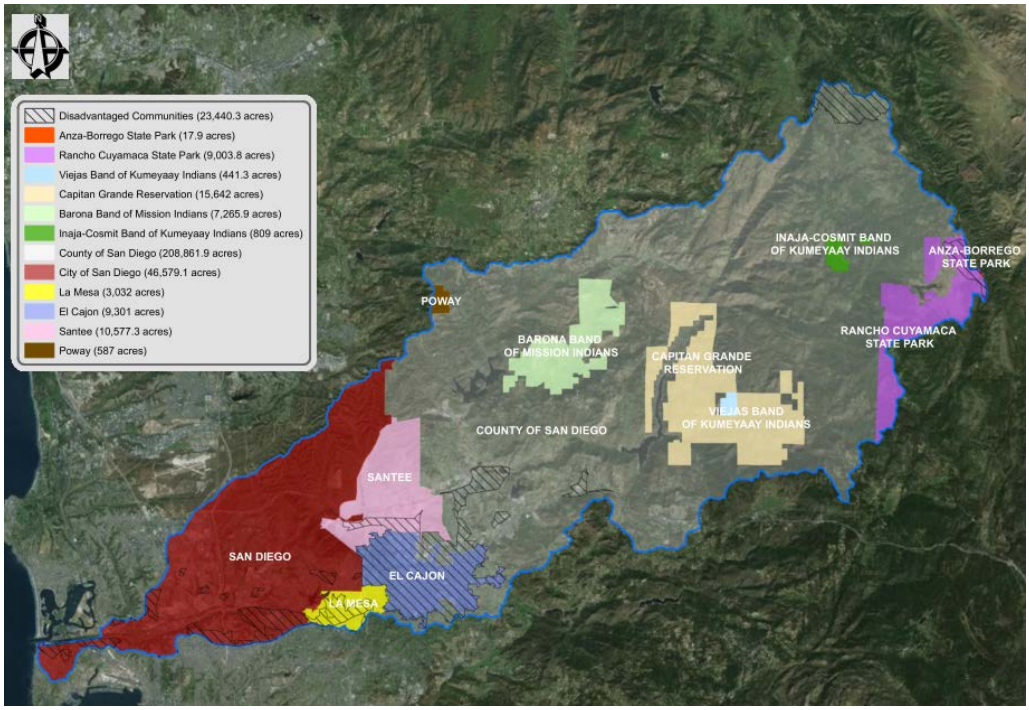


Figure 3. Local partners include but are not limited to the Resource Conservation District of Greater San Diego County, Fire Safe Council of San Diego County, San Diego County Fire Chief's Association, USFS

(Cleveland National Forest), Natural Resources Conservation Service, City of San Diego, San Diego County, California Tribal Nations and other non-profit organizations.

Figures 4 and 5: Left: Cedar Fire 2003, Right: 15 years later there remains many burned pine trees still standing in the San Diego River watershed.

Other severe fires have impacted lands located in the upper watershed including Cuyamaca Rancho State Park, Cleveland Nation Forest and 3 tribal reservations. The 2007 Witch Creek Fire burned over 240,207 acres in San Diego County eventually merging with the Guejito Fire leading to the largest evacuation in San Diego County of 500,000 people and resulted in $1.3 billion in damages. The Witch Creek Fire was the second-largest of the 2007 California wildfire season. As of 2018, the Witch Fire is the fifth most destructive wildfire on record in California.

After these wildfires, there was a tremendous loss of vegetation. Exposed soils left hillsides vulnerable to erosion, water runoff increased and sediments moved downstream and damaged riparian habitat or filled reservoirs putting endangered species and community water supplies at heightened risk.

The Conservancy is in a position with local partners to implement effective forestry practices to address erosion, carbon sequestration, storm water runoff reduction, wildlife habitat preservation and restoration, water conservation, healthy forests and meadows, climate change and remove dead and dying trees. The longer-term restoration and rehabilitation efforts will restore riparian areas and improve forest and meadow health in the San Diego River watershed.

In the following sections, the Conservancy will explain additional benefits forest land management and ecological restoration will have if implemented.

MANAGEMENT PRACTICES ON FOREST LANDS

Understory Clearing

Post-fire vegetation is usually dominated by herbs, shrubs and non-native re-sprouts, with some oak species. In some cases the landscape may return to its former climax community; however, in other cases, exotic plant species out-compete native plants for resources. This is called a type-conversion change[i] which occurred in the upper watershed of the San Diego River. Postfire vegetation surveys indicated Palmer Lilac increased from 3% to 31% and the cover of non-native annual grasses rose from 3% to 40%[ii] outcompeting native vegetation.

Invasive non-native vegetation impacts native ecosystems by changing the fire regime. If fire frequency or intensity are changed to encourage the dominance of invasive plants, an "invasive plant – fire regime cycle" will be established. This is difficult to reverse. In Western North America, cheatgrass has increased fire frequency to the point that some native species cannot recover. Giant reed (*Arundo donax*) increases vertical continuity in fires and changes surface fires into crown fires.

To support this activity, the Conservancy developed an invasive non-native plant control program and obtained the necessary permits to remove invasive non-native vegetation in the San Diego River watershed. As of June 2018, the Conservancy has removed and treated over 200+ acres. The removal of non-native plants improves the watershed's ability to function but also makes unanticipated forest fires manageable.

Forest Area Expansion/ Reforestation

After the Cedar Fire, conifer mortality in the Cuyamaca Rancho State Park (CRSP) was enormous resulting in low seed cone survival. ***A total of 28,109 acres of oak forest and woodland vegetation, 19,937 acres of coniferous forest, and 3,669 acres of cypress forest were burned*** (fn 1, page). Litter and duff layers were burned down to the mineral soil which resulted in disturbance of soil structure, nutrients and microbes (Ibid, page 5).

The Cedar Fire and subsequent Witch Fire in 2007 wiped out more than half of the mixed conifer in San Diego County, according to park documents. CRSP saw the worst of it. Before the fire, "conifers covered about 40% of the park", in pine-oak woodlands and mixed conifer forest, Mike Puzzo, Environmental Scientist with the California Department of Parks and Recreation said. All but a few stands were incinerated.
The re-establishment of mixed conifer forest will help to control erosion and protect water quality. Another important benefit of the reforestation project will be atmospheric carbon sequestration as the forest recovers[iii] . As of 2013 in CRSP, crews replanted 2,530 acres – about a tenth of the park. That's a small portion of the former forest, but they hope it will be the starting point for recovery. Nonetheless, the ecological aftermath of the Cedar Fire may not be known for a century. "If we're successful with the reforestation project, an area like this will have mature Coulter and Jeffrey Pines, and their seeds will eventually disperse," said Puzzo.

Prior to the 1940s, there were indications that an extensive Pinyon Pine Forest existed in eastern San Diego County. Currently, there are approximately 8,100 acres of Pinyon juniper woodland in San Diego County, but 12,000 acres of Juniper habitat has been lost. In the 1940s, a large fire burned through the area and destroyed the tree canopy. Pines were decimated and the forest did not recover. It is imperative to begin re-establishing and expanding healthy forests in southern California, managing them and a strong reminder to learn from the past.

ECOLOGICAL RESTORATION

Mountain Meadow Restoration

The purpose of meadow restoration is to replenish the health and biodiversity of the mountain meadow regions. Mountain meadows are located within the San Diego River watershed, are key habitats for many animal species. Mountain meadows, in particular, are key habitats for many animal species because they provide water and shade during the dry summer season. Implementation would address degraded meadows in the San Diego River watershed will be enhanced to provide increased benefits for wildlife, fish and people.

Restoring Mountain meadows is an important part of the post fire restoration process to improve ecosystem functions. Restoration practices produce immediate changes in habitat and are connected to outcomes: ground water levels are raised, streams recharged, and mountain meadow habitat enhanced. In restored areas wildlife readily colonize restored sites, and population increases over time. Meadow restoration benefits also include increase sustained summer water flows; mitigate effects of changing habitats; improve foraging, decrease flooding, decrease sediment load, increase biological diversity in the systems and protect Native American cultural resources and sacred sites and view sheds.

As an implementing agency, the Conservancy works with its partners to improve watershed health through meadow restoration that complements or amplifies restoration of fire scars on the land. This would be accomplished through improved management practices addressing habitat restoration, land and wetland restoration, water quality, instream riparian restoration, and restoring hydrology.

The San Diego Biological Resource Researchers of the San Diego Fire Recovery Network produced an observational summary report of affected flora and fauna in the 2003 wildfires. Several butterfly species were impacted by loss of habitat that provided their required host plants. These butterfly species include: Harbison dun skipper, Hermes copper, Thornes hairstreak, Quino checkerspot butterfly, and Laguna Mountains skipper. Loss of habitat is also a challenge for many bird species. Impacted riparian bird species include the southwestern willow flycatcher and the least Bell's vireo. Impacted coastal sage scrub/chaparral/grassland mosaic bird species include the California gnatcatcher, Rufous-crowned sparrow and the greater roadrunner. Raptor species of concern include the California Spotted owl, Bald Eagle,

Golden Eagle, and the Burrowing Owl. Impacted wetland bird species include the Light-footed clapper rail and Belding's savannah sparrow.[iv]

Oak Woodland Restoration

In CRSP prior to the Cedar Fire, the Cuyamaca Mountains stands consisted of open cover of Coulter pine, black oak, canyon oak, Engelmann oak, coast live oak, and scattered cover of woody shrubs, buckthorn and various types of manzanita. (Minnick page 504). A total of ***28,109 acres*** of oak forest and woodland vegetation were incinerated as a result of the Cedar Fire.

During the Cedar Fire, oak groves lost most of their foliar canopy and due to drought-stressed conditions, no leaves were left as a result. The San Diego Biological Resource Researchers of the San Diego Fire Recovery Network produced an observational summary report of affected flora and fauna in the 2003 wildfires. The researchers noted the oak woodland and oak forest are generally fire resistant, but intense heat killed drought-stressed oaks. Few old growth coniferous forest survived intact on the Cuyamaca Mountains likely due to hot crown fires created by undergrowth, trees affected by bark beetle death and competition for water. (San Diego Biological Resource Researchers, 2003)

Don Butz, President of the San Diego County Fire Chief's Association and Chairman of the Fire Safe Council of San Diego stated if provided $2,000,000 in funds they "could immediately apply forestry practices to thin out dead wood, prevent fuel load accumulation, limb up trees and trim new branches in order to prevent overgrowth of vegetation drying out to create fuel. These forestry practices are vital to protect view sheds near inhabited areas, parks, campgrounds, trails and around homes."

Conclusion

Fifteen years after the Cedar Fire, and subsequent wildfires, the forests in the upper watershed of the San Diego River are still recovering. The Colorado Desert District of California State Parks is engaged in a reforestation project, but more funds are needed to restore the land. The CRSP embarked on a reforestation project designed to restore the park's diverse native forests. The reforestation work consists of planting approximately 1,000,000 seedlings across 10% of the park lands in strategically located areas. Through maturation and seed dispersal, these seedlings will promote restoration of the conifer forests over time resulting in conditions favorable for rare and sensitive species critical habitat, increased recreational values for Southern California residents and visitors, and improved air quality through carbon sequestration and storage (fn 2, page 4). Since 2007, the Conservancy has been restoring native habitats under its invasive non-native removal and control program.

Rehabilitation and restoration are long-term processes that focus on repairing natural resource damages caused by a fire can take many years. Forestry practices address restoration of habitat includes planting trees, re-establishing native species, repairing damage to facilities

such as buildings, campgrounds, and fences, restoring habitats and removing invasive non-native plants.

The Cedar Fire in 2003 burned **273,246** acres and the land is still in recovery and needs additional funding and other resources to protect, restore and remove dead or dying trees and other vegetation located in Cleveland National Forest and Cuyamaca Rancho State Park and other open space areas.

The Conservancy has experience implementing projects to restore land within the San Diego River watershed in partnership with local agencies and non-profits. If the Conservancy is approved for implementation of Understory Clearing, Forest Area Expansion/ reforestation, Mountain Meadow Restoration, Oak Woodland Restoration the Conservancy would be able to work with its partners to develop projects that address forest sustainability, meadow restoration, carbon sequestration, rehabilitation of wildlife habitat, healthy watersheds, water quality and supply, healthy communities, and climate change and resiliency.

Success in implementing the NWL Plan and meeting California's climate goals depend on empowering interested parties to pursue sequestration opportunities, and by supporting new and existing collaborations that advance diversified, landscape-scale efforts to rehabilitate, restore and increase canopy cover.

Thank you.
Sincerely,

Julia L Richards
Executive Officer
San Diego River Conservancy

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[i] "Wildfire Preparedness and Recovery in San Diego County- A Review and Analysis White Paper of Data and Research Studies Relevant to Wildfire" Farm and Home Advisor's Office, University of California Cooperative Extension, Spring 2007, Page 14

[ii] Rancho Cuyamaca State Park Reforestation Project, Annual Report 2010-2011

[iii] http://www.sandiegouniontribune.com/news/environment/sdut-sprouting-from-the-cinders-2013oct27-htmlstory.html

[iv] "Wildfire Preparedness and Recovery in San Diego County- A Review and Analysis White Paper of Data and Research Studies Relevant to Wildfire" Farm and Home Advisor's Office, University of California Cooperative Extension, Spring 2007, Page 31