



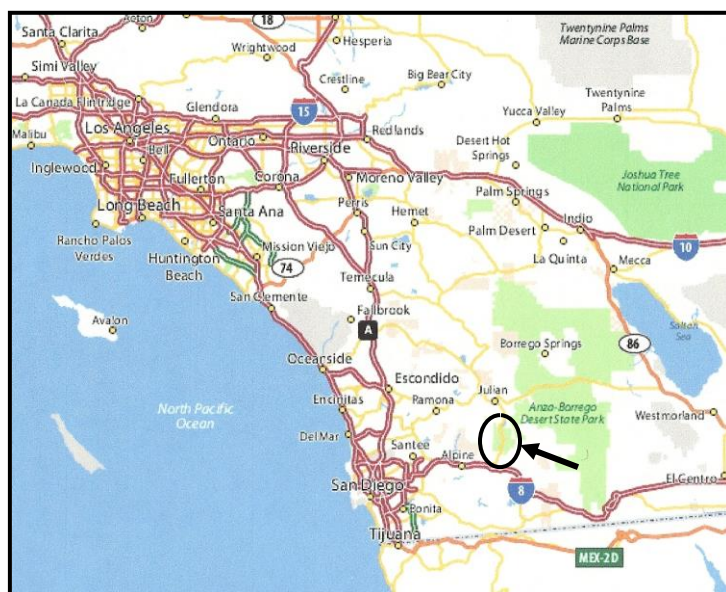
Cuyamaca Rancho State Park Reforestation Project

Project Description: In the fall of 2003, the Cedar Fire burned over 24,000 acres of the Cuyamaca Rancho State Park (CRSP) with a fire so severe that conifer species experienced greater than 95% mortality. This catastrophic fire also resulted in widespread destruction of the seed bank and the cone-producing forest canopy. As a result, only small amounts of the naturally regenerated mixed conifer forest have been observed. Post-fire vegetation is dominated by herbs, shrubs and re-sprouting oak species and there is a possibility that without active reforestation, site conversion to shade-intolerant brush and exotic annuals could become permanent. In 2007, the Colorado Desert District of California State Parks initiated a mixed conifer forest restoration project to re-establish native conifer trees in CRSP. The project consists of planting 2,530 acres of former forest lands in a series of polygons that will become centers for seed dispersal, and are expected to restore the larger conifer forest. Initial seedling densities and ongoing forest management practices are expected to reduce the future chance of catastrophic, habitat type-conversion wildfires.



*Inspecting seedlings on Middle Peak
one year after planting*

Project Location: Cuyamaca Rancho State Park is located 40 miles east of San Diego on Highway 79 in San Diego County, California. The park is situated within the Peninsular Range of mountains with elevations that range between 3,400 feet and 6,500 feet. Vegetation in the park is a mix of grassland, Chaparral, oak woodland, mixed conifer and hardwood forests (Coulter pine, canyon live oak, black oak) and coniferous forests (sugar pine, incense cedar, Jeffrey pine). Coniferous forests dominated the eastern and the northern aspects in the higher elevations prior to the Cedar Fire. The park averages over 400,000 total visitors per year. An additional 16,000 schoolchildren come through the park, most through the onsite Cuyamaca Outdoor School. The developed areas of the park include over 160 campsites, hiking, biking, and equestrian trails, the Cuyamaca Outdoor School campus, nine permanent, one seasonal residence, and one historic house which is not yet open to the public.



2003 Cedar Fire: In October of 2003, the Cedar Fire burned over 270,686 acres in Southern California including almost the entire Cuyamaca Rancho State Park. This was the largest recorded fire in California as measured by fire perimeter maps which have been used to document the extent of burned areas since the early 1900's. Between 2002 and 2007, over 51% of the coniferous forest habitat in San Diego County was destroyed by wildfire. The mixed conifer forest in CRSP has been widely studied, both pre- and post-fire and California State Parks environmental scientists are in a unique position to provide important data on the restoration of this important ecosystem which supports a diversity of species.



View from Middle Peak as the 2003 Cedar Fire approaches Cuyamaca Rancho State Park

Project Activities: Project activities started in fall of 2007 with planning, GIS mapping and site preparation by California State Parks and CAL FIRE employees for two pilot planting areas. Through February of 2013, 1,200 acres have been planted with approximately 350,000 mixed conifer seedlings. Planting takes place during January and February of each year because these months provide the weather conditions which are most favorable for seedling establishment and survival in Southern California's arid mountainous region.

Biological monitoring conducted by park staff and conservation biology students from the University of San Diego show the survival rate of those seedlings over the past two years at about a 70% survival, and in some places, as high as 90%.



Planting 2012

The project uses 100% native species with a composition of species based on historical species surveys. The overall target mix is 65% Jeffrey pine (*Pinus jeffreyi*), 15% Coulter pine (*Pinus coulteri*), 8% sugar pine (*Pinus lambertiana*), 5% incense cedar (*Calocedrus decurrens*), and 7% white fir (*Abies concolor*).

The project team completes a two to three year sequence of tasks prior to planting. These tasks include seed collection, site selection, botanical, avian and archaeological surveys, seedling procurement, site preparation, seedling delivery and storage, planting, seedling protection, and monitoring.

Co-Benefits: In the absence of the reforestation activities, the ceanothus vegetative cover is expected to continue to dominate the forest area for the foreseeable future. Restored coniferous forest habitat in the park will provide important protected areas for a wide variety of native mammal and bird species which are experiencing strong and continuous development pressure. Coniferous forest habitat is critical to forest dwelling species such as the red-breasted sapsucker, red-breasted nuthatch, and golden-crowned kinglet. Reforestation is necessary for preventing the spread of invasive weeds and reducing erosion risks, protecting watershed function, archaeological sites, botanical reserves and the recreational capacity of the park. The project is pioneering a new model of investing in climate benefits and ecosystems which has attracted interest from a broad range of educational institutions. Ongoing research includes studies of seedling survival and the role of ceanothus in soil restoration. University of San Diego, San Diego State, and University of California at Riverside, are among institutions supporting restoration-related research.



Carbon Offset Quantity and Accounting: In November 2009, State Parks listed the project with the Climate Action Reserve (Reserve), a non-profit public benefit corporation that serves as a voluntary greenhouse gas registry to protect, encourage, and promote early actions to reduce greenhouse gas emissions. The project became the first reforestation project and the first project on public lands to be listed with the Reserve. Between July 2011 and May 2012, Environmental Services Inc. (ESI), completed third party verification activities of the project for registration with the Reserve. On May 11, 2012, ESI submitted their final report, without any qualifications or limiting conditions, verifying that the project meets the requirements of the Reserve's Forest Project Protocol. The climate benefits include the ability to reduce atmospheric carbon dioxide at a rate of approximately 1.2 metric tons per acre per year and the potential storage of 120 metric tonnes of carbon dioxide equivalent per acre.



Awards: In December, 2010 The Ash Center for Democratic Governance and Innovation at the John F. Kennedy School of Government, Harvard University, selected the Cuyamaca Rancho State Park Reforestation project for its newly-created Bright Ideas program. The "Bright Ideas" is an award intended to highlight innovative government programs. During the spring of 2010 the Cuyamaca Rancho State Park Reforestation Project received the CAL FIRE Director's partnership award for demonstrating the ability of state agencies to be creative in identifying efforts that are complementary to more than one agency's mission.

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