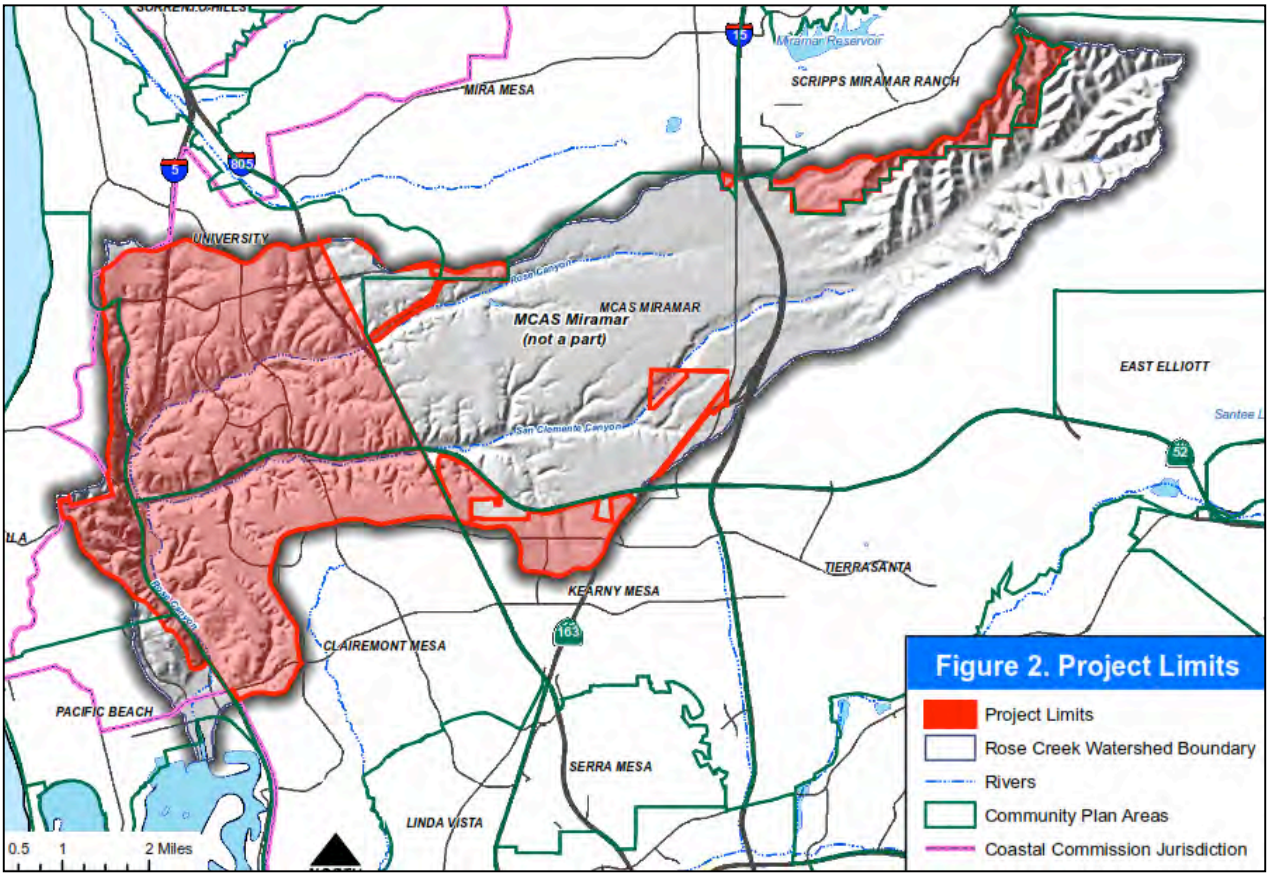
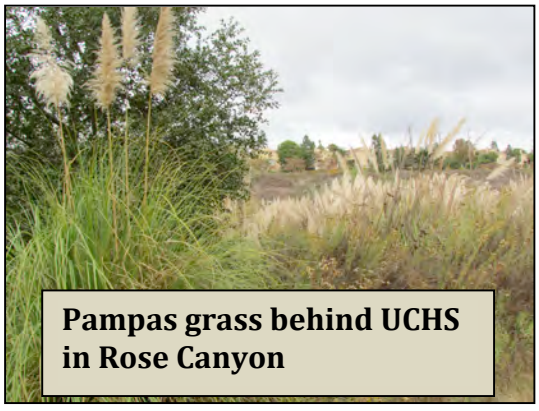
University City High School Native Plant Restoration Project

The Chaparral Lands Conservancy (Conservancy)[1] has received a grant and a private donation to undertake invasive plant control, including the removal of non-native trees like eucalyptus, in parts of the Rose Creek Watershed, including at University City High School (UCHS). The Rose Creek Watershed begins on MCAS Miramar and ends where Rose Creek meets the ocean in Mission Bay.



Rose Creek Watershed Invasive Non-Native Plant Control Project Area Map

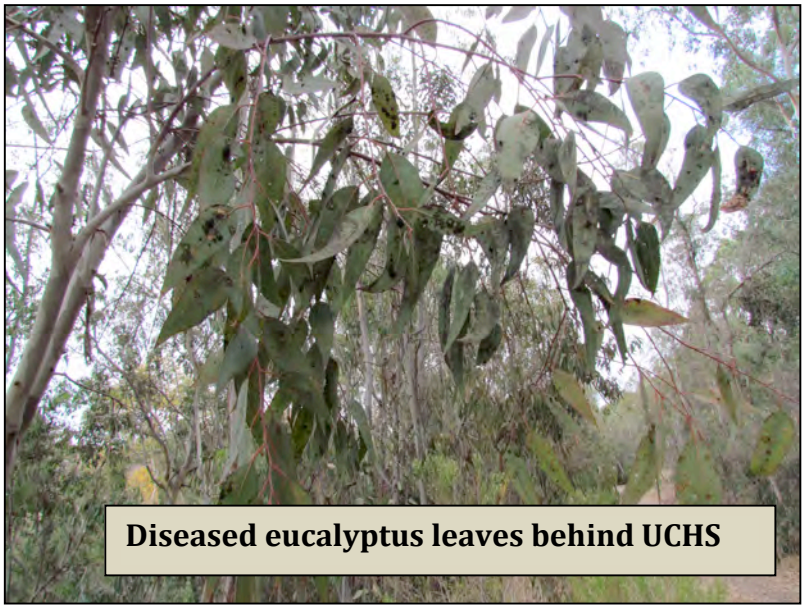
Invasive plants like non-native Pampas grass and non-native trees like eucalyptus displace native plants and animals and can increase the risk of fire and flooding in our creeks and canyons, including Rose and San Clemente (Marian Bear Memorial Park) Canyons.



Pampas grass behind UCHS in Rose Canyon

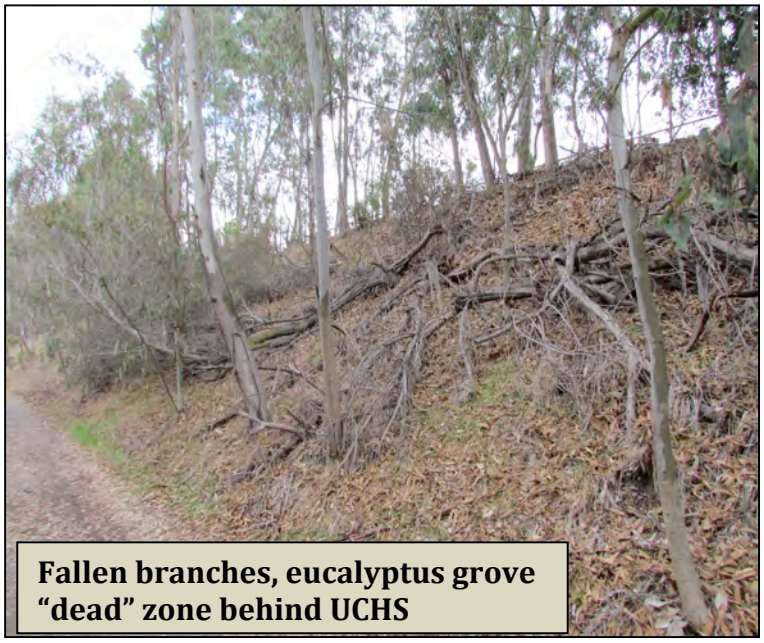
[1] www.chaparralconservancy.org

Additionally, eucalyptus suppresses the growth of other plants and of soil bacteria that are beneficial to native plants. This creates "dead zones" where there is limited diversity of native species.



Diseased eucalyptus leaves behind UCHS

In some cases the non-native eucalyptus trees have been weakened by the lerp pysllid wasp. Psyllids feed by sucking plant juices out of the leaves, causing serious leaf drop. This weakens the trees and makes them more susceptible to other pests. Branches die and fall off the trees, causing a threat to humans. The immature form of the wasps (the nymphs) secrete a waxy protective cover called a lerp. They also secrete large amounts of sticky honeydew on the leaves, which results in blackened foliage due to the growth of sooty mold.



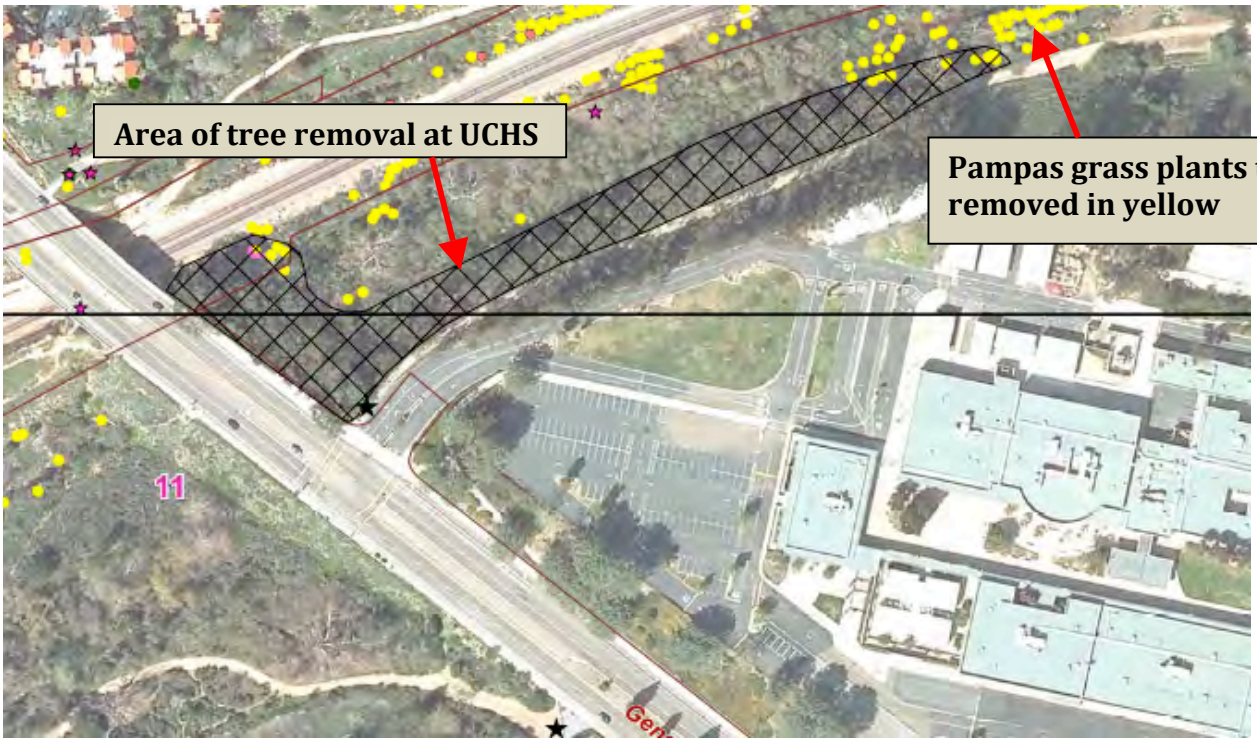
Fallen branches, eucalyptus grove "dead" zone behind UCHS

The Conservancy's control methods and products used have been approved by State and local regulators such as the U.S. Army Corps of Engineers, California Department of Fish and Game and the City of San Diego. Herbicides are designed for application near streams and are similar to Roundup, which you may use in your garden.

As part of a comprehensive plan to control invasives throughout the watershed, starting in the winter of 2012, the Conservancy's contractor, RECON Environmental[2], will remove eucalyptus trees and other non-native invasive plants located on the north slope of UCHS, below the access road and extending down into Rose Creek. Over 1,000 eucalyptus trees, most less than 6" in diameter will be removed from school property in the first phase. **All**

[2] www.reconenvironmental.com

eucalyptus trees below the road will be removed. Eucalyptus trees above the road will be retained until a later phase of the project. No work will be done during school hours.



Trees will be cut, and some chipping of cut trees will occur on site with a machine similar to a 2,000 pound Rayco 6-inch RC6D or RC6DV or Vermeer 6-inch BC625 brush chipper. Chippings of all trees small enough to be chipped (less than six inches in diameter at breast height) will be spread on site in an upland area, while other larger trees will be felled with chain saws and cut into lengths shorter than 5 feet, so that they may be removed from the site by pushing upslope with a dozer or chained and pulled upslope with a winch. Additionally, pampas grass plants and other invasive plants on school grounds and adjacent to Rose Creek will receive treatment with herbicides applied with backpack sprayers.

RECON employee spraying Pampas grass in a drainage above Marian Bear Memorial Park (San Clemente Canyon). RECON employees are specially trained and certified to apply herbicides. A blue or green dye is added to the herbicide to mark treated plants. Treated plants may be re-treated in subsequent years or "reduced" by cutting dead plant materials to the ground.

How the Site will be Restored

In invasive plant control projects, native plants will begin to grow almost immediately, even without the addition of new plants, as soon as non-native invasive plants are removed and access to sunlight is restored. The UCHS Native Plant Restoration Project will speed up the natural "recruitment" of the site by native plants by organizing students and community volunteers to plant native plants once the invasives have been removed.

UCHS "Roots and Shoots" students, Macky Forgey and Bridget Webb, planting an oak tree in Rose Canyon

This restoration project will be an amazing opportunity for UCHS students to monitor the changes in the slope and canyon after invasives control, applying science learned in the classroom. Students in Mrs. Howell's AP Environmental Science classes will create group research projects every spring and identify various hypotheses regarding rate of return of native shrubs after eucalyptus trees and pampas grass are removed. Control sites, where no plantings occur, will be compared to sites that receive plantings of different intensity. Over 900 UCHS students per year will participate in the restoration project.

Upon removal of the eucalyptus trees along the north slope of the school property, native plants will be planted, in phases, by UCHS students and community volunteers under the guidance of RECON and with the help of the Friends of Rose Canyon. The first plantings, of coast live oak acorns will occur in the spring of 2013. Students will monitor the rate of acorn sprouting and measure the degree to which native plants begin to emerge at the site.

Oak tree emerging from acorn in Rose

In the fall of 2013, students and community members will begin to plant native plants that have been grown in RECON's native plant nursery from seeds collected in Rose Canyon. Students and volunteers, with guidance from RECON and the Friends of Rose Canyon, will plant and water these new plants, while measuring and monitoring their growth rate. Besides the containers of native plants, students will also grow and plant "willow stakes" from willows in Rose Canyon on school property.

"This is applied conservation biology that most students won't normally get to do until college or even graduate school. Better yet, it only requires a ten minute walk from their UCHS classroom to the restoration site! "

UCHS AP Environmental Science Teacher, Tara Howell

Mrs. Howell is also designing curriculum to support Biology and Earth Science classes, which will have the opportunity to make observations and assist in the restoration of native plants. The goal is to provide the UCHS Science Department the ability to connect the classroom science with true research experience outdoors. For UCHS students not involved in AP science classes, the UCHS Roots and Shoots Club will offer all UCHS students opportunities to participate in the restoration project at their school.

Some examples of monitoring the students may do include:

Transect plots:

Students will create defined fixed areas, called transect plots, within which plant and animal characteristics will be measured. Students will create experiments within plots to measure different features such as soil samples to observe changes in pH, Nitrogen, Phosphorus, and Potassium over time. In these plots, students will also measure animal species diversity before and after invasive plants have been removed.

Stanford University doctoral student William Anderegg and a colleague use transect plots to study Aspen groves in Colorado stressed by drought. UCHS students will set up similar plots to study changes in Rose Canyon after invasives control. The sizes of the plots will be determined by the research questions students choose to study.

Banded Argiope Spider in Rose Canyon

For example, Ms. Howell's students have observed that the number of spiders is much lower under eucalyptus leaf litter than under sycamore leaf litter. Using fixed transect plots, students will measure how/if spider populations change after invasive trees and plants are removed and native plants restored.

Time lapse photography:

Students will create a chronological sequence of photos and data to evaluate the overall changes that occur at the site. They will take a photo record of the site and use the skills learned in the classroom by applying PASCO PASPORT probeware such as Water Quality Sensors (measure temperature, conductivity, pH/ISE/ORP and dissolved oxygen), Weather Sensor (measures barometric pressure, relative altitude, absolute and relative humidity, dew point, and temperature), Carbon Dioxide Gas Sensor (measures carbon dioxide concentration in parts per million), and Oxygen Gas Sensor (accurately measures oxygen concentration in atmosphere or in enclosed spaces). This will allow the students to measure changes in the landscape over time.

The Antarctic Heritage Trust has set up remote time lapse cameras to study penguin colonies and climate change. UCHS students will also use time lapse cameras to study changes in Rose Canyon after implementation of invasives control.

Photo Gallery of 2010-12
UCHS Roots and Shoots Willow Planting

January – UCHS students cut willow stakes from native willow trees in Rose Canyon. Megan Gramlich shows a willow stake she cut and rooted at home. After soaking for a few weeks, willows begin to sprout and are planted.

February - A month later, stakes show new growth

March - Soon, new branches

August, thriving