

Mill Creek Forest Restoration and Monitoring Activities for 2015

Del Norte Coast Redwoods State Park

Final Report for the Wildlife Conservation Board Forest Conservation Grant

From February 15 – November 30 of 2015, California State Parks (CSP) completed treatment on 7 acres of unnaturally dense forests (Figure 1). The areas were treated with CSP crews, which is a departure from past years where private contractors had been used to implement the treatments. The 2015 areas required a more complex prescription that could be implemented more effectively using Park personnel with backgrounds in forest ecology. CSP also delineated boundaries and completed rare plant surveys on an additional 370 acres. The completion of this preliminary work will make CSP more prepared to treat these 370 acres when funding allows. Rare plant surveys must be conducted at the appropriate time of year, so completing them ahead of time can prevent delays in future implementation.

During the same time period, CSP completed entering data and began analysis on the forest monitoring project. The monitoring is designed to compare the effectiveness of four treatments (including control, no treatment areas) over the long term. The data includes 60 plots that were measured immediately after treatment and then again four years later (see figures 2 - 5 for examples). CSP is in the process of assessing the effectiveness of the treatments at promoting growth, forest health, and structural complexity. The main questions we will answer are:

(i) “what were the outcomes of each treatment, in terms of species composition, structural diversity, canopy cover, understory light, plant species diversity, and fuel load from cut wood?”

(ii) “what was the response, in terms of growth and probability of bear damage, among individual tree species following each treatment across the range of sites and stands at Mill Creek?”

We expect to identify differences in response and damage among the numerous tree and plant species and range of conditions present throughout the study area. We can accordingly make recommendations for adaptive management to guide restoration of thousands of acres of degraded young forest at Mill Creek.

During this fourth and final year of the grant, CSP was able to complete all of the deliverables including treating a total of 1206 acres of overly dense forests. This is 6 acres over the minimum 1200 acres discussed in the agreement and is consistent with the plan discussed in last year’s report to WCB. CSP also managed to complete all monitoring scheduled during the grant period. Parks will continue to search for means to treat more highly altered forests and remeasure the monitoring plots over the longer-term.

Lessons Learned

California State Parks started forest restoration treatments under this grant in 2012, the same year that we began treating areas that were slightly younger than had been treated in previous years. Previous restoration projects treated areas planted between 1980 and 1993, and most areas treated under this grant were planted between 1994 and 2000. We were hopeful that the younger, smaller trees would allow an increased productivity rate, but couldn't be sure if the increased brush (not yet shaded out by the trees) would eliminate any time saved. Fortunately, the brush did not slow the crews significantly and overall productivity increased by 50% in the younger forests. The localized release prescriptions continued to be most efficient treatment method, even in the younger age class.

Treatment of younger stands presented CDPR with unexpected challenges. Many of the areas treated were planted by the previous owners shortly before the property was sold to State Parks and before the timber company began controlling vegetation that would compete with recently planted seedlings. As a result of this, many of the youngest forests had a lot of hardwoods (mostly alders and tanoaks), and some had fewer conifers (many of the planted conifers had died). State Parks had to design new prescriptions for these areas that would get crews to evaluate each conifer and determine if hardwoods and other vegetation needed to be cut to allow the most desirable trees to survive and grow vigorously. Contract crews were able to conduct the new prescriptions effectively, but we learned that in more complex cases, it was better to have Park staff with a stronger background in forest ecology do the thinning.

Monitoring of treated stands is an essential tool. Our monitoring efforts continue to give us insights into the most efficient ways to restore young, degraded forests. Our early efforts experimented with aggressive prescriptions designed to prolong vigorous growth and reduce the need to retreat forests for as long as possible. Avoiding the need to retreat is especially important when roads are being removed, making future access more expensive. The aggressive prescriptions reduced tree densities more than is typical under restoration treatments, but also had unintended consequences. The lower tree densities encouraged more natural tree regeneration and more bear damage. Natural tree regeneration may lead to overcrowded forests that once again need thinning. Small amounts of bear damage is a great way to introduce decadence into young forests – something that often takes a long time to develop naturally, and improves and diversify habitat. If the bear damage is too severe and kills too many trees, then it can delay a forest's progression towards late-seral conditions. It will take many more years of monitoring these young forests to answer these and other questions

Early experimental prescriptions were a learning laboratory. State Parks is confident that the early experimental prescriptions are more effective than not treating overly dense forests, but the continued monitoring has helped us improve the effectiveness of prescriptions. For example we no longer thin redwood sprouts coming off of an individual stump. While the sprouts are overly dense, they are reasonably good at self-thinning and the extra stems provide a cushion against heavy bear damage. The bears may damage or even kill some trees in a clump, but chances are good that many will remain healthy. Not treating the stumps has also helped increase productivity rates and added variability to the forest – a win win for our restoration efforts.

Effective grants administration is an essential support to strong program delivery. The work also took place during a dynamic period in State Park history. Parks had many people retire or transfer during grant period while the Transformation Team began revising many aspects of State Park operations. These factors slowed the invoicing process, but by the end of the grant the process was much improved. We look forward to the Transformation Team's efforts to continue to improve Park operations.

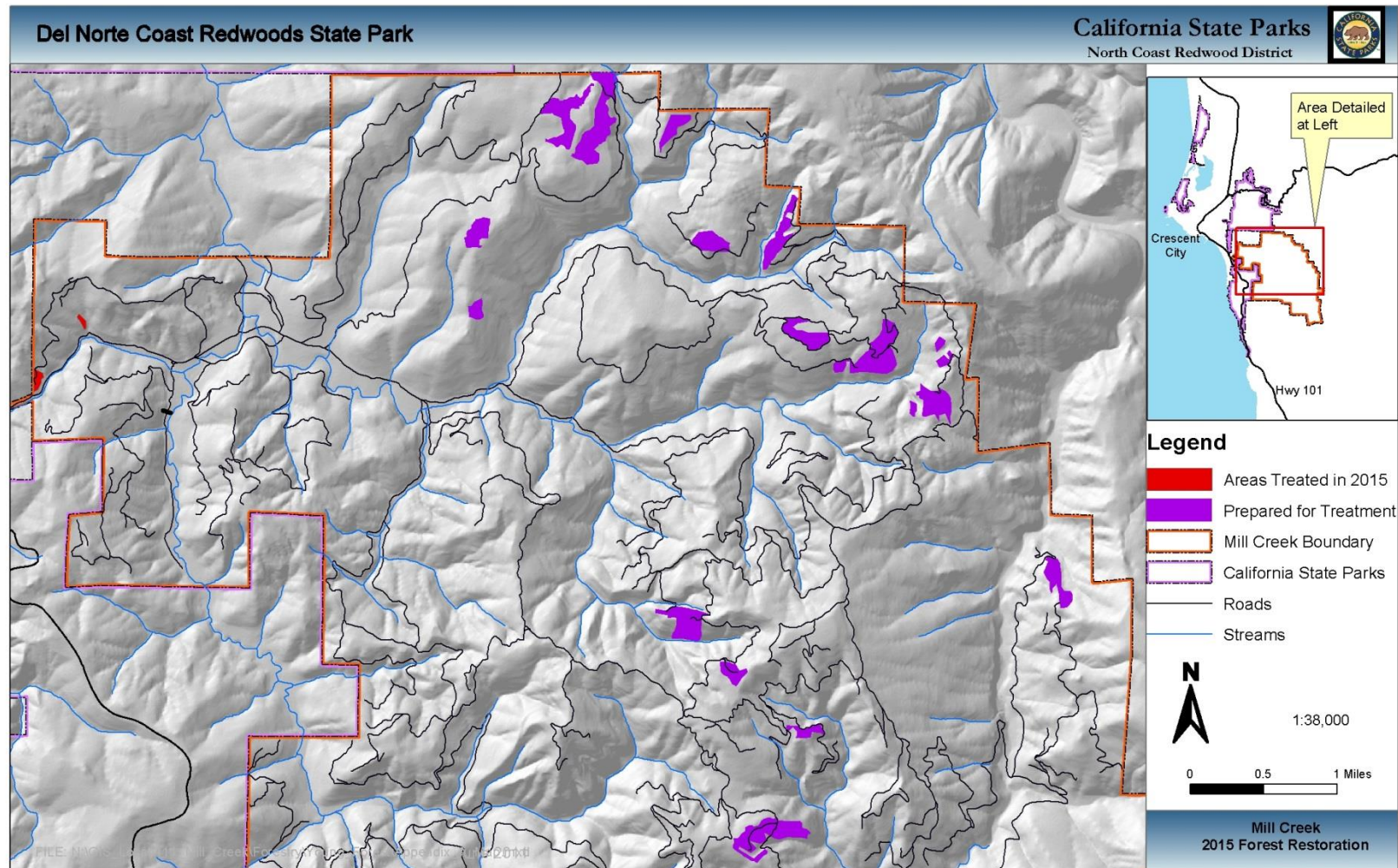


Figure 1. Areas treated and areas where preliminary work was conducted in 2015 under the Forest Conservation Grant

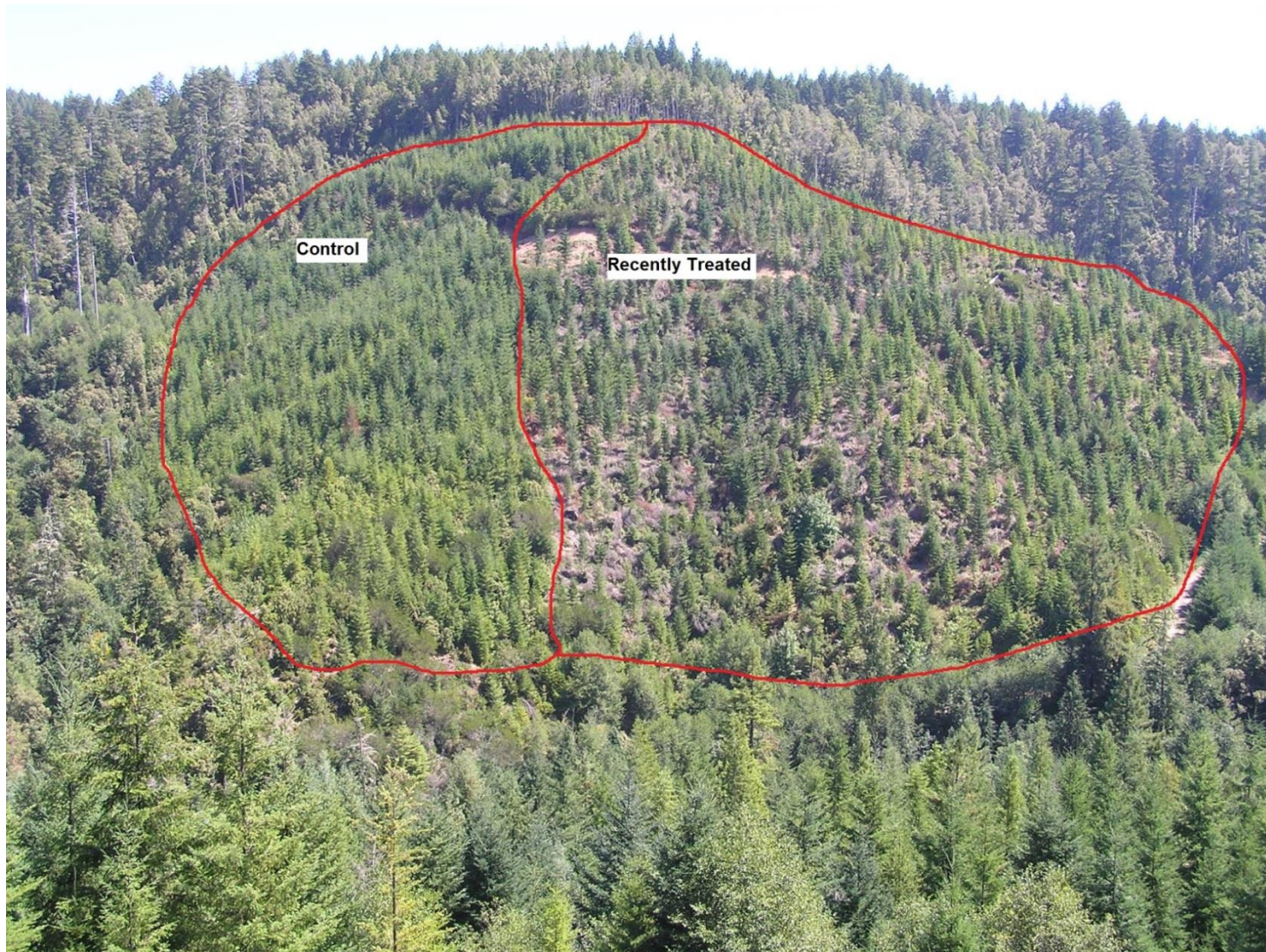


Figure 2. An area being monitored to compare the effects of treatments on forest development. The treated area was similar to the control before treatment.



Figure 3. A photo of the same area five years after treatment. Monitoring plots will help us determine the most effective treatments for improving forest conditions.

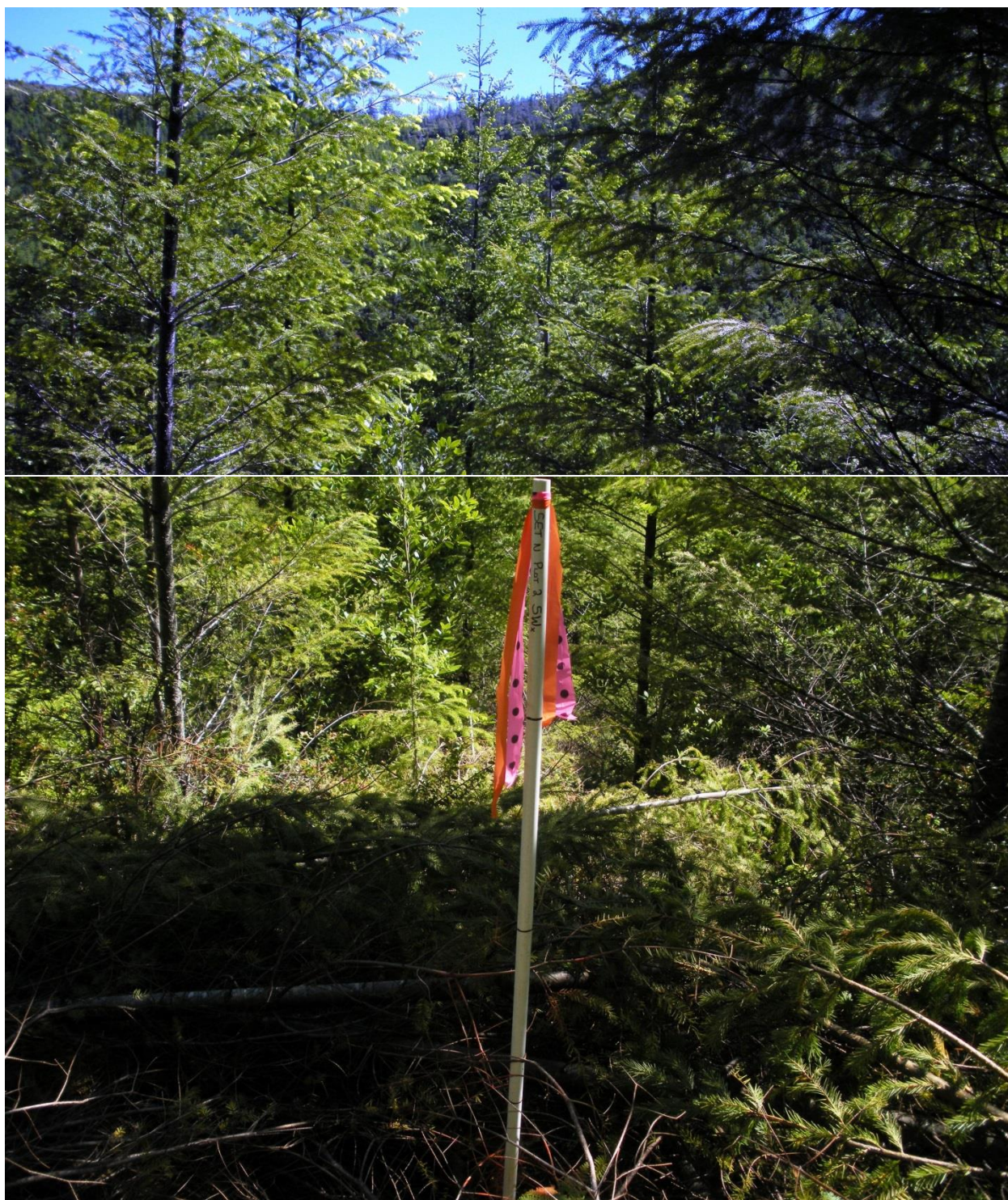


Figure 4. Photo of one of the monitoring plot corners taken just after treatment.



Figure 5. Photo of the same monitoring plot taken four years after treatment. Note the trees are larger, the slash is decomposing and the understory vegetation is growing.