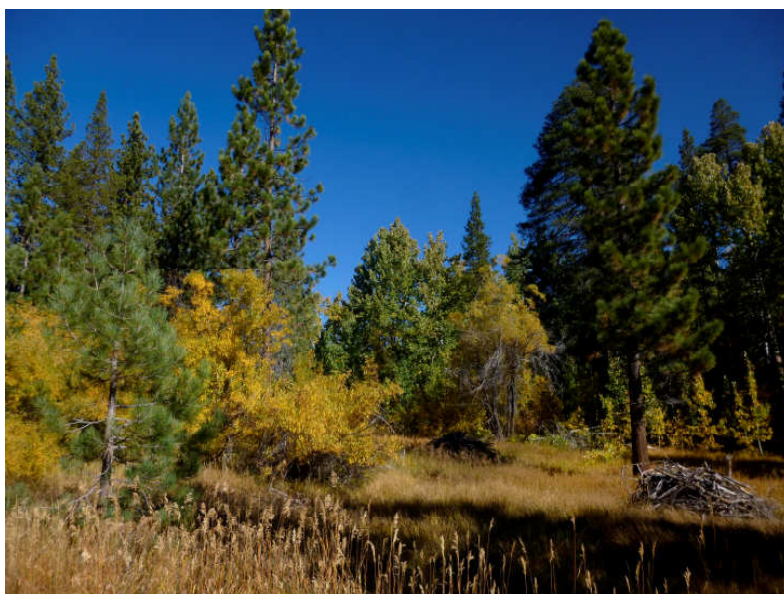


CARNELIAN WOODS

Forest Health

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Introduction

This report is based on observations made primarily in late summer of 2023. In early August I met with Celia Barry and others as we walked around the upper half of Carnelian Creek. I also visited the property in September and October. Overall the forest is in good health and the benefits of past projects are easily seen. Since the last report in 2020 there has been significant work done. The Carnelian Creek project of 2022 removed dead and decadent wood from the riparian area and reduced brush in the areas of open forest. Precipitation over the three winters has ranged from very low in 2021, to near average in 2022, and record breaking in 2023. The forest has fared well over this time with no storm damage and no summer fires.

Existing Conditions

The overstory forest (comprised mostly of Jeffrey pine, sugar pine and white fir) is in good health. A couple small pockets of dead trees were observed but no large-scale mortality that

would be associated with disease or insect infestation. The forest has been thinned effectively to meet fire prevention standards and future large tree removal will likely be limited to only dead trees. Tree density is greatest on the upper stand at the end of Silver Pine Drive and the area between the Clubhouse and the lake. The crown closure is similar to that of a shaded fuelbreak where the trees have separation but the shade keeps brush from thriving. Less densely stocked areas such as the hill across from the Clubhouse and at the end of Sahara Drive are very open and covered with much more brush cover.

Trees - conifers:

- ◆ Jeffrey pine. These trees are in great shape, showing no disease or insect problems. I have noticed slightly more beetle kill in the Jeffrey pines this summer in my travels around the Tahoe region but nothing concerning.
- ◆ Sugar pine. Most of these pines are in the upper area behind the gate. I found a couple dead trees along the road but only an isolated area. Some trees still exhibit signs of blister rust in their upper crowns. This was observed in 2020 and fortunately the trees don't look much worse today. The blister rust cycle requires gooseberry brush (currants) as an alternate host and these shrubs are not abundant on the property.
- ◆ White fir. As usual most of the new found dead trees are firs, but not as widespread as past years. Many areas in the region have seen large fir mortality recently, especially the west shore of Lake Tahoe. There are pockets of dead firs by the Carnelian Woods Avenue gate and farther upstream by the Par Course stations 7 and 8. More firs are declining near the eastern townhouses, possibly due to the stresses of growing around the pavement and buildings. Just past the clubhouse and up the hill there still is some mistletoe present but it does not appear to be spreading due to the open nature of the stand. These spores travel only by wind and gravity. The trees already affected exhibit dead branches and will continue to struggle.
- ◆ Lodgepole pine & Incense cedar. There are relatively few of these trees on the property, mainly along the creek area and upstream along the dirt road. They appear to be healthy.

Trees – riparian: The Carnelian Creek area extends from the tennis courts upstream to the crossing of the dirt Carnelian Woods Avenue and beyond. This area was opened up by the removal of dead wood and broken stems. As expected, the willows have sprouted vigorously.

- ◆ Aspen. The aspen grove is just upstream from the tennis courts. It appears healthy and seems to be slowly expanding as evidenced by many young stems within in the grove and along the edges.
- ◆ Willows. At least three types of willow are present in the wetland. These trees naturally have dead branches within the clusters and larger stems may be damaged by heavy snow.
- ◆ Alder. The alder grows in clumps in and around the willows along the stream edge. They are found around the dirt road crossing and upstream.

Regeneration: Conifer regeneration continues to be scattered and light. The pines prefer to become established in direct sunlight whereas the firs will regenerate in shady locations. The recent brush reduction project removed small trees growing underneath the large trees to eliminate ladder fuels. Relatively few sapling-sized trees are present in a timber stand that is mature and somewhat even-aged.

Brush:

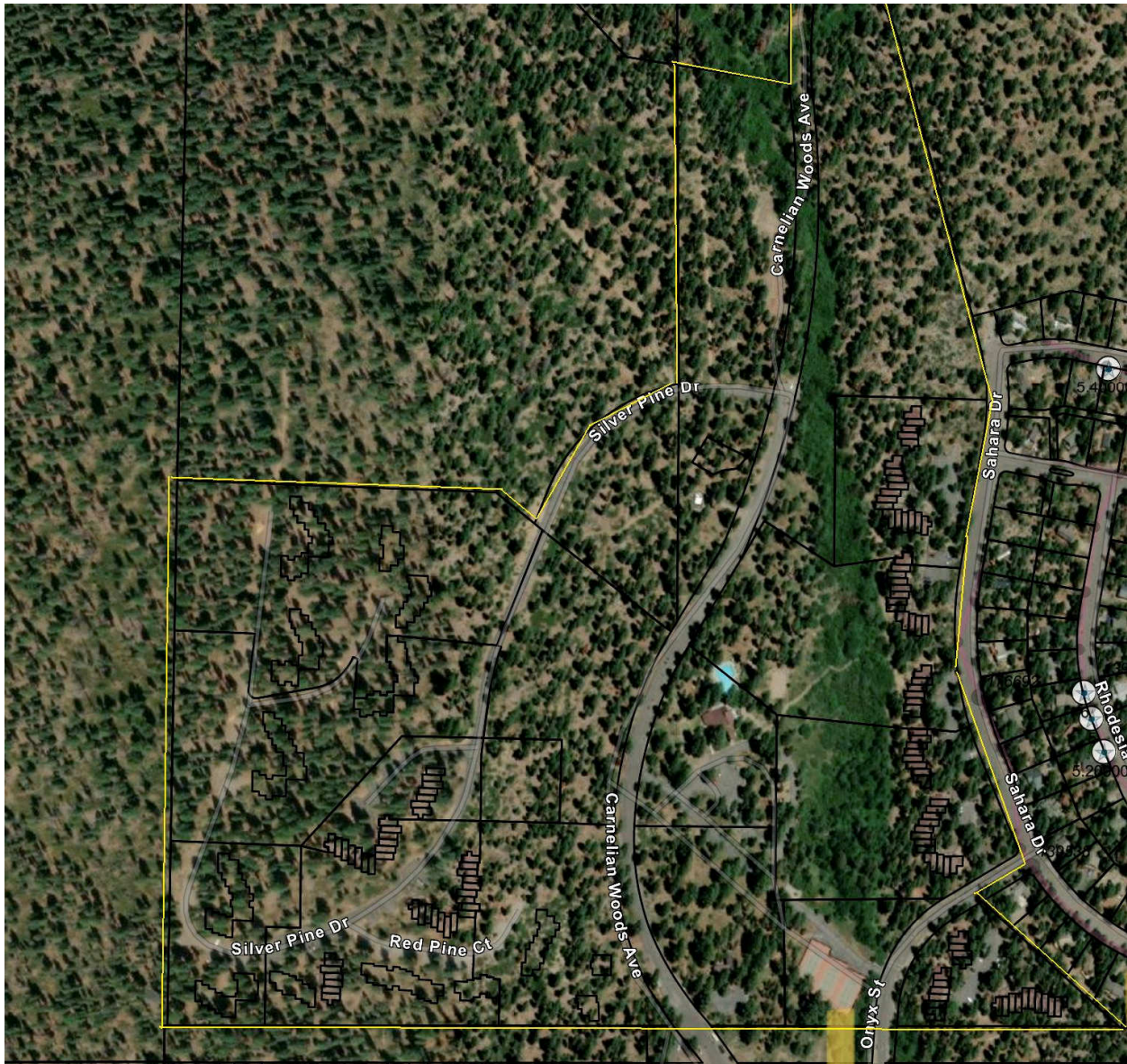
- ◆ Manzanita. These are generally scattered in sunny locations and are desirable as long as they don't become dense brush fields. Higher density is common on south facing slopes such as those below Units 120-135.
- ◆ Snow brush ceanothus. Most abundant on sunny open slopes and thrives on the hill above Carnelian Woods Avenue.
- ◆ Huckleberry oak and bush chinquapin. Both are similar in appearance but the oak is more common. Capable of growing to a very large shrub with a tough woody stem.
- ◆ Mahala mat and pinemat manzanita. These are ground cover species that are common in the upper forest and along Carnelian Woods Avenue. They are beneficial by filling openings and keeping other brush from becoming established.

Recommendations

- The final work of the stream project will be to burn the piles. Some of the smaller piles that were primarily brush were flattened by the snowpack. These could remain in place if visually acceptable and would act as a ground cover while they decay. Piles could also be chipped to avoid burning but possibly at an added cost.
- Growth of smaller conifers should be encouraged where they are located in openings. Desirable leave (keep) trees should be flagged for retention before future brush reduction projects since these smaller trees are scarce and to avoid confusion with workers.
- Following winter, special attention should be paid to any pines that were broken or lost large branches from storms. Material should be chipped or otherwise treated to dry and avoid attracting pine beetles.
- Monitor brush that is growing back. The abundant soil moisture has encouraged sprouting but maybe the shorter summer led to less overall growth. Brush will grow faster in different areas. With most of the forest in a healthy stable state, future work will likely concentrate on brush control.
- Dead trees should be cut in areas where they present a hazard to roads, trails and buildings. Groups were noted near Units 108-113 and the entrance to Units 59-76. Other scattered dead trees exist and should be cut when they could strike any buildings. Falling the trees is easier and less dangerous when the wood has not decayed. Cutting dead trees in the forest is better done periodically rather than letting them accumulate in order to reduce fuels and the need for large projects. Limbs and as much of the tops as possible should be chipped to avoid increased ground fuels.

PHOTO GALLERY

Aerial photo (date unknown) shows the tree spacing. Brush is visible as lighter shaded green between trees. This is noticeable on property off to the west (left). It will be interesting to see recent aerial photos as they are updated to base layers such as ones used in Google Maps.





Snowbrush ceanothus – left side is original shrub, right side was cut and resprouted.



Huckleberry oak – vigorous regrowth in the foreground.



2020



2023 – after brush work

Sugar pine on right with blister rust. Top = 2020 Bottom = 2023

