Thank you for having me out to look at the situation with your trees. I had two additional visits in the general area regarding the same issue. The assessments are all resulting in the same outcome. Below is the long and short of the discoloration you are seeing in your trees.

What you are observing is an abiotic condition, meaning not an insect or disease, that typically results from one or more environmental influences. This condition is technically called Winter Desiccation in general, however can be also termed Frost Damage, Winter Burn (kill), Red Belt, or Winter Drying depending on the suspected or observed source of impact. It is a form of tree injury which stresses and damages the needles in conifer (evergreen) trees and can range from light (partial tree injury) to extreme (full tree) damage depending on the type, duration, and degree of severity regarding the winter conditions the trees were exposed to. The two primary culprits involved are 1) a lack of adequate winter moisture in the trees and/or 2) exposure to very cold winter temperatures and/or wind currents. I believe you are seeing the combined impacts of both on those trees at TVW.

With regard to #1 above, evergreens lose moisture through needles to the surrounding environment during the winter months. In order to stay healthy, the plant must replace this lost moisture by absorbing water through the roots. If the soil does not contain adequate water or if it is frozen (or both!) then tree will be stressed and usually expresses this with changes in needle color (like you are seeing). Our prolonged drought conditions or scant fall precipitation levels need to be considered here. In addition, #2 above, our area experienced at least two super cold weather events, resulting from Artic air currents dipping down to our area and hanging around for days. One of these was in December 2022 and the other in February. The temperatures during this time remained far below freezing in the daytime with nighttime temperature observed to be near or below 0 degrees Fahrenheit. In addition, wind chill temperatures reached the -15 to -25 degree F range and you know about it being windy! I also suspect, based on the similar elevation of several areas of impacted trees, located around the Cucharas river drainage, that at least one temperature inversion occurred as well which locked in the severe cold air mass and held it there for some time. The combined impacts of all the above, which all lead to basically the same outcome-namely desiccation, have resulted in significant tree stress and injury across a large area.

In short, your trees were basically stressed for adequate water and also freeze dried. Usually, this does not result in tree death and trees recover but are weakened for some time. Isolated trees, or trees growing within unique air current areas, can be impacted in their entirety and injured beyond the needles which can result in rapid decline and death. Again, this depends on the severity of the stressor mentioned above. Typically though, trees recover completely especially with adequate water.

Moving forward, you will likely observe color changes from the red-orange toward blond to brown. You might also see more trees expressing this injury due to later impacting winter events. The trees will

retain their needles for a few months then drop (cast) them. New needles will be sprouting from the branch tips so look for that. New needle sprouts should show up in the next month or so and the damaged needles will drop during the summer-fall. If possible, supplementary Spring watering for trees near homes will aid in quicker recovery from this injury and trees are best watered by drip irrigation at the 'drip-line' of the tree. The 'drip-line' area is roughly located in a circle underneath the furthest reach of the branches, not at the trunk. Slow watering, like drip irrigation, started in the morning hours is most effective. Lately in our area, because of prolonged drought, supplemental watering has become a common recommendation for many types of landscape trees with special emphasis on watering also during the fall and even during winter months when higher temperature and lack of precipitation is noted. For the trees out on the landscape we are at the whim of seasonal weather to provide adequate water for the most part but I do have some unique ideas regarding that, hold-overs from my conservation projects in the Sonoran Desert. Ask if interested in that.

Lastly, trees that have been impacted by these winter conditions are weakened, sometimes severely, which makes them potential targets for insect and diseases. Close monitoring of the trees is recommended so that prompt action can be taken, especially if signs of beetle activity are noted. Please visit our new CSFS site and especially explore the Insect and Disease section to learn more. The entire website is worthwhile to explore by the way. Here's the link for the Insects and Diseases page:

https://csfs.colostate.edu/forest-management/common-forest-insects-diseases/

Again, thank you for having me out and for your consistent Stewardship of your Forest.

Paul

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