

Town of Patagonia, AZ

Town Park

Briefly Examine various Trees within the Park & then Report

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On March 28th, 2011 Juan Barba and Cliff Hirsch met at the town park in Patagonia to look at the park trees. We had been authorized by the city to do a walkthrough and identify and map the various trees there as well as document visible and recognized tree problems. Root excavations were not conducted nor were trees climbed. No invasive techniques were used to identify decay nor were samples collected or sent for disease or insect analysis. This report constitutes the findings and recommendations of our exam.

BACKGROUND

This park has been a Patagonia mainstay and point of community pride for many decades. The analyzed area is bounded north and south by Naugle and McKeown avenues and east and west by 3rd and 4th avenues and unequally divided by Quiroga Lane. In recent years some of the trees have languished and are under-performing. The town would like to have a comprehensive snapshot of tree problems and guidelines for improving health of the trees in general as well as identifying common problems and potentially risky trees. Recommendations for improved vigor or tree removal for health or risk abatement were requested. Report information is general in nature, not aimed at specific trees but rather to improve the urban forest located there. Occasionally specific trees have been pinpointed.

ANALYSIS

The survey was begun at the northeast corner of the park, 3rd and Naugle avenues. A map is attached and the attached survey notes correspond to the map. Many of the tree species are repeated in the park, most of them grow well in this meso-climate (larger than a microclimate). Certain species are performing better than others. Each tree has been placed on the map and information from a rapid assessment has been correlated to the trees by the control number. The tree numbers were generated by the route of the inspection. Please refer to the accompanying map and notes for specific issues.

Neither tissue nor soil samples were obtained or sent for lab analysis. Tissue samples could be analyzed by lab for nutritional value or for disease problems. Soil analysis would have mainly been able to specify soil texture, acidity and nutritional levels. If any additional tests are deemed necessary by the town, samples can be collected and sent when authorized. At the time of the walkthrough many trees were still replacing leaves at the end of winter and had bare stems. Several trees were tested for twig life by checking for viable cambium. In general, disease and nutritional deficiencies did not appear to be universal defects.

But it did appear that inadequate water was an issue. Many of the re-greening trees showed stress related to water deficiency. None of the soils viewed during our visit were moist except in the butterfly garden on McKeown. Irrigation valves and spray heads were located in parts of the park. A snapshot of the park shows many of the unthrifty trees were near Naugle and Quiroga. Because of this area's struggling trees, soil was excavated in order to form an opinion of soil type and texture as well as a rough idea of moisture, compaction and structure. This was the only area excavated and may not

reflect the soil conditions of the entire park. There is a linear raised area near the middle of the park with an east/west axis. 2 spots were excavated in this area; one was off the rise, the other on the rise. Refer to the photo. Soil near Quiroga was bare and the nearby turf was of very poor quality. Delving into the ground slightly revealed an under layer comprised of rock chips covered with only a shallow layer of soil. This soil had coarse and fine textured particles as determined by feel but was very shallow, less than 3 inches. The rock chips were uniform in size although angular with sharp edges. It is our opinion that the rise and the area near it are comprised of material brought to stabilize a now obsolete rail bed that has now been slightly covered with soil and turf. The only other area of the park with noticeable bare soil is near the flagpole in an area that appears to support vehicular traffic.

Native soils are commonly compacted unless the sand or organic contents are high. Both excavated spots were difficult to penetrate and can be characterized as compacted. Vehicles driving on soil will also cause compaction. Compacted soils do not permit air to infiltrate. Oxygen is needed by roots for respiration and when limited causes roots to perform poorly or die. Compacted soils also inhibit percolation and infiltration of water allowing runoff and excessive evaporation without being available to tree roots, especially the deeper ones.

Mistletoe is a problem in the park in the susceptible trees such as ash and walnut and cottonwood. There are 2 disease fungi showing symptoms in park trees. Cytospora is creating dieback in the Cottonwood trees and Sooty Canker is killing branches in the Mulberries.

Culturally there are 2 issues other than insufficient water – mower damage and heading cuts. Mower damage is close to the ground in many of the trees and can set plant health back more than desirable. It was particularly obvious in the smaller trees where wounds can have a greater impact. Several of the large trees have been headed in large branches, a practice also called topping. Heading larger branches immediately reduces a tree's ability to photosynthesize and over a long term can contribute to major limb failures and internal decay which also reduces structural strength. Topping cuts are disfiguring and especially unappealing when trees are deciduous. Trees closer to McKeown were more often topped than those near Naugle.

RECOMMENDATIONS

The amount of irrigation water needs to be increased during the year, especially during the hot dry months. All portions of the park with a water delivery system should be watered by irrigation and those without should have irrigation added or be converted to plant material that can exist on natural rainfall and harvested water. There were various types of sprinkler heads throughout the park so a single water calculation is not possible. Many of the heads are rotors. Depending on the head maker, the size of the nozzle, the water pressure and the cleanliness of the equipment, an average percolation rate of could be near 1.0" per hour. This average may be off by 50% in either direction depending on the unknowns just stated. Using that 1.0 inch rate and estimating that the soil without

rock chips will be wetted 8" – 9" per inch of water applied, then the irrigation should be set to apply about 1 inch, or stated differently - set to run for about an hour each week.

Because of the slopes, soil compaction and lack of turf the system should be set to run each valve with 3 or 4 multiple starts, 15 – 20 minutes at a time rather than a single 1 hour setting. This will possibly increase the water usage in the park approximately 200% over current use. At a minimum, the zones in the northwest portion of the park where there are many large trees in decline should have 1" applied, the remainder of the park with healthier trees could have the volume reduced by a third, i.e., 2 starts of 20 minutes per week, and determine if that is adequate. When rain and then lower temperatures come, water cycles can be reduced or eliminated if enough precipitation is received.

In general the park appears to be maintained in a low risk condition with good visibility inhibiting criminal activities. Low limbs and heaved sidewalks should be corrected before park users are injured. #18, the pine tree with co dominance concerns should be pruned to reduce risk of branch failure. Large dead branches in any tree should be removed before branch failure. Assess the trees on 3 – 5 year cycles to identify and mitigate flawed or defective laterals.

The large cottonwood tree, #28 with advanced cytospora and extensive mistletoe should be removed. There is no Cytospora treatment, it will continue to decline and become very unsightly, and dead branches will fall, some may fall into the roadway. Large- Leaf Mistletoe (Phorodendron) should be pruned out of infected trees at least annually by removing small infected branches before it extends into the main stems or just the mistletoe branches if it has. Florel is a chemical treatment that is applied to existing mistletoe clumps that will kill and then leave dead clumps for a while in the crown. Sooty Canker can be managed by improved water and fertilizer delivery. There are no fertilizer recommendations for the park in general but trees with Sooty Canker should receive nitrogen fertilizer at labeled rates. Infected trees can then often outgrow this fungus and develop a healthy crown. It is difficult to reverse dieback when Cytospora has gained a foothold, cottonwood continues to decline and the dead branches killed by this fungus should be removed before they fall. Take measures to prevent continued mower damage by keeping grass away from tree trunks, by using mulch as a barrier, or by selective grass herbicides. Unnecessary vehicle traffic on soil areas should be stopped. Necessary vehicle traffic on soil areas should be minimized to prevent further compaction of soils. It appears that vehicles have been driving frequently in the area south and east of the Town Hall.