



Trees of Saint Charles Avenue

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Introduction

This survey of the tree stand on Saint Charles Avenue is a continuation of previous surveys first conducted by John Benton and John Adams in 1992. In this report, you will find a data analysis based on the findings from this survey and the previous four surveys. This report should be considered the next chapter of ongoing research. Our goal for each survey is to provide an accurate overview of the current existing conditions, state our observations with corresponding theories, and offer recommendations for the preservation of these historical trees.

Methods

The St. Charles Avenue stand begins at the intersection of St. Charles and Leak Avenue and proceeds to the end of the Avenue at Lee Circle. In 2018, all trees along the Avenue were evaluated and recorded. Data collection has remained consistent with the previous four surveys to provide comparable long-term results when considering tree species, size, and conditions.

For the purposes of this report, we extract our data using three methods:

1. **Tree Identification:** Trees are identified by species (shown as an abbreviation of the common name) and located by proximity to the nearest street address.
2. **Tree Size:** Trees are further evaluated by a diameter measurement taken at 4'6" from the ground.
3. **Tree Condition:** The overall condition of each tree was rated and scored on a 0-4 scale as "Excellent (4)," "Good (3)," "Fair (2)," "Poor (1)," or "Dead (0)". Afterwards these scores were averaged (mean average) and used to compare tree conditions across the entire population.
 - **Excellent – 4:** Trees that have a dense symmetrical canopy with evenly spaced limbs and healthy, dark green foliage. The tree trunk and surrounding surface roots show no signs of major decay. These trees show they have successfully adapted to their urban environment, and providing that no major changes occur, will continue to grow through its normal life expectancy.
 - **Good – 3:** Trees in this category differ from the "excellent" category by showing signs of minor isolated root and/or trunk damage, a girdling root system, and having an asymmetrical canopy.
 - **Fair – 2:** A tree in this category is in the beginning stages of decline. It displays an open canopy, isolated decline in some terminal limbs and major decay in the trunk and/or root area. Life expectancy for trees in this category may be reduced by as much as 30% to 50% of normal urban trees within the species. Curative measures may successfully reverse decline in these trees depending upon factors such as species, age, and site conditions.
 - **Poor – 1:** These trees show signs of major decline including sparse foliage, major declining/dead limbs, and severe trunk and/or root decay. In our opinion, these trees are in, or very close to, an irreversible state of decline.
 - **Dead – 0:** As the name implies, these trees are in such poor shape that we recommend removal and replacing with a young tree of the same or similar species.

Noticeable observations:

While conducting this survey, we observed and recorded noticeable conditions, including the presence or absence of termites, structural limb or trunk damage, noticeable root conditions resulting from construction damage or girdling roots, potential hazards, and others. This data was not always apparent in previous studies and should be viewed as supplemental information to bolster a general understanding of tree condition, but not as a consistent metric to analyze all notes generated.

Newly planted or replacement trees:

As previously mentioned, this survey included a new metric relying largely on data from previous surveys to identify newly planted trees. Trees that were not incorporated in the initial survey in 1992 were identified as “new trees” and recorded.

RESULTS

The following is a summary of the data collected with comparison analysis to data gathered in previous surveys.

Population and Species Break Down:

Southern Live Oaks (*Quercus virginiana*) make up the vast majority of trees within the St. Charles Avenue Stand. The proportion of live oaks relative to the total tree population of St. Charles Avenue Stand has increased every survey to what is close to a monoculture today. With 756 total live oaks surveyed in 2018, 95.4% of all trees along the Avenue are live oaks (see figure 1, figure 2 and table 1). This is the largest number of Live Oaks on the Avenue recorded. Other than live oak, the most common species that remain on St. Charles Avenue today include southern magnolia (*Magnolia grandiflora*) (11), a few lingering water oak (*Quercus nigra*) (6) and an assortment of less frequent palms and ornamental trees (19). Live oaks were also classified into “mature” and “newly planted” categories to provide distinction between trees that are still standing since the inception of this survey in 1992, and trees that have been subsequently planted. Currently there are 596 “mature” and 227 “newly planted” live oaks in the St. Charles Avenue stand.

Size of Live Oaks:

After analyzing the sizes of live oaks along St. Charles Avenue, we found that the majority of trees continue to shift, as expected, to larger size classes with the largest portion of 26.21%, currently measuring 30” - ≤ 36” in diameter at breast height (DBH). This shift has remained an expected trend since the 1992 survey, where the overall size of mature live oaks continues to increase. Thankfully, the number of extremely large 48”≤ DBH continues to increase in number, indicating that we are retaining our largest specimens (see figures 4 and 5).

Comparing to surveys conducted from 1992-2002, our recent studies show newly planted and smaller size class trees are occupying a more significant proportion of the total population of the Avenue stand. Trees with a DBH of 6”≤ increased from 3.73% of the population, recorded in 2002, to 13.33% of the population, recorded in 2009. The 2018 survey indicates that the majority of these trees have survived and grown to reach the 6” - 12”≤ size class representing 17.2% of the 2018 live oak population (figures 4 and 5). There still remains a considerable gap in live oak size classes of 12”-18”≤ and 18”-24”≤ failing to crest 15% in any of the recorded surveys. This gap in size class illustrates the risk involved with not replacing or replanting trees on a regular basis.

Condition of Live Oaks:

The condition of the live oaks have continued to improve on average since the advent of this survey (figure 3). The overall average condition has improved from a mean average of 2.6 (out of a possible 4.0) in 1992-2002 to a mean average of 2.9 in 2018. This year, 75.68% of all live oaks surveyed were either in “good” or “excellent” condition. This is the highest percentage of live oaks in “good” condition ever recorded (62%). We also compared condition scores between newly planted and mature trees. The newly planted trees (227 total) had an average condition of 3.0, a higher score than the 2.8 average condition of older trees (529 total). However, the mature specimens are still showing improvement from previous years, increasing from an average of 2.6 in 1992-2002 to the current 2.8 today. While the condition scores continue to increase, we recognize some of this improvement in average condition ratings could be due to the removal of trees in poor condition.

Formosan Termites:

Termite activity was determined by visually inspecting trees for any typical signs of activity, for example, the presence of intact mud tunnels. Formosan termites were observed in 14.1% (112 total trees) of St. Charles Avenue live oaks. 58% of infested trees (65 of the 112 total trees) also had significant trunk or limb damage (Table 2). Trees that had very old termite damage, typically in cavities from old trunk damage, were not recorded because there were no signs of recent activity.

DISCUSSION

The results of the 2018 survey show an increase in live oak population and overall condition. Newly planted trees are incorporating well into the stand, meanwhile trees that have been removed, have also been replaced. Since the 1992 survey, 227 trees have been planted and maintained on St. Charles Avenue. Plantings have gone a long way to providing a successive population of live oaks to replace mature trees that have been removed.

Failure to replace trees can have a significant impact on a street scape. The observed "gap," or relative infrequency, in size classes 12"-18"≤ and 18"-24"≤ indicates that any loss of mature trees would not be readily replaced by trees maturing in the near future. In the event of such a loss, the St. Charles Avenue would experience a significant "lag time" in re-establishing a similar canopy structure. The data clearly illustrates a need to continue active planting measures to ensure that mature trees have a viable canopy replacement whenever/wherever planting site and locations allow.

Bayou Tree Service's recommendations for the long-term care and preservation of live oaks are having a positive impact on St. Charles Avenue. We will base our future management decisions on an adaptive management strategy, where we regularly evaluate stand conditions and observe the effects/responses of our management's practices.

RECOMMENDATIONS

Community Involvement:

Community involvement has been one of the strongest forces in the positive steps we have made managing and protecting urban trees, and continues to be at the forefront of our management objectives. Without public backing, the management of urban trees is not possible. We emphasize that there is still room to improve education and public/community support for urban tree care. As this survey spans nearly three decades, it is imperative to note that there are new generations of citizens entering the community. It should be considered a priority that we engage and educate these individuals on the care and preservation of urban trees. Generating new ways to involve local schools and youth groups will be the best way to continue a foundation of support, and if possible, we would like to engage these groups in future plantings. It is our belief that planting a tree in a prominent location, such as St. Charles Avenue, can cultivate a more engaged citizenry.

Mitigating Construction Damage and Pre-Construction Planning:

Damage resulting from construction and infrastructure improvements continue to be the leading cause of decline and death of mature live oaks. Bayou Tree Service and arborists with New Orleans Parks and Parkways have worked together in developing the current tree health care specifications included in current City of New Orleans construction projects. Pre-Construction planning is an effective way to avoid unnecessary damage to trees. We recommend that a licensed arborist be consulted prior to any construction activities near valuable trees. During Pre-construction planning we want to gather those who will be involved in the construction process such as architects, builders, general contractors, and private owners to address potential risks to a tree and discuss the relevant tree health care specifications for a project. All members of the project should be aware of how their scope of work may impact a tree or trees and be willing to discuss potential alternatives that would improve tree survival. Specifications are based off the best available research in tree health care and extensive hands on experience mitigating damage to urban trees. Abiding by these specifications, we have improved the likelihood of tree survival during construction.

To ensure that we continue providing the best possible tree care it is imperative that we provide opportunities to educate ourselves and the community. Bayou Tree Service engages industry leaders and the community by sponsoring programs such as Jefferson Parish Tree School, hosting various "Lunch and Learn" events, and speaking to local community organization meetings.

Proactive Stand Management

Replacing Mature Trees:

On an annual basis, mature trees in poor condition need to be reviewed for possible removal and corresponding replacement locations should be found. The least ideal way of addressing the situation is to replace a mature tree post mortem because newly planted trees take decades to develop similar canopy structure of a mature specimen. Our survey shows that since the 2009 survey, there has been an increase in the number of newly planted trees. These plantings will help avoid creating a gap in size or canopy development when large trees are lost. Unfortunately there will be some unavoidable loss of significant trees; therefore, we must develop effective means of replacement.

Pruning and Maintenance:

The St. Charles Avenue stand is not a static system. There has been little development in how we regularly prune and maintain trees to address potential conflicts between trees and the urban environment. Trees are frequently damaged from vehicular traffic, and actions taken to reduce the possibility of significant damage to trees is rarely done proactively. More often, pruning occurs retroactively to mitigate construction or vehicle damage that has already damaged an individual tree. This is a problem for two reasons, it fails to address similar conflicts and issues in more than one tree, and it does not prevent significant injury in the first place. One of the most frequently recorded observations came from vehicular damage. This damage is highly detrimental to the health of the tree and in many cases avoidable. We suggest that a regular pruning cycle be investigated as possible preventative measure. Regular pruning is very important with the 227 newly planted trees where proper pruning will increase the structural integrity of trees, and reduce conflicts between persons and property.

Physical damage to the trunk or major limbs appears to be highly correlated to the presence of secondary stressors such as termites. 58% percent of all termite infestations observed in this survey were on live oaks with significant limb or trunk damage. Mitigation of any physical damage to trees on St. Charles Avenue should include a preventative termite treatment. By providing a chemical application or drenching of the soil surrounding damaged trees, we may successfully prevent additional stress on a damaged tree from termite infestation.

CONCLUSION

We still face many challenges with regard to caring for and protecting live oaks in the urban environment, chief among them is mitigating root, trunk, and branch damage from construction activities. Preconstruction planning has come a long way since our first survey concluded in 1992. Communication between contractors, Parks and Parkways, private individuals and licensed arborists has become constructive to all parties.

We have made this significant progress in the care and condition of the trees on St. Charles Avenue largely due to public support for our actions. We must build for the future with this regard. In the same way that we continue to plant new live oaks today to replace old mature trees, we must educate and involve the next generation of New Orleans youth. Few cities have the historical and cultural linkage to trees as New Orleans, and as tree care professionals we have a responsibility to ensure that attachment to urban trees stays intact for the next generation.

The St. Charles Avenue stand continues to improve. Practices regarding the care and preservation of trees have changed dramatically, hopefully with continued public support new live oaks will continue to be planted in high numbers and are able to thrive in the urban environment. These trees represent a significant investment in the future of St. Charles Avenue and planting should continue where locations allow. Termite infestations appear to be highly correlated to trunk and limb damage, proactive pruning and chemical applications should be considered the best means for reducing the number of infested trees and preventing further decline in damaged specimens. Overall, we feel optimistic for the future of St. Charles Avenue as well as the live oaks the line it. We look forward to watching them grow and opportunity to continue helping to sustain them in the future.

Summary of Recommendations and Conclusions

Immediate Actions

- Termite Treatment – Identify and treat the most active sites
- Continue annual fertilization of live oaks
- Continue to educate public and develop new outreach strategies – newsletters, tree schools, social media, advertisement, word of mouth etc.
- Identify and engage schools/youth in educational and replanting activities.
- Identify new planting locations for fall planting

Long-term Actions

- Develop a budget and matrix for pruning trees. Identify objectives, goals, and priorities for large scale pruning efforts.
- Create a program for treating termites following limb, trunk, or root damage.
- Identify long term management goals and objectives.

St. Charles Stand
2018 Species Composition by Percent

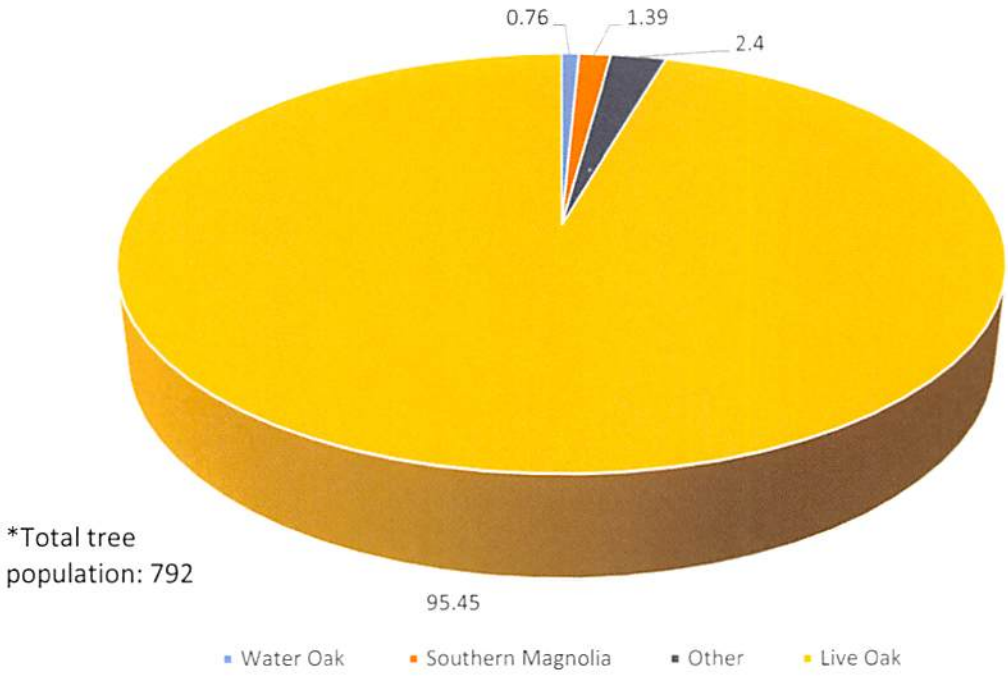
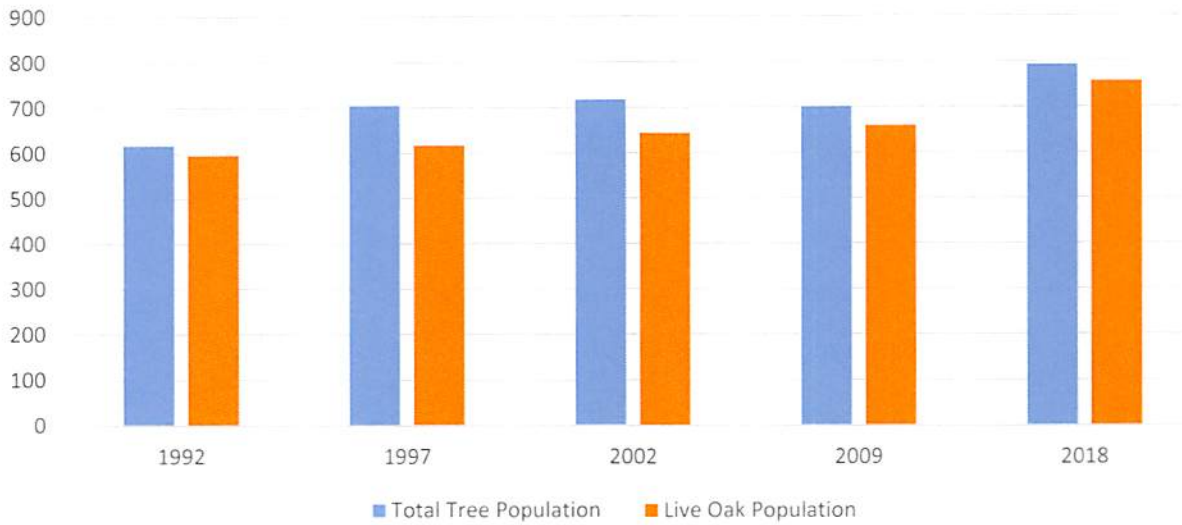


Figure 1: St. Charles Avenue stand species composition from 2018 survey. Total 792 trees recorded; Water Oaks 9 (0.76%), Southern Magnolia 11 (1.39%), six other species combined 19 (2.4%), live oak 756 (95.45%).

St. Charles Ave. Total Tree Population vs Live Oak Population



	1992	1997	2002	2009	2018
Total Tree Population	678	705	717	659	792
Live Oak	618	617	644	701	756

Figure 2 and Table 1: Total tree population on St. Charles Avenue as compared to the total number of live oak oaks for each survey year.

Live Oak DBH as Percent of Total Population

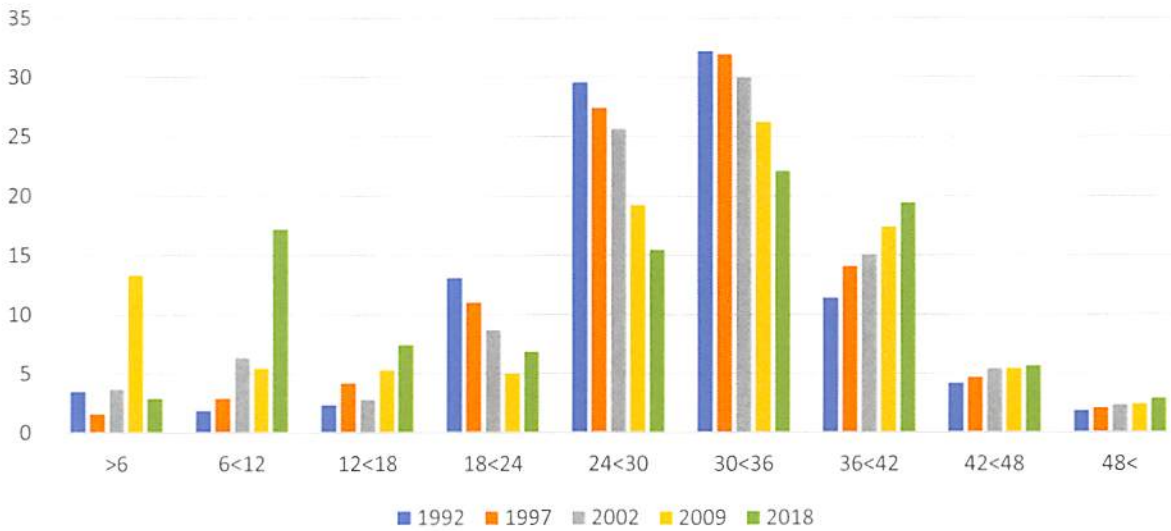


Figure 4: Live Oak DBH by size class. Values indicate the proportion of the population in each size class for a given survey year.

Live Oak DBH as Percent Population

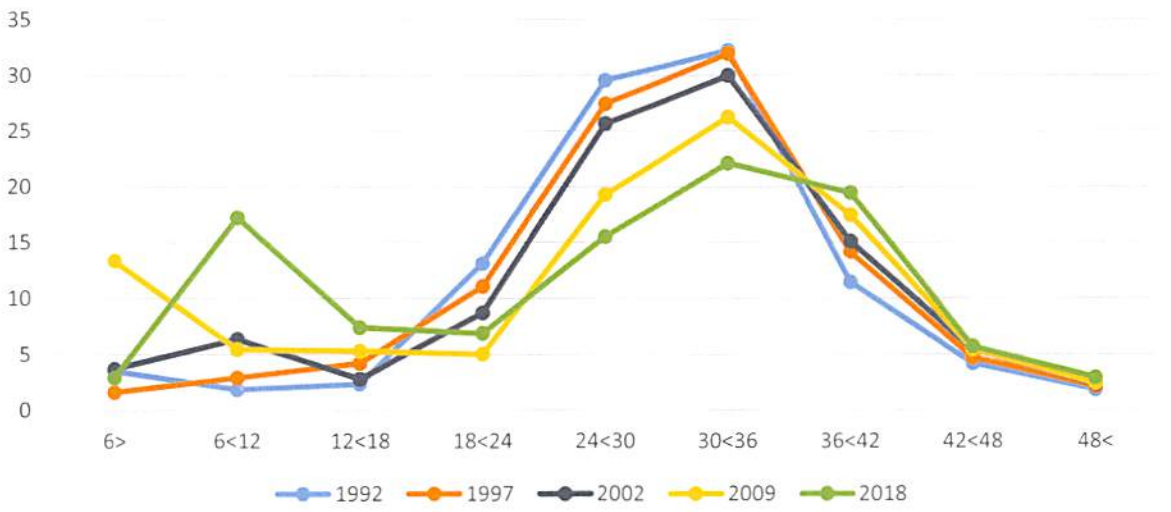


Figure 5: Live Oak DBH by size class. Values indicate the proportion of the population in each size class for a given survey year. Shown as line graph to illustrate trends from year to year.

Distribution of Live Oak Condition by Year

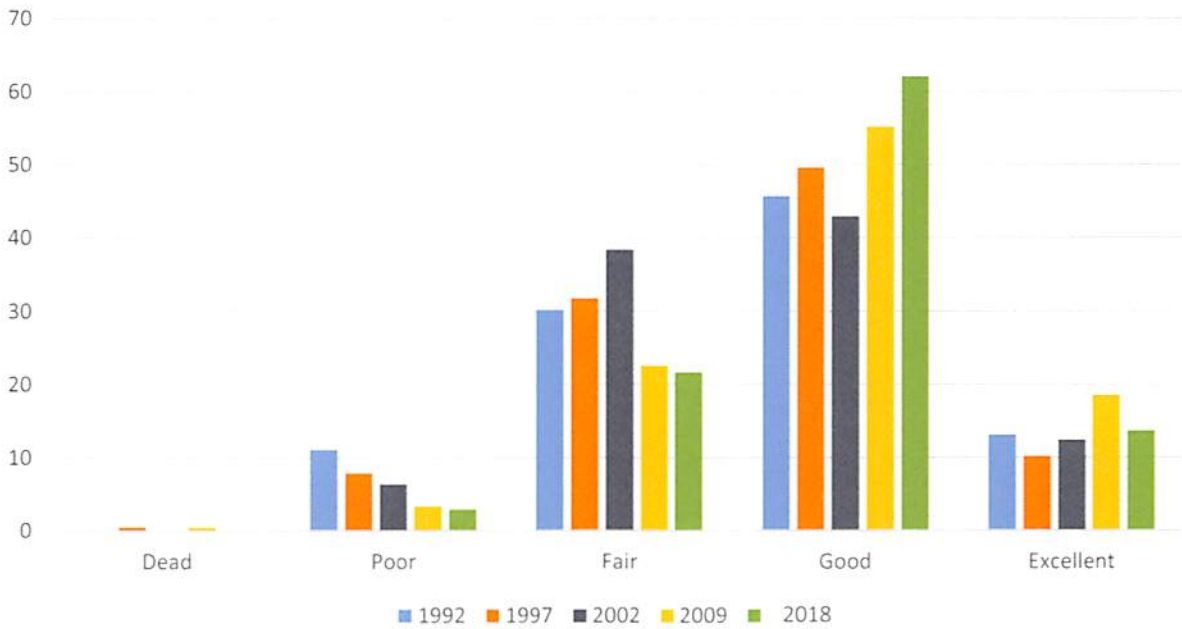


Figure 3: Live Oak condition by survey year; values based on percent of total live oak population for each survey.

	Count	Percent
Recent termite damaged trees	112	14.8
Major limb or trunk damage	122	16.1
Recent termite damaged trees with major limb or trunk damage	65	58.0

Table 2: Termite infestation and major limb/trunk damage observed in 2018. Termite damage presented as total number of live oaks with recent termite activity, and percent of total live oak population. Major limb and trunk damage presented as total number of live oaks exhibiting physical damage to limbs or trunk and percent of those trees within the total number of recorded live oaks in survey year. Trees with observed termite activity and limb and trunk damages both in count and proportion of termite infested trees with limb damage.

