University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
NEBRASKA FOREST SERVICE

409 9th Street
Gothenburg, NE 69138

Bruce,

Enclosed is the Community Threat Assessment Protocol (CTAP) community forest inventory report for Gothenburg. This document summarizes all of the work done during the summer of 2012 by the Nebraska Forest Service. When you get an opportunity, please read through the "report" section of the document (the first 4-5 pages) and let me know what information it is missing and what is not clear. The pages following the "report" section include all of the referenced appendices and maps showing inventoried trees. I would like to set up a time for either myself, Amy Seiler, our western Nebraska community forestry specialist, or Scott DeWald, our south-central district forester to discuss this report with you and/or your staff to ensure the report is complete and fits the needs of your community. Please call my office upon receiving this report to discuss this meeting. Thank you for your involvement in this inventory program and we look forward to working with Gothenburg to utilize the information collected during this process.

Sincerely,

Adam Smith

Adam Smith
Nebraska Forest Service
Forestry Project Coordinator
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Community Threat Assessment Protocol Project Summary

Beginning in the summer of 2011, the Nebraska Forest Service (NFS) began conducting rapid community forest inventories through the "Community Threat Assessment Protocol" project, or CTAP. This effort to establish a new inventory protocol is a response to the increasing concern of approaching forest insect, disease, and wildfire threats in Nebraska. These resulting inventories are aimed at providing communities with current information about their community forest resources, enabling them to make educated management decisions based on current data. This project was funded through a competitive redesign grant from the USDA United States Forest Service.

This CTAP inventory collected data on all actively managed, publicly owned trees in parks, on city managed properties, and in easements or planting strips along streets. These street tree inventories are considered "windshield inventories" as they were conducted from a vehicle along the street. To complete the street tree inventories, NFS employees were partnered with community staff or volunteers to drive every street in the community and collect data regarding all appropriate trees. Park trees were inventoried on foot by visiting and collected data about each tree. The information that was collected includes the following:

1. Tree location (by marking the tree location using ArcMAP® computer mapping)
2. Tree species
3. Stem diameter (measured in inches at 4.5 feet from the ground)
4. Tree condition (a general statement of a tree's health at the moment of inventory)

The purpose of this report is to provide current community forest resource information to accomplish the next step in community forest management which is a complete, overall management plan.

Gothenburg, NE Community Tree Inventory Summary

The Community of Gothenburg was inventoried in the summer of 2012. During the inventory in Gothenburg, there were 1,499 trees inventoried representing 58 different species, see Appendix A. The top ten species inventoried were silver maple, Northern hackberry, ash species, crabapple species, American basswood, Norway maple, spruce species, littleleaf linden, Siberian elm, and honeylocust, see Appendix B. Of these species, silver maple and Northern hackberry were above or very near 10% of the total community forest resource. As a rule, no single tree species should represent more than 10% of any community's tree resource. When tree species exceed this 10% threshold, it can signify low species diversity, which can increase the potential impact of insect and disease issues on the community's trees as a whole.

The relative age, or stem diameter distribution, can say a lot about a community's tree resource. It can provide clues about current or previous planting habits, types of trees being planted, and estimates about the longevity of existing trees. Gothenburg shows a diversely aged community forest resource, with approximately 21% of all trees less than 6 inches in diameter, 17% between 6 and 12 inches, 21% between 12 and 18 inches, 16% between 18 and 24 inches, and 25% over 24 inches in diameter, see Appendix C. These percentages represent an outstanding age diversity of the public trees in the community. When communities have a diversely-aged forest resource, it allows for trees to naturally succumb to mortality, while other trees fill the void of the lost trees. This diverse age level allows for community forests to "bounce back" quicker and retain their diversity after large weather events or tree die-offs. Communities with a non-diverse age distribution (such as all trees being very young or very old) will be impacted greater by a die-off of their trees because they won't have the younger generation of trees to eventually fill the void created by the loss of the older trees. Gothenburg

should continue an annual tree planting program in order to maintain the community forest to better be able to withstand unforeseen tree losses.

Studies show that large shade tree species provide more environmental benefits such as household utility savings, improving air quality, and the beneficial use of rain water. Planting high quality, site appropriate trees will reduce annual tree removals because of the improved overall health of the community's trees, leading to reduced tree care costs. The best way to increase the number of large tree specimens within the community is to annually plant a number of large shade tree species that will be able to withstand the weather conditions in the area, while providing sound tree care and maintenance.

Overall tree condition can be a good way to judge the general health of a tree. In our inventories, trees were categorized as being in one of four conditions based on the overall appearance of the tree at the time of the inventory. These condition categories are…

- Excellent – Healthy, vigorous tree. No apparent signs of insect, disease, or mechanical injury. Little or no corrective work required. Form representative of species.
- Good – Average condition and vigor for area. May be in need of some corrective pruning or repair. May lack desirable form characteristics of species.
- Fair – General state of decline. May show severe insect, disease, or mechanical damage, but death not imminent. May require major repair in renovation.
- Poor – No chance of correcting a declining condition, death imminent.

This tree condition designation is not a substitute for in-depth tree inspections, which should be completed on all questionable trees. Overall, trees in Gothenburg appear to be in good condition with approximately 13% of the tree population in fair or poor condition, see Appendix D. There is always room for improvement in tree maintenance and care throughout the community. Healthy trees provide more benefits, reduce clean up and overall maintenance costs, and resist forest health threats better than trees in questionable condition.

Community trees provide more than just simply a good looking street or boulevard. We can estimate the monetary value to the energy, CO2, air quality, stormwater, and aesthetic benefits that community trees provide. In Gothenburg, the community forest provides total annual benefits of $186,518, see Appendix E. Two things a community can do to increase the benefits they receive from the community forest are improve overall tree health in the community and plant large canopy shade trees. Canopy cover was determined by placing a randomly oriented dot grid over the community of Gothenburg and counting the number of occurrences where the dot landed on a tree. As a result, it is estimated that the canopy cover for the entire community of Gothenburg is 11%. This is below average for communities of this size and demonstrates the availability of planting sites throughout the community. An emphasize should be placed on tree planting communitywide.

An important figure for communities to know is the replacement value of their trees. Replacement values are estimates of the full cost of replacing trees in their current condition, should they be removed for some reason. These estimates are meant for the population as a whole and not intended to be used on a tree-by-tree basis. The replacement value for Gothenburg's public trees is $1,790,482, see Appendix F.

For communitywide ash species, Scotch pine, and walnut species information, see appendix O.

Community wildfire risk assessment will be sent at a later date, will be Appendix Q.

Street Trees (Zone 1)

There were 894 street trees inventoried in Gothenburg, representing 50 different species, see Appendix G. The top five species inventoried during the street tree inventory were silver maple, Northern hackberry, ash species, Norway maple, American basswood, see Appendix H. Silver maple, and Northern hackberry were over or very near the 10% diversity threshold, with these 2 species representing a combined 46% of all street trees. One way that foresters analyze the appropriate number of trees planted in a community is to look at the community's stocking rate. The "rule of thumb" for community forestry is that a community is fully stocked when there are roughly 200 trees per street mile. According to the Nebraska Department of Roads, in 2011 there were 29.15 miles of road in Gothenburg. This leads to a stocking rate of 31 trees/street mile and a stocking rate proportion of 15%, see Appendix I. This number emphasizes the continuing availability of street-side planting vacancies. For guidelines on identifying current planting vacancies and increasing stocking rates, see Appendix I. The street trees in Gothenburg were in fairly good condition with approximately 17% of the inventoried street trees in fair or poor condition, see Appendix J.

Park Trees (Zone 2)

There were 605 park trees identified in Gothenburg, representing 49 different species, see Appendix K. The top five species inventoried during the park tree inventory were Northern hackberry, ash species, spruce species, crabapple species, and littleleaf linden, see Appendix H. Northern hackberry and ash species exceeded the 10% diversity threshold. These 2 species represent 25% of all park trees. As tree species begin to reach maturity, and eventually mortality, planting a diverse tree population should to be emphasized. Since parks value open space as much as shade, stocking rate does not apply. The Nebraska Forest Service would simply stress the importance of shade when creating comfortable community parks. The park trees in Gothenburg were in very good condition with 7% of the inventoried trees in fair or poor condition, see Appendix L. This represents very good tree management and should commended.

Comments and suggestions

The Nebraska Forest Service (NFS) would like to thank you again for your participation and assistance with the Community Threat Assessment Protocol (CTAP) community tree inventories. These inventories allowed us to map more than 100,000 trees across Nebraska. We worked with great citizens who volunteered hundreds of hours of their time to assist with these inventories.

Now that the community tree inventories are complete, communities should take their reports and begin to use the information collected as a tool for continuing community tree management. With an up-to-date inventory in hand, the next process should be to establish a management plan highlighting goals and practices to be used to help achieve those goals. Some examples of management goals and practices are shown below.

Management goal	Practices to help achieve goals
Monitor ash, Scotch pine, and walnut trees for signs of pests	• Inspect individual trees annually for signs of decline • Work with state and local resources for assistance when tree pests are believed to be an issue • Review NFS Forest Health information regarding potential tree pests at nfs.unl.edu/publications.asp#foresthealth

Increase overall tree species diversity	• Reduce/discontinue planting of tree species identified as overplanted (more than 10% of total population) during the inventory • See 'Retree Nebraska 12 Tree Species for 2012' for tree species recommendations • Visit us at retreenebraska.unl.edu
Improve tree health, care, and maintenance	• Inspect potential problem trees identified as in 'fair' or 'poor' condition during inventory • Review NFS online Tree Care resources at nfs.unl.edu/treecare.asp

A community forest management plan is an invaluable tool when managing a community forest. It guides tree maintenance and care, assists with budget planning, prioritizes the needs of the community's trees, and can help encourage homeowners to follow the example of the community's leaders.

If your community would like to have the computer mapping-based raw data (the ArcGIS program was used for inventory data collection) to create custom maps and reports, we would be glad to provide it. To utilize this data however, a community must have ArcGIS computer software capabilities. If a community is not equipped with the ArcGIS software, NFS would be happy to provide additional maps or data reports (such as graphs and charts regarding specific parks).

The Nebraska Forest Service has foresters available to work with communities for developing and implementing these management plans. Enclosed is a map and contact information of NFS field staff. We strongly encourage communities to contact their respective local NFS personnel regarding the development of a management plan or any other community forestry-related issue. For assistance with management plan development, please contact your district forester or community forestry staff member. For tree pest and health concerns please contact (East) Laurie Stepanek, (402) 472-5503, or (West) Rachel Allison (308) 696-6718.

The CTAP inventories are a necessary first step toward improving community forest management and planning. With current tree information now available, communities can be proactive with tree management and community forestry planning, allowing Nebraska's community trees to thrive into the future.

Initial Recommendations

To improve the overall community forest of Gothenburg, the following recommendations are provided regarding the future management of the community's tree resources:

1. Due to potential forest health threats, planting of ash species, Scotch pine, and black walnut should be discontinued.
2. Reduce planting of currently over planted tree species. In Gothenburg, communitywide, that would be silver maple and Northern hackberry.
3. Work to increase stocking rate and decrease planting vacancies by increasing overall tree planting, see Appendix M for potential tree planting grant funds.
4. Increase species diversity by planting less common, yet site appropriate species, see Appendix N.

5. Maintain an annual tree planting and management plan.
6. Complete individual tree health assessments on known or potential defective trees.
7. Work with community maintenance staff and state and local resources to establish a management plan for the community.
8. The Community of Gothenburg should continue to support and strengthen the role of the tree board within the community. Many communities strive to form a close working relationship with the Director of Public Works and the volunteer tree board such that the tree board serves as an advocate for proactive management efforts. The City Council should be kept appraised about the "state" of the community forest resources and its benefits. This will support and enhance favorable financial support by the City Council for tree planting and management needs.