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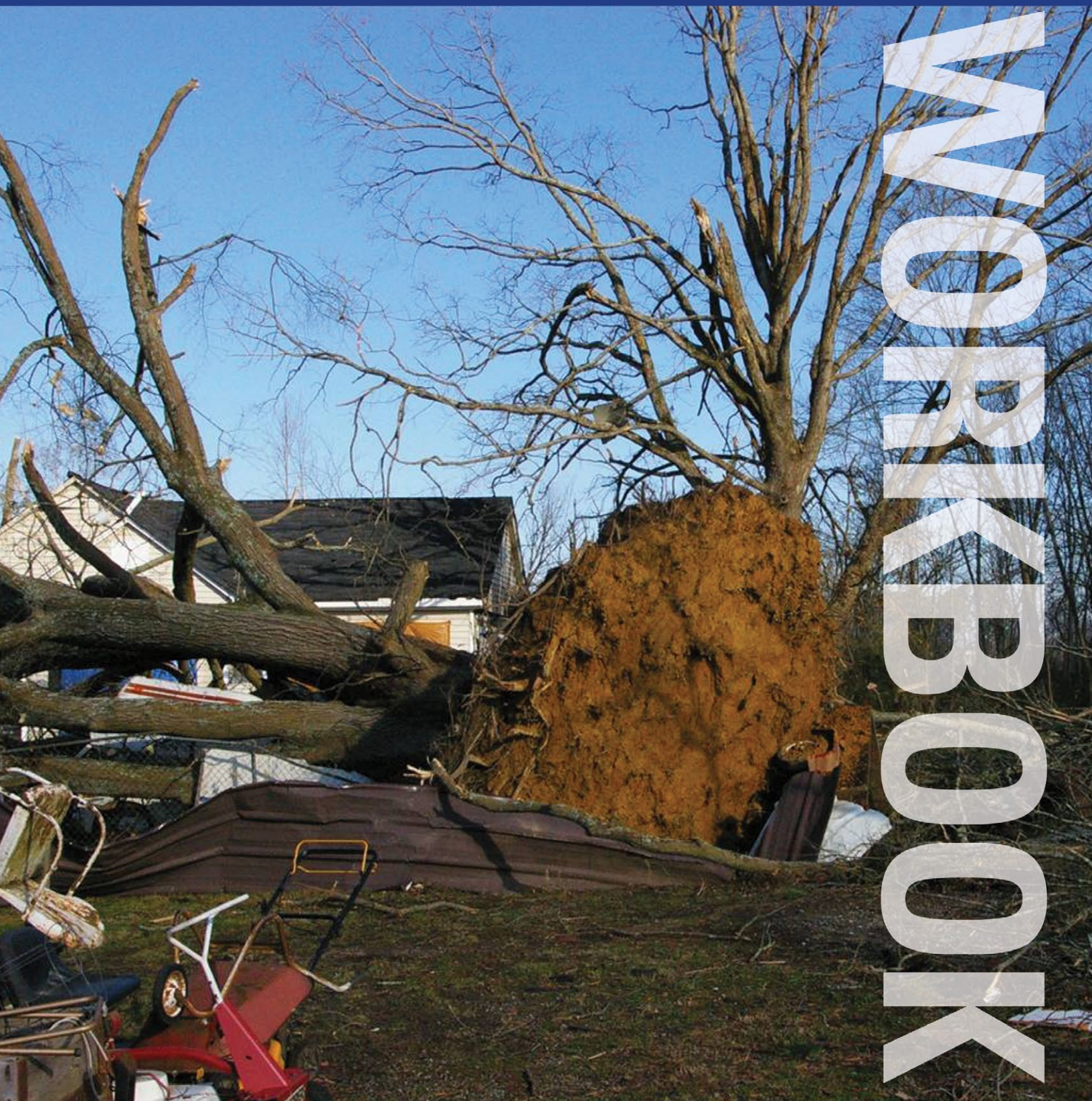
Community Forest Storm Mitigation Plan for Georgia Communities

March 2013



WORKBOOK

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Georgia Forestry Commission

WORKBOOK
Community Forest Storm Mitigation Planning for Georgia Communities

March 2013

For more information on this Workbook, contact:
Susan Granbery
Sustainable Community Forestry Program
Georgia Forestry Commission
sgranbery@gfc.state.ga.us or 678.476.6227.

Plan template written by
Connie Head
Consulting Urban Forester
Technical Forestry Services
706.202.5279 / tfshead@aol.com

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How to Use This Workbook

This *Community Forest Storm Mitigation Planning Workbook* and the accompanying *Community Forest Storm Mitigation Plan Template* are intended as tools for Georgia communities to use in assessing their community forest storm readiness, mitigating tree risk and reducing tree-related storm damage, and developing a community forest storm mitigation plan.

The workbook guides you through filling in the template, which serves as a basic framework for developing your Community Forest Storm Mitigation plan. As the template is filled in, gaps in storm readiness, tree risk mitigation and community forest management will be identified. As these gaps are addressed, the plan should be revised and updated. Communities may find it helpful to work with their neighbors to develop plans that are similar and include agreements to share resources.

Not all sections within the template will be applicable to every community. Some sections, while applicable, require you to gather additional information or complete mitigation activities before they can be filled in.

Copies of your current storm mitigation plan and other important storm mitigation documents should be stored in hard copy format in the office of the county emergency response manager and the tree care manager. They should also be made available on the government website or a cloud-based storage site where they can be viewed in the field using a smart phone, tablet, or computer by those involved in storm preparation, response and recovery.

Both the workbook and template are available as PDF and Word documents on the Georgia Forestry Commission's website at www.gatrees.org. Copies of the workbook and template can be printed out, placed in a three-ring binder, and distributed to those developing your plan. The completed template should be distributed to your storm mitigation team members, who should meet at least annually to review and update the document.

The Georgia Forestry Commission can provide guidance in developing your plan and completing the template. For assistance, contact the Sustainable Community forester in your area by visiting the GFC website. The forester can also provide you with a list of consultants in your area who can help you develop your community forest storm mitigation plan and community forest management program.

NOTES:

INTRODUCTION

A community forest storm mitigation plan is an essential part of your community's hazard mitigation and emergency management plans and systems. The plan should focus specifically on ways to avoid or mitigate the damage trees cause during a storm or other catastrophic event and ways to avoid the loss of trees and tree canopy across a community.

This *Community Forest Storm Mitigation Planning Workbook* and accompanying *Community Forest Storm Damage Mitigation Plan Template* have been developed by the Georgia Forestry Commission to assist communities in storm mitigation planning and developing their own storm mitigation plans.

The workbook and template are divided into four (4) parts:

PART I. COMMUNITY SETTING

PART II. STORM PREPARATION

PART III. STORM RESPONSE

PART IV. STORM RECOVERY

The workbook appendix also includes a list of resources as well as detailed information on the Federal Emergency Management Agency's *Disaster Assistance Policy DAP9580.204 Documenting and Validating Hazardous Trees, Limbs, and Stumps*.

Your plan should include a description of your community setting for storm exposure and tree damage, the activities you will undertake to prepare for storms, how you will respond and begin short-term recovery, and then the actions you will take for long term recovery and restoration of your community forest.

This workbook includes suggested activities for preparation, response and recovery, and the template, which guides you through the process of developing your plan.

PLAN OBJECTIVES AND PURPOSES

The objectives of a community forest storm mitigation plan are to:

- Reduce the amount and severity of the damage and losses to people, property, the economy and the environment that results from tree failures during storm events
- Reduce tree canopy cover losses resulting from storm events

The purpose of the plan is to:

- provide information
- set policies
- describe actions to be taken related to trees and the community forest
- effectively prepare for, respond to, and recover from a storm event

The plan is intended to be an active document that should be implemented on an ongoing basis and reviewed at least annually as well as just prior to and after each event.

PLANNING STRATEGIES

The strategies recommended for community forest storm mitigation planning are to:

- Focus on preparation to improve response and reduce the level of recovery efforts required
- Gather, maintain, and utilize accurate pre-storm, baseline data about the community forest resource and its management
- Utilize a community forest storm mitigation team led by the tree care manager (preferably an arborist or forester) to manage the storm mitigation process
- Provide regular information, education, and communication to staff, team members and the community about storm mitigation
- Reduce losses by implementing a routine tree risk assessment and management program and a long-term, comprehensive community forest management program
- Utilize an annual planning process to update the storm mitigation plan

TREE BENEFITS

Trees are an important part of our community's infrastructure. They provide us with many valuable and irreplaceable environmental, economic, and social benefits. Our large canopy trees, which are most at risk during storm events and can cause the most damage, also provide the most benefits. These benefits include:

- Improvements in air quality; absorption and sequestration of carbon dioxide; production of oxygen; filtration of particulate matter; reduction in ground level ozone through shading and reduction of surface temperatures; cooling of the air through evapotranspiration

- Improvements in water quality; interception and slow release of storm water; reduction of soil erosion; shading and cooling of streams
- Cost savings for reductions in energy use, stormwater control infrastructure, road paving frequency
- Traffic calming along road rights-of-way
- Increases in real estate values; increases in shopper activity; attraction of visitors, businesses, and residents to the community
- Promotion of recreational activity and exercise; reduction in the incidence of asthma; improvements in human health; promotion of learning in young girls; reductions in crime and domestic violence; decreased health costs

PLAN BENEFITS

The development and implementation of a community forest storm mitigation plan will provide the following benefits:

- Reductions in damage and losses of people and property due to trees
- More efficient and effective response to storms
- Increased reimbursement for tree losses
- Reductions in tree failures and tree canopy losses
- Improved community forest health and safety
- Increased community forest benefits
- Maintain and enhance community confidence in elected officials, city staff and community forest management program

EMERGENCY MANAGEMENT AGENCIES

Responses to minor emergency events involving trees that require less than 24 hours to clear roadways, repair utilities and restore public safety are often handled by the street or public works departments. Major events that require longer periods of response, external resources, and longer periods of recovery usually require the involvement of county, state and federal emergency management agencies.

The community tree care manager should work with the local emergency management agency director or designee to fully understand and agree on the responsibilities, procedures and information required of them in hazard and storm mitigation. They should also understand

what procedures and documentation are required for the community to be eligible for federal disaster assistance for storm debris removal.

The local emergency management director will contact the Georgia Emergency Management Agency (GEMA) and the Federal Emergency Management Agency (FEMA) as needed prior to, during or after a storm event according to the protocol outlined in the community's hazard mitigation and emergency response plans.

The following information reproduced from the FEMA and GEMA websites describes these agencies' missions and roles in hazard and emergency management.

Georgia Emergency Management Agency (GEMA)

www.gema.ga.gov

Mission: *GEMA's mission is to provide a comprehensive and aggressive all-hazards approach to homeland security initiatives, mitigation, preparedness, response, recovery and special events in order to protect life and property and prevent and/or reduce negative impacts of terrorism and natural disasters in Georgia.*

Vision: *Create a culture of preparedness by fostering partnerships between local, state and federal government, local business and industry, volunteer and faith-based organizations, and the citizens of Georgia.*

Core Businesses: *Mitigation, Preparedness, Response and Recovery.*

Federal Emergency Management Agency (FEMA) Region IV

http://www.fema.gov/region-iv-al-fl-ga-ky-ms-nc-sc-tn

FEMA Region IV serves the southeastern states of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee. The Regional Office is located in Atlanta, Ga., and the Federal Regional Center is located in Thomasville, Ga. Region IV currently has Recovery Offices in Florida and Mississippi.

Region IV has built a skilled workforce to support our citizens and first responders to work together to build, sustain and improve our capabilities to prevent, prepare for, protect against, respond to, recover from, and mitigate all hazards. Our Regional team works hand-in-hand with federal, state, tribal, local and private sector partners to meet the needs of its state emergency management agencies.

Region IV's natural risks include hurricanes, tornadoes, flooding, droughts, ice storms, earthquakes, wildfires, and tropical storms. Six of our eight states are hurricane-prone, so Federal Coordinating Officers have been pre-designated to plan for hurricane response issues and work closely with the state emergency management agencies.

FEMA DISASTER DEFINITIONS

It is important that everyone with a responsibility in community forest storm mitigation planning and implementation understands the terms used in emergency preparation, response, and recovery. FEMA publishes a glossary of disaster terms which can be found at http://www.fema.gov/glossary. Some terms from the FEMA Glossary that are relevant to the community forest storm mitigation planning process are provided below.

Advanced Readiness Contracting – A type of contracting that ensures contracts are in place before an incident for commonly needed commodities and services such as ice, water, plastic sheeting, temporary power and debris removal.

Assessment - The evaluation and interpretation of measurements and other information to provide a basis for decision-making.

Coordinate - To advance systematically an analysis and exchange of information among principals who have or may have a need to know certain information to carry out specific incident management responsibilities.

Damage Assessment – The process used to appraise or determine the number of injuries and deaths, damage to public and private property [trees], and the status of key facilities and services such as hospitals and other health care facilities, fire and police stations, communications networks, water and sanitation systems, utilities, and transportation networks resulting from a man-made or natural disaster.

Hazard – Something that is potentially dangerous or harmful, often the root cause of an unwanted outcome.

Hazard Identification and Risk Assessment (HIRA) -A process to identify hazards and associated risk to persons, property and structures and to improve protection from natural and human-caused hazards. HIRA serves as a foundation for planning, resource management, capability development, public education and training and exercises.

Long-term Recovery – A process of recovery that may continue for a number of months or years, depending on the severity and extent of the damage sustained. For example, long-term recovery may include the complete redevelopment of damaged areas.

Risk – The probability of harmful consequences, or expected loss, resulting from interactions between natural and human induced hazards.

Mitigation- Activities providing a critical foundation in the effort to reduce the loss of life and property from natural and/or manmade disasters by avoiding or lessening the impact of a disaster and providing value to the public by creating safer communities. Mitigation seeks to fix the cycle of disaster damage, reconstruction and repeated damage. These activities or actions, in most cases, will have a long-term sustained effect.

Preparedness- Actions that involve a combination of planning, resources, training, exercising and organizing to build, sustain and improve operational capabilities. Preparedness is the process of identifying the personnel, training and equipment needed for a wide range of potential incidents and developing jurisdiction-specific plans for delivering capabilities when needed for an incident.

Recovery - The development, coordination and execution of service- and site-restoration plans; the reconstitution of government operations and services; individual, private-sector, nongovernmental and public-assistance programs to provide housing and to promote restoration; long-term care and treatment of affected persons; additional measures for social, political, environmental and economic restoration; evaluation of the incident to identify lessons learned; post incident reporting and development of initiatives to mitigate the effects of future incidents.

Response - Immediate actions to save lives, protect property and the environment and meet basic human needs. Response also includes the execution of emergency plans and actions to support short-term recovery.

Short-Term Recovery - A process of recovery that is immediate and overlaps with response. It includes such actions as providing essential public health and safety services, restoring interrupted utility and other essential services, reestablishing transportation routes and providing food and shelter for those displaced by a disaster. Although called "short term," some of these activities may last for weeks.

Staging Area - Any location in which personnel, supplies and equipment can be temporarily housed or parked while awaiting operational assignment.

Volunteer- Any individual accepted to perform services by the lead agency (which has authority to accept volunteer services) when the individual performs services without promise, expectation or receipt of compensation for services performed.

NOTES:

PART I. COMMUNITY SETTING

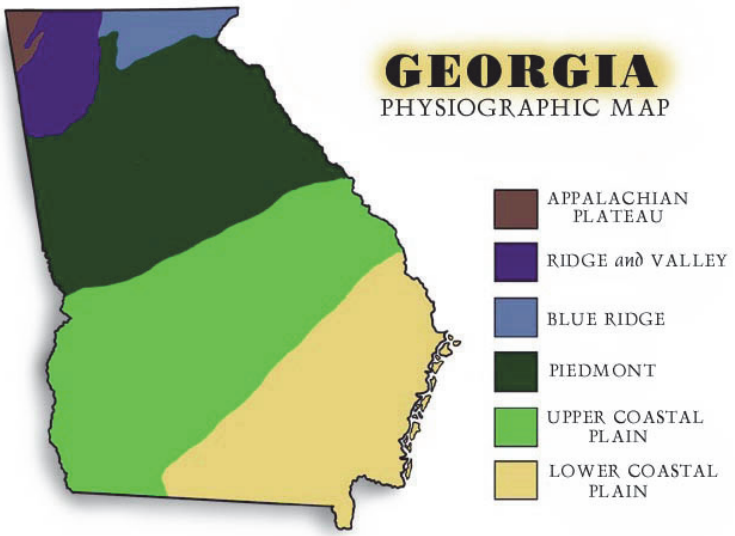
The degree of storm preparation necessary in your community and the type and amount of damage that is likely to result depends on:

- Your geography and size
- Your storm history and exposure, including your climatological and meteorological conditions
- The level to which your community forest resource is being managed

A. COMMUNITY GEOGRAPHYAND SIZE

Your physical location in Georgia, the topography within your jurisdiction, the size in square miles of your community, the number of miles of roads, and the population of your community all will have an effect on storm and damage potential.

There are five physiographic regions in Georgia—the Appalachian Plateau, the Ridge and Valley, the Blue Ridge, the Piedmont, and the Coastal Plain (upper and lower). Locate your physiographic region on the map to the right.



Record on the template:

- ✓ **The name of your community**
- ✓ **The date of adoption and last update of your storm mitigation plan**
- ✓ **Your physiographic region**
- ✓ **Physical size of jurisdiction in square miles**
- ✓ **Number of miles of roads**
- ✓ **Population according to the latest official census**

B. STORM HISTORY AND EXPOSURE

1. Potential Storms and Emergency Events

Your local hazard mitigation plan includes information on the types of hazards, including weather and storm events that could occur in your community. Consider these hazards and storm events in terms of the amount of tree damage possible, and how these events may increase the risk of tree failure--including uprooting, trunk failure, co-dominant stem failure, and loss of large limbs.

In addition to reviewing your local hazard mitigation plan, do some additional research on the primary weather and catastrophic events that have occurred or are likely to occur in your community. Catastrophic storms and weather-events that impact trees can occur at any time, but certain events can be predicted or at least expected based upon the meteorological history of your area. Visit the *NOAA National Climatic Data Center* storm event database, or other sources of historical weather data listed below, for details on past storm events in your community.

Sources of Historical Weather Data

National Oceanic and Atmospheric Administration (NOAA) http://www.noaa.gov/

NOAA Storm Prediction Center http://www.spc.noaa.gov/climo/historical.html

NOAA National Hurricane Center
http://www.nhc.noaa.gov/

NOAA National Climate Data Center
http://www.ncdc.noaa.gov/stormevents/
http://www.ncdc.noaa.gov/oa/climate/sd/
http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html

University of Minnesota
http://climate.umn.edu/doc/historical.htm

Hail, wind damage, and lightning can accompany a severe storm at any time of the year, but severe storms are more likely to occur in the spring and summer months with warm temperatures and strong weather fronts. Tornadoes may also accompany these fronts and severe storms. Georgia averages 30 tornadoes annually and they have occurred during all months of the year.

Hurricane season in the Atlantic and southeastern U.S. begins June 1 and ends November 30. Georgia regularly experiences flooding, wind, and tornadoes during tropical storms and hurricanes, accompanied by significant tree damage.

Drought conditions, high temperatures and wind during the summer months can result in an increase in wildfire risk.

All of the possible storm events that occur in our area can cause considerable damage to trees, including whole or partial failure of tree roots, trunks and limbs, and those tree failures in turn result in damage to roads, utilities, facilities, buildings, vehicles and in some cases, people. While we cannot control the occurrence of most of these events, we can prepare the community forest to better withstand their effects.

Descriptions of the damage to trees that can be expected at various wind speeds are included in the Enhanced Fujita Scale degrees of damage charts for hardwoods and softwoods, which are reproduced below.

For hardwood trees:

Degree of Damage	Damage Description	Expected Wind Speed	Lower Bound Wind Speed	Upper Bound Wind Speed
1	Small limbs broken (up to 1” diameter)	60	48	72
2	Large branches broken (1” to 3” diameter)	74	61	88
3	Trees uprooted	91	76	118
4	Trunks snapped	110	93	134
5	Trees debarked with only stubs of largest branches remaining	143	123	167

For softwood trees:

Degree of Damage	Damage Description	Expected Wind Speed	Lower Bound Wind Speed	Upper Bound Wind Speed
1	Small limbs broken (up to 1" diameter)	60	48	72
2	Large branches broken (1" to 3" diameter)	75	62	88
3	Trees uprooted	87	73	113
4	Trunks snapped	104	88	128
5	Trees debarked with only stubs of largest branches remaining	131	112	153

Note that damage occurs to softwoods at slightly lower wind speeds than hardwoods.

As these descriptions show, the primary types of tree damage that occur during storms involving high winds are limb failures, trunk failures, and whole tree failures.

The damage that occurs to trees from fire, hail, lightning, hurricanes, tornadoes and wind is usually immediately apparent after a storm. But subsequent damage to trees as a result of chemical contamination, flooding, hail or major insect or disease infestations may only be evident later. The damage may not even be visible, but tree decline and death may eventually result, at which time they pose a considerable risk. As trees decline and die, large dead limbs with a high probability of failure appear throughout their crowns. The potential for failure of the entire tree also increases.

- ✓ **Check off on the template the primary types of weather and other catastrophic events that have occurred and impacted trees, or are likely to occur, in your community.**

2. Snow and Ice Storms

Snow and ice storms can occur during the months of October through May, but most often occur in Georgia in the months of December through March. Snow and ice storms will occur during the months in which freezing temperatures are possible.

- ✓ **Record on the template the months of the year when freezing temperatures are possible.**
- ✓ **Record on the template the largest single event snow totals that have occurred during the snowiest months in your area.**

3. Rainfall and Flooding

Excessive rainfall and flooding, usually as a result of high amounts of precipitation, causes destabilization of trees, whole tree failures, or tree death.

- ✓ **Record on the template the months that have the highest average precipitation in your area.**
- ✓ **Record on the template the months that have the lowest average precipitation in your area.**

4. Droughts and Fires

Tree damage can result from periods of high temperatures and low moisture, such as during droughts. These drought conditions, combined with high winds, can predispose trees and communities to wildfires. Tree damage, decline, and root loss, the destabilization of trees and tree failures can result.

- ✓ **Record on the template the warmest months of the year in your area.**

The National Fire Protection Association (NFPA, www.nfpa.org) conducts a Firewise Communities Program that teaches residents about the hazards of wildfire and how they can prepare for and reduce the risk of home destruction due to wildfires. The program is co-sponsored by the USDA Forester Service, the US Department of the Interior, and the National Association of State Foresters. There are 776 active Firewise communities in 40 states. Visit the Firewise website at www.firewise.org for a guide to Firewise principles and a Firewise tips checklist for homeowners.

- ✓ **Record on the template if your community is a designated Firewise Community.**

5. Other Significant Conditions

- ✓ **Record on the template any other significant geographic, climatological or meteorological conditions that predispose your community to storms or catastrophic events.**

6. Storm History and Records

- ✓ **Record on the template in the chart provided the severe storms and catastrophic events that have occurred over the last 30 years in your community.**

You may also use this chart to record storm events as they occur. Include the year, date if known (at least the month if possible), the type of event, the severity, and the type of damage that occurred.

C. COMMUNITY FOREST RESOURCE MANAGEMENT

1. Tree Care Manager

For storm mitigation planning (and community forest resource management), it is recommended that someone be designated as the tree care manager and given the responsibility for both coordinating community forest resource management and storm mitigation planning. Ideally your tree care manager should be an arborist, forester, horticulturist, or landscape architect and also be certified as an ISA Certified Arborist[1].

Communities that do not have a forester or arborist on staff should consider designating an existing staff member as the tree care manager, or hire a consulting forester or arborist to fill this role.

The designated tree care manager should have technical expertise, field experience and knowledge in community forest management, tree risk assessment, and tree maintenance standards and best management practices. Computer software skills that include Microsoft Word, Excel and PowerPoint, and geographic information systems are also desirable.

- ✓ **Record on the template the name, title and contact information of the community's tree care manager.**
- ✓ **Record on the template whether or not your tree care manager is an ISA Certified Arborist.**

[1] See www.isa-arbor.com for information on the International Society of Arboriculture's voluntary arborist certification program.

2. Tree City USA

Many communities in Georgia have been designated as a Tree City USA by the National Arbor Day Foundation. To be eligible for this designation, four (4) standards must be met. The community must:

- Have a tree ordinance
- Hold an annual Arbor Day Celebration with an Arbor Day Proclamation
- Have a tree board
- Spend at least $2 per capita on community forest management

✓ **Record on the template whether or not your community is a Tree City USA community; indicate the first year that you were designated as such.**

✓ **Record on the template the type of ordinance you have, your annual program expenditures, the number of members of your tree board, and the date of your last Arbor Day celebration, as listed in your latest Tree City USA application.**

✓ **Include in the template appendix a copy of your tree ordinance and a list of your tree board members and their contact information.**

3. Management Plan

Many communities, in addition to having a designated tree care manager and becoming a Tree City USA, have developed a management plan to guide their community forest management programs. These plans may be basic or more complex, may be developed annually or may have a five year or longer time frame, and may include plans for administration, field operations, and information and education.

✓ **Indicate in the template whether or not your community has a forest management plan in place; indicate when your management plan was first adopted and the last time it was revised.**

✓ **Include in the template the name of the person responsible for administering and updating your community forest management plan.**

NOTES:

PART II. STORM PREPARATION

Preparation for anticipated storm events will reduce the storm impact and damage that occurs during an event. Storm preparation has the following additional benefits[2]:

- Improvement of local, state and federal information sharing
- Identification of critical infrastructure
- Coordinated response plans
- Facilitation of mutual aid agreements for communities to share resources
- Identification of capacity needs
- Provides opportunities for training and field exercises

Keeping in mind the storm damage potential in your area, you should begin preparations for storm events by taking the following steps.

- Develop a storm mitigation team
- Assess the community forest resource
- Inventory available equipment and services
- Develop memoranda of understanding and advanced readiness contracts
- Develop a storm mitigation map
- Implement a tree risk mitigation program
- Develop a communication, information and education program

A. STORM MITIGATION TEAM

The first step in preparation is to build a storm mitigation team. Assemble a team of individuals that can contribute not only to storm preparation, but also to storm response and recovery.

Your tree care manager should lead the team and coordinate storm mitigation planning, preparation, and response, as well as community forest recovery and reforestation.

The tree care manager, in addition to coordinating and leading the team to complete the template and develop a community forest storm mitigation plan, should also coordinate an annual meeting to review the plan, discuss storm mitigation objectives, team member roles, and procedures, and share preparation, response, and recovery experiences, accomplishments, and information, and update the plan accordingly.

[2] Adapted from GEMA

Specific roles and detailed responsibilities should be assigned to team members or reconfirmed during these annual meetings and job descriptions further developed to promote an organized approach to mitigation, preparation, response and recovery.

For ease in updating, printing and distributing your list of storm mitigation team members and their contact information, you should enter this information in an Excel spreadsheet. A sample spreadsheet can be downloaded with the workbook and template from www.gatrees.org. Store your contact list in a cloud-based application for access by all storm mitigation team members before, during, and after a storm.

Your storm mitigation team should include individuals from the agencies, departments, organizations and companies listed below, as applicable to your community.

1. **Emergency Management Personnel**

2. **Government Staff**

3. **Utility Companies and Departments**

4. **State Agencies**

5. **Contractors (debris removal, tree service, landscape)**

6. **Equipment and Materials Vendors (equipment rental, tree nursery)**

7. **Volunteer Organizations (tree board, local agency and non-profit)**

8. **Community Forest Management Program Sponsors**

9. **Additional Team Members and Emergency Contacts**

   - ✓ **Record on the template your storm mitigation team members' names, titles, radio and phone numbers, and e-mail addresses.**

B. COMMUNITY FOREST RESOURCE ASSESSMENTS

One of the first tasks of the tree care manager in storm mitigation planning should be to review or gather information on the community forest resource, including:

- Total amount of tree canopy cover across the community
- Number, location and size of public trees, especially street trees
- Number, location and size of trees at risk for failure
- Estimate of the dollar value of the benefits that trees provide
- Total annual cost of community forest management
- Benefit to cost ratio of community forest management and tree risk mitigation

The tree canopy assessment will provide information on the percent of the community that is covered by tree canopy. A public tree inventory will provide detailed information on the number, location, size and condition of street trees. A tree risk assessment will provide information on which trees need immediate attention to mitigation the risk and reduce potential storm damage.

Using the tree canopy and tree inventory data, the value of the benefits provided by all trees within the community, and specifically the public street trees, can be estimated. While trees provide many benefits, they also cost money to establish and manage. With information about the value of tree benefits and the total cost of management, a benefit to cost ratio can be calculated and used to justify tree risk assessment and community forest management activities and costs.

1. Tree Canopy Assessment

Another way to gauge your storm damage potential related to trees is through a tree canopy cover assessment. The purpose of the assessment is to determine the amount of land area within your community that is covered by tree canopy. Tree canopy can be measured using aerial photography or satellite imagery and geographic information software. These measurements can be done periodically to detect tree canopy cover change and trends. The community should also set a goal for tree canopy cover, and conduct these periodic measurements to assess the progress made toward achieving that goal.

You may already have a recent urban tree canopy study, but if you do not, there are several methods that can be employed in measuring tree canopy cover. A simple, but time consuming, method involves placing a clear dot grid (or using geographic information software) over aerial photographs and then categorizing and color-coding the type of land cover beneath each dot. The categories you choose to identify can simply be *tree cover* and *no tree cover*, or you can distinguish between tree cover, other vegetation (shrubs, grass), impervious surfaces (paved roads, rooftops, driveways, and parking lots), bare soil and water. The number of dots of each cover type is divided by the total number of dots to calculate the percent cover.

A more sophisticated system for this type of sampling can be found in the i-Tree software suite at www.itreetools.org, which includes an application called i-Tree Canopy for determining tree canopy cover. The tree canopy cover analysis can be done in a matter of days using this software by an individual with experience in geographic information software and the identification of trees and land cover types.

The Natural Resource Spatial Analysis Laboratory (NARSAL) at the University of Georgia has data on tree canopy and impervious surface cover in Georgia developed using satellite imagery. For more information on NARSAL's *Georgia Lands Use Trends* surveys, visit the NARSAL website at www.narsal.uga.edu.

Arboricultural, environmental and mapping consultants specializing in the analysis of satellite imagery can also perform tree canopy cover analyses for communities for a fee.

- ✓ **Record on the template your community's current tree canopy cover percent and the year it was last measured; indicate the method used for your assessment; include historical information on previous tree canopy cover measurements.**
- ✓ **Describe the changes and trends in your tree canopy cover if you have completed multiple tree canopy cover assessments.**
- ✓ **Include on the template your community's tree canopy cover goal.**

2. Public Tree Inventory

An inventory can provide important information on the number, location, type, size, condition, and maintenance needs of public trees, including street, park, cemetery, and school trees, and trees growing around public offices and facilities. Ideally, data should be collected using a handheld GPS and data recorder which will facilitate the display and analysis of tree data. But, at a minimum, tree inventory information should be maintained in an Excel spreadsheet for easy access, updating and printing. A hardcopy of the tree inventory information should be maintained in the tree care manager's office.

At a minimum, the following information should be collected for each tree:

- Site type
- Location (street, address, GPS coordinates)
- Species
- DBH
- Condition

- Risk rating
- Maintenance needs
- Site conditions

The analysis should include the following data summaries:

- Number of trees by location
- Number of trees by species
- Number of trees by DBH (trunk diameter at 4.5 feet above the ground)
- Number of trees by condition rating
- List of trees recommended for regular inspection
- List of trees by level of risk

  ✓ **Record on the template the number of trees within your community by site and the date the information was collected.**

  ✓ **Record on the template the number of street trees 24 inches and larger in trunk diameter at 4.5 feet above the ground (a measurement known as DBH)**

  ✓ **Record on the template whether or not a map of the locations of street trees 24 inches DBH and greater is available from the tree care manager.**

3. Tree Risk Assessment

An assessment of tree risk can be completed during the inventory of public trees or as a separate activity focusing specifically on identifying trees with an elevated risk of failure.

Only those individuals qualified to conduct tree risk assessments should do so. If your community does not have an arborist or forester on staff who can perform this task, you can contract with a consultant to complete the assessment. It is recommended that you only hire consultants that are ISA Certified Arborists that have experience in performing tree risk assessments.

Tree risk assessment procedures should conform to the most current and professionally accepted standards and best management practices. The following standards and best management practices for tree risk assessment have been developed by professionals and are published by the International Society of Arboriculture.

- *ANSI A300 (Part 9) – 2011, American National Standard for Tree Care Operations – Tree, Shrub, and Other Woody Plant Management—Standard Practices (Tree Risk Assessment a. Tree Structure Assessment)*

- *Tree Risk Assessment Best Management Practices* (companion publication to the ANSI A300 Part 9 standard practices)

Another excellent source of information on trees and risk management, which should be reviewed by everyone developing a storm mitigation plan, is:

- *Urban Tree Risk Management: A Community Guide to Program Design and Implementation*, USDA Forest Service, Northeastern Area, State and Private Forestry, Publication NA-TP-03-03, Coordinating Author Jill D. Pokorny (available online at http://www.na.fs.fed.us/spfo/pubs/uf/utrmm/)

Using the methodology described in the ANSI standards, a Level 1 tree risk assessment should be performed on all trees growing along high priority streets within the community—those streets leading to and from emergency and critical facilities. A Level 2 tree risk assessment should then be performed on all trees considered to be at risk growing along the priority streets.

- ✓ **Record on the template whether or not your community has on file copies of the ANSI standards and best management practices for tree risk assessment.**
- ✓ **Record on the template whether or not your community has in place a tree risk assessment program or plan.**
- ✓ **Record on the template the frequency and most recent date of the Level 1 tree risk assessment performed on all trees growing along priority streets**
- ✓ **Record on the template the frequency and most recent date of the Level 2 tree risk assessment performed on trees at risk growing along priority streets**

Citizens and businesses are also encouraged to complete an assessment of their trees, evaluate their trees' maintenance needs, and complete the necessary maintenance to increase tree structure, integrity and health.

Trees found to be at risk will most often be large trees with damaged roots, structural defects, or significant amounts of deadwood. These conditions can cause either part of or the whole tree to fail, causing serious damage. Tree risk mitigation may require:

- Pruning to remove deadwood or structurally weak branches, improve form or increase clearance
- Supplemental support (cables and bracing rods)
- Further inspections
- Removal if in irreversible decline or their risk of failure cannot be otherwise mitigated

These basic activities should be completed as soon as possible, once the need is identified, to mitigate tree risk and should also become routine activities within the community forest management program.

4. Tree Benefits and Value

To strengthen support for storm mitigation and community forest management efforts, it is useful to know and promote the functions, benefits, and value of community trees. Using tree canopy assessment or public tree inventory data, the value of the benefits provided by trees can be calculated.

i-Tree Tools for Assessing and Managing the Community Forest available at www.itreetool.org include calculations of tree value in the i-Tree Canopy component for tree canopy values and in the i-Tree ECO component for tree inventories. Additional methods used for calculating the value of trees include:

- Council of Tree and Landscape Appraisers. *Guide for Plant Appraisal*, 9th Edition, International Society of Arboriculture, www.isa-arbor.com.
- *National Tree Benefits Calculator*, http://treebenefits.com/calculator/

Include the annual dollar value or amount of the following benefits provided by your tree canopy and street trees:

- aesthetic and other benefits
- air quality benefits
- pounds of carbon sequestration and avoidance
- carbon dioxide benefits
- energy benefits
- gallons of stormwater intercepted
- stormwater benefits

✓ **Record on the template the amount and value of each of the benefits provided by your community's tree canopy.**

✓ **Record on the template the amount and value of each of the benefits provided by your public street trees.**

5. Community Forest Management Costs

While your trees provide considerable benefits that can be valued in dollars, your trees also cost money to manage. You should maintain accurate records of the cost of managing your community trees. Include annual costs for:

- Tree inventory (staff or contract)
- Tree risk assessment (staff or contract)
- Tree purchases
- Tree planting (staff)
- Tree planting (contract)
- Mulching (labor)
- Mulch materials
- Pruning (staff)
- Pruning (contract)
- Supplemental support and lightning protection system installation (contract)
- Pest management
- Irrigation (staff)
- Inspection (staff)
- Removal (staff)
- Removal (contract)
- Equipment and supplies
- Consulting services
- Infrastructure repairs
- Leaf and limb pick-up
- Liability/claims for damages
- Administration (staffing, office supplies, education, advertising and promotion)
- Other costs (provide description)

  ✓ **Record on the template the total annual cost of community tree management by category and calculate the total community forestry program expenditures.**

  ✓ **Record on the template the percentage of all public trees that are street trees; calculate the pro-rated cost of managing the street tree population.**

6. Benefit to Cost Ratio of Community Forest Management

With knowledge of the total value of your street trees, and information on your annual tree management or tree risk mitigation costs, you can also calculate the benefit to cost ratio of your trees. Divide the dollar value of the annual benefits by the total annual cost for management to arrive at the value of benefits returned by the trees for each dollar spent on their management.

- ✓ **Record on the template the benefit to cost ratio of your community tree management or tree risk mitigation program, for your total tree canopy or for your public street trees.**

C. STORM MITIGATION MAP

A storm mitigation map that includes the locations of critical facilities, transportation corridors (especially high priority roads to critical and emergency facilities), street trees (especially very large trees and trees at risk), and emergency response sites is an essential tool for storm preparation, response and recovery. After this information is placed on the map, priorities for tree risk mitigation should become apparent where priority roads, large trees, and critical facilities intersect and overlap. When completed, the storm mitigation map should be printed out, distributed to all storm mitigation team members, and distributed in preparation for storms and for review during the annual storm mitigation planning meeting. It should also be made available online.

The locations of the following facilities and infrastructure should be included on the storm mitigation map:

Critical Facilities

- Hospitals and other critical health care facilities
- Fire stations
- Police stations
- Communications networks and facilities
- Electric utilities and other utility networks and facilities
- Water and sanitation systems

Transportation Network

- Street network
- Priority streets to critical facilities highlighted

Trees

- All public trees
- Large canopy public trees highlighted
- Tree canopy density

Emergency Response Sites

- Emergency management centers
- Homeland Security offices
- Personnel and equipment staging areas
- Debris staging and storage areas

CREATING YOUR STORM MITIGATION MAP

You can create a storm mitigation map using your geographic information system. Include layers containing your transportation network, critical buildings and facilities, utility infrastructure, tree canopy, and public trees. Large trees along roads to essential facilities become the highest priority for storm damage mitigation.

A paper map can also be developed. The location of critical buildings, facilities, and utilities should be highlighted on the map. Transportation corridors to these critical facilities should then be highlighted. The arborist/forester should then conduct a windshield survey of large public tree locations along these transportation corridors and around critical facilities and mark the locations of these trees on the map. The areas of intersection of critical facilities, roads to those facilities, and areas with large trees then become the highest priority areas for storm response.

THE URBAN TREE RISK INDEX

The Central Alabama Regional Planning and Development Council and partners, through a grant recommended by the National Urban and Community Forestry Advisory Council, have developed an *Urban Tree Risk Index* (UTRI) tool to help arborists/foresters and emergency management personnel define, rank, and map the areas of greatest need for tree risk mitigation. This GIS based system results in the development of a map and database that can be used for prioritizing tree risk mitigation activities prior to, during, and after a storm event.

The UTRI is developed by the arborist/forester in partnership with emergency management personnel and city/county or regional planning GIS staff. The critical facilities, the road segments leading to those critical facilities, population density, and the tree canopy along each road segment are ranked. The layers of information are combined to create the urban tree risk index. Field verification of the index values is conducted and the values are adjusted based on field conditions.

For more information on the *Urban Tree Risk Index*, visit www.UrbanForestrySouth.org and search for "UTRI", or contact Dudley R. Hartel, USDA Forest Service, Center Director, Urban Forestry South, dhartel@fs.fed.us, 706.549.4236.

- ✓ **Record on the template whether or not you have developed a storm mitigation map, where copies of the map are available, and if the map can be accessed online.**
- ✓ **Record on the template the information that is included on your storm mitigation map.**
- ✓ **Record on the template the person responsible for developing and updating your storm mitigation map.**

D. TREE RISK MITIGATION

After the potential for storm and tree damage is assessed, information is gathered on the community forest resource and a tree risk assessment is completed, the process of mitigating tree risk should begin immediately by beginning short-term tree risk management activities. A long-term plan for tree risk mitigation that involves improvements in the overall community

forest management program and health and structural stability of the tree resource should then be developed and implemented. The tree care manager should be assigned the responsibility for completing or coordinating tree risk mitigation and further developing the community forest management program.

1. Short-term Tree Risk Mitigation

Trees found to have an elevated risk of partial or whole tree failure should be pruned, removed, or cabled and braced where feasible and effective, as soon as they are identified to mitigate the immediate risk. Short-term tree risk mitigation should begin with the following activities:

- Risk reduction pruning
- Supplemental support (cabling and bracing)
- Installation of lightning protection systems
- Pest management
- Risk reduction removals

The installation of lightning protection systems and the management of pest infestations should be completed to improve tree health and reduce the potential for tree damage and decline. In addition to reducing tree risk through maintenance, an annual tree planting program to replace trees removed for risk mitigation and to improve the overall quality of the community forest and resiliency to storms should be implemented.

Record on the template the following:

- ✓ **Total number of trees identified with a risk of partial or whole tree failure during the last tree risk assessment**
- ✓ **Number of trees scheduled to be pruned for risk reduction annually**
- ✓ **Number of trees scheduled to be cabled for risk reduction annually**
- ✓ **Number of trees scheduled for installation of lightning protection systems**
- ✓ **Number of trees scheduled for pest management**
- ✓ **Number of trees scheduled to be removed for risk reduction annually**
- ✓ **Number of trees scheduled to be planted to replace trees removed for mitigation annually**

2. Long-term Tree Risk Mitigation

While implementing a tree risk management program, many other community forest management activities in addition to those already discussed in this workbook, can be implemented to mitigate tree risk and storm damage on a long-term basis. These components and activities include improving policies, procedures, and regulations, increasing educational opportunities, and encouraging more responsibility and involvement of the entire community in tree care.

Program components that will promote long-term tree risk and storm damage mitigation include:

- Tree care standards and best management practices
- Tree ordinance
- Ongoing training program for tree care personnel
- Established tree care budget
- Alternate program funding mechanisms
- Tree bank
- Routine street tree inspection program
- Routine large tree inspection program
- Routine pruning program
- Routine tree planting program
- Routine tree mulching, irrigation, and soil aeration
- Recommended tree species list
- Species selection guidelines
- Site selection guidelines
- Minimum rooting areas and soil volume requirements
- Growing space protection requirements
- Critical root zone protection requirements
- Public information and education program
- Program analysis and feedback

  ✓ **Record in the template the additional community forest management program elements that have been adopted and implemented that will contribute to long-term storm mitigation.**

E. EQUIPMENT AND SERVICES

The equipment required and available for storm mitigation, response and recovery should be inventoried annually and kept maintained so that it is operable and ready to use when needed. Maintain an up-to-date list of the type and amount of available equipment, along with the department or other source that will supply the equipment (local government, equipment rental vendor, contractor, or another government entity).

The type of equipment that is likely to be needed for storm response and recovery includes (but is not limited to):

- Supervisor and crew vehicles
- Aerial lift trucks
- Loaders
- Chippers
- Refuse packers
- Dump trucks
- Barricades
- Traffic safety cones
- Lighting equipment
- Chain saws
- Hand saws
- Pole pruners
- Cell phones
- Portable radios
- Computers/tablets
- GPS units
- Cameras
- Clipboards
- Data sheets
- DBH tapes
- Safety vests
- Hardhats
- Eye protection
- Ear protection
- First aid kits

- ✓ **Record on the template the equipment needed, the number needed of each and the availability by amount and source.**

F. MEMORANDA OF UNDERSTANDINGAND ADVANCED READINESS CONTRACTS

Depending on the size, severity and impact of a storm event, the community will likely have to rely on outside sources of materials and services. Consider whether or not your community has the training, resources or capacity to provide or purchase these materials and services. When possible, cooperate with surrounding communities, local agencies and non-profit organizations to provide equipment, materials and services. Execute memoranda of understanding with these individuals to describe the nature of the cooperative agreement. You may need to hire contractors to perform some services or contact vendors for large quantities of supplies during storm preparation, response or recovery. By executing advanced readiness contracts with these companies you will be better prepared and know what to expect in terms of costs.

The types of services and supplies that might be necessary during storm response and recovery related to trees include:

- Staffing
- Equipment
- Debris removal
- Mulch grinding
- Tree pruning
- Tree removal
- Tree risk assessment
- Nursery stock
- Tree planting

1. Memoranda of Understanding

Memoranda of understanding (MOUs) that outline the sharing of personnel, materials, functions, services and equipment for storm mitigation, response, and recovery should be completed between the government and those willing and able to provide such resources. MOUs are not binding contracts, but clearly establish expectations for providing, and receiving, needed assistance.

Complete the following steps to execute your MOUs:

- Hold a meeting with neighboring communities, agencies, and organization to discuss what functions, services or resources will be needed and shared. You may meet individually or collectively with the parties that will be involved. If several parties will operate in conjunction with one another, also discuss and determine how they will operate together.
- Write out the main purpose of each agreement. Detail the specific outcomes that are expected.
- Determine an appropriate timeline for the beginning, and end, of the partnership, or an appropriate time frame. Be specific and include the dates in the MOU. Include a mechanism for terminating the MOU.
- Include details on the functions, services, and resources to be provided by each party.
- Have all parties review, sign and authorize the MOU.
- Include contact information for all parties.
- Distribute copies to all parties.
- Review at least annually and revise and re-execute as necessary.

MOUs are commonly executed with:

- Neighboring communities
- Local agencies
- Non-profit organizations

  ✓ **Record on the template the names of the communities, agencies, and organizations with whom you have an MOU in place; include copies of the MOUs in the template appendix.**

2. Advanced Readiness Contracts

Advanced readiness contracts (ARCs) should be executed with equipment rental vendors, debris removal contractors, mulch grinding contractors, tree service contractors, tree suppliers, and landscape contractors. These contracts are legally binding and should include a description of the services to be provided, the cost of the services, and the standards to be met when executing the services. By preparing and executing these ARCs before a storm occurs, the capacity for storm preparation, response and recovery should be increased and the overall cost of the same should be reduced.

Include the following in each ARC:

- Names of all parties involved
- Address and contact information for all parties

- Contract period with a beginning and ending date
- Mechanism for terminating the contract
- Detailed description of services
- Standards to be met while providing service (safety, performance, results)
- Purchasing requirements
- Cost for services
- Payment schedule
- Signatures of authorized representatives
- Date of execution of contract

✓ **Record on the template the names of the contractors with whom you have an ARC in place; include copies of the ARCs in the template appendix.**

G. COMMUNICATION, INFORMATION, EDUCATION AND AWARENESS

1. Communication

A designated call center for notification of fallen and hazardous trees and tree damage should be established.

✓ **Record on the template the location and contact information for the designated call center for notification of fallen and hazardous trees and tree damage; include the physical address, phone number, fax number, website, e-mail address, and director or primary contact person.**

The primary communication between storm mitigation team members during storm events should be through an established system of radios or cell phones. The contact list of storm mitigation team members that includes cell phone and radio numbers should be distributed in printed form and placed online for access through computers, tablets and smart phones. These communication devices should be maintained in a fully charged condition prior to any predicted event and on a daily basis in preparation for unpredictable events.

Regular and timely information should be provided internally to staff and externally to the public through a variety of media.

2. Information and Education

Internal Information Sharing

During storm preparation, information can be shared internally through:

- Phone calls
- E-mails
- Meeting notices, agendas, and minutes
- Cloud-based storage site

  ✓ **Record on the template the preferred and chosen methods for internal information sharing.**

  ✓ **Record on the template the individual responsible for coordinating internal information sharing.**

External Information Sharing

Information can be shared externally through:

- Written scripts and recorded public service announcements
- Press releases and newspaper articles
- Government websites (home page, community forest management program website)
- Neighborhood association websites
- Facebook page
- Twitter account
- Pamphlets and brochures

  ✓ **Record on the template whether or not you have available information to disseminate to the public on storm mitigation, preparation, response and recovery.**

  ✓ **Record on the template the preferred and chosen methods for external information sharing.**

  ✓ **Record on the template the individual responsible for external information sharing and education.**

Information and Education Topics

Written scripts, sample press releases and recorded public service announcements can be prepared and made available in the county emergency management office, public information office or tree care manager's office. Distributing information on the following topics related to storm preparation, response and recovery are recommended:

- Benefits of trees
- Tree maintenance standards and best management practices

- How to hire an ISA Certified Arborist
- Chainsaw safety
- The location and contact information of the designated call center for notification of fallen trees and tree damage
- Magnitude of the storm
- Debris pick-up schedule and procedures
- Expected clean-up time
- Post-storm hazards—hangers, leaning trees, downed power lines
- Type of debris to be collected
- Caring for storm damaged trees
- Tree selection and planting best management practices

The tree care manager should keep these scripts and PSAs up to date, with the assistance of the storm mitigation team. The information can be distributed and broadcast via websites, social media, radio stations, television stations and newspapers within the local area.

Ongoing education on tree care, tree risk, and community forest management will enhance both short- and long-term tree risk mitigation. There are many tree care and tree risk mitigation resources accessible on the internet. Below are two (2) examples of educational brochures addressing tree risk that are available from the *National Arbor Day Foundation* and are included in their *Storm Toolkit*.

Tree City USA Bulletin #2: When a Storm Strikes

With the exception of mistreatment by humans, never is danger to a tree greater than during the inevitable trial by storm. The pounding of rain or hail and the fury of wind test the strength of limbs, trunks, and roots. Survival or loss – the key can be the care you give your tree before and immediately after a storm.

This bulletin is dedicated to helping people who care about trees minimize the impact of storms on our community forests.

TREE CITY USA BULLETIN
2

When a Storm Strikes

Tree City USA Bulletin #8: Don't Top Trees!

Tree topping is the senseless brutalizing of older trees. It brings about the disfiguration of America´s forest, striking some communities like a plague. Many communities top trees because they grow into wires, interfere with views or solar collectors, or simply grow too large.

This issue will help you learn the proper way to manage tree growth.

TREE CITY USA BULLETIN
8

Don't Top Trees!

- ✓ **Record on the template whether or not you have written scripts, press releases public service announcements or educational brochures available for disseminating information to the public.**
- ✓ **Record on the template in the chart provided the topics addressed by the written scripts, public service announcements, press releases, websites and social media content, and brochures.**
- ✓ **Record on the template the media outlets that will be used for disseminating this information.**

- ✓ **Record on the template the individuals responsible for distributing information and educational materials on storm preparation, response and recovery to the public.**

3. Awareness

Storm, weather and emergency event preparedness is promoted state-wide and nationally through awareness programs during designated awareness weeks. Local awareness information and education can be coordinated with these awareness weeks and days. These awareness programs include:

- Air Quality Awareness Week
- Fire Prevention Week
- Hurricane Preparedness Week
- Severe Weather Preparedness Week
- Tsunami Awareness Week
- Flood Awareness Week
- Heat Awareness Day
- Lightning Safety Awareness Week

- ✓ **Record on the template the upcoming dates of statewide and national awareness weeks and days.**

H. PREPARATION RECORD KEEPING

The following information and records should be kept on file in the tree care manager's office, included in the template, and placed online in a cloud-based storage service for ease of access during preparation, response and recovery activities.

- Storm mitigation team contact information
- Storm mitigation team meeting announcements, agendas and minutes
- *Community Forest Storm Mitigation Plan*
- Storm mitigation map
- Memoranda of understanding
- Advance readiness contracts
- Data and cost information for:
    - Program administration (personnel and overhead)
    - Tree canopy assessments
    - Tree risk assessments

  - Tree inventory assessments
  - Tree pruning
  - Cabling and bracing
  - Lightning protection
  - Tree removal
  - Other tree maintenance
- Date, amount and source of volunteer hours for program activities
- Public information scripts, public service announcements and press releases

NOTES:

PART III. STORM RESPONSE

Community forest storm response begins with the mobilization of resources immediately prior to an anticipated event and continues through the short-term recovery efforts required to restore community-wide clearance of fallen trees and woody debris. Initial storm response focuses on:

- Mobilization of resources
- Clearing of fallen trees and woody debris from high priority areas, then throughout the community
- Debris management
- Tree risk and damage assessments
- Public information
- Record keeping
- Cost reimbursement through FEMA public assistance grants

A. MOBILIZATION

The responsibility for mobilization of equipment and resources should be assigned to a member of the storm mitigation team. The removal of fallen trees and woody debris will begin immediately after storm damage is identified by debris removal crews and calls are received providing information on the location of downed trees and damage. All tree, limb, and stump removal should be done in accordance with Occupational Safety and Health Administration (OSHA) rules and regulations.

Priorities for mobilization should be established by the community, using the *Storm Mitigation Map*. Crews should be directed to clear fallen trees and woody debris from the highest priority areas first, including:

- Priority roads
- Priority facilities
- Buildings, vehicles or other situations with a personal injury
- Buildings and vehicles without injured persons
- Utility repair
- Remaining rights-of-way, public buildings and public facilities

✓ **Record on the template the person responsible for mobilizing resources to respond to storm damage.**

- ✓ **Record on the template the priority areas for the removal of fallen trees and woody debris.**

B. DEBRIS MANAGEMENT

1. Debris Staging and Storage

One or more debris storage sites that will accommodate large volumes of woody debris and logs should have been established during storm preparation. The routes to these debris storage areas should be cleared immediately after the routes to critical facilities have been cleared.

- ✓ **Record on the template the location of all debris storage sites.**
- ✓ **Record on the template the person responsible for coordinating debris staging and storage.**

Woody debris should be kept separate and free from metals, plastics, or other contaminants so that it can be utilized later. An initial sorting of debris should be done at each debris storage site to the extent practical to sort brush and limbs from trunks that may be marketable as saw logs.

Property owners should keep woody debris separate from garbage, yard waste and demolition debris. Public service announcements should inform property owners about pick-up times and schedules, and emphasize that the removal of standing trees and woody debris on streets leading to critical facilities will be a priority.

Brush and limbs should be chipped for mulch and be made available free to the public after storm response and short-term recovery are complete. An effort should be made during long-term storm recovery to utilize mulch for mulching all public trees where practical. Chips not suitable for mulch should be marketed as bio-fuel.

Saw logs should be marketed to area saw mills for use as dimensional lumber, furniture, or other products.

2. Debris Estimation

The following FEMA resources (www.fema.gov) provide information on debris management and estimation:

- *Public Assistance Debris Management Guide*, FEMA 325, July 2007
- *Debris Estimating Field Guide*, FEMA 329, September 2010

- ✓ **Record on the template the person responsible for debris estimation.**

C. TREE RISK AND DAMAGE ASSESSMENTS

After the initial response to a storm, the community can utilize government staff, consultants, trained volunteers or Urban Forest Strike Teams[3] to assess tree risk and damage as roads are cleared and trees can be accessed.

After the initial response, the city/county will utilize [city/county staff] [trained volunteers] [Urban Forest Strike Teams] to assess tree risk and damage immediately following a storm as roads are cleared and trees can be accessed. Tree risk assessment crews will perform a Level 1 risk assessment as soon as it is safe to travel in the affected area. The location of trees and stumps that need pruning or removal for risk mitigation and hazard reduction as determined by ISA Certified Arborists or other trained personnel shall be recorded using either a GPS based data collection system or paper tally sheets. Other information needed for FEMA Public Assistance shall be recorded. Some trees may be identified for a Level 2 Risk Assessment by the city/county arborist/forester.

Particular attention should be paid to trees with:

- Hangers (detached limbs hanging in the crown)
- Splitting limbs
- Leaning trunk with soil broken and heaved opposite the lean
- Splitting trunk

Record on the template:

- ✓ **The groups or individuals that will be performing tree risk and damage assessments.**
- ✓ **The person responsible for coordinating tree risk and damage assessment crews.**
- ✓ **The types of conditions that will require the removal of additional standing trees due to their imminent risk of failure and damage potential.**
- ✓ **The person responsible for determining which standing trees should be removed.**

[3] Contact your GFC Sustainable Community Forester to request tree damage assessment assistance from the Urban Forest Strike Team.

The location of public trees that are not hazardous, but meet the following criteria, should also be noted during tree risk assessment and should be removed after initial response and recovery:

- Primary trunk failure (broken tops, less than 50 percent of the crown remaining)
- Co-dominant trunk failure with less than 50 percent of crown remaining
- Multiple limb failures with less than 50 percent of the crown remaining

D. INFORMATION

During storm response, information provided to the community should focus on safety, tree risk and debris cleanup efforts. The scripts, press releases and public service announcements developed in preparation for an event should be customized to fit the details of the current storm event. After initial response is completed, information and education can be refocused on long-term recovery and restoration of the community forest.

The person responsible for providing information and education during storm response, if not the tree care manager, should work closely with the tree care manager to make sure that information being provided to the public regarding trees is accurate.

- ✓ **Record on the template the person responsible for providing public information during a storm event.**

E. RESPONSE RECORD KEEPING

During initial storm response and short-term recovery, the following records should be retained:

- Tree and debris removal call log
- Debris removal costs
- Debris volume estimates
- Number and location of trees removed
- Number and location of tree pruned
- Number and location of stumps removed
- Tree, limb, and stump removal costs
- Contractor invoices
- Staff hours by person
- Equipment hours by piece of equipment

- Volunteer hours by person and activity; volunteer contact information
- Tree damage assessment data and costs

Documents and record keeping required by FEMA for obtaining Public Assistance grant funding for reimbursement of response and recovery costs are described in the following section.

F. FEMA PUBLIC ASSISTANCE GRANTS

FEMA provides Public Assistance grant funding for the removal of hazardous trees, limbs, and stumps that present immediate threats to lives, public health and safety, or improved property and meet other eligibility criteria specified in the *Debris Management Guide, FEMA 325*. The documentation of costs and work performed that is required for receiving funding is outlined in FEMA's *Disaster Assistance Policy Disaster Assistance Policy DAP9580.204 Documenting and Validating Hazardous Trees, Limbs, and Stumps*, which is reproduced in Appendix B.

1. Hazardous Trees Documentation

Hazardous tree removal is eligible for Public Assistance grant funding for all trees leaning and in an imminent state of falling or those whose canopies pose an immediate threat to life, public health, safety, and improved property. Trees must be six inches or larger in diameter measured at 4.5 feet above the ground to be eligible.

Documentation required for hazardous tree removal includes:

- Spreadsheet showing the number of trees removed and size and location of each tree
- Location should include the street/road name and GPS coordinates of each tree removed along public rights-of-way, and the property address and GPS coordinates of each tree removed from private property
- Photographs of trees cut flush with the ground along with a certification that the trees were six inches or larger in diameter

  ✓ **Record on the template the document retained for hazardous tree removal.**

2. Hazardous Limbs Documentation

The costs of removal of broken limbs two inches or larger in diameter measured at the point of break that pose an immediate threat to life, public health, or safety, or pose an immediate threat of significant damage to improved property, are eligible reimbursement of Public Assistance grant funding.

Documentation required for hazardous limb removal includes:

- Spreadsheet showing the location of the trees and number of limbs cut on each tree (information on number of hazardous limbs removed per tree is not necessary if removal was contracted for on a per-tree basis)
- Certification that the limbs were two inches or larger in diameter
- Location should include the street/road name and GPS coordinates of each tree with hazardous limbs removed along public rights-of-way, and the property address and GPS coordinates for trees with hazardous limbs removed on private property
- Photographs showing the number of limbs cut

✓ **Record on the template the document retained for hazardous limb removal.**

3. Hazardous Stumps Documentation

Public Assistance grant funding is available for the removal of stumps 24 inches or larger in diameter measured at 24 inches above the ground that have 50 percent or more of their root ball exposed. Reimbursement for the removal of stumps less than 24 inches in diameter will be based on the reasonable cubic yard prices for vegetative debris removal.[4]

Documentation required for hazardous limb removal includes:

- *Hazardous Stump Worksheet* (http://www.fema.gov/pdf/government/grant/pa/9523_11.pdf)
- Include number of hazardous stumps removed, locations, and sizes
- Quantity of fill material required to fill the remaining hole
- Photographs of the stumps removed may also be submitted

✓ **Record on the template the document retained for hazardous stump removal.**

Applicants who request reimbursement for force account labor and equipment should provide all of the above information except the sizes of the stumps removed.

The FEMA documentation requirements stated above only apply when applicants are collecting, hauling, and disposing of the debris. They do not apply during the emergency debris clearance phase when crews clear roads to provide emergency access to critical facilities. FEMA will validate hazardous tree, limb, and stump removals in the field within 45 days of the completed operation.

[4]Please see *Disaster Assistance Policy DAP9523.11, Hazardous Stump Extraction and Removal Eligibility*, for additional information on the estimated volume of various size stumps.

Record on the template the person responsible for documenting the hazardous trees, limbs and stumps removed.

PART IV. STORM RECOVERY

As storm response and short-term recovery efforts are completed, long-term recovery of the community forest can begin. This recovery includes the following steps:

- Post-storm mitigation analysis
- Inventory of tree losses
- Inventory of potential planting sites
- Selection of appropriate species for planting for each site
- Development of tree replacement plan
- Mobilization of tree replacement partners
- Continuation of ongoing tree risk mitigation
- Ongoing distribution of information and education focusing on community forest recovery
- Maintaining records of storm recovery costs and activities

After major tree losses, recovery efforts will focus on the replanting of trees lost and restoration of the community's tree canopy. Replanting projects provide the community with opportunities to work together and build long-term partnerships. Engage storm mitigation team members in your restoration efforts, along with the communities, organizations, agencies, contractors and vendors with whom you have in place a current memorandum of understanding or advanced readiness contract.

During this period, the government will focus on the replacement of trees on public properties—along streets and around public facilities, on school campuses and in parks and cemeteries. The government can also assist private property owners in their replanting efforts by facilitating partnerships and providing information and education on tree replacement and planting.

A. POST-STORM MITIGATION ANALYSIS

The storm mitigation team should meet within 30 days after short-term recovery activities are complete to review the community forest storm mitigation plan and make any changes necessary to the information, policies, and action steps it contains.

Discuss the activities that contributed the most to the mitigation of tree-related damage during the most recent storm. List the greatest areas of need in preparing for future storms.

- ✓ **Record on the template the activities that contributed most to the mitigation of tree-related damage and losses during the most recent storm(s).**
- ✓ **Record on the template the greatest areas of need identified during the most recent storm(s) for preparation and mitigation for future storms.**

B. SUMMARY OF TREE LOSSES

An accounting of the total number of public trees lost during the storm should be made using tree damage assessment data and subsequent inventories of public trees. Summarize the data by species and DBH and use the summaries to assist in the selection of replacement tree species.

- ✓ **Record on the template the total number of public trees lost in the most recent storm by species and DBH category.**

C. INVENTORY OF POTENTIAL PLANTING SITES

Public trees lost during a storm should be replaced on a one-to-one or greater basis, with trees equal to or greater in mature size, as resources permit, to maintain no net loss of tree canopy cover. Large canopy trees should be planted wherever space permits to further maintain tree canopy. Where it is not possible for trees to be replaced in the same or nearby location, they should be planted on other streets or public property. Refer to the community's list of trees recommended for planting for guidance on typical mature tree height. Trees that typically grow to heights of 50 feet or taller at maturity are considered to be large trees. Trees that typically grow to heights of greater than 25 feet but less than 50 feet at maturity are considered to be medium trees. Trees that typically grow to heights of less than 25 feet at maturity are considered to be small trees.

Complete an inventory of the location and type of available planting sites on public property as soon as practical after storm response and short-term recovery are completed.

- ✓ **Record on the template in the spreadsheet provided (or develop your own spreadsheet in Excel) the number of trees and recommended species to be planted by site type (streets, parks, cemeteries, schools, public facilities), location name, street, address, available growing space.**

D. TREE SPECIES SELECTION

The tree species selected for replacement planting on a site should be compatible with the site conditions, including above and below ground growing space. The mature size, crown shape, form, compatibility with the area's soils and climate should also be considered during tree selection decisions. Fast-growing species with weak wood and species with inherent structural defects should be avoided for planting along street rights-of-way, in parks and cemeteries and around public buildings and facilities.

In our area these species include:

- Bradford Pear
- Red Mulberry
- Siberian Elm
- Hackberry/Sugarberry
- Water Oak

Information on the frequency of failure of individual tree species during storm events should also be used to make tree planting decisions and may be used to revise the city's/county's list of trees species recommended for planting in the community.

- ✓ **Record on the template whether or not your community has an official tree species list to guide tree species selection.**

E. TREE REPLACEMENT PLAN

A small number of tree losses can be replaced during the next planting season. The preferred season for planting trees in Georgia is December through March. Replacement planting for heavy tree losses should be spread over multiple years.

The number of public trees planted each year to replace losses will depend on the amount of resources available—budgets, donations, staff and volunteer time and labor, and trees. Based upon the number of tree losses, the number of planting sites available, and the resources available on an annual basis, determine the number of years it will take to replace the trees lost and establish a goal of planting a specific number of trees per year over that time period.

The community should include in their public tree replacement plan a schedule for new tree maintenance to include, at a minimum:

- Mulching (annually)
- Irrigation (during the growing season—April through October—in the absence of adequate rainfall)
- Pest management (as insect and disease problems are identified)
- Young tree training pruning (beginning the winter after the first growing season and annually as necessary)
- Routine inspections (annually)

✓ **Record on the template whether or not your community has a written 3-year maintenance plan for newly planted trees.**

✓ **Record on the template the persons responsible for developing and coordinating the community's public tree replacement plan and for the maintenance of newly planted trees.**

F. TREE REPLACEMENT PARTNERS

Financial, labor, and material assistance for large scale and multi-year public tree replacement projects should be solicited from local companies, non-profit organizations, and citizens. Some of these partners may already have been identified and have entered into a memorandum of understanding or advanced readiness contract for providing some of this assistance.

The tree care manager, storm mitigation team members and other community leaders should develop additional partnerships and solicit additional assistance to the level necessary for a successful replacement program.

✓ **Record on the template the person responsible for soliciting financial, labor and material assistance for large scale and multi-year tree replacement projects.**

✓ **Record on the template the names of program partners who will provide financial, labor and material assistance for tree replacement.**

G. ONGOING TREE RISK MITIGATION

Tree risk should continue to be mitigated on an ongoing basis as described in the storm preparation section of this workbook. Tree risk mitigation should be a consideration in all community forest management activities, including replanting. Mitigation efforts during

replanting and recovery should focus on tree health, tree pruning, tree and site selection, routine tree maintenance, and tree protection.

- ✓ **Record on the template whether or not the community has an ongoing tree risk mitigation program, and the activities included in that program.**
- ✓ **Record on the template the person responsible for coordinating ongoing tree risk mitigation.**

H. INFORMATION AND EDUCATION

After short-term recovery and response has been completed, the community will continue to benefit from guidance on tree replanting, maintenance, and mitigation efforts. With initial response and recovery completed, recognition programs for the response teams should also be a priority.

- ✓ **Indicate on the template whether or not your community has in place a program to identify the individuals, organizations, and companies that deserve recognition for their storm response and recovery efforts.**
- ✓ **Record on the template the person responsible for coordinating the community's recognition program.**

During long-term recovery, the community's information and education program should continue and should focus on the following topics:

- Tree and tree canopy loss results
- Tree planting programs and grants
- Availability of assistance and materials, including volunteer labor, replacement trees, mulch
- When and how to hire an ISA Certified Arborist
- Ongoing tree risk assessment
- Tree health maintenance
- Crown restoration pruning
- Recommended species for planting
- Tree planting techniques
- Tree benefits

- ✓ **Record on the template the topic that will be the focus of long-term recovery information and education program.**

The types of information and education programs during storm recovery may include:

- Recognition programs for responders
- Field demonstrations
- Neighborhood workshops
- Website content
- Newspaper articles
- Public service announcements

✓ **Record on the template the types of information and education programs that will be utilized for communicating with the public.**

I. RECOVERY RECORD KEEPING

The maintenance of accurate records on community forest management and storm mitigation activities should continue during the recovery phase. These data and records will provide the basis for gaining additional program capacity and improving existing programs. They may also be helpful in securing grants for future mitigation projects.

- Staff hours
- Equipment hours
- Contractor invoices
- Donations by source with contact information
- Volunteer hours
- Tree purchase data (nursery, number purchased by species and cultivar) and costs
- Tree planting data (species, location, date) and costs
- Tree survival data (annual results)

✓ **Record on the template the types of records that will be maintained during long-term recovery.**

The person responsible for maintaining long-term recovery records will most likely be the tree care manager, but others may share that responsibility.

✓ **Record on the template the person responsible for maintaining long-term recovery records.**

APPENDIX A. RESOURCES

The following documents, websites, and presentations were either used as resources for the development of the *Community Forest Storm Damage Mitigation Plan Template* or are recommended for review by communities for storm damage mitigation planning.

Burban, Lisa L. (USDA Forest Service); Andresen, John W. (University of Illinois).*Storms Over the Urban Forest: Planning, Responding, and Regreening—A Community Guide to Natural Disaster Relief*, Second Edition, 1994, USDA Forest Service; http://www.na.fs.fed.us/spfo/pubs/uf/sotuf/sotuf.htm

Burban, Lisa L. (USDA Forest Service); Hermann, Jim (Minneapolis Park and Recreation Board); Himanga, Katie (Heartwood Forestry).*Tree Em*ergency Plan Worksheet, Updated May 2006; http://www.na.fs.fed.us/urban/inforesources.

Department of Public Services, Columbus Consolidated Government. *Emergency Storm Response Plan*, publication date unknown;

Escobedo, Francisco; Northrop, Robert; Zipperer, Wayne. Developing an Urban Forest Management Plan for Hurricane-Prone Communities, Publication FOR121, University of Florida, Institute of Food and Agricultural Sciences Extension, September 2007; http://hort.ifas.ufl.edu/woody/documents/FR176.pdf

Fazio, James R. *Helping Communities Recover in the Wake of Storms*, *ARBOR DAY*, September/October 2012, National Arbor Day Foundation;www.arborday.org.

FEMA Mitigation Planning; Mitigation's Value to Society; http://www.fema.gov/multi-hazard-mitigation-planning.

GEMA/Homeland Security. *Hazard Mitigation;* www.gema.ga.gov.

Available from the Georgia Urban Forest Council, Inc. at www.gufc.org:

McKenzie, Martha Nolan. *Natural Storms, SHADE Magazine*, 2007
A Canopy of Benefits, SHADE Magazine, 2010
Risk Management, A Balancing Act, SHADE Magazine, 2012

Hartel, Dudley R. *Storm Resources* (Slides with Notes 30May07), Storms Conference presentation, USDA Forest Service Southern Center for Urban Forestry Research & Information.

Pokorny, Jill D. (Coordinating Author). *Urban Tree Risk Management: A Community Guide to Program Design and Implementation*, USDA Forest Service, Northeastern Area, State and Private Forestry, Publication NA-TP-03-03; http://na.fs.fed.us/spfo/pubs/uf/utrmm/.

Tree Care Industry Association, Inc. *ANSI A300 (Part 9)-2011 American National Standard for Tree Care Operations—Tree, Shrub, and Other Woody Plant Management—Standard Practices (Tree Risk Assessment a. Tree Structure Assessment)*, 2011, Tree Care Industry Association, Inc.

Additional organizations, websites, and publications that provide information on tree risk assessment, storm mitigation planning, and community forest management are listed below.

Letson, Neil. *Making Our Urban Forests Safer, ANR1210*, Alabama Cooperative Extension Service. 2001; http://www.aces.edu/pubs/docs/A/ANR-1210/index2.tmpl

Ready Georgia

Launched January 2008, *Ready Georgia* is a statewide campaign supported by the Georgia Emergency Management Agency (GEMA) aimed at motivating Georgians to take action to prepare for a disaster. GEMA is the state agency that is responsible for emergency mitigation, preparedness, response, recovery and special events.
http://ready.ga.gov/Get-Involved/Emergency-Management-Agency-Contacts
Online Toolkit: http://ready.ga.gov/Get-Involved/Online-Toolkit

Citizen Corp Councils

http://citizencorps.gov/citizencorps/councils/councilindex.shtm

Community Emergency Response Teams (CERTs)

http://www.citizencorps.gov/cc/CertIndex.do?reportsForState&cert=&state=GA

Firewise Communities

http://www.firewise.org/

Georgia Regional Development Centers

http://georgiainfo.galileo.usg.edu/regionmaps/rdc.htm

Storms Over the Urban Forest Toolkit (CD-ROM)

Copies of the CD may be obtained from:
Southern Center for Urban Forestry Research & Information
USDA Forest Service, 320 Green Street, Athens, GA 30602-2044
(706)559-4236

Other Resources

In addition to the many websites and resources cited in the plan template, there are many other resources available on the internet addressing tree risk, storm damage, and storm mitigation. You can find these resources by searching using one of the following key phrases:

- Tree risk
- Tree damage
- Storm damage
- Storm mitigation
- Hazard mitigation

APPENDIX B. Disaster Assistance Policy DAP9580.204 Documenting and Validating Hazardous Trees, Limbs, and Stumps

Reproduced from http://www.fema.gov/9580204-documenting-and-validating-hazardous-trees-limbs-and-stumps

OVERVIEW

Removal of hazardous trees, limbs, and stumps that present immediate threats to lives, public health and safety, or improved property and meet other eligibility criteria specified in the *Debris Management Guide, FEMA 325*, may be eligible for Public Assistance grant funding. The regulations governing FEMA's Public Assistance Program (Code of Federal Regulations, Title 44: Emergency Management and Assistance, Part 206, Subparts G (*Public Assistance Project Administration*)and H (*Public Assistance Eligibility*) require States and local government applicants to provide documentation of costs and work performed to support requests for reimbursement from FEMA (44 CFR §206.202(b) (4), *Application procedures*, *Grantee*). The regulations also require States to monitor grant and subgrant supported activities such as debris removal and disposal operations. 44 CFR §206.205(b)(1), *Payment of claim*, *Large projects*, states: "The Grantee shall make an accounting to the RD [Regional Director, now Regional Administrator] of eligible costs for each approved large project. In submitting the accounting the Grantee shall certify that reported costs were incurred in the performance of eligible work… [and] that the approved work was completed." Additionally, 44 CFR §206.205(b)(2) states: "The RD shall review the accounting to determine the eligible amount of reimbursement for each large project and approve eligible costs. If a discrepancy between reported costs and approved funding exists, the RD may conduct field reviews to gather additional information."

This Fact Sheet provides guidance on the documentation applicants should provide in their requests for Public Assistance funding for removing hazardous trees, limbs, and stumps. It also describes the process FEMA will use in coordination with States and local government applicants to validate that eligible work was completed when a discrepancy between reported costs and eligible funding arises.

DOCUMENTING HAZARDOUS TREES, LIMBS, AND STUMPS

General

Applicants should provide documentation that directly supports their requests for Public Assistance funding and certification that they performed the work in accordance with FEMA eligibility criteria. The documentation may include photographs, maps, and other documents that show the location of the work on public rights-of-way, evidence of the immediate threat, and details of the work performed to remove the threat. If applicants perform the work, they should submit documentation of labor and equipment charges required to do the work, such as payroll records, applicant-owned equipment usage records, and equipment rental invoices. If applicants hire contractors to perform the work, the applicants should submit the contract and invoices to FEMA.

Applicants should separate costs for the removal of hazardous trees, limbs, and stumps from debris removal paid on a cubic yard or ton basis to avoid double payment, unless they can clearly show that costs for cutting are separate from costs to remove and dispose of the debris.

Specific eligibility criteria and documentation requirements for each item of work are provided below. Failure to provide sufficient documentation may jeopardize the applicant's request for Public Assistance funding.

Hazardous Trees

Eligibility Criteria: Trees that are leaning such that they are in an imminent state of falling over and trees with broken canopies may pose an immediate threat to life, public health, safety, and improved property. Trees should be six inches or larger in diameter, measured 4.5 feet above ground level.

Documentation: Applicants should submit a spreadsheet showing the number of trees cut and the size and location of each tree. The location should include the street/road name and GPS coordinates of each tree removed along public rights-of-way, and the property address and GPS coordinates of each tree removed from private property. Applicants may also provide photographs of the flush-cut trees and certify that the trees were six inches or larger in diameter, measured 4.5 feet above the ground.

Hazardous Limbs

Eligibility Criteria: Broken limbs two inches or larger in diameter measured at the point of break that pose an immediate threat to life, public health, or safety, or pose an immediate threat of significant damage to improved property, are eligible for removal.

Documentation: Applicants should submit a spreadsheet containing the location of the trees, the number of limbs cut on each tree, and a certification that the limbs were two inches or larger in diameter. The location should include the name of the street/road and GPS coordinates for each tree or cluster of trees along public rights-of-way, and the street address or parcel number for hazardous limbs cut on private property. Applicants may also submit photographs to document the number of hazardous limbs cut. If the applicants contracted for the removal of hazardous limbs on a per-tree basis, the number of limbs cut per tree is not necessary.

Hazardous Stumps

Eligibility Criteria: Stumps that are 24 inches or larger in diameter measured 24 inches above the ground and have 50 percent or more of their root ball exposed are eligible for removal on a per-stump basis. Reimbursement for the removal of stumps measuring less than 24 inches in diameter will be based on the reasonable cubic yard prices for vegetative debris. Please see Disaster Assistance Policy DAP9523.11, *Hazardous Stump Extraction and Removal Eligibility*, for additional information on the estimated volume of various size stumps.

Documentation: Applicants should complete a *Hazardous Stump Worksheet*, found in Disaster Assistance Policy DAP9523.11. The Worksheet captures information on the number of hazardous stumps removed, hazardous stump location and size, and the quantity of fill material required to fill the resultant hole. Applicants that request reimbursement for force account labor and equipment should provide all of the above information except the sizes of the stumps removed.

The documentation requirements stated above only apply when applicants are collecting, hauling, and disposing of the debris. They do not apply during the emergency debris clearance phase when crews clear roads to provide emergency access to critical facilities.

Additional information on the eligibility of hazardous trees, limbs, and stumps can be found in Part I of FEMA's *Debris Management Guide, FEMA 325*, and in Disaster Assistance Policies DAP9523.11, *Hazardous Stump Extraction and Removal Eligibility*, and DAP9523.13, *Debris Removal from Private Property*.

VALIDATING ELIGIBLE WORK

FEMA, in coordination with the State and the applicant, may select a small sample of hazardous trees, limbs, and/or stumps to validate eligible scopes of work and eligible project funding if a discrepancy between documentation, work performed, and eligible funding exists. The validation process will include field visits to verify that the applicant performed work in

accordance with FEMA eligibility criteria. FEMA will use the results of the validation process to determine eligible project funding.

FEMA, State, and Applicant Validation Team

The validation of work to remove hazardous trees, limbs, and stumps should be a coordinated and collective effort between FEMA, the State, and the applicant. Validation teams performing physical inspections should be comprised of representatives from FEMA, the State, and the applicant who are familiar with debris removal operations, FEMA policy and debris removal eligibility, and debris monitoring documentation practices. The validation teams should meet prior to conducting validations to identify expectations and objectives, and hold meetings as necessary to resolve issues. The validation teams should work to achieve consensus on validation determinations.

Validation Samples

FEMA, the State, and the applicant should select a sample of at least 500 work items to validate the applicant's request(s) for reimbursement. Separate validations should be conducted for hazardous trees, limbs, and stumps and for work performed on public and private property. Only one validation should be conducted for each scope of work selected for validation.

Interim Validations

FEMA may conduct interim validations before the completion of the debris removal operation as a quality control measure and to establish Public Assistance grant amounts for the applicable scope of work. The decision on whether or not to conduct an interim validation should be a joint decision between FEMA, the State, and the applicant. Interim validations should include a sample of at least 500 work items completed up to the date of validation. The results from any validation should apply exclusively to the scope of work that the applicant completed before FEMA conducted the validation. For example, an interim validation may occur 30 days after the applicant initiates a debris removal operation and focus on work performed during the first 30 days. FEMA may conduct a final validation for the remainder of the work after the applicant completes the debris removal operation. The final validation should include a sample of at least 500 work items completed after the date of the interim validation. The results from the first validation will be used to determine the eligible scope of work for work and costs claimed during the first 30 days, and the final validation results will be applied to determine the eligible scope of work for the remaining work and associated costs claimed.

Documentation Requirements

The documentation for the validation process should include:

- ☐ names and affiliations of validation team members;
- ☐ date and locations of inspections;
- ☐ the number of hazardous trees, limbs, and stumps selected for validation;
- ☐ the debris removal load tickets or invoices for the hazardous trees, limbs, and stumps selected for validation;
- ☐ the validation results;
- ☐ name of the debris removal contractor that performed the work (if applicable);
- ☐ name of the applicant's debris monitor that provided oversight for the work claimed (if applicable); and
- ☐ rights of entries and indemnification agreements when the applicant performed work on private property.

Applying Validation Percentages to Determine Eligibility

FEMA will apply the percentage of the debris removal work that it validated to the applicant's total claim for reimbursement. However, FEMA will approve 100 percent funding for the applicable scope of work if it validates at least 80 percent of the sample of work items. Eligible funding for scopes of work validated at less than 80 percent will be based on the actual percentage of validated work.

Timeframe

FEMA should validate the removal of hazardous trees, limbs, and stumps within 45 days of project completion.

Elizabeth A. Zimmerman
Assistant Administrator
Disaster Assistance Directorate
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06/13/2012 - 14:18

GEORGIA FORESTRY
COMMISSION

GaTrees.org