



COMMUNITY FOREST STORM MITIGATION PLANNING

A Guide for Communities

BOOK 2— STORM PREPARATION





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BOOK 2— STORM PREPARATION

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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:

- ◆ 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, and
- ◆ Provides opportunities for training and field exercises.
- ◆ And during a federal major disaster declaration can result in substantial impacts to reimbursements associated with both debris removal and lost/damaged tree replacement.

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, and
- ◆ Develop a communication, information and education program.



A. STORM MITIGATION TEAM

Assemble a team of individuals who 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.

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.

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.



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, non-profit and Tree Stewards)
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 number, 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 high risk for failure;
- ◆ For all trees that serve as infrastructure (most commonly used for stormwater management or slope stabilization) you should create a mapped database with each tree's location, type, size, replacement value, and maintenance schedule.
- ◆ Estimate of the dollar value of the benefits that trees provide;
- ◆ Total annual cost of community forest management, and
- ◆ 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 mitigate 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. With information on 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.

- ✓ 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.
- ✓ Record on the template whether there is a community forest management plan to obtain the tree canopy cover goal; include your tree canopy cover goal (percent).



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;

- ◆ Diameter Breast Height (DBH) (trunk diameter at 4.5 feet above the ground);
- ◆ Condition;
- ◆ Risk rating;
- ◆ Maintenance needs, and
- ◆ 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;
- ◆ Number of trees by condition rating;
- ◆ List of trees recommended for regular inspection, and
- ◆ List of trees by level of risk.

- ✓ Record on the template the date of your community’s last tree inventory and the number of trees by site.
- ✓ 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.



- ◆ *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/utrm/>)

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.

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 hire only consultants who are ISA Certified Arborists that have experience in performing tree risk assessments and have the Tree Risk Assessment Qualification (<https://www.isa-arbor.com/Credentials/ISA-Tree-Risk-Assessment-Qualification>).

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:

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 or the whole tree to fail, potentially 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, and
- ◆ 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

Trees are an important part of our community’s infrastructure. They provide us with many valuable and irreplaceable environmental, economic and social benefits. 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 <https://www.itreetools.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, and
- ◆ *National Tree Benefits Calculator*, <http://treebenefits.com/calculator/>.

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

- ◆ Aesthetic and other benefits;
- ◆ Air quality benefits;
- ◆ Carbon sequestration benefits;
- ◆ Energy benefits, and
- ◆ Stormwater benefits. (http://gicinc.org/trees_stormwater.htm)

- ✓ 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. The following are examples of expenses that may be included in your community forest management costs:



- ◆ 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. Trees as Infrastructure

Community infrastructure includes things like buildings, roads, bridges, water and sewer systems, and electrical lines. Trees are the least documented piece of infrastructure, making them the most difficult to receive reimbursements for repair and replacement after a major federal disaster declaration. Public trees are often planted for a specific function, which is important to document both for purposes of priority maintenance and restoration after storms. If planted and maintained as infrastructure to manage storm water or reduce erosion, these can form the basis for recovery assistance after a storm, or a way to think about applying for hazard mitigation funds to build up your tree infrastructure system. As with any infrastructure, there is a cost for installation, maintenance, and eventual major repair or replacement of trees. The objective is for the benefits or value to exceed the costs and result in a positive benefit cost analysis (BCA). After accounting for all costs (including long-term maintenance) and associated benefits, healthy, well-placed public trees have shown routinely a two to three time's greater benefit than cost to society, including any costs associated with storm repairs (Vogt, Hauer, and Fischer, 2015). In addition, different from most other infrastructure investments, trees increase in value as they grow, providing more rainfall interception and greater soil stabilization at maturity than at installation (Miller, Hauer, and Werner, 2015). Ensuring that you have a catalogue of your trees that serve as infrastructure, which is updated annually to reflect the tree's increasing replacement cost will make the process of quantifying damage to this infrastructure much easier.



7. 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 and tree risk mitigation program for your total tree canopy and for your public street trees.



C. DEBRIS MANAGEMENT PLAN

The process of creating a strong Debris Management Plan will allow your community to think about what should be done with your debris before the emergency. Although local jurisdictions are not required by FEMA to have a debris management plan in place to receive Public Assistance funds, FEMA did establish financial incentives in 2013 through the Public Assistance Alternative Procedures (PAAP) Pilot Program for Debris Removal to promote the adoption of plans that speed up the post-disaster debris removal process.

Creating a well formulated Disaster Debris Management Plan is essential and typically part of a broader Emergency Response Plan, which may be contained within a Hazard Mitigation Plan (HMP). Check with your state Office of Emergency Management for annual funds available to support the development of or update to an existing HMP.

A strong Disaster Debris Management Plan should:

- ◆ Divert as much vegetative material from disposal as possible through recycling, composting and other legitimate diversion options.
- ◆ Utilize volume reduction techniques to improve debris management efficiencies and minimize impacts on landfill capacities.
- ◆ Consider alternative technologies for managing portions of the debris waste stream, in-state or out-of-state (i.e., biomass facilities).
- ◆ Use approved temporary Debris Management Sites (DMS) for processing debris for recycling and/or final disposal. (source: State of Connecticut Disaster Debris Management Plan, revised June 2013)

One helpful resource is the EPA's "Planning For Natural Disaster Debris" Guide (March 2008), is intended to help in the beginning stages of the planning process or in revising an existing disaster debris management plan, and it provides a community with more awareness for environmental protectiveness when it comes to dealing with disaster debris (source: epa.gov).

D. 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 disseminated in preparation for storms and for review during the annual storm mitigation planning meeting. It should also be made available online.

- ✓ **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.**



E. 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 starting 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.

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

1. 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 system
- ◆ Sanitary sewer system

2. Transportation Network

- ◆ Emergency evacuation routes
- ◆ Street network
- ◆ Priority streets to critical facilities (highlighted)

3. Trees

- ◆ All public trees
- ◆ Large canopy public trees (highlighted)
- ◆ Tree canopy density
- ◆ Trees at risk

4. Emergency Response Sites

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

- ✓ **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 and date of last update.**

THE URBAN TREE RISK INDEX

Urban Tree Risk Index (UTRI) is a tool to help city 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, 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".

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, and
- ◆ 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/braced 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, and**
- ✓ **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 updates
- ◆ 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
- ◆ Tree planting 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
- ◆ Species to avoid or not permitted list

✓ **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.**



F. 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).

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

Equipment List

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

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

G. MEMORANDA OF UNDERSTANDING AND 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.

Additionally, if you end up with a major federal disaster declaration, receiving and keeping money reimbursable to you through FEMA depends on compliance. And the most frequent reason for funds being denied for reimbursement or de-obligated after award is failure to comply with federal procurement rules.

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 organizations 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 and other individuals and groups.

- ✓ **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.**

FEMA Compliance for Debris Removal and Monitoring

After a large event which may result in a major federal disaster declaration, debris hauling and monitoring (services required by FEMA to be performed by **separate** companies if contracted out) represent an enormous cost to impacted communities. FEMA estimated that between 2002-2006, debris removal operations accounted for approximately 27% of all disaster recovery costs (FEMA 325 Debris Management Guide, 2007). Between 2000 and 2010, FEMA and local governments spent over \$8 billion in disaster-generated debris removal costs alone (www.resource-recycling.com).

If you end up with a major federal disaster declaration and want money reimbursed for contracted work like debris hauling and monitoring, the federal government requires that you comply with the most restrictive procurement standards set forth by the federal, state, or local government. Unfortunately, many jurisdictions fail to realize that their existing procurement and contracting policies may not meet federal standards, which can jeopardize very large amounts of funding reimbursements during a disaster.

The worst time to be trying to sort through federal procurement compliance and attempting to bid out and award contracts that contain federally-required contract clauses is in the midst of disaster response activities. For this reason, FEMA allows pre-positioned contracts, which are different from disallowed retainer contracts. Jurisdictions should also be aware of potential issues with using Cooperative Purchasing Programs or 'buy boards'. In 2018 FEMA issued a fact sheet that stated: "As a general matter, FEMA suggests that non-state applicants exercise caution when using cooperative purchasing programs because the Agency has observed problems with non-state applicants' ability to meet all of the requirements of the federal procurement standards found in 2 C.F.R. §§ 200.317 – 200.326 when a non-state applicant uses these programs. Applicants are not permitted to use out-of-state cooperative purchasing programs."

Having contracts in place (pre-positioned) prior to a large event, including a major disaster declaration, makes a big difference in 3 ways:

1. It helps you avoid delays;
2. It affects Federal reimbursement; and
3. It allows you to divert more debris from landfills.

FEMA frequently updates procurement and contracting policy guidance. For the most up-to-date information, you can visit www.fema.gov. Contact your State Office of Emergency Management or FEMA Regional Office for additional assistance with creating and implementing federally compliant procurement policies and drafting federally compliant contracts.



2. Advanced Readiness Contracts

Advanced readiness contracts (ARCs) should be executed with equipment rental vendors, debris removal and monitoring 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, and
- ◆ Date of execution of contract.

ARCs are commonly executed with equipment rental vendors, debris removal and monitoring contractors, mulch grinding contractors, tree service contractors, tree suppliers and landscape contractors.

- ✓ **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.**



H. 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 among 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.

If assistance is needed, determine if your community has a Certified Emergency Response Team (CERT). Local emergency management coordinators will know of locally trained volunteers who can be mobilized for education or local response to disasters. To learn more about CERT visit: <https://www.ready.gov/cert>



2. Information and Education

Internal Information Sharing

During storm preparation, information can be shared internally through:

- ◆ Phone calls;
 - ◆ E-mails;
 - ◆ Predetermined and set up cloud-based storage site, and
 - ◆ Meetings (notices, agendas and minutes).
- ✓ **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.**





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;
- ◆ Chain saw 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;



External Information Sharing

Information can be shared externally through:

- ◆ Government websites;
 - ◆ Neighborhood association website;
 - ◆ Facebook page;
 - ◆ Twitter account;
 - ◆ Phone;
 - ◆ E-mail;
 - ◆ Cloud-based storage site;
 - ◆ Pamphlets and brochures;
 - ◆ Meetings (quarterly, semi-annual, annual);
 - ◆ Community forest management program website;
 - ◆ Scripts and recorded public service announcements, and
 - ◆ Press releases and newspaper articles
- ✓ 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.

- ◆ Post-storm hazards (hangers, leaning trees, downed power lines);
- ◆ Type of debris to be collected;
- ◆ Caring for storm damaged trees, and
- ◆ 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.

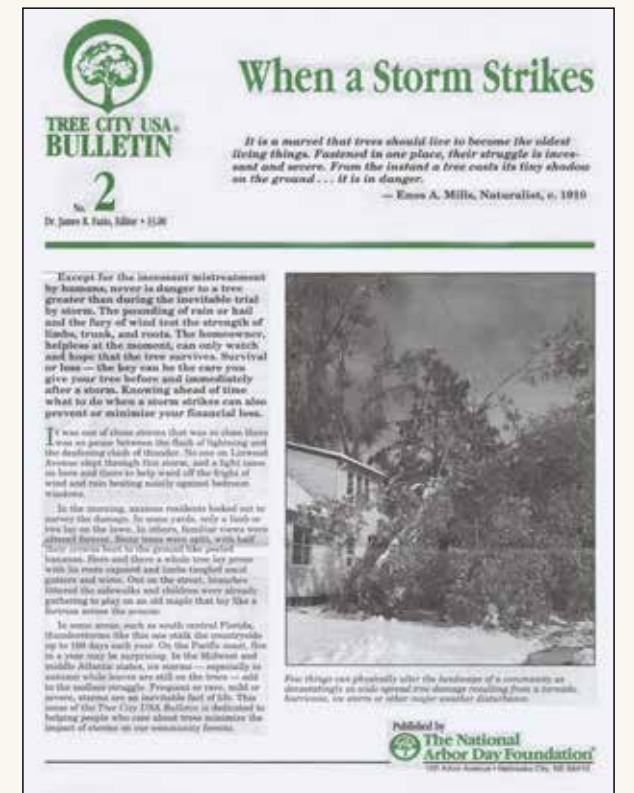
Ongoing education on tree care, tree risk and community forest management will enhance both short- and long-term tree risk mitigation. There are many tree care and tree risk mitigation resources accessible on the Internet, including educational brochures that are available from the *National Arbor Day Foundation*.

- ✓ 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.

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.



3. Awareness

Storm, weather and emergency event preparedness is promoted statewide 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.



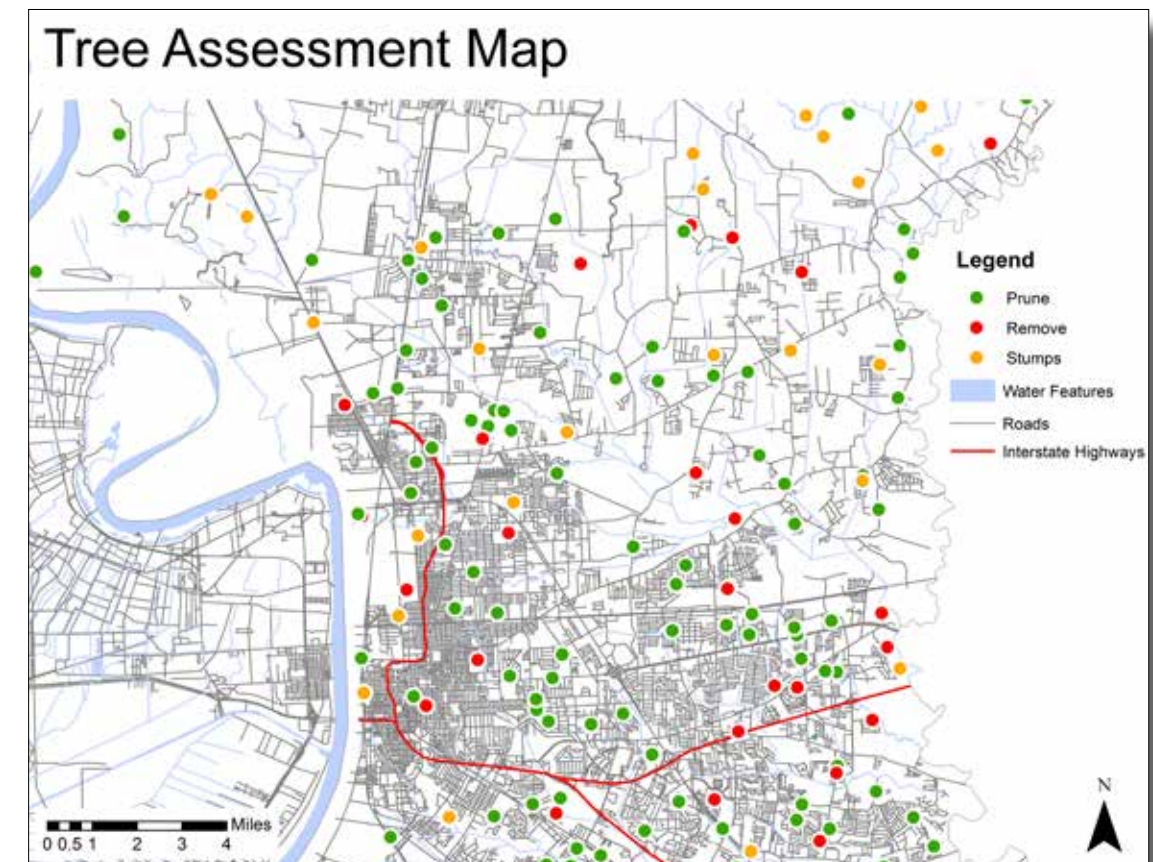
I. PREPARATION RECORD KEEPING

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

✓ Record on the template the records maintained by your community.



SUMMARY

The most effective ways for communities to protect the urban forest from natural disaster are to develop a debris management plan, create advance readiness contracts for debris hauling and monitoring services, and conduct tree risk assessments and mitigate risk of trees. These strategies reduce risk and increase storm response time after the disaster.



STORM READY ACTIONS:

- 1. Identify critical infrastructure and assets.
- 2. Collect tree inventory data around critical assets before expanding the tree inventory.
- 3. Conduct a Level-1 tree risk assessment on the public tree inventory. Follow-up with a Level-2 tree risk assessment on any flagged trees.
- 4. Develop a mitigation strategy for high-risk trees.
- 5. Record ecosystem service values and connect to tree inventory.
- 6. Document trees as green infrastructure in Hazard Mitigation Plans and in local policies.
- 7. Develop a debris management plan.
- 8. Develop advanced readiness contracts with debris haulers and monitors.
- 9. Create a post-disaster communications and public education plan.

NEXT BOOK: BOOK 3. STORM RESPONSE



NOTES



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