SOUTHERN GROUP OF STATE FORESTERS

DISASTER RESPONSE

HANDBOOK FOR STATE FORESTRY AGENCIES

www.southernforests.org

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Preface

In the Fall of 2005, with the destruction caused by hurricanes Katrina, Rita and Wilma ever present and the hurricane damage of 2004 still occupying much of southern state forestry activities assisting with disaster response and recovery, the Southern Group of State Foresters made the decision to begin compiling a southern "Disaster Response Handbook." The intent of the handbook is to give an overview of the key activities state forestry agencies need to consider when dealing with all types of disaster response, from hurricanes and wide-spread tornado outbreaks, to wildland fire and ice-storms. The handbook compiles information into three main categories for consideration: State Agency Issues when dealing with preplanning, response and recovery, Forest Damage Assessment, and Forest Recovery Operations.

Understanding that disaster response is an ever-changing activity and there will never be a "one-size-fits-all" approach, this handbook is intended to be a living document. Changes and additions will occur on an ongoing basis to continuously improve and enhance the functionality of the handbook for all southern states. As you utilize and review the handbook, please take the opportunity to consider how this information best fits your state agency's responsibilities for response and recovery prior to, during and after a major incident or disaster.

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I. State Agency Issues

A. Incident Preplanning Considerations

1. Employee considerations and emergency Numbers

a. Develop Policy and Procedure so that all employees understand what the agency plan of action is and what role/assignment is expected of them.

b. Develop roster of employees with contact numbers both for current residence as well as emergency contact numbers, if they have to reposition out of harm's way.

c. Require each employee in the impact area following the incident to report their status/availability. (Where available the use of 800 numbers at dispatch and/or administrative offices will make it easier for displaced employees to call in)

d. Develop and plan alternative methods of contact/communication with personnel in the impact area following the incident, should traditional methods fail.

2. Building and equipment preparedness

a. Manned Facilities:
Secure by boarding up windows or installing hurricane windows.
All loose items on exterior should be stowed.
Know the location for all utility cutoffs or disconnects.
Post utility phone numbers for quick reference in case of emergency.
Ensure that backup power (generators) is in place.

b. Unmanned Facilities:
All utilities (gas, water, power, etc.) should be cut off at these facilities.
Board up windows and glass doors.
Computers and data backup information should be relocated.

c. All facilities in high risk areas (Coastal areas) for dangerous storms should have accounts in place with local building suppliers. This would be a big help in times of last-minute preparation for storm or for materials needed to repair a facility after storm passes.

d. Buildings and systems check lists prepared with individuals designated to determine and report status of facilities and communications equipment (ability) following the incident.

e. Insurance issues: Need to get photos of all buildings and their contents. Need to make sure adequate insurance coverage is in place. Need to check on liability issues.

f. Relocate equipment, vehicles, and aircraft from potential impact area.

g. Ensure that equipment and supplies needed for response teams are available and are pre-positioned.

3. Evacuation planning

Make sure all employees are familiar with Emergency Management evacuation plans and routes and know when and how they will relocate. Keep employees updated on current plans and expected affected areas. Website coastal evacuation directions, route maps and reversal plans can be located at: www.dot.state.sc.us/getting/evacuation.shtml.

4. Coordination with other local, state and federal agencies

The State Emergency Management Agency in most states is the lead state agency for coordination of emergency and disaster response activities. Plans are developed so that all parties know who, what, when, where, and how to contact the appropriate state or federal agency for assistance. Examples:

South Carolina	www.scemd.org/
Georgia	www2.state.ga.us/GEMA
North Carolina	www.dem.dcc.state.nc.us/
Florida	www.floridadisaster.org/

5. Fiscal considerations – preplanning for emergency purchases

a. Develop a checklist of resources needed for different types of disasters. What are financial or reimbursement arrangements?

b. Develop a checklist of resources available at agency facilities. Are these resources reserved for use in emergency situations only?

c. Develop a list of potential suppliers that would include: Company Name, Address, Phone Number, Fax Number, Email address, Contact Person, Account Number and Material Provided. If on state contract, provide contract number.

d. Develop a timeline for purchasing (based on state/agency procurement code requirements)

e. Ensure that emergency procurement guidelines are in place for emergency needs.

6. Safety and Training

a. Ensure that arrangements are in place with state health officials for employees to receive recommended/required vaccinations (Note: Ensure employees' tetanus vaccinations are up to date; Hepatitis vaccinations, if needed, are administered over several months).

b. Assign appropriate PPE assigned to personnel (fire, chainsaw, hazardous materials, other).

c. Ensure that response crews have crew member(s) trained in First Aid/CPR and a specific crew member is assigned overall safety responsibilities.

d. Train or appraise personnel on how to handle or avoid potential hazards associated with the incident (electrical, other utilities, hazardous materials, dangerous trees, etc).

e. Make crew bosses aware of any special needs/limitations of crew members.

f. Identify alternative routes of travel in case of bridge closures or height/weight restrictions of equipment. This includes being aware of and communicating DOT required clearances for out-of- state equipment determined and communicated (Requires advance communication with state DOTs).

g. Identify training needs, especially specialized training for disaster response and damage assessment (i.e. Incident Management – Unified Command and Complex Incident Management, Safety and First Aid, Chainsaw, etc.).

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h. Training should enable the agency to meet basic NIMS Training Guidelines for FEMA.

i. Provide and document training, and maintain records of completed training/qualifications for personnel (IQS or similar system)

7. Public Information

a. An agency PIO is designated and is responsible for dissemination of information and responding to media inquiries.

b. Agency Section and Division Chiefs regularly apprise PIO of operations and provide information for media inquiries

c. WUI – identify issues & programs to mitigate impact

d. Prevention/Fire Mitigation/Coordination of Outdoor Burning
Be prepared to determine immediate need for outdoor burning ban or whether to encourage postponement/use of extreme caution. Some examples of when a burning ban could be instituted are as follows: power outage, smoke problems associated with wildfires or debris burning, or water shortages due to drought or loss of water pressure due to technical problems in an area.

e. Potential fire mitigation needs evaluated annually, based on long range forecast, historical seasonal availability of other (out of state) resources, etc.

f. Develop preplanned media campaign regarding above decision on outdoor burning and stress need to establish defensible space around structures – be prepared to carryout the campaign throughout fire season.

g. Utilize WUI/Firewise concepts and previously established contacts from these efforts.

h. Identify additional needed contacts with fire services, other cooperators, and county emergency management agencies.

i. Attached are examples of:
Emergency Back up list
Critical Systems Check List
Training concerns
Safety concerns

B. Incident Response

1. Potential response assignments

a. Local Events: responding in your own state at the request of the State Emergency Management Agency. Request from local Emergency Management Agencies could potentially cover a wide range of activities some of which state forestry agencies may not be well prepared for and could include:
   1) Set up and management of staging areas for other responders
   2) Set up and management of base camps for other responders or the public
   3) Set up and management of logistical staging areas to receive and re-distribute truck loads of emergency supplies
   4) Management of trailer staging area to receive and track trailers or mobile homes
   5) Operation of emergency supply distribution points to distribute emergency supplies to the public
   6) Saw crews to open roads
   7) Evacuation of people and property by truck or by helicopter
   8) Area searches for people or evidence

b. Regional or National Events
   Responding to events out of your own state:
   Response to Regional or National Events would likely be made through the national mobilization system "ROSS" in support of federal wildland fire agencies or possibly through EMAC. Potential assignments could include any of the above. Before accepting a mission, make sure that the assignment is well understood, that you have a good system in place to track personnel time, equipment time and any other expenditures and that there is a clear understanding of the support that the host unit will provide for responders.

2. Lengths of assignment

   a. For dispatches through the national mobilization system "ROSS", the normal assignment period is 14 days excluding travel but may be extended by complying with NWCG work/rest guidelines.

   b. Dispatches through EMAC do not have a specific length of assignment, but instead are negotiated between the sending and receiving units.

3. Self-sufficiency of responding resources
   Responding resources must assume that they are going into situations where food, water, electricity and even housing may not be available. It is suggested that responders bring the following with them:

   a. Fresh refill of any necessary prescriptions
   b. MREs or other non-perishable meals and water for three days if driving, if flying obtain food and water at the first opportunity

c. Tent
d. Rain gear
e. Insect repellent
f. Sleeping bag
g. Flashlight and extra batteries
h. Hard hat
i. Gloves
j. Small first aid kit
k. Cash – credit cards require phone lines
l. Cell phone
m. Portable water purifier

4. Available Methods to Acquire Resources and Benefits of each:
Wildfire Compacts

   a. The Southeastern and South Central Forest Fire Compacts provide a system for obtaining resources and providing for reimbursement for fire related activities. The compacts do not support all risk activities.

   b. The benefits of using the compact for fire related activities are:

      1) Resources are more available because they do not have to meet NWCG standards

      2) Cost of resources obtained through the compacts are usually less expensive than those obtained through the national mobilization system "ROSS"

      3) Resources received through the Southern Fire Compacts are likely to be more familiar with the operations of Southern state forestry agencies.

      4) The primary disadvantage of obtaining resources through the compact is that travel for mobilization and demobilization may not be supported by state dispatch centers.

5. Emergency Management Assistance Compact (EMAC)

   a. EMAC is a compact or agreement between the various state emergency management agencies. EMAC provides for the exchange of emergency resources between the states and reimbursement for the use of those resources. Rates for reimbursement are negotiated at the time of dispatch.

   b. Before accepting EMAC assignments make sure you understand the EMAC process

c. If an EMAC mission is accepted make sure that you keep good records of personnel time, equipment time and any other expenses.

d. For EMAC missions make sure you have a good understanding of the mission and what the level of support will be for the responders.

e. If you are ordering resources from another state forestry agency through EMAC, good coordination between the state forestry agencies is essential.

6. National Interagency Resource Ordering and Status System (ROSS)

   a. Assistance is available from the federal land management agencies through cooperative agreements. Assistance is also available from other state forestry agencies via cooperative agreements with the U. S. Forest Service. These resources would be ordered and supplied through ROSS.

   b. The primary advantage to supplying resources through ROSS is that mobilization and demobilization will be supported by your state coordination center and the order will be well documented for billing purposes.

   c. ROSS is available online, at http://ross.nwcg.gov/.

7. The National Response Plan (Federal Response)
   The National Response Plan provides for integrated response to Incidents of National Significance. Responsibility for coordination of the federal response lies with FEMA within the Dept. of Homeland security. Federal land management agencies within the Dept. of Agriculture and the Dept. of Interior are assigned either primary or support responsibility for various Emergency Support Functions (ESFs). FEMA tasks the appropriate federal agency to provide needed assistance to other federal agencies or to state and local jurisdictions. Taskings to the Dept. of Agriculture and Dept. of Interior are made by FEMA through the use of Mission Assignments. The Departments of Agriculture and Interior may then request the assistance of state forestry agencies in carrying out the assigned mission, through the use of cooperative agreements once the President has declared an emergency.

8. Coordination Issues

   a. In all risk emergencies coordination with the state emergency management agency is critical. State emergency management agency plans usually follow the structure of FEMA's National Response Plan; which is set up around Emergency Support Functions.

b. In all risk situations requests for assistance from outside the state can be made by the state emergency management agency to FEMA who would task one of the federal agencies with providing the requested assistance or the state emergency management agency can request the needed assistance through the Emergency Management Assistance Compact (EMAC).

c. State forestry agencies normally would not make a direct request for assistance from outside the state, for all risk emergencies. If they do, they should make sure that they get the approval of their state emergency management agency in order to receive reimbursement for expenses incurred.

9. Communication Issues

a. Following disasters, normal communication links may not function.

b. Responders may have to provide their own communication networks.

c. Consider providing portable repeaters, towers, generators, mobile and handheld radios, as well as communication technicians.

d. Satellite radios may be especially useful.

e. Radio equipment may be ordered from the interagency caches system.

10. Critical Incident Stress Debriefing (CISD) Procedures

Critical Incident Stress can be a serious issue. Critical Incident Stress may manifest itself in a variety of physical and emotional ways. Incidents where traumatic events occur, such as deaths or serious injuries CISD services will usually be provided. Available resources include the following:

a. State Departments of mental health

b. National Mental Health Information Center
http://www.mentalhealth.samhsa.gov/

c. Center for Disease Control, http://www.bt.cdc.gov/mentalhealth/

11. Safety/Hazard Issues
During all-risk responses state forestry agency personnel may be exposed to hazards not normally encountered. This risk can range from environmental issues such as weather and hazardous materials to desperate people and animals. For additional information see the Southern Hurricane Guide on the SACC web site at:

http://gacc.nifc.gov/sacc/administrative/Hurricane%20Guide/HurricaneGuideContents.htm

12. Fiscal Documentation Issues

    a. When dispatched to any type of incident, it is critical to have a Resource Order in hand before resources are actually dispatched.

    b. It is important to understand which dispatch system is being used: Resource Ordering and Status System (ROSS), Emergency Management Assistance Compact (EMAC), or the state wildfire compacts for wildland fire incidents only.

    c. Instruct all responders to keep good records of personnel time, equipment time or mileage and any expenses incurred.

C. Incident Recovery

Damage Assessments and Recovery Efforts:

1. Internal agency damage assessments and communications with FEMA.

2. Assess and report your agency's ability to provide assistance and capacity to function in designated emergency response roles. This involves assessment of the following:

    a. Buildings
        1) Estimated damage
        2) Availability of strategically located buildings to house emergency workers (internal and external) and victims.
        3) Availability of strategically located buildings to warehouse and distribute emergency supplies.

    b. Towers
        1) Estimated damage
        2) Availability of temporary antennas and portable repeater stations.

    c. Fire Equipment
        1) Estimated damage
        2) Available for assistance by type, size, and kind.
        3) Equipment and resources available through the Southern Compact.

    d. Communication systems
        1) Estimated damage
        2) Capabilities to link, patch, or cover the other emergency workers' communications needs.

3) Availability of the National Communications Equipment Cache.

e. Personnel Resources
   1) Assess & report availability of Forestry personnel (Help your own so they can start helping others).
   2) Availability of State Forestry T2 Incident Management Teams.
   3) Evaluate number of unavailable personnel deployed on National Guard, State & National Assignments.

II. Forest Damage Assessment

A. Initial (Quick) Assessment vs. Long Term Assessment

When a natural disaster event occurs it is very important to start an initial assessment of the resource (timber) damages as soon as possible after the event has passed to facilitate salvage activities, however this has to be conducted in such a manner that does not conflict with restoring infrastructure to the surrounding urban and rural private citizen interface.

1. Initial (Quick) Assessment

An initial (quick) assessment is necessary to determine the extent or magnitude (low, moderate, extreme) of resource damages and also assists with planning preparation of salvage activities. Most initial assessments are conducted primarily with ground inspections (if access is not impaired) and supported with aerial inspection as well. There are several key components that are needed to perform the initial assessment:

a. Manpower – adequate manpower is necessary to perform any type of assignment especially a disaster related assessment and this manpower has to be properly divided into workable units to prepare a viable "quick" assessment.

b. Supporting Documents - a complete set of up to date maps (aerial photograph formatted, road route maps, etc.) of the affected area is vital to assure the information derived from this "quick" assessment is valid.

c. Coordination – the assessment activity has to follow some level of direction and also needs cooperative involvement from agencies, associations, local governments, and private individuals that are involved in some form of natural resource management.

It is very important to understand that this initial "quick" assessment must be credible and completed efficiently, but also to take note that the information that is derived from this provides the basic numeric information necessary to

develop the requests that are prepared for funding assistance that is needed for restoration of public and private forestlands and also provide the numeric information for the restoration of the urban forest as well.

2. Long Term Assessment

   Long term assessments of natural disaster events are separated into categories that go well beyond the actual resource salvage and reforestation activities. These type of assessments usually center on the amounts of resources not salvaged, increased fuel loads as it pertains to wildfire suppression, impacts to the regional/state/local fiber supplies, market capacities, stumpage price fluctuations, etc…. Each of these specific areas require different types of information (fact finding, surveys, mill questionnaires, intensive forest data collection, etc…) to produce quality documents that can be the basis for future projections of anticipated resource losses. The final product that would be derived from the long term assessment would be a summary of all information compiled into a report that details the long term economic impacts that are a result of the natural disaster.

B. Aerial and Ground Assessment Methods

Aerial and ground assessments are generally not independent of one another. They both are necessary components of an initial assessment of timber resource damage. They are usually conducted in unison, with each having some form of coordinated priority level. Also, they are not a one-time activity. They continue until a desired or acceptable level of statistical confidence is attained regarding resource damage.

1. Aerial Assessment Methods

   This assessment method (a major component of the initial assessment) uses fixed wing aircraft and helicopters to provide the aerial view for documentation of the damage to timber resources. A disaster event area is divided into workable assessment units (workable units are delineated by counties, natural features, and access routes) which are supported by the up to date aerial photograph and access route maps. Flight lines are assigned to the assessment units and flown at varying altitudes and the supporting map documents are notated to determine where damage levels (low, moderate, extreme) have occurred. Forestland ownership is a part of the map criteria so once the flight information is completed it is usually possible to obtain adequate estimates of damages by ownership category. After each flight is conducted, aerial survey information is provided as document support for ongoing ground assessments.

2. Ground Assessment Methods

As the aerial assessment is being conducted the ground assessment activity is ongoing. Information from the aerial assessment and the ground assessment are shared in order to make this a coordinated efficient effort. The same workable assessment units that are used in the aerial process are ground truthed in order to verify initial damages calculated from initial aerial assessments. Also included in this ground truthing is an assessment of access impediments. Ground truthed information can be used to enable prioritization for salvage activities.

The final product of aerial and ground assessments is an estimate of timber volume and the degree level of timber damage. This information is used to support funding requests that would be a part of the initial "quick" assessment.

3. Summary: Checklist For Conducting An Initial (Quick) Assessment

Request Aerial Support Equipment (fixed wing aircraft & helicopters)

- ✓ Assemble Adequate Manpower For Ground and Aerial Needs (Size and magnitude of disaster event will determine number)
- ✓ Assign Project Leader Position
- ✓ Assign Manpower to Aerial and Ground Teams
- ✓ Prepare Necessary Maps (Arc View-Shape-Files aerial photos and road routes)
- ✓ Prepare Damage Level Documentation Worksheets
- ✓ Divide Damaged Area Into Workable Units
- ✓ Assign Workable Units to Aerial and Ground Teams
- ✓ Coordinate Aerial & Ground Activities
- ✓ Provide Detailed Instructions On Determining Damage Levels
  - * Low < 30% Overall Stand/Stem Damage (OS/SD)
  - * Moderate > 35% - 55% OS/SD
  - * Heavy > 60% - 100% OS/SD

  (Damage areas noted on maps with GPS locations)
- ✓ Disperse Aerial and Ground Teams to the Damaged Area
- ✓ Retrieve Information From A&G Teams
- ✓ Compile Field Data Into ArcView Shape Files
- ✓ Produce Detailed Damaged Timber Resource Location Maps
- ✓ Provide Information To Forest Resource Salvage Managers

4. Cooperative Efforts With Federal Agencies

Federal agencies possess specialized skills and experience in conducting both short and long-term damage assessments following catastrophic events. Rapid assessments of damages done by states can be complemented by rapid assessments using both aerial survey modeling approaches (e.g., Jacobs and

Cooke 2000)[1] and (for hurricanes) precipitation and wind contour mapping methods. State agencies can contact the USDA Forest Service's Southern Research Station's Forest Inventory and Analysis unit in Knoxville, Tennessee, for input and feedback on state-level assessments done by state agencies with jurisdiction in the damaged region.[2] Economic assessments of forest damage and long run timber price impact forecasts can also be developed by the Southern Research Station, in collaboration with state agencies.[3] The National Oceanic and Atmospheric Administration has assembled Hurricane Planning and Impact Assessment Reports that can also be consulted.[4]

The USDA Forest Service Region 8 Forest Health Protection Unit works with state agencies to compile damage assessments for purposes of evaluating eligibility for federal aid.[5] The Southern Research Station of the Forest Service may also conduct economic damage estimates from affected states, as well. States may be contacted by federal agencies such as the Forest Service and the Federal Emergency Management Agency[6] to provide initial damage estimates on rural forests (in volume, area), on urban tree canopy, and for estimates of changes in fire-related hazardous fuels.[7] An example of urban forest damage assessment protocol is also available on the Web.[8]

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[1] Jacobs, Dennis, and William H. Cooke III. 2000. "Generating continuous surface probability maps from airborne video using two sampling intensities along the video transect." USDA Forest Service Research Paper SRS-022. Also, see Barry, P.J., C. Doggett, R.L. Anderson, and K.M. Swain, Sr., "How to evaluate and manage storm-damaged areas", United States Department of Agriculture Forest Service Southern Region, Management Bulletin R8-MB 63. This is available at http://www.fs.fed.us/r8/foresthealth/pubs/storm_damage/contents.html

[2] SRS FIA, Knoxville: Tel. 865-862-2000, Fax 865-862-0262

[3] SRS Economics and Policy, 919-549-4011, Fax 919-549-4047.

[4] NOAA Hurricane Planning and Impact Assessment reports can be found at http://www.csc.noaa.gov/hes/general.html

[5] USDA Forest Service Forest Health Protection, Region 8, 1720 Peachtree Road, NW, Room 862 N, Atlanta, GA 30367, Tel. 404-347-2961, Fax 404-347-1880.

[6] Regional contact information is available at http://www.fema.gov/about/contact/regions.shtm

[7] The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288, as amended), provides the authority for such assistance; the USDA Forest Service is typically tasked with gathering the relevant rural forest, urban tree canopy, and fuels information.

[8] "An Initial Storm Damage Assessment Protocol for Urban and Community Forests." 2001. USDA Forest Service Northeast Center for Urban and Community Forestry, University of Massachusetts, Amherst, Amherst, MA 01003, and the Davey Resource Group, 6050 Hicks Road, Naples, NY 14512. Available at: http://www.urbanforestrysouth.org/Resources/Library/TTResource.2004-12-02.0911/view?parentObj=Collection.2005-10-17.1528

III. Forest Recovery Operations

A. NIPF/Industry Lands

1. Salvage Operations:
There are many factors that determine the success of any salvage operation. Financial return is a consideration but, at times, simply the removal of downed or damaged timber is the highest priority. There needs to be a systematic triage to determine areas that can be salvaged both in time and space. Some of the factors influencing salvage success include the following:

a. The magnitude of the disaster. The wider the scale of the disaster, the more timber will be prematurely forced into the marketplace, reducing market values.
b. Ease of access to salvageable stands. Buyers have to determine which tracts are immediately accessible, which ones need road construction and which have ROW issues.
c. The amount of harvestable timber. The landowner will have to determine if he or she is selling all downed and standing timber or if the sale includes only downed timber.
d. The time of year. The landowner will fare better if log yards are not already at capacity when the disaster hits. Logs will degrade quicker in hot, humid weather making it imperative to get logs harvested as quickly as possible.
e. The species impacted. Particularly with hardwoods, timing is critical for successful marketing because almost all species have peaks and dips relative to fair market value. Generally, high quality sawlogs and veneer logs are less influenced by market saturation than pulpwood.
f. The size and quality of impacted timber. Demand for pulpwood, chip-n-saw, sawlogs, tie logs, veneer and other specialty products vary widely, not only across the region but even within individual states.
g. Available markets. In many cases, there is no market for some products.
h. The extent and the nature of the damage to timber.
i. Availability of loggers. This is a serious impediment to salvage following large-scale disasters. This limitation can be alleviated if landowners are given access to a list of Master Loggers working in their area.
j. Availability of loggers with knowledge of voluntary and mandatory Best Management Practices in the state. Special considerations include operating procedure guidelines. (special contracts and performance bonds will have to be developed, a system of processing timber volume, load or weight tickets will have to be determined), RTE species guidelines. (loggers will need to be informed of location of known rare, threatened or endangered species)

Knowing where to get information and knowing the right questions to ask will be critical in getting any salvage operation underway. State agency foresters,

industry foresters, consulting foresters and university extension foresters can offer the best advice to landowners.

Questions that landowners should ask are:

a. Is my timber salvageable?
b. How quick can I get a logger?
c. What is a ballpark figure I can expect for my timber per ton, mbf or acre?
d. How soon will my timber loose all value?
e. What are the timber tax dos and don'ts regarding salvage operations?
f. Is there a pre-harvest notification law in my state and is that law being waived during this time of salvage?
g. How do I get the best price for my timber?
h. Should I be concerned about price or simply getting the downed timber off site?

2. Wet Decks:
   During salvage operations it is important to know who has wet log storage facilities. Logs that are stored under a water spray can be held much longer before processing than logs that are stored dry. Timber should be harvested within four to six weeks of the disaster to prevent blue stain. Getting logs under wet storage can prevent this problem. GPS locations of mills and concentration yards are available and should be mapped within 200 miles for widespread disasters.

3. Permitting Procedures:
   There has to be an awareness of state permitting procedures for the use of concentration yards, storage ponds and/or lagoons, barge and rail loading facilities. Entities operating these facilities must have current permits.

4. Transportation Considerations:
   Consideration should be given to application for a temporary waiver of weight limits. Industry utilization of all means of transporting raw material including rail and barge transportation where available can be crucial.

5. Landowner Communications:
   The efficient and effective movement of information among landowners, buyers and loggers is critical for maximum utilization of downed and damaged timber. Landowners need to know who is buying and what is being bought. Most likely, companies buying NIPF-owned timber will consider ease of access, volume, extent of damage and other factors when they prioritize purchases. County/Parish landowner associations, newsletters, local media, professional foresters and university extension agents should be utilized to communicate important salvage information to include: sample contracts, maps, sale procedures, consultant and logger lists and where to go or legal and tax advice.

6. Market Considerations:

Landowners need to have access to company procurement contacts. Landowners need to be educated as to timber value expectations during times of widespread timber damage and the volatility of pricing as influenced by supply.

7. Forest Industry Assistance:
   Industry foresters will put the landowners in their respective cooperative programs high on their priority list, but they can also be counted may also be available to assist other landowners. Statewide forestry associations can provide contact information at the local level. A system of coordination should be established to control wood flow locally and regionally.

8. Tax Issues:
   Landowners should be concerned with how to claim timber casualty loss on state and federal income tax reports and how to take advantage of tax incentives for reforestation. In some states, severance tax is a consideration and determining whether or not the disaster changed the property tax is an issue for the landowner. A timber tax specialist should be contacted for individual advice.

9. Debris Removal:
   NIPF owners and industry land managers alike will be concerned about debris removal for maintaining property access, maintaining access to utility lines and rights of way, keeping waterways clear of fallen trees, for reducing fire hazards and for reestablishing their forests. State forestry agencies may assist in opening roads and utility rights-of-way.

10. Issues between States:
    Disasters do not respect political boundaries. Often, widespread disasters affect more than one state either directly or in some way relative to response and recovery. States need to be ready on short notice to share market and logger information, highway weight limits and other transportation information, and they need to communicate regarding their availability of resources to assist in recovery operations. There should be DOT communication between states. Interstate business licenses need to be investigated and a determination made as to whether or not they apply. Joint recovery efforts will be handled through the compact.

11. Coordination with Landowner Groups and Forestry Associations:
    These groups represent the grassroots foundation of forestry interests in each state. Cooperative efforts among association landowners have proved successful in some areas in salvaging damaged timber. Current contact information within and among groups and associations can expedite the salvage process.

12. Federal Funding Opportunities:

FEMA declared incidents would be handled differently than non-FEMA disasters. The USDA Forest Service will be the agency responsible for providing input at the proper levels of government to secure funds to conduct loss and damage assessments and to provide incentives to landowners for reforesting areas where timber was lost or salvaged. If programs are funded to assist landowners then it becomes the responsibility of state agencies to get the information to associations, groups and individual landowners on the availability of funds and the guidelines that will be used to distribute the money.

13. Forest Restoration Efforts:

    a. Reforestation Assistance: State agency foresters, industry foresters, university extension foresters and private consulting foresters can all play important roles in educating and, in some cases, providing on-site assistance to landowners. This assistance will be technical in nature and will provide reforestation options to landowners. The foresters providing this information should be prepared to discuss costs associated with reforestation. Landowner objectives should always dictate the type of reforestation. Any disaster can be the catalyst that moves a landowner to a position of planning the future of his/her forest. Disasters may also provide opportunity for state agency foresters to make inroads with individuals or groups of underserved landowners.

    b. Seedlings: Seedling availability is critical to timely reforestation where artificial regeneration is prescribed. A list of all southern nurseries is readily available. It should be the responsibility of state agencies to keep up with seedling availability, price structure and ordering procedures for all nurseries throughout the region. This information should be made available to landowners, foresters, and vendors.

    c. Federal and State Disaster Programs: Both the federal and some state governments have developed special reforestation incentive programs in the past to encourage landowners to replant or naturally regenerate acres of timber lost to a disaster. The typical incentive is cost sharing with the landowner at the expense of reforestation. State forestry agencies should take the lead in informing landowners of the availability of these programs as they are developed.

    d. Landowner Tax Relief: Landowners need to be made aware of available reforestation tax credits and amortization schedules. Consulting foresters knowledgeable in tax law and/or timber tax specialists should be contacted for case-dependent advice.

    e. Deductibility of loss etc.

B. State and Other Public Lands

The recovery of damaged timber that is a result of a hurricane disaster event is very important to public land management. A coordinated effort of all public agencies that utilizes the information developed in an initial "quick" damage assessment must be efficient to expedite the salvage of the damaged timber resource and also to retain as much of the original stumpage value as possible. By doing so, public land managers will demonstrate to the private citizens that their "public lands" are managed by professionals who have the best interests of the forested resource as a priority.

1. Salvage Operations

The recovery and utilization of damaged timber in an expeditious and efficient manner is key to a successful outcome of the "unplanned volume removals" from the public forest land. The amount of timber affected will determine both the time required for conducting the salvage and the personnel needed to manage the operation.

The initial damage assessment that is completed in an affected region will be vital to the salvage operation. This information will provide the overall damaged timber volume that is within the available resource market. Following large-scale events, the amount of damaged timber that "drops" into the market pool will be very large and will cause a reduction in stumpage prices. Price reductions stem from two sources; because the timber entering markets is generally of lower than average quality, and because volumes entering the market are large, which pushes out supply and reduces the market price. The astute salvage timber sale manager will understand local markets-the potential for probable wood flows for a long term salvage operation (if necessary) and an understanding of market price sensitivity to increased supply. Prior to the marketing of the stumpage, a determination should be made on what type of sale will be conducted-i.e. lump sum or per unit. In most salvage situations, it is preferable to use a per unit sale type instead of a lump sum. If a per unit sale type is chosen, then a developed haul ticket system (dual ticket copies – field/load copy) should be used for better accountability. (A field copy is matched to a load copy which is submitted with a corresponding market scale weight ticket when stumpage payment settlements are tendered). The manpower necessary for sale monitoring has to be assessed and then scheduled prior to initiating the sale in order to assure adherence to best management practices and contract performance. (e.g. proper product separation, special conditions, etc.)

To initiate a salvage operation, the forest resource salvage manager prepares to market the damaged timber based on the information provided from the initial assessment. The "workable sale units" are either used as a whole salvage area or are further reduced in size to facilitate expeditious removals and the preparation of "bid prospectus packages". The bid prospectus package

should contain a cover letter notifying of seller intent, sale location, and time length of sale contract, purchase requirements, and date and time of sale. Also included should be a clearly defined location map, detailed tract/compartment maps, an example sale contract that describes the condition of the timber to be salvaged, product specifications, and any other special conditions of the sale. Once the sale bid prospectus packages are prepared, then they should be distributed to a well developed list of wood suppliers and timber buyers. Distribution is normally by mail, but a hand delivered sale prospectus offers the opportunity to answer questions that potential buyers may have. Hand-delivery also is useful for scheduling a meeting time for visits to the sale area(s). Good communication skills and business relationship building with potential buyers is very important to meet the overall goals of an expeditious and efficient salvage operation. Follow-up with all buyers after distribution of the sale packages is key to making the salvage operation successful.

2. Summary: Checklist For Conducting Damaged Timber Salvage Sale
   - ✓ Obtain Damaged Timber Resource Location Maps from Assessment Project Letter.
   - ✓ Divide Damaged Area Workable Units Into Manageable "Sale Areas"
   - ✓ Determine Timber Sale Type "Per Unit is Preferred"
   - ✓ Set Timber Sale Date (Market Quickly As Possible)
   - ✓ Prepare Per Unit Bid Prospectus Packages
     - Cover Letter
     - Location Maps
     - Tract/Compartment Maps
     - Example Contract
       - ➢ Timber Description
       - ➢ Contract Length
       - ➢ Product Spec's
       - ➢ Special Conditions
   - ✓ Develop Wood Suppliers and Timber Buyers List
   - ✓ Distribute Per Unit Sale Packages
   - ✓ Set Minimum Bid Per Unit Product Sale Values
   - ✓ Market Sale With Communication Skills
   - ✓ Assemble Manpower Necessary For Monitoring Sales
   - ✓ Conduct Timber Sale Openings
   - ✓ Execute Timber Sale Contracts
   - ✓ Conduct Pre-Harvest Meetings
   - ✓ Print Dual Haul Tickets for Each Sale Area
   - ✓ Assign Manpower To Sale Areas
   - ✓ Commence Harvesting Operations
   - ✓ Monitor Sales / Process Settlements

3. Wet Decks
   With a large scale regional catastrophic event, the amount of damaged timber resource that has been added to the stumpage markets may be so large that

market saturation is rapidly achieved. Therefore, in order to prevent degradation of the timber while being stored at the market facility, other log storage methods are needed. These include wet deck yards and log storage ponds. Most large scale lumber product facilities already have these kinds of storage capabilities, but when a forest-based catastrophe occurs, market yards fill up and cannot accept additional stumpage. This situation can be alleviated by constructing and maintaining temporary satellite wet deck sprinkler yards or log storage ponds. Strategically locating these temporary facilities within an affected region can increase the amount of timber resource salvaged by providing timber price support. If the public forest land base is large enough or has available space, wet deck storage yards can be temporarily located there, providing an opportunity to facilitate both public and private timber salvage activities.

The establishment of a wet deck essentially creates a new "market" opportunity for the purchasers of the damaged timber. As with any wood receiving facility a functioning wet deck has to have the following:

a. Log truck weighing facilities.
b. Appropriate equipment to handle the job of unloading trucks and stacking timber for storage
c. A water source for a sprinkler system
d. Manpower to handle all of these assignments
e. Support equipment to make all of this function (power, water, system infrastructure, tools, etc.)
f. Available space to store the timber resource
g. A yard design to catch water runoff for recycling of the sprinkled water.

To remove any potential for a conflict of interest for the state selling entity, the wet deck should be operated by a private contractor. Possibly some of the wood suppliers or timber buyers that purchase the timber sale areas would have an interest in operating such a facility.

4. Permitting Procedures
There has to be an awareness of state permitting procedures for the use of concentration yards, storage ponds and/or lagoons, and barge and rail loading facilities. Entities operating these facilities must have current permits. For a large scale disaster emergency event, a relaxation or waiver of specific rules and guidelines for these permits may be available from water regulatory agencies. This still should not preclude the operation of a wet deck operation to take all reasonable care in prevention of non-point source water pollution where applicable.

5. Transportation Considerations (Overweight Issues)
Consideration should be given to application for a temporary waiver of weight limits. Any suspension of weight restrictions should only be for an affected area, and for emergency response movement of damaged timber resources.

This suspension generally originates in the executive branch of state government and if the affected region crosses adjoining state lines then all relaxation or suspensions need to be done in reciprocity to recognize each individual state permit.

6. Debris Removal
   Non-merchantable wood debris that results from a traditional harvesting operation has always been a problem for the forest manager. A disaster event that affects managed forest land, traditional recreational usage land and urban areas amplifies the problem of what to do with this raw material type. Where the forest and wildlands interface with urban areas, increased wildfire fuel loading is also a major concern. With the recent storm activity that has occurred in the southern United States, woody debris removal has been done by locating tub grinders and other kinds of wood chippers at various locations to facilitate joint private rural forest land and urban forest cleanup activity.

7. Wildand fire assessment
   a. Acres impacted
      One of the first steps in assessing the wildland fire situation after a disaster of any kind has occurred is to determine the area impacted. This may be done by aerial surveys using maps and GPS tools, ground surveys, comparison of satellite imagery before and after the disaster

   b. Fuel conditions (before and after)
      Fuel conditions after the disaster can be determined by aerial and ground surveys and compared to the fuel models that existed prior to the disaster. The Southern Wildfire Risk Assessment (SWRA)[9] will make determining fuel conditions before and after a disaster much more efficient.

8. Increased danger to Communities at Risk (before and after)
   a. If a disaster is of a type that increases fuel loading (hurricane, tornado, etc) it will produce a corresponding increase in wildfire risk to communities in the vicinity.

   b. Once new fuel information is entered into the Southern Wildfire Risk Assessment, the change in communities at risk from wildfire can be calculated.

   c. Fire breaks may be constructed around communities in areas with large amounts of storm debris in order to reduce the risk of the communities to wildfire.

   d. Fire prevention programs should be a key component in addressing increased risk to communities.

[9] See http://dev.sanborn.com/swra/default.htm

9. Wildand fire suppression safety issues
    a. Disasters such as hurricanes and tornados in the South typically blow down larger numbers of trees which make fire fighting more difficult and dangerous.

    b. Salvage of as much timber as possible reduces the number of trees on the ground and decreases fire fighting difficulty.

    c. If a disaster results in a large number of trees on the ground, larger dozers may be necessary to safely suppress fires.

    d. Construction of new fire breaks and opening up existing fire breaks and woods roads will increase safety in fire fighting.

    e. Fire suppression tactics may require that fire fighters stay farther away from the fire than normal due to decreased maneuverability.

    f. In some cases firefighters may have to work around and avoid pockets of concentrated storm debris.

10. Long term problems and needs
    a. Large woody debris left by a hurricane or tornado can persist for several years, necessitating larger equipment for fire fighting along with special tactics.

    b. Fire prevention should be a primary component for addressing long tern increases in fuel loading.

11. Prescribed fire issues and debris burning problems
    a. Prescribed burning can be a primary tool to reduce the increased fuel loading that may result from a disaster.

    b. Depending on the affected state's strategy, a state may ask the public to refrain from burning until fire breaks can be constructed to protect communities.

    c. Every effort should be made to encourage the public to have debris hauled away rather than burning it.

    d. Work with the state emergency management agency and others who are involved in establishing debris dump sites to ensure a safe location if the debris is to be burned.

e. Air quality issues should be evaluated before allowing the public to burn for fuel reduction or debris disposal.

12. Prevention/Education issues
After a natural disaster, when the public starts to clean up debris, burning may seem an obvious choice for removing debris, a strong prevention/education program is needed to advise the public when it is safe to burn and how to burn it.

13. Federal funding opportunities
    a. After major disasters supplemental state and private funding may be made available by congress for increased fire prevention and suppression capability in the affected area.

    b. FEMA hazard mitigation funds may be available for fuel reduction, fire break construction and fire prevention activities, depending on the severity of the situation.

14. VFD assistance
    a. After any disaster that increases the potential for wildland fires, particularly in the wildland urban interface, volunteer fire departments will play a key role.

    b. VFDs may need additional support in the form of equipment and training in how to deal with fires in a heavier than normal fire situation.

C. Urban Forest Damage Assessment

There have been a number of good resources on storm response developed by the urban & community forestry community. The following document will only be a brief summary of extensive material. Web links to various sources will be included throughout this outline. However, those wanting more detailed information will find detailed information from the following three sources:

Storms Over the Urban Forest
http://www.na.fs.fed.us/Spfo/pubs/uf/sotuf/sotuf.htm

Storms Over the Urban Forest Toolbox CD ROM available from the Texas Forest Service

Tree Emergency Manual for Public Officials
http://www.umass.edu/urbantree/tem.shtml and
http://www.umass.edu/urbantree/TEM.pdf

Good urban forest management will go a long way towards minimizing the impact of a devastating storm. Communities should first think in terms of mitigation which can be defined as "activities which eliminate or reduce the occurrence of future disasters."
Emergency action for a natural disaster consists of three chronological phases:

1. Preparation
   Disaster planning and warning activities. Examples of activities include: the identification of an early warning system for severe weather, development of a disaster response plan, identification of roles of various individuals and municipal departments during disasters, determination of debris disposal options and identification of groups or communities to contact for additional assistance when necessary.

   The best time to begin dealing with a storm event is before it strikes. Communities should consider the following:

   a. Personnel, equipment and supplies: Knowing what resources the community has and (just as important) what it may need to arrange for is critical.
      1) Inventory of human resources and their capabilities, special talents, limitations

      2) Inventory of community equipment, its capabilities, limitations, reliability. What equipment will need to be rented or contracted for (cranes, trucks, etc.)?

      3) Inventory of supplies - Emergency rations, first aid, flashlights, gloves, coveralls, etc.

   b. Tree inventory: Having information on the trees that will be impacted is important for organizing the disaster response. A good tree inventory is also the basis for a community's urban forest management plan.
      Inventory of all municipal trees:
      1) Species, size, condition

      2) Location with respect to utility lines, important routes, key buildings

      3) Readily available maps or location printouts
         - Linked to community GIS? This is beneficial!

   c. Urban Forest Comprehensive Management Plan*:* a good community forest management plan can lay the groundwork for good disaster response with respect to trees.
      1) Specifies who is responsible for various aspects of tree management

      2) Integrates tree management with other community government functions (i.e. public works, transportation)

3) Provides for planting of appropriate species

4) Provides for prioritized maintenance and removals

5) Identifies "hazard trees" and their management

6) Includes a *tree emergency plan*

d. Tree Emergency Plan Worksheet
http://www.urbanforestrysouth.org/Resources/Library/TTResource.2005-10-05.0514/view

This comprehensive worksheet will provide valuable information to public officials preparing for storm response. A community's worksheet should have all of the following elements:

1) Early warning system/weather forecasting service
   a) Staff lead
   b) Contact information

2) Local emergency manager – This is the lead contact for a community and responsible for emergency planning and response activities.
   a) Name
   b) All contact info

3) Public relations coordinator
   a) Name (also alternates)
   b) Contact info

4) Disaster planning and response team members – This team should include the mayor, selected department heads, local emergency managers, police chief, fire chief , public relations personnel and others.
   a) Name
   b) Role/responsibility
   c) Contact info

5) Available disaster response staff and crews – Identify and list all municipal staff and crews available for disaster response work.
   a) Staff name
   b) Role/responsibility

6) Emergency call out procedure – Phone contact tree for staff.

7) Primary transportation and evacuation corridors and routes for emergency vehicles – Identify and map for reference. Have map available and accessible, and review and update annually. Having a GIS based map is a plus.

8) Critical power transmission corridor restoration sites (medical treatment centers) – Identify and map for reference. Have map available and accessible, and review and update annually. Having a GIS based map is a plus.

9) Identify who is responsible for decision making and priority response setting for multiple life threatening situations
   a) Name
   b) Contact info (phone, mobile phone, pager)

10) Tree damage clean-up priorities – List areas that need attention after life threatening situations have abated.

11) Procedure for debris staging and removal –Identify several areas for staging and processing debris.
    Location:
    a) Name/role for each location
    b) Contact info

12) Debris and brush removal from private property – Identify how you will address this issue and what resources you can commit.
    Person responsible and contact info:
    a) Minor storm policy
    b) Major storm policy
       - Listing of available tree care companies and other contractors

13) Identify wood utilization options – Develop a list of companies and resources that can process the wood material generated from storm damage. When possible, establish a contract for utilization services.
    Wood utilization contract:
    a) Company or organization name
    b) Contact info
    c) Description of service

14) Equipment listing (available in-house) – Develop a list of public works and parks department equipment and vehicles available for tree clean up work. Keep it current. Include wood chippers, aerial bucket trucks, refuse packers, loaders, supervisory vehicles, chain saws, barricade and lighting equipment, hand saws and pole pruners on the list.
    a) Person responsible
    b) Contact information
       - Type equipment and quantity available
       - Department where kept and contact information

15) Additional equipment and assistance sources – Make a list of potential vendors and keep it current. For certain equipment and assistance needs, it is critical to establish an emergency contract. Also consider agreements with neighboring localities that may not be as badly affected by a given storm event and would be capable of sending assistance.

a) Person responsible
b) Contact information
   - Type equipment and quantity available
   - Department/contact
c) Emergency contracts
   - Organization
   - Contact information

16) Staff, crew organization and equipment needs – In an emergency, staff members may need to lead crews from other departments or of private contractors. Determine staff that can function in this manner.
    a) Name
    b) Crew
    c) Equipment needed

17) Individual(s) responsible for record keeping – This person(s) does documentation and cost accounting during and after disasters. Note – define a specific accounting code for each storm event.
    a) Name
    b) Contact information

18) Individual(s) responsible for damage assessment and damage survey – This person is familiar with FEMA and Division of Emergency Management procedures and prepares the reports needed for public assistance.

19) Disaster budget(identify potential activities to anticipate costs)

20) Funding information from past storms – Review costs from past storms to anticipate costs for future storms and establish funding needs.

21) Individual(s) and/or organization(s) responsible for community regreening efforts – Develop a list of contacts for use in efforts to regreen the community after storm events.
    a) Name of organization
    b) Contact information
    c) Potential organizational role in recovery

22) Community Urban Forestry Comprehensive Management Plan – This document, if the community has one, should be useful in identifying specific trees or areas most prone to storm damage or trees that might interfere with utility lines or emergency travel corridors.

23) Community Tree Risk Management Plan – A tree risk management plan will provide the community with a systematic approach to accurately identify moderate to high risk trees, and initiate the timely removal or corrective treatment of hazardous trees. Go to: http://www.na.fs.fed.us/spfo/pubs/uf/utrmm/index.htm

24) Storm Damage Assessment – If a storm is significant enough to receive a formal disaster declaration, state and/or federal funding may be available. To assist communities in the process of applying for reimbursement for storm associated costs, it is important to be able to quickly develop an estimate of damage. Consider adopting a Storm Damage Assessment Protocol as a tool prior to a storm. For more information, go to:
>http://www.umass.edu/urbantree/icestorm/index.html
>*http://www.urbanforestrysouth.org/Resources/Library/TTResource.2004-12-02.0911/view?parentObj=Collection.2005-10-17.1528*
>*http://www.itreetools.org/applications/sdap.html*

25) Contacts for additional assistance in natural disaster planning, response and recovery:
   a) State forestry agency
   b) University extension agent
   c) Municipal foresters in neighboring cities and towns

2. Response
Immediate activity during and after the disaster. Examples of activities include: tree damage clean up, clearance, identification of methods of communication from the field to the office, determination of debris disposal options, identification of trees that have been damaged but are salvageable and use of efficient record-keeping methods.

Tree emergency response should proceed in an orderly and prepared manner for maximum safety and minimum cost. Considerable attention was given in the preceding section to developing an emergency tree plan. Now is when that plan should be put into action!

a. Debris Removal
   1) Locate and consult the emergency tree plan with all its contact lists.
      a) Notify all appropriate parties as the storm approaches
      b) Begin to implement communications strategies with the public
      c) Start activating contractual arrangements as necessary

   2) Identify live electric wires in, on or under trees.
      a) Block access to them and report them to appropriate utility officials
      b) Coordinate tree response efforts with those of the appropriate utilities. These protocols should have been established in the emergency tree plan.
         - Only trained arborists should work around live wires, and the work should conform to ANSI standards Z133.1 and A300
         - OSHA 1910.269 and other safety standards may also be relevant http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9868

   3) Debris Clearance Response – Phase I (FEMA)
      a) Clear priority traffic lanes and culverts

- Main routes
- Roads to hospitals and other vital services

b) In phase 1, simply push debris to the side
   - Do not attempt removal or disposal at this time

c) Clear at least one lane on each arterial, major highway, and secondary road as soon as possible

d) Open major walkways to provide access to critical buildings as well as other locations that might be important under emergency conditions

4) Debris Clearance Response – Phase II (FEMA)
   a) Use established routes and methods for clearing tree debris. These should have already been identified in your pre-storm planning. If not, use established routes for trash pickup or snow removal
   b) In larger communities, set up temporary collection points (malls, playgrounds, etc.) around the community, then clear these as things calm down
   c) Tree debris removal is usually reported as the most difficult tree disaster problem for communities and individuals
   d) In general, removal of debris from public property is eligible for FEMA assistance when a federal disaster has been declared and when it constitutes an immediate threat to life, public safety, or improved property

b. Communication

Communication is critical to surviving disasters. If you do not actively manage information during tree emergencies, things have a way of quickly getting out of hand and complicating your work.

1) Set up clear communication channels among emergency agencies and personnel

2) Establish and publicize a phone number and staff person for public contact

3) Work with the media early and often
   a) Take the time to get accurate information out—it will be well spent
   b) Be frank about the extent of damage and the estimated time needed for recovery
   c) Useful tree disaster media releases can be downloaded from the web at http://www.arborday.org/storm

4) Indicate how the public can help:
   a) Placing debris at curbside
   b) Keeping debris away from fire hydrants and valves
   c) Segregating recyclable and flammable materials

5) Emphasize the need for careful professional damage assessment.

a) People often tend to become radical about trees after a disaster, wanting either to "kill" or "save" them all, and they need to hear voices from officials
b) Trees can recover from substantial damage, and what looks awful at first to an amateur may be judged as much less serious by an experienced professional

c. Records
It will definitely be easier later if you start your paperwork at the beginning, and keep it up as you go along. It is very hard to recreate records after an emergency.

1) Maintain good records from the beginning
   a) Keep track of date, personnel, job, equipment, location and hours
   b) Have supply of basic FEMA forms ready. These are available on the FEMA web site: http://www.fema.gov or in the *Applicant Handbook* for public assistance available from the regional FEMA office

2) Complete an accurate damage assessment, and estimate associated costs
   a) Use any methods that will give you quick and reliable results. If your community is large, sample a random selection of streets that make up at least 2% of street miles
   b) Accurate damage assessment is vastly easier if you already have a pre-storm survey in place
   c) You will need an accurate damage assessment for local officials, as well as for state and other emergency officials
   d) Estimate hours of labor and equipment that will be required for:
      - standing tree removals
      - hazard pruning
      - debris removal
   e) Multiply hours of costs to obtain job cost, or determine a lump sum for the cost of the job

3. Recovery
Activities after the disaster that attempt to restore conditions to those prior to the disaster. Examples of activities include: public and private tree planting and care, training, tree planting awareness events and celebrations, and recognition activities for volunteers, citizens, municipal workers, and others involved.

a. Post-Storm Clean-Up
Once the immediate tree emergency has been remedied, a community will still have considerable follow-up to do. There will still be critical tree work to do, FEMA Paperwork to file, and further media relations activities.

1) Identify immediate threats, and make Priority 1 (danger of immediate failure) decisions about removals and pruning.

2) Determine Priority 1 Removal
   a) Systematically search for trees that are:
      - Uprooted
      - Split in half
      - Undermined
   b) Select trees for immediate removal if they have a building, sidewalk, major electric wires, road, or other important structures as likely targets
   c) Distribute work orders for the immediate removal of these hazardous trees

3) Determine Priority 1 Pruning
   a) Systematically conduct high priority pruning street by street, taking out limbs 2" in diameter that are hanging, broken or cracked
   b) Select these trees for immediate pruning if they have a building, sidewalk, major electric wires, road, or other important structures as likely targets
   c) Contracting out the work for these steps is often easy and cost-effective. This frees up staff for other emergency needs

4) Hire Professionals
   a) The professionals hired should be capable of doing work consistent with ANSI A300 standards. Include the phrase "…all work to be carried out according to ANSI A300 standards" in contracts
   b) <u>Let professionals know</u> that you are aware of ANSI A300 standards before they start
   c) <u>Expect a reasonable markup</u> for emergency work, but try to keep it under 20-25%
   d) <u>Inspect work closely</u> before you sign off on payment

5) Alert the Public
   a) "Fly-by-night" contractors often take advantage of storm damage situations.
      - Arborists should be licensed and bonded
      - Look for ISA certification
      - Ask for referrals
      - Do not pay for work in advance
   b) Media releases should be prepared (in advance) on this topic

6) Assessment and Planning
   a) Inventory/Survey
      - Make a survey of all community trees
      - If the community already has a survey or inventory, revise it now:
        - To update data
        - To establish damage, safety problems, work, and cost
   b) Tree Inspection: Systematically inspect each tree for maintenance needs and site information
      - Maintenance needs include pruning, removal, cabling, mulching, etc.

- Site information includes the presence of wires, width of planting area, soil texture, etc.
- Include potential planting sites, if not already noted in your inventory

c) Policies: This is a good time to get in place – or review – standard tree documents such as:
   - Up-to-date specifications for buying, planting, pruning, and removal
   - Tree ordinance and/or policy

d) Education: Work with media based on plans that have been developed.
   - Publicize your next actions and decisions. People get most upset when they do not know what or when something is going to happen.
   - Notify homeowners before doing work on any public tree they might consider "theirs". Use letters, postcards, door hangers, or any other means that work.
   - Get out good information on replanting and tree care. Excellent materials are available from the International Society of Arboriculture, www.isa-arbor.com

7) Reducing Delayed Threats to Public Safety

Disasters weaken surviving trees, leaving future safety and cost questions.

a) Priority 2 Removal. Priority 2 trees have no danger of immediate death and failure, but they are expected to decline and fail over the next 5-10 years. Making decisions about Priority 2 removals is probably the hardest and most controversial step in managing storm-damaged forests.
   - Decide which trees should come down now to remove a likely source of future hazards, and to be most cost-effective. Use your inventory/survey to set priorities.
   - Consider factors such as safety, looks, neighborhood effect, cost, age, vigor, crown loss, balance, heartwood damage, and species.
   - Good candidates for Priority 2 removal are:
     - Low-vigor trees with 50% or more of crown heavily damaged
     - Trees with leaders broken back into the trunk
     - Split or tipped trees that were not removed as Priority 1
   - FEMA usually does not reimburse communities for non-hazardous tree removal

b) Priority 2 Pruning
   - Use the community tree inventory to locate trees with a high hazard rating that need to be pruned
   - Many communities have found it more cost-effective to clean and repair Priority 2 trees than to remove them and replant
   - FEMA usually does not pay for non-hazardous pruning

8) Working with FEMA to Recover Tree-Related Costs

A little bit of care and attention to FEMA requirements on the front end can save a lot of pain at the back end!

a) Records! Know what is needed, and keep track of it from the start.
b) To be eligible for FEMA reimbursement, work must be:
   - overtime
   - required as the result of a major disaster event
   - located within a designated disaster area
   - the legal responsibility of an eligible applicant
c) Understand the "disaster area" declaration process
   - Initial emergency response occurs at the local level
   - Local officials can decide to contact their State Emergency Management Agency (SEMA) for assistance
   - SEMA determines whether the affected area should be declared a disaster by the Governor
   - The governor can request that the situation be declared a "major disaster" by the President.
   - If approved, the Federal Emergency Management Agency names a Federal Coordinating Officer who oversees the determination of what type of relief is needed
   - Local, state, and federal representatives work together to develop the Damage Survey Report, which provides an estimated budget
   - Tree removal and pruning in natural forest systems are excluded from FEMA reimbursement, unless the trees directly impact public safety of persons using a maintained public facility
   - Hazard mitigation funding is also possible to reduce future damage, though it is much more limited.
d) Inform yourself about reimbursement requirements:
   - Get a copy of your state's Emergency materials
   - Understand FEMA and its role (current info on the web at www.fema.gov/about
   - Get a copy of FEMA's *Applicant Handbook* (FEMA 323).
     - Interactive application forms that can be filled out on the computer are available on the web at: http://www.fema.gov/r-n-r/pa/appfj.ml.htm
     - Directions for those forms can be found in the *Applicant Handbook*, and on the same web site as the forms
   - Find out what will be reimbursed before you contract out work.
     - Public tree removal necessitated by a disaster in a declared area is usually reimbursed; stump grinding is not unless a clear threat to life and public safety can be identified.
     - Tree replacement is usually not covered by federal and state emergency management offices, unless it is a component of an otherwise eligible FEMA project.
     - **Only overtime emergency labor is eligible for FEMA reimbursement**
e) Individual tree valuation may become necessary in some instances for establishing the value of a specimen tree. Tree valuation is difficult and often disputed, and for this reason is best carried out by a certified or registered consulting arborist trained and experienced in the

technique (Reference: Guide for Plant Appraisal www.isa-arbor.com)

b. Recovery and Community Planting

Tree loss means the community itself has lost value because of factors such as reduced cooling, less air purification, and lower attractiveness. It is in the community's best long-term interests to promote recovery and reforestation. The first tree-related step in recovering from a major storm event is to initiate a tree inventory or update one if the community has one in place. The community will then do maintenance on the surviving tree population. Next the community will develop a community replanting plan. Finally, the community will involve the public in its reforestation efforts.

1) Tree Inventory
The better you manage and maintain trees, the less damage they will suffer in future storm events.
   a) Inventories of public trees have multiple benefits:
      - Making and defending budgets much easier with hard data
      - Work orders, annual costs and tree histories can be quickly produced
      - Funding requests to emergency agencies will usually be processed more quickly, and requests for reimbursements will be easier to justify
      - Potential planting sites can be included in the inventory. This will help when making reforestation plans and planning future planting budgets
   b) Computerized inventory programs and inventory templates are readily available from both public and private sources
      - State U & CF coordinators can direct you to various vendors of inventory software
      - Free basic inventory templates based on Excel TM and Access TM are downloadable from the web at:
        http://www.umass.edu/urbantree/inventory.shtml
      - The USDA Forest Service has developed the ***i-tree package*** that integrates tree inventory information with sophisticated environmental benefits models. Go to:
        http://www.itreetools.org/

2) Maintenance on Surviving Trees
Regular maintenance on a community's tree population will minimize damage in future storm events.
   a) The community tree inventory will be a guide in prioritizing maintenance work
      - Priority 2 (see Post–Storm Clean up section) trees not removed in post-storm clean-up can be rehabilitated
      - Younger trees should be pruned for strength and form
      - Trees with hazard potential should be systematically eliminated or the hazard characteristic treated (i.e. removal of large co-dominant stem)

- Detailed information on tree maintenance can be obtained from each state's U&CF Coordinator and/or Cooperative Extension

b) The community maintenance program should be pro-active rather than reactive
   - Tree maintenance work should be performed by professional staff in-house or qualified companies under contract
   - Regular tree maintenance pays for itself by minimizing future problems and should be a line item in a community's budget

3) Community Reforestation

Community reforestation should begin with written reforestation plan that has broad public input and support. Standards for tree selection and planting should be established. The community tree board or commission should lead this effort.

a) Establish a tree commission
   - Include concerned citizens as well as tree management personnel
   - Use the tree commission for help in such areas as:
     - Basic tree inventory and assessment information
     - Tree selection
     - Keeping track of species diversity
     - Matching tree species to site
     - Relations with private property owners

b) Develop a reforestation or re-greening plan
   - The plan should identify areas to be replanted
     - Tree inventory will be valuable in this regard
   - The plan should identify good criteria for tree selection
   - The plan should set up purchasing and planting specifications

c) Tree selection criteria
   - In general, avoid fast-growing, weak-wooded species such as willows, silver maple, cottonwood, Siberian elm, callery pear cultivars
   - Plant only small to medium size trees in proximity to power lines
     - Local utility companies often have their own recommended list of trees
     - For a good discussion of this topic, go to: http://www.ext.vt.edu/pubs/trees/430-029/430-029.html
   - The best tree selection lists are state specific and obtained from the state's U & CF coordinator and/or Cooperative Extension Service
   - Some good examples are:
     - http://texastreeplanting.tamu.edu/
     - http://www.ag.auburn.edu/hort/landscape/hurricane_BMPs2.html#four

d) Funding for Reforestation
   - Some major storm events may have special federal funding sources associated with recovery efforts. Consult the state forestry agency.
   - Some states have their own programs that are dedicated to community tree planting
   - Seek replanting funds from private and public sources while

memories of the storm are still fresh

- Resources: "How to Fund Urban Forestry", Tree City USA Bulletin # 34, National Arbor Day Foundation: http://www.arborday.org

MORE DETAILED INFORMATION

The following websites contain extensive information on storm response as well as links to several of the publications already referenced in this document:

- http://www.urbanforestrysouth.org

This is the website of the USDA Forest Service Region 8 Urban & Community Forestry Program. Go to: http://www.urbanforestrysouth.org/Resources/Collections/Collection.2005-10-17.1528/view
This page links to detailed information on storm damage assessment protocol and materials presented here draw on experience with recent hurricanes in Florida and the Gulf states.

- http://www.umass.edu/urbantree/forest.shtml

This is the website for USDA Forest Service Northeast Center for Urban & Community Forestry. This site contains several downloadable tools for tree inventories and for storm damage assessment. The *Tree Emergency Manual for Public Officials*, from which much of the material in this document was derived, can be viewed and downloaded here.

- http://www.isa-arbor.org

The International Society of Arboriculture has numerous publications that deal with tree maintenance, tree planting, and arborist safety. ISA also has publications on the pertinent ANSI standards associated with tree work

- http://www.treelink.org

This website is an excellent portal site to all manner of urban forestry information. Almost all of the aforementioned web pages can be accessed through this site.

Future Appendix

- Glossary of Common Terms
- State Statutory Requirements/Limitations – spreadsheet overview
    - Within state boundary (state/local disaster)
    - Within state boundary (federal disaster)
    - Outside state boundary (state disaster)
    - Outside state boundary (federal disaster)
- Copies of state fire compacts, EMAC, federal activation agreements etc.
- Examples of State Briefing Materials (i.e. answering the questions Governor's and state governments have before they are asked…)
- Case Studies/Lessons Learned
    - Gov's Forest Disaster Task Force examples
- Review and Updating Schedule of Handbook