

USDA Forest Service Station Fire Lessons Learned Report

October 2010



Key Lessons Nationally

Night Flying of Aircraft

Fire Behavior Modeling

Working With Urban Interface Communities

Defensible Space Around Structures

Tracking Aircraft Water Delivery

Interagency Agreements

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Night Flying of Aircraft

The Forest Service has received criticism for not utilizing night flying capability by partnering agencies during the evening of August 26 and early morning hours of the 27th, 2009. As a result, the Forest Service identified this topic as an area to explore for potential use in the future.

National

The Chief of the Forest Service has initiated a national assessment of night flying operations. The Forest Service stopped these operations in the early 1980's due to night flying accidents that resulted in fatalities. So far, the preliminary findings and options for rotor-wing aircraft are under review. Fixed wing night flying finding will be assessed during the winter of 2010 and 2011.

- The study identified Kern County, Los Angeles City, Los Angeles County, Orange County, San Diego City, and Santa Barbara County are currently or preparing to operate helicopters in a night operations mode.

- There are an estimated 17 helicopters that support the current night operations in Southern California and their primary operational missions are emergency medical service.

- Utilization of the aircraft has been minimal for actual firefighting night operations and their zone of coverage is well defined. This is to ensure the safety of the pilot and aircraft so the familiarity of the terrain and any hazards are well known in advance of flying a mission.

- CALFIRE has chosen not to develop this capability at this time due to the age and characteristics of the helicopters they operate.

Elements of the Study: The study reviewed the past practice of using helicopters in support of night firefighting, which agencies are currently doing night operations, what technology is available today, mission definition and qualification, risk assessment for the candidate helicopter night missions, effectiveness and utilization of night water drops and cost estimates. The missions that were identified to move forward for further evaluation were:

- Water and retardant dropping using a fixed tank with ground fill
- Aerial supervision
- Emergency medical transport (Hoist)
- Aerial ignition with plastic sphere dispenser

Night Flying of Aircraft Continued ...

Risk Assessment: The assessment utilized the 2008 Systems Safety Aviation Guide and the 2009 Aviation Risk Management Workbook, and identified all hazards to be classified as Section 5 (c), FAA Circular 120-92, acceptable with mitigation. There were five systems identified with an additional 24 subsystems following the workbook. The five systems are:

- Helicopter Aircraft;
- Helicopter Facilities Night;
- Helicopter Personnel Night;
- Helicopter Technology Night; and
- Helicopter Operations Night.

Regional

The Region will explore and develop training for utilizing cooperators night flying operations for all Incident Management Teams in the Pacific Southwest Region.

Develop night flying operations briefing package for all out-of-area resources to review, including Incident Management Teams.

Augment existing aviation management training to include management of night flying operations.

Local- Angeles National Forest (ANF)

The Angeles NF Forest Supervisor and LA County have agreed to modify the Cooperative Agreement Annual Operating Plan (AOP) to specify management's expectations regarding night flying. Routine training and operations will ensure Incident Commanders (IC) are aware that they may approve the use of properly fielded night-flight helicopters during evening and early morning hours to contain a fire that is an immediate threat or may become a threat to life and property, when appropriate, and or when both agencies are in Unified Command. This would apply to all Angeles NF lands, including lands within the Initial Action Zones. Angeles NF personnel will receive additional training on safety requirements when using night flying helicopters. The Forest will pay for these operations as 'Assistance by Hire'.

At the 2010 spring forest chief officer meeting, and annual spring chief officer meeting with Los Angeles County, the topic of night flying operations was discussed. All forest chief officers with duty officer status are aware that they **can** utilize Los Angeles County Fire helicopters for night flying fire suppression support anywhere on the Angeles National Forest.

Fire Behavior Modeling Improvements

Fire behavior during the Station Fire was unprecedented and proved difficult to model. It has been recognized that there is a need to enhance and update the fire behavior modeling tools to better support decision making in the complex Southern California fire environment.

National

Fire behavior models, specifically rate of spread, need to be updated to reflect changes in fuel conditions and observed fire behavior. For example, plume-dominated fire behavior is extremely difficult to predict and model as seen throughout the Station Fire. As a result, the Agency will explore new and emerging technologies that can aid in modeling plume-dominated fires.

The Agency is reinforcing the intent of the Fire Spread Probability (FSPro) model and its current limitations as part of the Wildland Fire Decision Support System (WFDSS) training package.

- The Fire Spread Probability model is currently being enhanced with the addition of gridded forecast weather for short term fire forecasting (3-5 days) and intermediate term fire forecasting (6-10 days). This is a great leap forward in the accuracy and reliability of fire forecasting and modeling.
- Prior to these enhancements, FSPro used the historical range of past weather occurrences to plot the possible spread of a wildfire expressed as percent chance and that nuance was not well understood.

Local- Angeles National Forest (ANF)

The Angeles Forest made the review of current plume-dominated fire modeling and recognition a part of the 80 hour refresher training for the 2010 fire season. Strong emphasis on recognition of factors, weather and burning conditions leading up to plume domination on fires was discussed. The Forest provided our training modules to Los Angeles County Fire for incorporation in their preseason training.

Working with Urban Interface Communities in Volatile Fuels

The fire environment continues to change and people continue to move closer to wildland areas. As a result, the Agency needs to strengthen outreach efforts to communities and stakeholders in these high risk areas and expand the development of joint plans to mitigate risk.

National

The Forest Service has provided considerable support for the national Firewise efforts and National Fire Safe Councils, and needs to continue to encourage all forests with “communities at risk” to ramp up outreach efforts prior to a fire occurring. This has begun on forests throughout the country with a “Continuous Improvement” initiative that greatly emphasizes stakeholder and community involvement for high risk areas.

Local- Angeles National Forest (ANF)

Today there are 19 Fire Safe Councils working with “at risk” communities adjacent to the Angeles National Forest. The Forest is continuing to work with surrounding communities through these Fire Safe Councils to prioritize fuel mitigation, develop evacuation plans, and educate homeowners on steps they can take to protect themselves from catastrophic fires.

Defensible Space Around Structures

There continues to be confusion around responsibilities for defensible space on private lands. The Forest Service routinely cooperates with state and local government entities that have this responsibility. We

recommend this section be combined with the working with urban interface communities lessons learned as this is the platform for sharing the resources available to deal with this issue.

National

The Agency has to better recognize the distinction of fast-moving, highly volatile fuel types and engage communities and cooperators before ignition in planning, evacuations and defensible space where human life and critical infrastructure are at risk.

Building upon Region 5's experience, consider a set of national standards for defensible space on National Forest lands based upon *Firewise* and *Fire Safe Council* principles or state and local standards, if stricter.

Regional

On December 17, 2009 the Pacific Southwest Regional Forester issued a letter directing that the minimum requirement for defensible space around structures within and adjacent to National Forest lands in California be increased from the Federal minimum of 30' to 100'. Utilizing a 100' minimum makes the Forest Service standard consistent with California State and Los Angeles County standards for defensible space. Each Forest Supervisor has the authority to authorize more than 100' clearance, if warranted by site specific conditions. The Angeles NF is currently working with Los Angeles County Fire Department and CALFire to implement this new direction.

Local- Angeles National Forest (ANF)

In addition to complying with the Regional letter of direction, the Forest is currently developing a Defensible Space Zone map that incorporates the 100 foot minimum clearance for structures.

"The WUI Defense Zone is the area directly adjoining structures and evacuation routes that is converted to a less-flammable state to increase defensible space and firefighter safety. This is a strip of land where planned suppression activities involve both containment of the fire perimeter and protection of structures". *ANF LMP, Appendix K page 81*

This Defense Zone map will include all structures in the National Forest and structures on private land within 200 feet of the National Forest. The Defense Zone will also identify evacuation routes with appropriate defense zone buffers. Calculated acreage can be analyzed for impacts. There will be three focus areas in identifying defense zones:

- Protection of Angeles National Forest and other Federal facilities and infrastructure.
- Protection of private structures by enabling owners to come on to NFS lands for treatments to meet LA County Fire Code.
- Identify and maintain evacuation routes in the forest.

Tracking Aircraft Water Delivery

During the Station Fire, the Forest Service was questioned about the quantity and location of water and retardant drops. This same issue has been raised on other large fires around the country. The Agency should

improve methods for tracking and displaying the location of water and retardant drops during wildland fire suppression operations.

National

The Agency will continue to test and evaluate the tracking of airborne water/retardant delivery via GPS to assist in real-time and post-incident evaluation of aircraft use.

The Forest Service is also assessing infrared technology in evaluating water/retardant application; and will explore working with contract pilots to determine feasibility of capturing this data using current capability.

Interagency Agreements

Interagency and multi-jurisdictional fire suppression operations are extremely complex and require clear understanding of agreements regarding operational response. It is a best management practice to ensure these agreements and annual operating plans are appropriately updated to account for any changed conditions and in place prior to fire activity.

National

Cooperative Agreements and Annual Operating Plans (AOP) need to be updated annually. Ensure that Cooperative Agreement and AOPs are reviewed and understood by agency and elected officials.

- Cooperative Agreements and Annual Operating Plans, particularly in California, have been reviewed and updated by the Regional Office and the local Forests ensuring that they are understood by all parties, including elected officials.

Local- Angeles National Forest (ANF)

The Angeles NF Forest Supervisor and LA County have already had discussion regarding modification and improvements of their Cooperative Agreement and Annual Operating Plan (AOP). The changes will include night flying, training and joint response and use of resources.

Resource Ordering and Status System (ROSS) Enhancements

There were several concerns that arose regarding ordering during the Station Fire – such as duplication and cancelation of key aircraft orders. Federal wildland fire agencies use ROSS to locate available resources and track those resources for initial and extended attack as well as large fire management, in California – other fire response agencies still use other Computer Aided Dispatch (CAD) programs for Initial Attack. This can be challenging when working in an interagency environment. During initial and extended attack the need for quick response often promotes using direct communication to get resources mobilized and then “catching it up” in the system after the fact.

National

Determine and take necessary steps to prevent duplication of orders and promote accuracy. Changes are in the works to improve ROSS to respond to mobilizations related to aircraft requests.

- Addition of Contact tab for Aircraft and Equipment resource items – Approved as a high priority and is currently in progress.

- Addition of a unique autodoc for divert of tactical aircraft
- Priority Resource button should flash if there are pending requests in the queue.
- Allow messaging between dispatch centers in ROSS.

Documentation and Record Keeping on Incidents

The Agency received many internal and external inquiries regarding the actions taken in the during the early stages of the Station Fire. The Agency's inability to rapidly respond to these requests during and subsequent to fire suppression operations- highlighted the need for improvements in our documentation processes.

National

The need for thorough and accurate documentation cannot be overstated. The Forest Service encourages record keeping at all levels of incident management and will use the Station Fire incident as an example in future training to emphasize the need for improved documentation when using standardized ICS documents such as the 201 and 214.

Develop a fact finding exercise as a developmental training tool for Incident Management Teams and Fire Managers so they have a better understanding of the importance of documentation of decisions, such as the Key Decision Log, and other communications throughout an incident.

Review Procedures

The Forest Service routinely conducts internal reviews to identify potential improvements in programs and policies. These reviews need to be appropriately structured to encompass the complexity of the incident.

National

While the Review of Initial Attack provided important data and met the stated objectives, in retrospect the report should have looked into additional factors including asset utilization.

Standard Operating Procedure for the Forest Service is to use lessons learned and facilitated learning analysis after catastrophic incidents, but we recognize that we need to improve upon this process. As a result, future Forest Service after-action review panels will include a wider range of voices, including qualified individuals who were not in any way involved in the action.

Also, standardizing fact finding methodology and clearly defining what needs to be reviewed in an expansive incident would provide better understanding of outcomes.

During an incident that has the potential of becoming "nationally significant", immediately assign a Liaison to the local unit to assist with fact finding.

Incident Communications, Public Relations and Freedom of Information Act (FOIA)

Timeliness of the release of documentation of records and communication with the media regarding the outcomes of the Station Fire has been questioned. The following have been identified as potential actions.

National

Work with the public information staff of Department of Agriculture and at every level of the Forest Service to improve responsiveness; ensure transparency; and provide timely, accurate information to the public and the media.

Develop a better tracking and communication/coordination protocol between the Washington Office, Regional Office and Forest FOIA staff.

Standardize process for publicly posting FOIA requests on the web.

Follow FOIA guidelines for release of information for all requests. Shortcutting normal protocols lead to confusion and misunderstandings of what has been released and what hasn't; this includes ensuring all documents have been properly redacted and cleared through the proper officials.

Local- Angeles National Forest (ANF)

The issue of media and public scrutiny has been discussed with LA County Fire Department. As a result of the Station Fire, both organizations have agreed to work together in developing joint information processes to address the coordination of incident information, questions and positions regarding response to fires in proximity to each other's jurisdiction.

Dispatching/Emergency Communication Center Protocol

Standardization of dispatch and communications is important during all fires. During the Station fire, there were questions raised about how dispatchers communicated and what resources were ordered. Established best management practices by geographic area could reduce lack of standardization and questions.

National

Explore standardization of dispatch center radio recordings nationally. This should include how frequencies are recorded, how long they should be archived and which channels are to be recorded.

Standardize operating procedures and after hour protocols for when dispatch or coordination center closes.

Standardize how Geographic Area Coordination Center (GACC) tentative airtanker assignment documents need to be prepared, shared, and retained.

Standardize how or if 'holds' should be placed on orders. This common practice can lead to misunderstandings regarding if the order was even placed or acted upon. (see ANF LL below)

Develop protocols to document interagency decisions at the GACC level when incidents occur outside of Multi-Agency Coordinating (MAC) groups' mode.

Identify common language in radio protocols. This would include eliminating the use of local identifiers while on incident with identified positions- e.g. DIV1 was IC at different times but on radio and in records was called “DIV1” or “Chief 1” or “Chief”. This makes it difficult to keep track of who is who during incident.

Date/time stamps for WildCAD, dispatch clocks, and radio frequency recording need to be synced.

Continue to field test ground resource tracking capabilities and archiving data similar to Flight Following.

Explore modernization of current frequency recording equipment and procedures (digital commo...voice over IP, auto transcription, and location of transmission).

Explore need to record radio frequencies that are used by Incident Management Teams (IMTs) during large fire management.

Set standards for use of “off-line” communications, i.e.; crew net frequencies, cell phones, texting, etc. while on an incident.

Develop a national or regional standard that addresses how and what should be debriefed when dispatches transition from one shift to another. (avoids duplication of orders, missed orders and increases SA)

Regional

Share Angeles Lessons Learned with all Emergency Communications Centers in Region.

Institute a Standard Operating Procedure (SOP) that all ECCs and GACCs submit all orders when requesting resources.

Local- Angeles National Forest (ANF)

The Angeles National Forest will continue to use the “Closest Forces” concept to request additional resources as described in the California Mobilization Guide.

The Angeles National Forest currently uses and will continue to utilize mutual aid agreements to obtain available resources such as aircraft, handcrews, equipment and key overhead resources from local fire agencies.

The Angeles Emergency Communications Center will relay and document all delays of resources to incident commanders so they may amend or alter plans of attack. (Implemented 2/1/2010)

The Angeles National Forest will not make any “informal” requests for resources. All requests will be entered into the Resource Order and Status System” (ROSS) and placed either to cooperators with mutual aid agreements that may be able to provide the resource or to the Geographic Area Coordination Center (GACC).

This will provide a documentation record of what requests are declined or filled and by whom. (Implemented 2/1/2010)

The Angeles National Forest will document when and why resources are released from an incident, such as by the request of a providing agency, they are excess resources, etc. This will be documented by the Incident Commanders as well as the Dispatch Center. (Implemented 2/1/2010)

The Angeles National Forest will continue to record all radio traffic that is transmitted to the Emergency Communications Center on Forest Net, Forest Repeat and Admin Net. The Angeles is in the process of upgrading its Dictaphone server to be able to record additional frequencies which will include Aircraft Flight Following and Law Enforcement frequencies.

The Angeles National Forest has been reminded that the ECC emergency phone lines are for emergency business. Use of these phone lines for other than emergency business is not authorized. Phone conversations must remain professional and related to business only.

Transitional Briefings- Transfer of Command

Confusion regarding what resources had been ordered and/or released on the Station Fire seemed to be commonly questioned. Much of this was the need to improve briefings during transitions or transfer of command. As a result the following actions have been recommended.

Local- Angeles National Forest (ANF)

Incident Commanders (IC) will ensure that an accounting of all resources on the incident, released from the incident, and ordered resources is relayed to the incoming IC regardless of complexity. This information will also be validated through the Emergency Operations Center. This will confirm that a seamless transition has occurred and all resources are accounted for.

All Incident Commanders will follow the guidelines that are spelled out in the 2010 Interagency Standards for Fire and Fire Aviation Operations Guide.

Copies of all the Incident Commander's documentation will be given to the incoming IC. The outgoing IC will also retain a copy of the documentation that was given to the incoming IC.

Incident Commander Type III Refresher

On the Station Fire, questions regarding decisions and actions during initial and extended attack were raised. All firefighters are qualified for the positions they are asked to perform. Lessons learned are routinely incorporated in Agency refresher trainings.

Regional

The Agency review of the initial attack events reinforces the value of Type III Incident Commander Time/Pressure Simulations for Qualification Certification.

Local- Angeles National Forest (ANF)

Annually, the Forest will continue to use Time Pressure Simulations for all Type III Incident Commanders. These simulations were completed by all ANF Type III Incident Commanders during the month of April 2010.

The Forest will continue to train with Chief Officers from our cooperating agencies on the Unified Command Process and Procedures.

Interagency Coordination

As stated in the cooperative agreements section, fire response is always an interagency environment, so continued relationship building and knowledge sharing will help ensure there is no breakdown between agencies. Unfortunately during the Station Fire, many of the questions posed by external parties deflated relationships which are critical for future response. As a result additional effort will need to be made to make sure these relationships are repaired.

Regional

Continue to work with individual national forests, to strengthen relationships and communication with cooperating agencies; which includes extensive pre-season communication and planning with stakeholders and communities.

Local- Angeles National Forest (ANF)

Continue to work with all agencies, elected officials, communities and stakeholders to strengthen relationships and communication.

The Forest will work with cooperators in an effort to develop a Joint Information System (JIS) with area cooperators to ensure there is consistent and timely internal and external communications before and during a fire.

In the future, the Forest will evaluate the need for a daily joint Agency Administrator meeting to make sure leader's intent and the intended fire strategy is being met.