

**STATEMENT OF  
JAMES HUBBARD, DEPUTY CHIEF  
FOREST SERVICE  
UNITED STATES DEPARTMENT OF AGRICULTURE  
BEFORE THE  
COMMITTEE ON TRANSPORTATION AND INFRASTRUCTURE  
AVIATION SUBCOMMITTEE  
UNITED STATES HOUSE OF REPRESENTATIVES  
OCTOBER 7, 2015  
CONCERNING  
Ensuring Aviation Safety in the Era of Unmanned Aircraft Systems**

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to present the views of the Forest Service regarding the safety of Unmanned Aircraft Systems. Increasingly severe fire seasons are one of the greatest challenges facing the Nation's forests and 2015 has been no exception. The Forest Service and the Department of Interior (DOI), in full coordination with our state and local fire response partners, are responsible for responding to unplanned wildland fire incidents which threaten lives, property and resources. The agency mobilizes ground crews, fire engines, helicopters, airtankers and other assets in our suppression efforts. At the same time we are investigating the potential of using Unmanned Aircraft Systems (UAS), we have also experienced unwanted incursions from recreational drones in our suppression efforts.

**WILDLAND FIRE SUPPRESSION**

The United States has developed a complex and sophisticated wildland fire response framework that is composed of local, state, tribal and federal entities. Federal and state land and fire managers, Tribes, non-governmental organizations, and other stakeholders work as partners to safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire. Each entity has specific responsibilities for responding to wildfires occurring within their jurisdiction (initial response). Federal, state and local entities also coordinate and share resources and responsibilities as fires become larger and exceed the local response capacity. Fortunately, local response capacity is generally all that is needed for controlling or extinguishing most wildfires, though escalating risks including more people moving into (and next to) wildland areas may impact response effectiveness in the future.

During this fire season, we spent 24 days at National Preparedness Level 5 -- the highest level -- meaning all available ground and air assets are committed to priority work. Severe drought across the west has increased fire severity in several states. Washington State, among others, recorded a record season of severe wildfires. Drought-ridden California also experienced tremendous fire activity. The Forest Service and DOI, in coordination with our state and local fire response partners, mobilized over 27,000 firefighters along with numerous airtankers, helicopters, fire engines and other assets through our integrated, interagency suppression efforts.

Every state, Puerto Rico and Pacific Island, along with the military and international support, has provided people and equipment this season to help manage over 50,000 wildfires.

This season, over 9 million acres burned across the United States and destroyed over 2,500 single residences. The greatest losses, however, involved the fatalities of 13 wildland firefighters who made the ultimate sacrifice to protect the lives of others. Our thoughts and prayers will forever be with their family and friends.

### **AIRSPACE ABOVE WILDLAND FIRES**

Aviation operations are one of the highest risk suppression activities we perform. Large airtankers and helicopters are often mobilized during initial response and extended attack suppression efforts. Often, we request and receive a temporary flight restriction and a Notice to Airmen to maximize safe airspace over wildfires. The airspace above large fires is very complex. Firefighting agencies have established a communication protocol known as the Fire Traffic Area (FTA) to reduce risk in the airspace over a wildfire. The FTA establishes a protocol for communication and operations by firefighting aircraft. In general, fire aircraft must make radio contact with the command and control “Air Attack” when they are 12 nautical miles from the fire. If contact is not made, the fire aircraft will remain outside the area orbiting a minimum of seven miles away. Once cleared into the FTA, there is a structure based on altitude for the various missions. Air Attack remains at higher elevations above the tactical aircraft to retain the best visual perspective. Airtankers waiting their turn stay higher in altitude than those maneuvering for a retardant drop. Helicopters operate at the lower altitudes as their mission often involve transport of firefighters, cargo or water. The complexity of the airspace above a wildfire can rapidly change as fire activity increases, resources arrive on scene and smoke reduces visibility. Safety depends on understanding what other aircraft are in the airspace and where those aircraft are operating.

### **USE OF UNMANNED AIRCRAFT SYSTEMS**

UAS are among the technologies that hold significant potential to aid in fire detection and increase firefighter safety efforts. We aim to be a leader in embracing the new technology and enhancing our capacity to accomplish our mission to “sustain the health, diversity, and productivity of the Nation’s forests and grasslands to meet the needs of present and future generations.” The Forest Service established a UAS Executive Steering Committee to coordinate efforts with our state and federal partners. The Executive Steering Committee is charged with developing policy regarding the operation and use of UAS, including natural resource research along with recreational use on National Forest System (NFS) lands. Through Executive Steering Committee guidance, policy will be evaluated and updated with UAS technology in mind to ensure safe and efficient integration of UAS in government mission and public safety for forest visitors.

As a part of our efforts to explore new technologies to enhance firefighter safety and effectiveness, we partnered with DOI’s Office of Aviation Services to develop a 2015 Unmanned Aircraft Technology Demonstration Strategy. The Strategy outlines a five-phase process enabling us to test UAS capabilities to support fire suppression efforts by completing scenario-based missions. The Forest Service and DOI will develop summary of the activities during the

2015 field season, along with lessons learned, and will then make recommendations on further integration of UAS on a national level.

Although the focus of today's hearing is UAS and wildfire, the Forest Service is aware of the potential of UAS to augment the agency's capacity to gather information to support several resource management programs. Examples include mapping, monitoring the condition of natural resources, assessing the effectiveness of natural resource management projects, engineering inspections, and public use inventories.

We have identified five main ways the wildland community can benefit from UAS in fire management including:

1. ***Increasing awareness of ground resources regarding real time fire characteristics, such as location, behavior and spread.*** A small UAS above the tree canopy can help ground assets learn more about fire activity in their vicinity. In some situations, heat signatures or infrared sensors could help in smoky or other low visibility situations.
2. ***Enhancing safety through scouting fire line and identifying escape routes and safety zones.*** Significant potential exists to enhance firefighter safety by aerially assessing the terrain, condition of fuels, fire behavior, and potential escape routes without putting a human in dangerous situations.
3. ***Tracking and monitoring ground resources in real time.*** UAS technology can help provide accurate locations of personnel and equipment and direct them to strategic locations or advise them out of dangerous situations.
4. ***Enhancing communication links.*** Use of UAS can help link radio communications when terrain hinders line of sight transmissions or over a larger area for longer term incidents.
5. ***Supporting aerial supervision and mapping in low visibility situations.*** UAS tools can observe ground crews and providing mapping capabilities in smoky or other low visibility situations.

We continue to investigate the future possibilities for potentially deploying UAS for direct attack and supply support.

## **DRONE INCURSIONS**

In 2014, we experienced four incidents during the fire season where a non-participating UAS was flown over or near a wildfire, neither of which affected firefighting aircraft. This season, there have been 21 documented instances of UAS incursions near and over wildfires with ten being over NFS lands. Twelve of the incidents required firefighting aircraft to stop operations and shut down, relocate to another area or be grounded at base. In two of the events, firefighting pilots reported taking aggressive maneuvering action to avoid a collision. Approximately five hours of operational time was lost while ensuring the risk of mid-air collisions had been mitigated. These incursions by untrained operators inhibited the ability to deliver retardant and water to slow the fire's advance; prevented transportation of firefighters to vital locations for fire suppression and containment efforts; and stopped cargo delivery.

While it may be hard to quantify how shutting down air operations affects a wildfire's growth, we do know a rapid response including aviation assets, is successful in suppressing fires while

they are small and controllable. In a well-publicized UAS wildfire incursion in Southern California, five non-participating UAS were flown during critical fire suppression activities on the North Fire. At the time the first non-participating UAS was spotted, the fire was only 4-5 acres, but was spreading rapidly. The two airtankers over the fire were directed by a smaller fixed-wing aircraft known as the lead plane. Two helicopters were dropping water in an effort to slow the fire's growth. Once a UAS was observed in the airspace over the fire, all six firefighting aircraft broke off suppression activity and relocated away from the fire. The command and control aircraft, known as air attack, then proceeded to assess the airspace. Multiple UAS were identified over the fire. After an approximate 20-25 minute delay, the firefighting aircraft re-engaged with suppression activities. By then, the fire had crossed over Interstate 15, with life and property at risk. The North Fire ultimately consumed 4,250 acres, burned or destroyed 74 vehicles, and destroyed 23 structures before it was stopped. Fortunately, there were no injuries reported.

### **COORDINATION WITH OTHER FEDERAL, STATE AND LOCAL AGENCIES**

The Forest Service is coordinating with other federal, state and local agencies on several efforts including utilizing UAS in the National Airspace System, public education campaigns and UAS monitoring technology.

#### *Utilizing UAS in the National Airspace System*

The Federal Aviation Administration (FAA) and DOI have a Memorandum of Agreement (MOA) to allow DOI to fly UAS in the National Airspace System under a notification system for over a year. The Forest Service is currently working toward an MOA with FAA as well. The MOAs streamline airspace approval and reduce processing time to obtain a Certificate of Authorization. The Forest Service is grateful that the FAA has been active in helping to find solutions to the UAS wildfire incursions and in facilitating UAS integration into Forest Service operations.

#### *Public education campaign*

In 2014, shortly after the first UAS was seen near a wildfire, the Forest Service, in partnership with other federal, state, and local agencies issued a national news release urging members of the public not to fly UAS near wildfires. Shortly thereafter, the Forest Service developed a poster for use in public education and outreach with the slogan "If you fly, we can't". The campaign has evolved to include a series of tools to help promote aviation safety including several public service announcements and short videos, news releases, and Facebook and Twitter posts.

As UAS incursions began to increase, a concerted public education effort began through news releases, social media posts, local news conferences, preliminary discussions with the Ad Council, direct outreach to the UAS industry and hobbyist communities through the FAA "Know before you fly campaign," the Association for Unmanned Vehicle Systems International, and the Academy of Model Aeronautics. We continue to coordinate with the FAA, and DOI to identify and coordinate public education efforts and determine success can be accomplished.

#### *UAS Monitoring Technology*

The United States Department of Agriculture (USDA) Office of Homeland Security and Emergency Coordination (OHSEC) facilitated UAS technology coordination between the Forest

Service and the Department of Homeland Security (DHS). DHS is adding wildfires to their modeling process to help identify technology that might be of benefit to fire managers in addressing UAS incursions. The Forest Service is providing DHS with information about fire operations, fire environment and non-participating UAS airspace issues and will provide opportunities to assess technologies in live fire environments as the project progresses.

## **CONCLUSION**

The use of UAS holds significant potential to increase firefighter safety, and to assist in suppression efforts. At the same time, we remain very concerned about the dangers to firefighters and the public associated with non-participating UAS incursions in airspace above a wildland fire. We look forward to working with the subcommittee to identify specific protections that would allow wildland firefighters to take action on individuals who operate UAS over emergency situations.