

Forest Products Modernization: Innovation Underway

Drone-use facilitates quick response after deadly tornado in Region 8

In April 2019, the Davy Crockett National Forest suffered three deadly tornados with winds up to 160 mph. With more than 3,000 acres of forest severely damaged, it was imperative to establish a quick recovery strategy for safety and efficiency. Having access to drone technology helped in many ways.

An unmanned aerial system (UAS), commonly referred to as a drone, was utilized to search for any trapped forest visitors, evaluate the damage to the forest resources, and safely map areas for salvage opportunities. Expedited salvage responses after the tornados were possible under the authority of the 2013 National Forests in Texas Wind Event Environmental Assessment (EA). Use of UAS and the EA saved the Davy Crockett National Forest months of work and created the opportunity for new collaborative stewardship project proposals for post-tornado recovery. Other specific benefits include:

- Timely offering of salvage timber sales allowed the local economy to recapture gains from the tornado-damaged forest. Downed timber in the humid Coastal Plain of the Southern United States usually loses commercial value after about 3-6 months due to decay and deterioration. Decreasing the sale preparation time by 30 days increased sale bids by \$350,000 and increased volume sold by 14,000 board feet.
- Response time and cost were significantly reduced by using UAS. An estimated 10 days were saved ensuring there were no trapped people in the salvage area, translating to \$19,873 saved in base time, overtime, and equipment. An estimated 30 days were saved by using high-definition video from the UAS for salvage sale layout translating to \$17,759 savings in layout costs and reduced safety risks to employees from working in blown-down timber.
- With 2,000 acres of timber available for salvage sale, a new stewardship project proposal expanded to include site preparation, reforestation, soil stabilization, Red-Cockaded Woodpecker habitat improvements, and controlled burning. These efforts also fostered collaboration with other Federal agencies, such as the U.S. Fish and Wildlife Service and Tribal partners.



Davy Crockett National Forest employees survey tornado damage. USDA Forest Service photo.

Ingredients for Success

Availability of UAS, avenues for immediate collaboration, and fast-paced authorities for extreme weather events allowed for quick recovery and continued partnerships after a devastating event. The three main ingredients for success were:

- Access to new technology
- Expedited EAs for extreme weather events
- Stewardship projects for collaboration

Lessons Learned

The value added by UAS is exponential: saving time in many areas (i.e., human safety, salvage) rolls over into saved costs and reduced risk in a post-tornado environment. Paired with extreme weather authorities (i.e., Texas wind event EA), access to UAS shows benefits in areas of National Forest management beyond fire and aviation.

Next Steps

The National Forests and Grasslands of Texas continue to look for opportunities to utilize UAS through our partners to monitor and collect information on the ongoing tornado salvage restoration operations.

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