

WildFire PreCogs

*Empowering Wildfire Prevention:
Advanced Digital Solutions for Accurate and Efficient
Forest Fuel Load Estimation*

Problem

Every year, uncontrollable wildfires devastate millions of acres, threatening lives, homes, and ecosystems. According to the National Interagency Fire Center (NIFC), in 2023, there were 56580 wildfires burning 2.7 million acres nationally. Wildfires cost the US economy between 394 and 898 billion dollars each year, amounting to 2-4% of the nominal GDP. This cost is so massive that it is equivalent to the entire GDP of Switzerland.

The challenge of estimating forest fuel loads is pivotal in wildfire prevention but fraught with inefficiencies. Traditional photoloading methods, while effective, are cumbersome requiring extensive fieldwork and manual data analysis. This process is not only time-consuming but also prone to human error, limiting the speed and accuracy of critical wildfire prevention efforts.

Solution

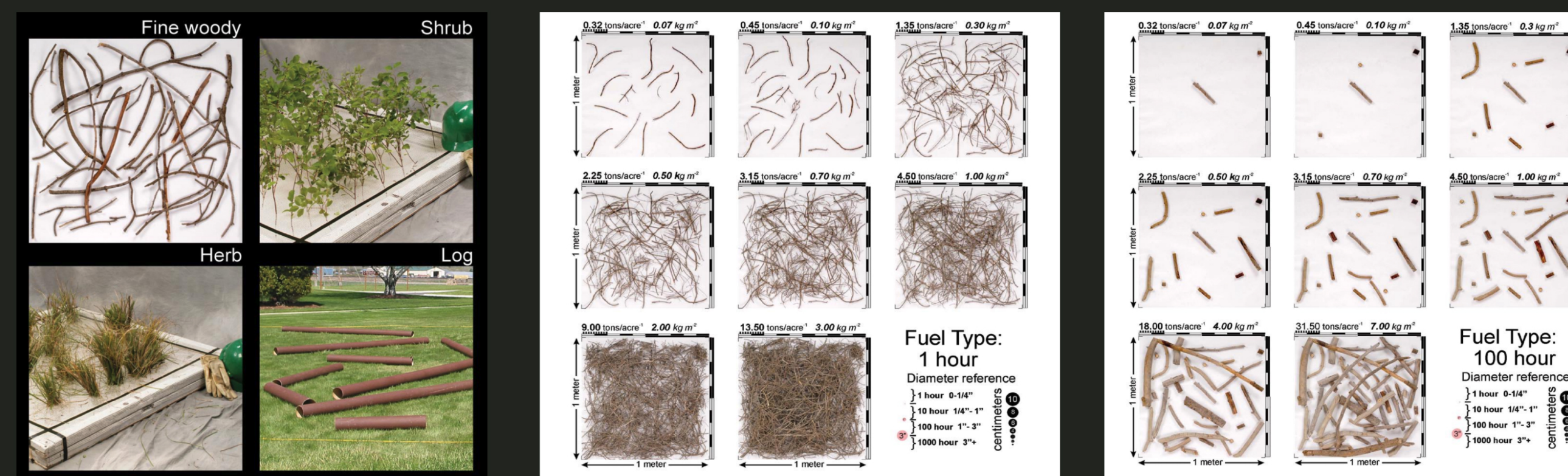
Our solution introduces a transformative approach to the photoloading method through its innovative features:

- **Image Quality and Capture:** Ensures consistent, high-quality images are taken, with guidelines for optimal angle and framing, crucial for accurate human analysis. This also acts as a foundation for the future implementation of AI based features.
- **Comparison Mode:** Reduces decision fatigue by allowing practitioners to compare captured images against a database of reference images, guided by AI, for accurate fuel type identification and estimation.

Approach

Leveraging a human-centric design approach, our team engaged directly with forest practitioners and experts in the field to identify a critical problem within the domain of forest management. This initial phase focused on understanding user needs and aligning our project with these insights, leading to the development of targeted features aimed at digitizing and streamlining the photoloading process.

Through iterative prototyping and testing in actual forest environments, we refined our app to incorporate advanced image recognition, enhancing both usability and accuracy. This process was guided by continuous user feedback and a strategic focus on feature prioritization based on high-impact activities, ensuring our solution effectively meets the demands of forest practitioners.



(Source: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.)

The Photoload Sampling Technique (ANA Photoloading) is a method developed for estimating fine dead fuel loadings in forests, grasslands, and shrublands using photographs for comparison. This technique was designed to improve the efficiency and accuracy of fuel load estimations, which are crucial for managing wildland fire risks and ecosystem health.

How does Photoloading works?

1. Development of Photographic Series
2. Training
3. Field Sampling
4. Data Collection and Analysis

