

APP's Fire Monitoring and Early Detection System

Fires are a major threat to the forests and plantation areas under the management of Asia Pulp & Paper's (APP) pulpwood suppliers.

Historically, our data suggest that the vast majority of fires that impact our pulpwood suppliers' concessions originate from:

- Subsistence 'slash and burn' agriculture
- Fires to clear land for local agriculture - oil palm/rubber tree cultivation
- Shifting cultivation
- Underground peat fires
- Arson linked to financial compensation for land claims
- Incidental fires – throwing of lit cigarettes and abandoned unextinguished cooking fires

Prevention, Detection and Suppression

APP and its pulpwood suppliers have invested heavily in equipment, technology and human resources in order to detect and extinguish fires in forest concessions. Because the areas are so vast (approximately 2.6 million hectares on the islands of Sumatra and Kalimantan), a variety of detection techniques are used to locate fires. These include remote sensing; fire lookouts; aerial patrols with helicopters; ground patrols and cooperation with local communities. In 2013, APP and its pulpwood suppliers spent more than \$4 million USD (excluding capital expenditures) on fire detection and response, infrastructure maintenance and personnel training. APP and its pulpwood suppliers also support fire response efforts outside of the forest concessions.

Prevention

APP has enforced a no-burning policy for land preparation since 1996 and a 'zero deforestation' policy since February 2013. APP's pulpwood suppliers socialise these policies internally and with all outside parties hired to clear land, replant trees, and/or maintain the replanted trees to ensure these policies are adhered to. All parties then sign a contract, which forbids them from using fire to clear land, and ensures they adhere to best practices to avoid accidental fires.

The majority of fires are caused by individuals who want to clear land cheaply and quickly for subsistence farming, agriculture or other purposes. Raising awareness of the issues associated with fires will help reduce this practice and will also increase the likelihood of quick response when fires do occur. As such, APP and its pulpwood suppliers work with the Community Fire Awareness (MPA) program. The MPA has been set up in more than 120 villages surrounding the concession areas. MPAs are tasked with conducting fire patrols and assisting with fire suppression.

Detection - Remote Sensing

Remote sensing 'Hot Spot' data allows potential fires to be quickly detected and investigated. This data is provided daily by the Asean Specialised Meteorological Centre using an NOAA satellite, and the Centre for Remote Imaging Sensing and Processing using TERRA and AQUA satellites.

Detection - Patrols

Throughout the fire season, regular ground patrols are carried out, mostly along the boundaries of the forest concessions where most fires start but also along each concession's internal network of roads. The aims of the patrols are fourfold: 1) to verify recent satellite 'Hot Spot' data; 2) detection of illegal activities; 3) the detection and timely intervention in case of fire; and 4) providing public information and awareness to local communities. Furthermore, during high and extreme fire conditions, ground patrols are augmented with helicopter air patrols.

Suppression

Firefighting efforts require different techniques, equipment, and training depending on the type of forest, size of the fire and terrain. Most fires, when detected early, are small and can be controlled and extinguished with small crews and land based equipment. Most fires occur at the interface between communities and forest concessions and suppression activities usually employ ground resources. However, when fires are large or important areas are threatened, APP employs helicopters equipped with 'Bambi Buckets' that enable accurate and rapid water drops to support the fire-fighting efforts on the ground.

Fire Danger Rating (FDR)

Fire danger ratings are done on a daily basis, using meteorological data collected from weather monitoring equipment installed in APP supplier concessions. The Fire Danger Rating (FDR) is a daily, location-specific assessment of potential fire behaviour, the difficulty of suppressing a fire, and the potential impact should a wildfire occur. Fire danger ratings vary from country to country with some having more divisions (e.g. low to Catastrophic); however, all rating systems rely on the same meteorological variables to determine a Fire Danger Index. FDR signs are placed on roads entering forest concessions and strategically located within concessions.



Fire Danger Index (FDI)

The FDR is determined by the Fire Danger Index (FDI). The index combines a record of dryness, based on rainfall/drought and evaporation, with meteorological variables for wind velocity, temperature and humidity and concludes with an aggregated numerical value - FDI. An FDI of 1 (Low) means a fire will not burn, or will burn so slowly that it will be easily controlled, whereas an FDI 100 (Extreme) means that a fire will burn so fast and so hot that it can become uncontrollable.

What the Danger Class Ratings mean:

Low	Fires will spread slowly or be self-extinguishing and there will be minimal involvement of deeper fuel layers or larger fuels. Grassland fires can usually be controlled by hand.
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Moderate	Forest fuels are drying and there is an increased risk of surface fires starting – forest operational activities should be carried out with caution. Control of cooking fires in field camps is essential. Smoking in the field is prohibited.
High	Forest fuels are very dry and the fire risk is serious. New fires may start easily, burn vigorously, and challenge fire suppression efforts. Forest operational activities should be carried out with extreme caution. Open burning and industrial activities may be restricted. Cooking fires and smoking in the field are prohibited.
Extreme	Extremely dry forest fuels and the fire risk is very serious. New fires will start easily, spread rapidly, and challenge fire suppression efforts. General forest activities may be restricted, including open burning, industrial activities and campfires. Cooking fires and smoking in the field may be prohibited in all areas.