The FIREBird System

Early Wildfire Detection Along Power Lines

Presented to the Senate Committee on Insurance

March 17, 2022

LINDSEY FireSense

California's Major Wildfires

Fire	Cause	Year	CALFIRE Category	Acres	Structures	Deaths
Camp	Powerline	2018	20 Most Destructive 20 Deadliest	153,336	18,804	85
Witch	Powerline	2007	20 Most Destructive	197,990	1,650	2
Woolsey	Powerline	2018	20 Most Destructive	96,949	1,643	3
Nuns	Powerline	2017	20 Most Destructive	54,382	1,355	3
Thomas	Powerline	2017	20 Most Destructive 20 Largest	281,893	1,063	2
Butte	Powerline	2015	20 Most Destructive	70,868	921	2
Redwood Valley	Powerline	2017	20 Deadliest	36,523	544	9
Atlas	Powerline	2017	20 Deadliest	51,624	781	6
Dixie	Powerline	2021	20 Largest	963,195	1,329	1
Butte	Powerline	2015	20 Most Destructive	70,868	921	2
TOTALS				1,977,628	29,011	115

Table sources: https://www.fire.ca.gov/stats-events/, data accessed 9/19/2021;
https://www.cnn.com/2020/10/30/us/southern-california-edison-responsible-woolsey-fire/index.html

On average, power line fires are 10x larger than other wildfires[1]

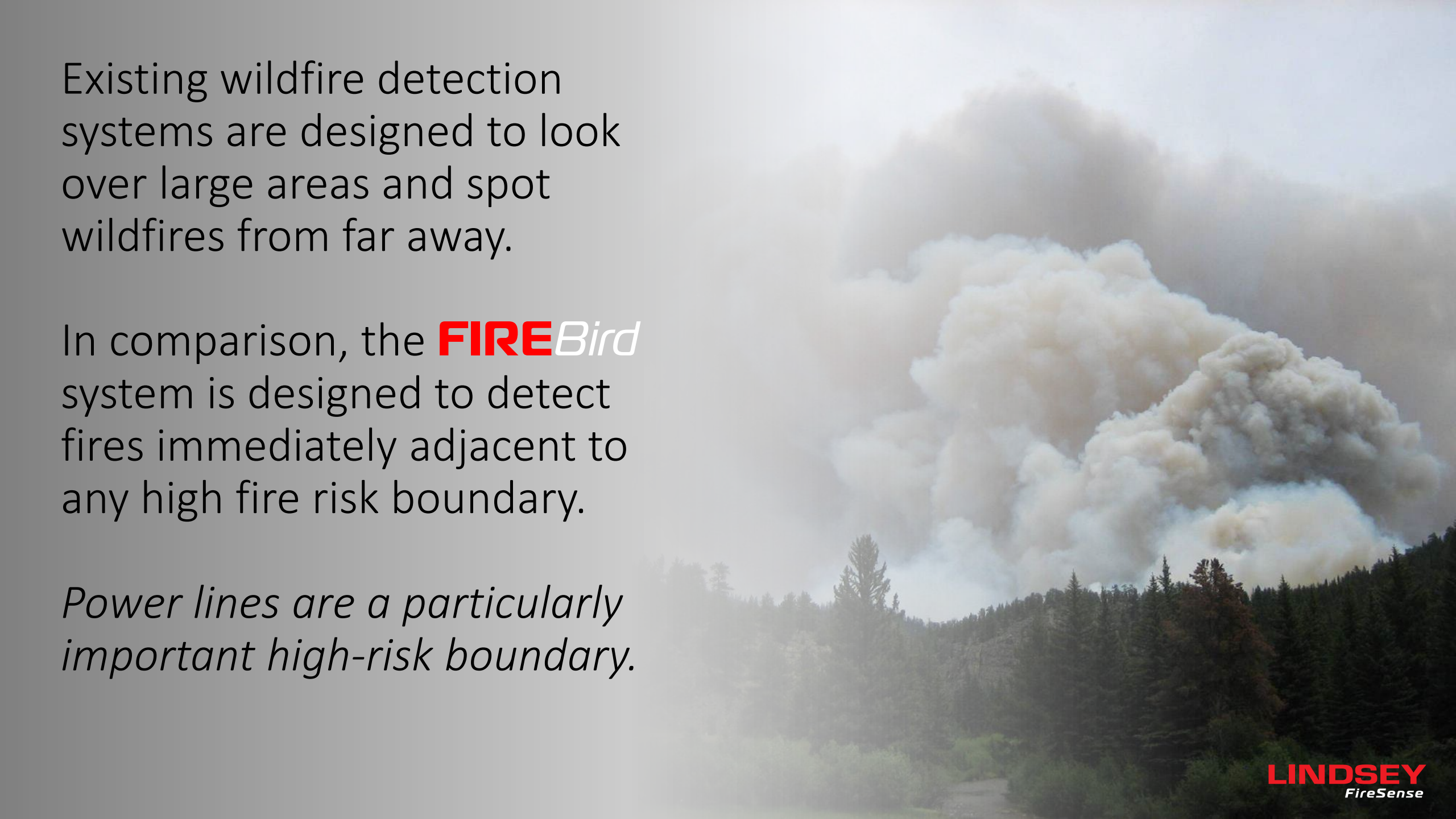
[1]Mitchell, Joseph W; "Power Lines and Catastrophic Wildland Fire in Southern California";
Fire & Materials 2009, San Francisco CA, Jan 26, 2009

LINDSEY FireSense

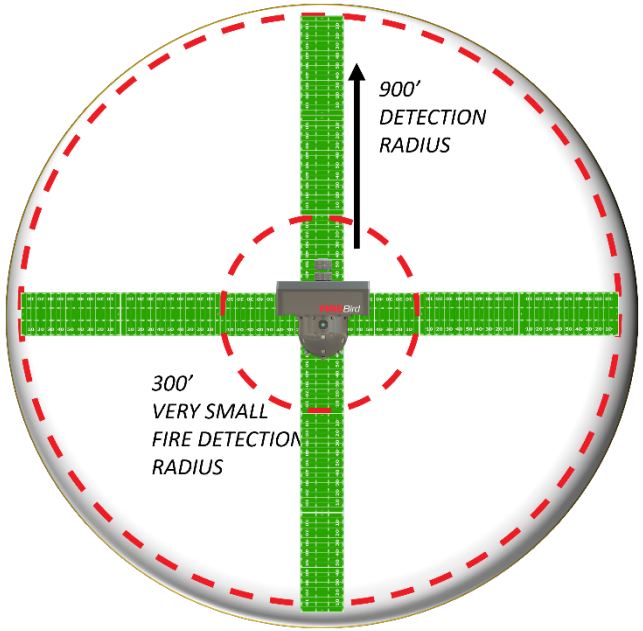
Existing wildfire detection systems are designed to look over large areas and spot wildfires from far away.

In comparison, the FIREBird system is designed to detect fires immediately adjacent to any high fire risk boundary.

Power lines are a particularly important high-risk boundary.



Key Functions of the FIREBird System



WILDFIRE DETECTION

- Detects small wildfires within 300’
- Provides detection over 60-acres

WILDFIRE NOTIFICATION

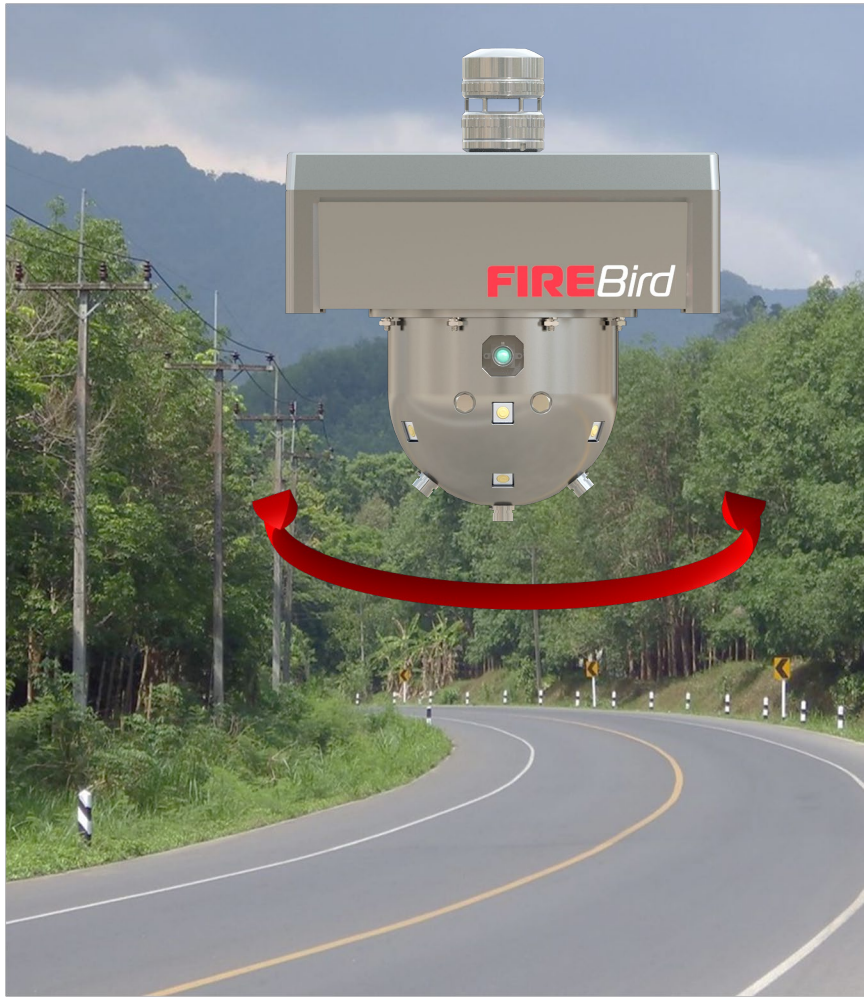
- Reports within 2 minutes of detection

LINDSEY FireSense

FIREBird System Overview

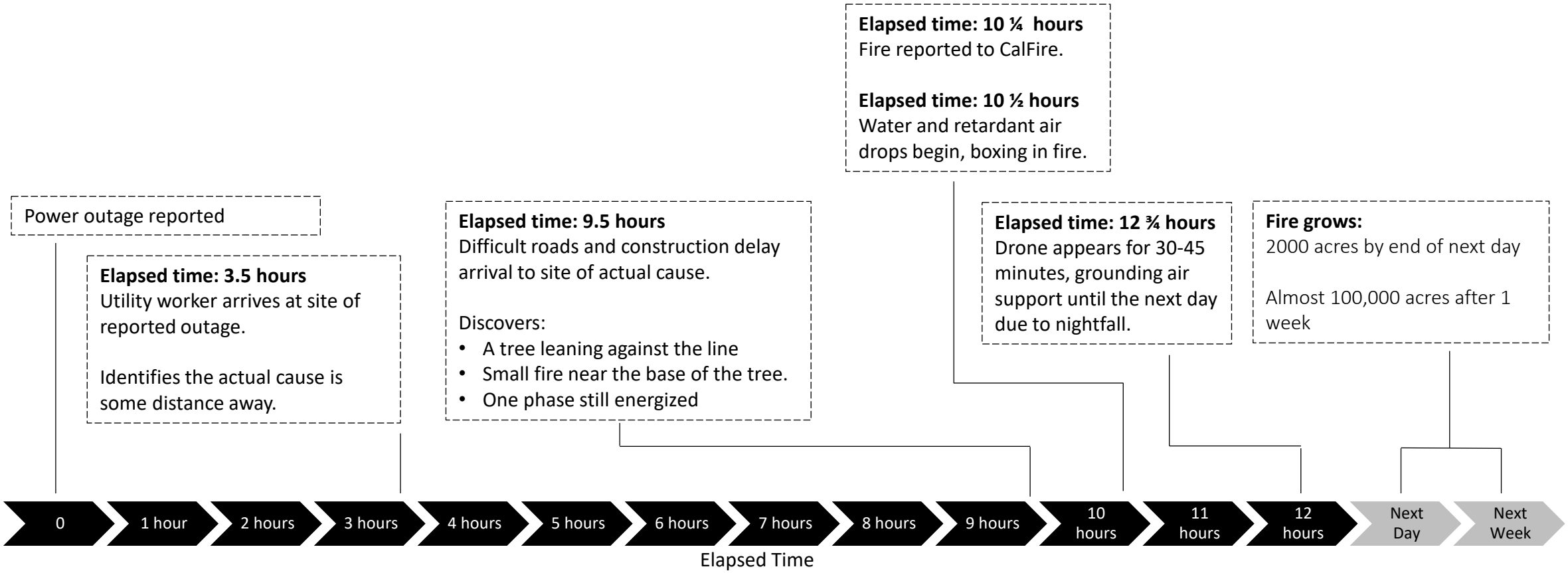
Designed specifically for deployment along utility rights-of-way

- Continuously monitors the surrounding area via 6 wildfire specific thermal detectors and 8 optical camera cameras; not a slow, scanning, system.
- Operates autonomously; no personnel are required for monitoring.
- Provides automatic notification by text and email.
- Quickly detects, photographs, and reports wildfires along power lines or other rights-of-way.
- Solar-powered, with built-in communications.
- Documents conditions along power line rights-of-way to help speed Public Safety Power Shutoff (PSPS) restoration.



LINDSEY
FireSense

Example Wildfire



☐ Documented event

LINDSEY FireSense

Example Wildfire

With early felled tree detection

FIREBird Timeline
(Hypothetical [1])

FIREBird units can provide images of the power line, which may have detected the tree.

These images could have been collected and examined at the time of the outage report, or after arrival at the reported outage site.

Once detected, the power line could have been de-energized, possibly preventing the fire.

Likely End of Event

Power outage reported

Elapsed time: 3.5 hours
Utility worker arrives at site of reported outage.

Identifies the actual cause is some distance away.

Elapsed time: 9.5 hours
Difficult roads and construction delay arrival to site of actual cause.

Discovers:
- A tree leaning against the line
- Small fire near the base of the tree.
- One phase still energized

Elapsed time: 12 ¾ hours
Drone appears for 30-45 minutes, grounding air support until the next day due to nightfall.

Fire grows:
2000 acres by end of next day

Almost 100,000 acres after 1 week

Elapsed Time

☐ Documented event
■ Hypothetical FIREBird action

Likely end of event

 www.lindsey-firesense.com

[1] Hypothetical scenario assumes none of the other events from the actual timeline were changed other than the time. The scenario is theoretical and is not meant to be a representation or guarantee of actual performance of the system, which depends on proper installation, operation and multiple other factors. Note the FIREBird system was not available for deployment before the example fire occurred. The FIREBird system is an aid to wildfire detection and should not be relied upon as the sole means of detection.

LINDSEY FireSense

Example Wildfire
With earlier fire notification

FIREBird Timeline
(Hypothetical [1])

Assume the FIREBird system provided only one hour's advance notice to CALFIRE.

Assuming all other events stay in sequence, the drone's departure now leaves one hour of daylight for air support.

Fire Likely Controlled

Per CalFire: "We believe they *[emergency responders]* could have effectively controlled the fire to one to two acres with the additional time that they were robbed of" due to the drone not allowing resumption of air support before nightfall.

Power outage reported

Elapsed time: 3.5 hours
Utility worker arrives at site of reported outage.

Identifies the actual cause is some distance away.

Elapsed time: 10 ¼ hours
Fire reported to CalFire.

Elapsed time: 10 ½ hours
Water and retardant air drops begin, boxing in fire.

Elapsed time: 12 ¾ hours
Drone appears for 30-45 minutes, grounding air support until the next day due to nightfall.

Fire grows:
2000 acres by end of next day

Almost 100,000 acres after 1 week

Elapsed Time

Fire likely controlled

☐ Documented event
■ Hypothetical FIREBird action

 www.lindsey-firesense.com

[1] Hypothetical scenario assumes none of the other events from the actual timeline were changed other than the time. The scenario is theoretical and is not meant to be a representation or guarantee of actual performance of the system, which depends on proper installation, operation and multiple other factors. Note the FIREBird system was not available for deployment before the example fire occurred. The FIREBird system is an aid to wildfire detection and should not be relied upon as the sole means of detection.

LINDSEY FireSense

Faster Wildfire Detection with FIREBird Can:

- Reduce the likelihood of small wildfires going unnoticed
- Reduce the fire fighting resources needed to control an event
- Reduce property damage
- Reduce the loss of life
- Increase public safety
- Increase time for evacuation, if required

FIREBird is California

Designed and built in Azusa, CA

Field tested in cooperation with the Rancho Cucamonga Fire District
and
San Bernardino County Fire Department

For more information contact:

Jack McCall
jmccall@lindsey-firesense.com
1-626-771-1960

www.lindsey-firesense.com