

**Potential Fire Blow-up Modeling
for the
Tiger-Rock Complex**



Prepared by the Fire Behavior Assessment Team

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Background

Acceleration of fire in canyons or chimneys pose grave safety threats to firefighters and communities. Fires can accelerate rapidly, often with little warning or wind. The Southwest Area Incident Management Team (IMT) asked us to model potential arrival times for two canyons in the Tiger-Rock complex that have the potential to funnel fire rapidly into the Crown King area.

We applied the Viegas canyon blow-up model to two canyons in the Tiger-Rock Complex to provide information to the IMT. The first canyon was from Hell-hole to the west toward Crown King (Figure 1). The second canyon was from Fort Misery along Humbug Creek to the southern edge of Crown King properties. We modeled two different initial winds for each run. One was assuming low winds of 1.3 miles/hour and a second with high winds of 20 miles per hour.

Findings

Hell-hole to Crown King (east to west)

The distance from Hell-hole to the eastern edge of Crown King is a distance of approximately 1.65 miles. If the fire spotted or reached Hell-hole and accelerated due to convective processes, with winds of 1.6 miles/hour the fire could reach the eastern edge of Crown King in 2.5 to 3 hours (figure 2). With winds of 20 miles/hours, the fire could reach the eastern edge of Crown King in 15 minutes (figure 3). With low winds the fire could accelerate to rates of spread of 0.5 miles/hour or more. With high winds, the fire could accelerate to rates of spread of 4 to more than 8 miles/hour.

Figure 1. Map of fire area with two drainages that were modeled. Time of modeled arrival is shown next to each arrow along the drainages.

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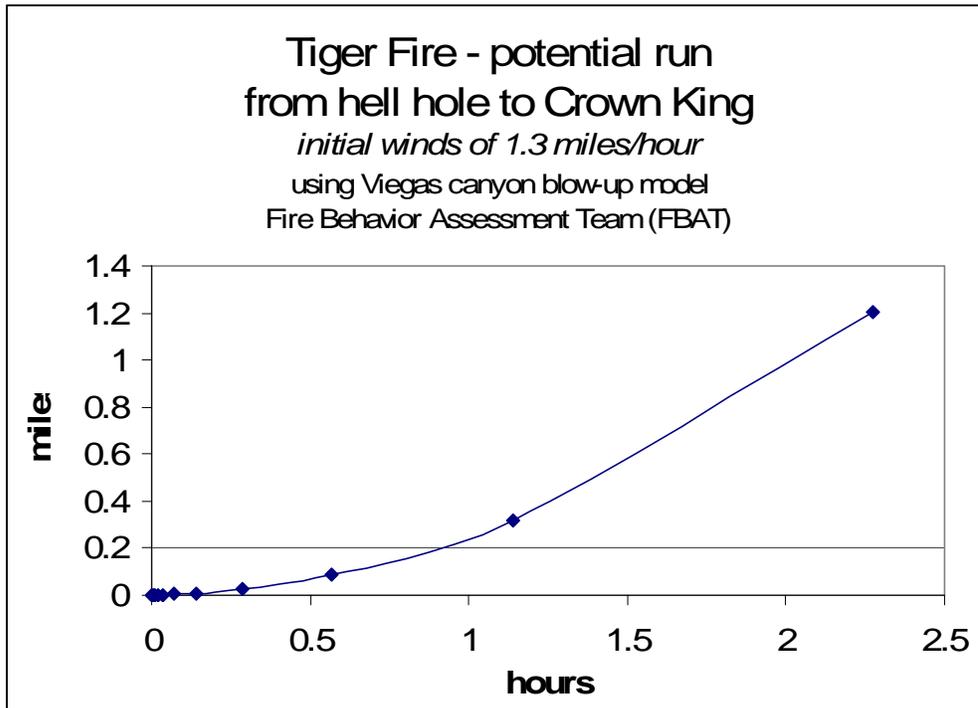


Figure 2. Potential arrival times from Hell-hole to Crown King, initial winds of 1.6 miles/hour.

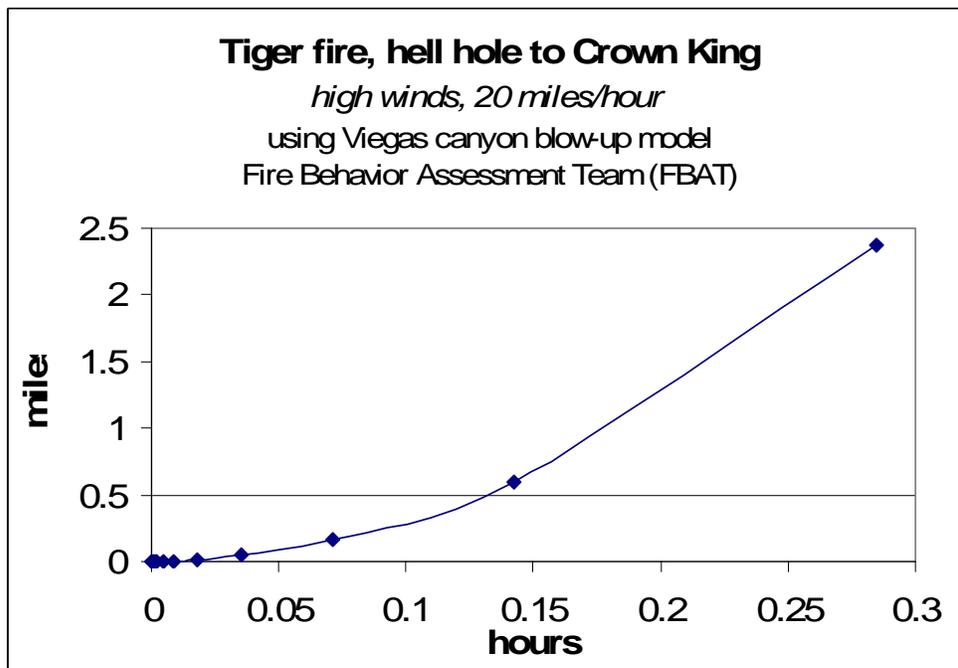


Figure 3. Potential arrival times from Hell-hole to Crown King, initial winds of 20 miles/hour.

Fort Misery to Crown King (south to north)

The distance from Fort Misery to the southern edge of Crown King Properties along the Humbug Creek drainage is approximately 1.5 miles. If the fire reached Fort Misery and accelerated due to convective processes north in the Humbug Creek drainage, the fire could reach the southern edge of Crown King in 2 and ½ hours. With winds of 20 miles/hour, the fire could reach the southern edge of Crown King properties in 15 minutes.

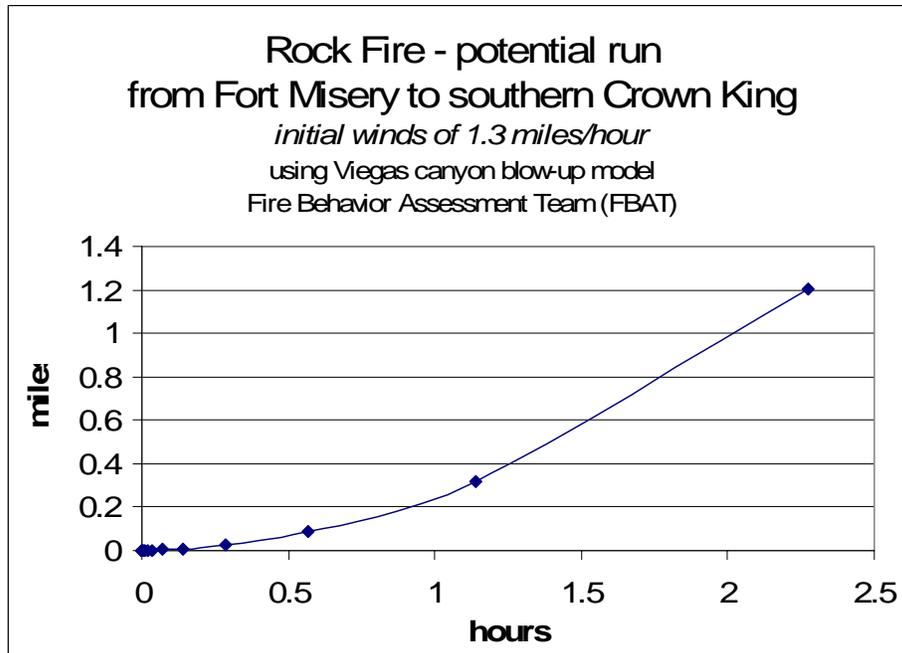


Figure 4. Potential arrival times from Fort Misery to the southern edge of Crown King Properties, initial winds of 1.3 miles/hour.

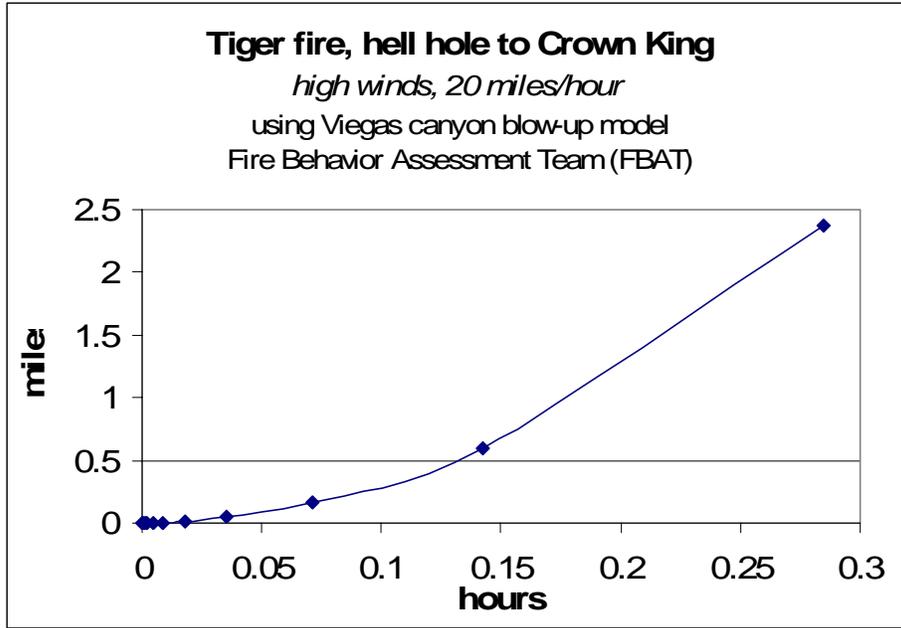


Figure 5. Potential arrival times from Fort Misery to the southern edge of Crown King Properties, initial winds of 20 miles/hour.