Furthermore, lightning has been associated with wildfires in the area in recent decades (1986-2013), but past frequencies or probabilities remain relatively unknown (Hostetler et al. 2018, Lorimer et al. 2009, Carroll et al. 2018, Stuart and Stephens 2006, Lorimer et al. 2009).

~~Levels of tree survival indicate low to moderate fire severity, strongly controlled by topography. Earlier fires occurred but were not dateable~~

To provide an estimate of fire activity across all sites throughout the reserve, we applied a Bayesian Gaussian mixture model to the probability distributions of calibrated ages (Bchron R package, cite). [EXPAND]

**A screenshot of a cell phone

Description automatically generated**

**Fig. 4. Cumulative fire activity simulated by Bayesian Gaussian mixture model of calibrated ages.** Black bolded line represents cumulative estimate of fire activity through age based on the proxy of probability distributions of calibrated ages. Grey curves represent individual probability distributions of calibrated ages.

## 3.3 Estimated Fire Activity across history

Estimates of fire activity based on calibrated radiocarbon age show a sharp increase in fire activity around 1,500 years BP, and pulses of activity around 2,250 years BP and between 4,000-5500 years BP. These results are highly dependent on the specific fragments both found and dated but indicate a higher cumulative distribution of probability in the last 1,000 years (Fig 4). [quantification of uncertainty?]

Twenty-six duplicates were run during elemental analysis, showing machine accuracy [precision? Not sure what you want to say here?] to be within 0.15%. Inter-sample variability was 0.015% within each tray of 92 samples, and 0.03% between each tray (4 total). The 10% charcoal standard (from western red cedar) had a 34% loss of PyC during digestion. [maybe convert?]