Climate change is likely facilitating larger wildfires in the Western U.S., although its effects are location-dependent. It influences wildfire size and severity either directly, e.g. increasing the dryness of fuel loads (thus fire susceptibility), or indirectly, e.g. through increasing the frequency of bark beetle outbreaks, which can affect forest hydrology, surface fuel loads, and the moisture conditions. However, our knowledge on how bark beetle outbreaks could alter wildfire regimes (i.e. its occurrence, extent, severity, and the system type, i.e. fuel-limited, flammability-limited, or mixed) remains very limited. Recent studies demonstrated that bark beetle outbreaks do affect fuel status and wildfire behavior. However, the response varies to multiple factors, such as time since outbreaks, tree mortality rate, and fire regimes. To characterize the responses of fuels and fire behavior to bark beetles across a range of scenarios (e.g., forest management and climate) and site-specific environmental conditions, we use the integrated ecohydrologic-fire model (i.e. RHESSys-WMFire) coupling with a beetle effects model. We use no beetle attack as the control scenario, and use multiple gradients of outbreaks frequencies and tree mortality rates as response scenarios. We then estimate wildfire size in responding to variation in outbreaks frequency and mortality rate, which will enable us to determine whether there are thresholds that would significantly shift fire regimes. We hypothesize that the effect of beetle attacks on wildfire size is largely determined by the rate of beetle-caused tree mortality, and this response will also be influenced by the extent to which the fire regime is fuel- versus flammability-limited. Beetle attacks can also increase fire severity and frequency by increasing the fuel loads. With climate change and more severe and frequent bark beetle attacks, there is a high probability of larger and more severe forest fires. By mapping wildfire regimes and its dynamics over time, we can identify hotspots (i.e. most vulnerable locations) of beetle attacks, gauge the extent to which climate change versus beetle attack and their combinations affect the size and severity of wildfires, and therefore assistant decision-making procedure on wildfire management.