

Rainfall but not selective logging affect changes in abundance of tropical forest butterfly in Sabah, Borneo

Abstract

We investigated the effects of rainfall on the distribution and abundance of the satyrine butterfly *Ragadia makuta* in selectively logged and unlogged forest on Borneo. In 1997-98, there was a severe El Niño-Southern Oscillation (ENSO) drought, and annual surveys over a 4-y period showed that abundance of *R. makuta* was greatly reduced during the drought, but that populations quickly recovered after it. Monthly surveys over a 12-mo period of typical rainfall showed that high rainfall in the month preceding surveys significantly reduced butterfly abundance. Butterfly abundance and distribution did not differ between selectively logged and unlogged areas in either monthly or annual surveys and there was no difference between selectively logged and unlogged areas in the pattern of post-drought recovery. These results indicate that the abundance of *R. makuta* was significantly reduced both after high rainfall and during severe drought, but that these impacts were short-lived and were not affected by habitat disturbance. ENSO droughts on Borneo naturally often lead to widespread forest fires and thus impacts of ENSO events for butterflies are more likely to be due to indirect effects of habitat loss, rather than direct effects of drought on butterfly population dynamics.