To ascertain what controls modern biodiversity and to predict future changes given contemporary trends in global climate, habitat disturbance and other human impacts we need to understand what happened in the past. A major goal of palaeontology is to generate benchmarks for guiding maintenance or restoration of ecosystems. Nowhere is this more important than in Australia, where biotas have been severely impacted by human activities over the past 200 years. This followed two earlier phases of extinctions that were likely driven by human activities and influenced by climate change. This seminar will review what we know about past biotic responses to environmental changes and what we can learn from them in light of the modern biodiversity crisis.