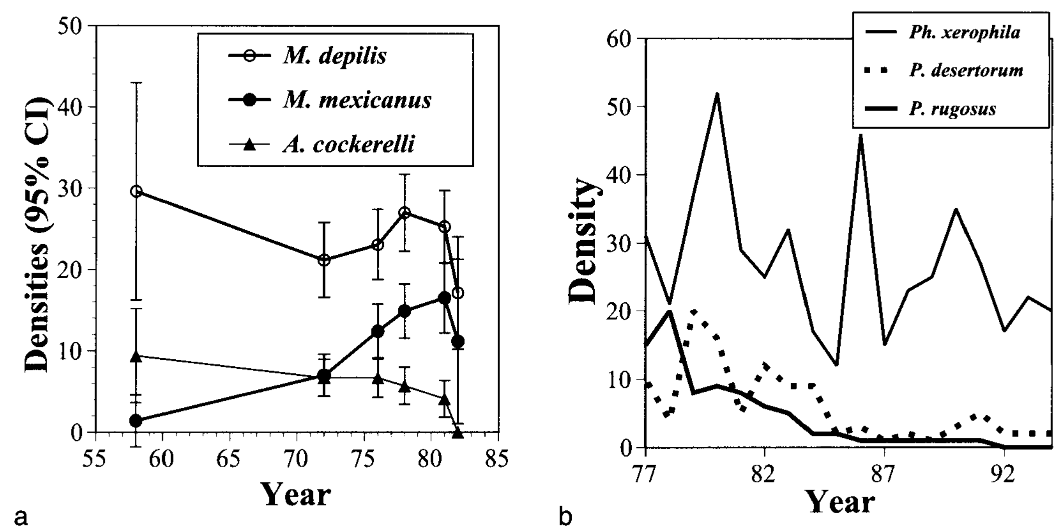

Figure 7.3. Changes in two Chihuahuan desert ant assemblages as reported by (a) Chew and De Vita (1980) and (b) Brown et al. (1997). In both systems, over roughly the same time period, populations of seed-harvesting ants decreased.

requires the simultaneous monitoring of multiple control sites. Over time, one accumulates data on the trajectories of both control and perturbed sites with the goal of determining when those trajectories have converged.

The trajectory taken by each disturbed ecosystem is by definition unique. However, all have a number of features that can be quantified by a monitoring program and measured against control sites. To discuss these features, we use the metaphor of a spring stretched and allowed to recoil. The resulting terminology has been elegantly set forth by Westman (1986), and we develop some of his terminology in the following sections (Fig. 7.4).

Inertia

Inertia reflects the ability of an ecosystem to retain its properties in the face of a stressor. Some ecosystem properties are highly sensitive to certain stressors. For example, in response to chemical pollution, a lake's species richness is likely to change more rapidly than its produc-

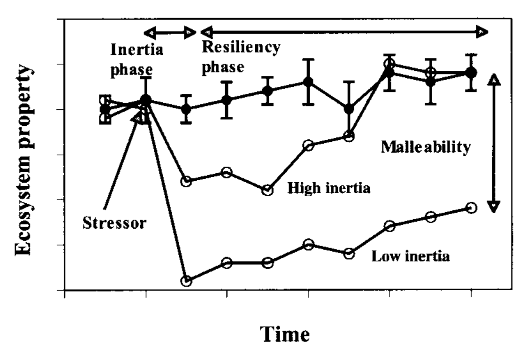

Figure 7.4. Model illustrating the response of an ecosystem to perturbation using the terminology of Westman (1986). A number of control assemblages (with error bars) are compared with two disturbed assemblages, before and after the stressor. One assemblage (labeled High inertia) has high inertia and resilience—responding less to the stressor and quickly attaining properties of the control assemblages. The other (labeled Low inertia) has low inertia and resilience and fails to recover control conditions completely. It is considered more malleable and may have reached an alternate equilibrium point.