area, species diversity) and landscape variables (e.g., distance to edge, distance to water) were collected and compared between roost and random sites.

Why are There No Flightless Bats?
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To illustrate the high frequency with which flightless forms have appeared, Steadman has argued that flightlessness may have appeared as many as 2000 times in the fossil record of the South Pacific alone. Within the Order Chiroptera, however, no examples of flightlessness are noted, nor are there apparent instances of a tendency to be flightless in the fossil record. The evolution of bats has been spectacular, resulting in over 1000 known extant species distributed around the globe. All bats are distinguished from other mammals by powered flight, a form of aerial locomotion. In contrast, within the Class Aves, numerous examples exist of a return to flightlessness, considered a directional selection that is correlated with several factors. These factors might include distribution on islands without mammalian predators, or existence on islands without significant competition for resources. Additionally, the maintenance of flight muscles, which may represent up to 17% of body mass, might be negatively impacted by the reduced energetic demand that accompanies a diminution of the flight muscles. Flightless conditions have evolved in aquatic birds (including wing-propelled and foot-propelled swimmers) and terrestrial forms including the rails. Is this due to biogeographic factors, or simply due to mechanical constraints? Could the lack of flightlessness in bats be due to lower numbers of species of bats relative to birds? Coupling of the forelimbs (wings) and hindlimbs is presented as a main factor preventing the assumption of a flightless condition in bats, and examples of bats that are known to be agile on the terrestrial substrate are presented. Although birds have successfully "un-coupled" the wings and the hindlimbs within the development of a suitable airframe, bats have utilized the attachment of the plagiopatagium to the hindlimb or foot to facilitate flight. Although permitting skillful flight, this coupling of the wing to the hindlimb and associated skeletal rearrangements may be the major determinants of the relatively poor terrestrial locomotion of most bats.

Computer Vision for Tracking Bats in Infrared Thermal Video: A Tool for Understanding the Behavior of Bats in Flight
Diane E. Hirsh, Margrit Betke, and Thomas H. Kunz, Boston University, MA

We recorded the nightly activity of Brazilian free-tailed bats (*Tadarida brasiliensis*) with an infrared thermal camera and developed a method to follow the flight paths of individual bats appearing in the video. Our method builds upon previous work to automatically analyze infrared thermal images of emerging, foraging, and returning bats. It utilizes predictive search and geometrical resolution techniques. With this method, the paths of individual bats can be followed when they change direction and speed, and when bats appear in moderately dense groups. This tracking method promises to expand our ability to better understand the movements, interactions, and group dynamics of bats in flight, including flight patterns observed in different species or at different stages of development.