

Effect of Sampling Effort on Estimated Richness of Road-Killed Vertebrate Wildlife

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Road-killed mammals, birds, and reptiles were collected weekly along 117 km of federal highways in southern Brazil during 2002 and 2005. The objective was to assess the variation in the richness of species impacted by road-kills as estimated from different sampling efforts, to aid in the experimental design of future sampling campaigns. We discuss how different objectives (e.g., the maintenance of ecological processes and the reduction of road-kill rates of the most-affected species) require different sampling efforts with respect to the frequency and number of samples. The richness observed in weekly samples was compared with resamplings for different periods. The sampling sufficiency of each period was calculated by the Chao 1 species-richness estimator. In each period, the list of road-killed species was evaluated with regard to: 1) the maintenance of community structure in relation to the weekly samplings; 2) the presence of the ten species most subject to road mortality; and 3) threatened species. Weekly samples were sufficient only for the reptiles and mammals, considered separately. The richness estimated from the biweekly samples was equal to that found in the weekly samples, and gave satisfactory results for sampling the most abundant and the threatened species. The road-mortality rates and the dominance structure of the ten most-affected species remained constant, independently of the sampling interval. The experimental designs changed when reptiles, birds, and mammals were considered separately; birds required greater sampling effort. When species are killed at different rates in different seasons, it is necessary to take biweekly samples for a minimum of one year. For monitoring the total richness impacted by road-kills, weekly or more-frequent sampling for periods longer than two years is necessary.