Swift foxes (Vulpes velox) are one of the smallest and most den-dependent and nocturnal canids in North America (Egoscue 1979, Tannerfeldt et al. 2003). Though research concerning swift fox fecundity has been conducted, it is a difficult and arduous task because pups do not emerge from natal dens until they are weaned at 5–7 weeks of age (Egoscue 1979). Previous techniques for determining fecundity of swift foxes have included excavating the den and counting pre-emergent pups (Cutter 1958, Kilgore 1969) and visual counts of post-emergent pups (Covell 1992, Olson and Lindzey 2002, Schauster et al. 2002, Harrison 2003, Sovada et al. 2003).

Visual counts are the most commonly reported technique for counting post-emergent swift fox pups (Covell 1992, Olson and Lindzey 2002, Schauster et al. 2002, Harrison 2003, Sovada et al. 2003). In this technique ≥1 concealed observers with binoculars or spotting scopes watch a female’s den from a distance (usually >40 m) in the evening and morning hours during early summer; in an attempt to count the number of pups. Visual counts also have been effectively used with similar species such as the kit fox (Vulpes macrotis; Cypher et al. 2000, Koopman et al. 2000) and arctic fox (V. lagopus; Strand et al. 2000).

Prior research concerning determination of pre-emergent pups has been highly invasive, as dens were excavated or disturbed via observer presence. As more advanced technology becomes available to researchers, less insidious means of obtaining data can be implemented. Recently, video probe systems have been used to document various cavity-nesting and burrowing animals such as red-cockaded woodpeckers (Picoides borealis; Richardson et al. 1999) and western burrowing owls (Athene cunicularia hypugia; Gervais et al. 2000). Night-vision devices have been used to enumerate migrating owls (Tyto alba, Aegolius acadicus, Asio otus, Asio flammeus, and Otus asio; Russell et al. 1991) and to observe the emergence of big brown bats (Eptesicus fuscus) from maternal colonies (Kirkwood and Cartwright 1993). Automated videography has been used to observe nests and index population abundance (York 1991, Kristan et al. 1996, Booms and Fuller 2003). Yet, none of this technology has been evaluated for use in swift fox research.

Measuring fecundity is an essential component in examining demographics of any wildlife species. Information on litter sizes is necessary to understand the dynamics of swift fox populations. Yet, no pups were observed from preliminary efforts at visual counts of swift fox pups during our study. Thus, the objective of this study was to compare visual counts, night vision, a den-probe system, and an automated video monitoring system for counting swift fox pups.