Due to being endemic, and because their fossorial habits apparently increase the presence and abundance of numerous other species, the Bolson tortoises, *Gopherus flavomarginatus* (Legler, 1959), are considered both a flagship and keystone species for the Mapimi Biosphere Reserve (Aguirre *et al*., 1997). Burrows of this species can measure over five meters in length and have a depth of 1.6 meters (Auffenberg, 1969, Morafka, 1982, Aguirre *et al*. 1984). These burrows provide a thermal gradient that ranges between 42°C at the entrance to 28°C at 30 cm inside (Morafka, 1982). Due to these characteristics, such burrows are an attractive place for other vertebrate and invertebrate species looking for refuge. Thirty-six vertebrates have been observed occasionally, temporarily or seasonally occupying the burrows of *G. flavomarginatus*, (Valenzuela-Ceballos unpublished data). The importance of burrows of other *Gopherus* tortoises for facilitating the occurrence and tropic interactions of multiple species is well documented; for example, for the *G. flavomarginatus* sister taxa, *Gopher* tortoises (*G. polyphemus*), 60 vertebrate species and 302 invertebrate species were observed making use of their burrows (Jackson and Milstrey, 1989, Ashton and Ashton, 2008). However, similar associations and interactions at *G. flavomarginatus* burrows have not previously been published. To document species use and interactions at Bolson tortoise burrows we installed 9 cameras (Bushnell Trophy cam®, 8 mega pixel) directed towards nine active adult bolson tortoise burrow entrances within the Mapimi Biosphere Reserve in Mexico (due that we were searching for vertebrate associated to the tortoise burrows, we did not take into account the sex of the bolson tortoise burrows inhabitants). Active burrows were selected based on external characteristics according to Auffenberg and Franz (1982) and Cox *et al*. (1987). Observations of predators included coyotes (*Canis latrans* Say, 1823), bobcats (*Lynx rufus* Schreber, 1777), foxes (*Urocyon cinereoargenteus* Schreber, 1775 and *Vulpes macrotis* Merriam, 1888), badgers (*Taxidea taxus* Schreber, 1777) and skunks (*Mephitis mephitis* Schreber, 1776). These species appeared regularly on photographs that showed them near the burrows, apparently looking for prey. Among the burrow entrance observations two predation events were recorded during 2014, the first was the predation of a black tail-hare (*Lepus californicus* Gray, 1837) by a coyote (*Canis latrans*) (Figure 1). The hare was taking refuge inside of the burrow when it was caught. The second predation event was upon a kangaroo rat (*Dipodomys sp.*)) by a burrowing owl (*Athene cunicularia* Molina, 1782) (Figure 2). The kangaroo rat was near the burrow’s entrance when the burrowing owl chased it.

Gopher tortoise burrows were found to be a key factor for the abundance and interactions of a broad range of species (Ashton and Ashton, 2008 and Catano and Stout, 2015). While Bolson tortoises and their burrows have not had the same level of detailed studies, their burrow’s cooler microclimate in a region where daytime summer temperatures regularly exceed species’ thermal tolerances (Morafka, 1982), plus the abundance of predator activity at the burrow entrances argue that Bolson tortoises and their burrows may play a similar, keystone species role in the Chihuahuan Desert. The regular visitation of predators at Bolson tortoise burrows suggests that these sites probably are suitable not just as a refuge for vertebrates, but also provide an important predator / prey interaction.
Figure 1. The picture shows a hare (*Lepus californicus*) being predated by a coyote (*Canis latrans*) on the entrance of a Bolson tortoise burrow.

Figure 2. Burrowing owl (*Athene cunicularia*) with a kangaroo rat (*Dipodomys sp.*) prey at the entrance of a Bolson tortoise burrow.
References


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