

Outside MA

Currently, there is an estimated 14,876 ha (36,758 ac) of flat-tailed horned lizard habitat outside the MA. Of this habitat, 8,376 ha (20,697 ac) are owned by either the Arizona State Land Department, private interests, or the Cocopah Tribe. No immediate plans for development of this land are known; however, AGFD considers the land to be vulnerable to development. The other 44 percent is owned primarily by the BOR, which is a signatory agency of the Conservation Agreement, so the land is less likely to be developed (Shroufe *in litt.* 2002). However, approximately 6,475 ha (16,000 ac) of habitat managed by the BOR are within the "5-Mile Zone" of the international border with Mexico, which has been identified by the City of San Luis in their General Management Plan for potential development (Robert Kritzstein, BLM, *in litt.* 2002). These lands do not comprise a significant percentage of the flat-tailed horned lizard habitat in this geographic area, and the potential development of this land will not fragment or degrade the contiguous habitat remaining in the Yuma Desert MA. Therefore, these activities do not constitute a significant threat to the species or its habitat such that the species warrants listing under the Act.

Invasion of non-native plants into the desert systems has been noted as a threat (Hodges 1997, Shroufe *in litt.* 2002). Non-native species that have become prevalent in certain areas of the Sonoran Desert include *Schismus barbatus* (Mediterranean grass) and *Brassica* spp. (mustard). In Arizona, high densities of Mediterranean grass currently appear limited to disturbed areas in proximity to Yuma (Shroufe *in litt.* 2002). These species can become dense and effectively stabilize substrates that were once loose sand, likely reducing flat-tailed horned lizard habitat quality. Increased fuel load for fire is also a concern with these non-native plant species, and the effects of a new fire regime on the desert ecosystems and ultimately the flat-tailed horned lizard is unknown. Because of the limited extent to which non-native plants have established themselves in flat-tailed horned lizard habitat in this geographic area, this threat does not warrant listing the species under the Act.

Mexico

At this time, much less is known about the threats of habitat loss and modification in Mexico. Urban and agricultural farming are the most immediate threats to the species in

Mexico (CEDO 2001). Considerable habitat loss has occurred in the Mexicali Valley in Baja California Norte where urban and agricultural development extends from Mexicali to the Colorado River (Johnson and Spicer 1985, Foreman 1997). This development from Mexicali to the Colorado River together with the All American Canal, has isolated flat-tailed horned lizard habitat on the Andrade Mesa in Mexico from East Mesa in the U.S. and also from the Yuha Desert in Mexico. Habitat fragmentation also has resulted from a variety of human activities, such as the creation of roads and highways. Other potential threats to the habitat of the flat-tailed horned lizard include invasion of non-native plants such as Russian thistle (*Salsola kali*), mustards (*Brassica* spp.), and salt cedar; cattle grazing in the Gran Desierto/Pinacate region; and the increasing use of OHVs in sandy plains, dunes, and back-roads (CEDO 2001). However, the effects of these threats have not been adequately documented (CEDO 2001).

In conclusion, after considering all the current available information, we have determined that the threats identified under Factor A are not significant enough to conclude that the flat-tailed horned lizard is likely to become endangered throughout all or a significant portion of its range in the foreseeable future. However, the Coachella Valley has experienced a significant amount of habitat curtailment and there is the potential for significant habitat destruction in the immediate future, because of the predominant private ownership of habitat and the rate of development in the Coachella Valley. The available data do not suggest that habitat modification by OHV use threatens the flat-tailed horned lizard on the west side of the Salton Sea/Imperial Valley and east side of the Imperial Valley. We conclude that the Arizona population is not likely to become endangered within the foreseeable future, because the low percentage of lands in private ownership makes for a low degree of threat from development. Further, OHV use has not been shown to be a threat to populations here and this geographic area experiences a relatively low level of OHV activity.

B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

In the past, scientists have reported on collection of flat-tailed horned lizards. The most noted example was the collection of 381 flat-tailed horned lizards along an 11.3 km (7 mi) stretch of SR78 between the Coachella and East

Highline Canals between 1961 to 1964 (Bolster and Nicol 1989). Norris (1949) noted that near Palm Springs the capture of flat-tailed horned lizards was not a common occurrence, and that collecting was good if it yielded two flat-tailed horned lizards in one day. Collection of flat-tailed horned lizards has not been reported since 1964. Because of the difficulty in locating these lizards, due to their cryptic coloration and tendency to remain motionless when approached, no threat of overutilization of this species is known or expected in the future on either public or private lands. Collection for the pet trade has not been identified as a threat to the species.

C. Disease or Predation

While disease is not known to be a threat to flat-tailed horned lizard persistence, flat-tailed horned lizards are depredated by a variety of predators. Flat-tailed horned lizard predators include loggerhead shrikes, round-tailed ground squirrels, grasshopper mice, snakes, canids, American kestrels, common ravens, and burrowing owls (Muth and Fisher 1992, Duncan *et al.* 1994, Young and Young 2000). Round-tailed ground squirrels were documented as the main predator of flat-tailed horned lizards during research conducted in California (N = 19; Muth and Fisher 1992) and Arizona (N = 26; Young and Young 2000), with loggerhead shrikes being the second most common predator. The 1993 proposed rule noted that Bolster and Nicol (1989) suggested that predation of flat-tailed horned lizards near agricultural areas and urban areas may be elevated because of the presence of house cats in urban areas and the abundance of loggerhead shrikes and other predatory birds in croplands. We were unable to find any documentation suggesting that house cats increased mortality rates for flat-tailed horned lizards adjacent to urban areas. Increased predation rates on flat-tailed horned lizards by loggerhead shrikes and American kestrels have been reported in localized areas where human-provided perches (*e.g.*, power lines or palm trees) have been used by shrikes and kestrels as points from which to hunt (Young and Young 2000, Barrows pers. comm. 2002). Despite this, available evidence does not suggest that predation has caused a significant threat to the persistence of the species in any part of its range, public or private.