



Research Brief for Resource Managers

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Improving Forage Quality for Desert Tortoises

Abella, S.R., L.P. Chiquoine, E.C. Engel, K.E. Kleinick, F.S. Edwards. 2015. Enhancing quality of desert tortoise habitat: augmenting native forage and cover plants. *Journal of Fish and Management* 6: 278-289. [doi: 10.3996/022015-JFWM-013](https://doi.org/10.3996/022015-JFWM-013)

The desert tortoise (*Gopherus agassizii*) was listed as federally threatened in 1990 in the Mojave and western Sonoran Desert in part because of changing habitat conditions. Increasing abundance of non-native annual grasses, such as red brome (*Bromus rubens*) and *Schismus* spp., was among the major changes in recent decades within desert tortoise habitat.

Conserving the desert tortoise is linked with fuels and fire management in several ways. In addition to providing fuel for wildfires, invasion by non-native annual grasses has changed forage quality available to tortoises. Non-native grasses are non-preferred forage plants for tortoises, and some tortoises have even died when fed experimental diets of senesced annual grasses.

Researchers with the University of Nevada Las Vegas partnered with the Bureau of Land Management (Southern Nevada District) to explore techniques for favorably changing forage available to tortoises. The main technique was promoting establishment of the preferred native annual forb desert plantain (*Plantago ovata*).

The results of the study showed that seeding pelletized seed covered in a protective coating quadrupled the density of desert plantain, compared to not seeding or seeding untreated seed, by the end of the first year (autumn 2013).

Management Implications

- Providing fencing and seeding pelletized seed augmented availability of the tortoise forage plant desert plantain for at least two years
- This technique created patches of hundreds of square meters (up to 1 acre) of augmented forage
- While successful, this technique was labor- and resource-intensive, and should be compared with other candidate techniques for shifting the annual plant community from exotic to native species.

Fencing tripled the density of desert plantain, compared to untreated sites, to 17 plants/m².

Seeding pelletized seed plus providing fencing produced 39 plants/m², more than six times the density of desert plantain in untreated areas.



Juvenile desert tortoise foraging at the study site in the southern Nevada Mojave Desert, where techniques were assessed for augmenting availability of native forage plants favored by tortoises. Photo by S.R. Abella, 2014.