

thing, would you do differently if you were to do the project again? What would you recommend to others implementing this project?

This was an easy project to do and involved a lot of collaborative fun putting it together. By using the grant process, the financial impact was minimal. Highlights of the process were visits to the county Extension gardens and the actual purchasing of plants. The committee consists of teachers, school staff, and students who actually compiled the list through research and visiting the Extension gardens. The golf course and horticulture staff were always available to answer questions. Garth Boline, superintendent of grounds, Chuck Grussing, horticulture, and Jayme Pecci, school counselor, purchased the plants.

Economic Costs and Benefits

What was the funding source for the project: A grant from SAVE (Students Against Violence Everywhere)

How much did it cost to implement this project? \$675

What are your anticipated or actual financial savings? Monies will be saved through reduced maintenance costs

Wild Side Toad in the Road!

By Craig Weyandt

One of our employees was edging a flower bed when a giant toad popped out. It took the worker several tries to contain it and bring it in alive for identification. I had seen these *Bufo* toads before, but not this far north. We took a couple of photos for our wildlife scrapbook and released him back into the wild. Here is what we found out about these critters.

Bufo marinus is also known as the Cane Toad, Giant Toad, or Marine toad. The species is not native to Florida, but was introduced here, the Caribbean Islands, and Australia to control French and Grayback beetles on sugar cane. (Tyler, M, et al, 1996)

The toads, however, can jump only about 30 centimeters, and were therefore not able to reach the beetles, which normally stay in the upper regions of the cane stalks. Also, when the time of year came that served as breeding season for the beetles and their larvae was profusely found crawling from the ground, *Bufo marinus* was nowhere to be found.

One of the reasons Cane toads are so successful when introduced to new areas is that they possess a remarkable ability to adapt to a wide range of habitats. One study conducted in 1990 by Australia's Commonwealth Scientific and Industrial Research Organization showed that these toads are very effective

competitors with other insect-eating animals, were highly toxic to many possible potential predators, and also could have a negative impact on other native frog species. (Zug, et al, 1979)

Bufo marinus is a tropical species that if



Imported in the 1930s to control sugar cane beetles, the Giant Toad is a threat to the native frog populations in South Florida. Photo by Craig Weyandt.

given a choice, prefers to inhabit forested areas with water, and therefore insects, nearby. The species is usually much more active at night, but can also be seen hopping along sidewalks and resting in or near canals or pools of water. During the daytime hours and even in cold or dry seasons the toad will remain inactive underground in small shallow excavations or hide under debris, fallen trees, stones, or any other covering found typically outdoors. (Zug, et al, 1979)

Bufo marinus exhibits two prominent, triangular paratoid glands that extend from the anterior side of the tympanum to the halfway point down the toad's back. It is from these glands that the toad expels a milky-white fluid when attacked or threatened, capable of irritating the mucous membranes of the attacker. This toxin is largely composed of cardioactive substances, and the toxins can lead to profuse salivation, vomiting, shallow breathing, twitching, and even collapse of the hind legs if ingested.

Although many species of snakes and birds seem unaffected by this poison, it may seriously sicken or even kill small mammals, and dogs and cats that have been exposed have been frequently reported as victims of its effect (Carmichael and Williams, 1991; Conant and Collins, 1991).

An interesting aspect of *Bufo marinus* reproduction is that males are able to reproduce without the presence of female toads because they possess a structure called a rudimentary ovary. (Behler et al, 1994).

Marine toads are voracious, omnivorous animals and will prey on a large variety of animals. They have been known to consume small vertebrates, mollusks, arthropods, plant matter, and even dog and cat food when found (Krakauer 1968). They have

been reported to scavenge garbage and vegetable matter that had been discarded such as fruit and vegetable peels and pits in Florida (Alexander 1964). Lab specimens have even been kept on strict diets of small mice!

An idea of the size of the toad population in a particular area can be correlated to the size of individual toads found within it. It is thought that when the toads first populate a new patch of land, there is a fresh and "untouched" abundant supply of food. The toads gorge themselves and eat every possible food source imaginable, growing up to their maximum lengths. Once they begin to multiply and increase in numbers, the food supply is not able to regenerate to the previous amount in existence at the time prior to the toads spreading, and because food then becomes more limited the resulting sizes of the toads found tend to be smaller than the previous ones.

Although there is still much work to be done in areas such as Australia where *Bufo marinus* continues to spread, there are reasons for optimism as far as the control of the problem. (Aguirre et al, 1999) In areas where the toads have been around for the longest times known to this day, their population numbers tend to decline after the initial breeding sprout and increase.

One of the reasons is that some native animals are learning to get around the toxins and have adapted to eating them. The Keelback snake can detoxify the toxins found in *Bufo*, and it has been shown that some species of ibis, water rats, and crows have developed ways to eat them by ingeniously "peeling" the skin and glands off, thereby avoiding the venomous secretions.

We are still a very long way to effectively controlling *Bufo marinus* population numbers and stopping their continual expansion, however. They are definitely a great example of what can happen to native species when an exotic species is introduced into the ecology of a new habitat.

References

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