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Investigating the Impact of Giant African Land Snails on South Florida

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Problem Statement:

What effect do Giant African Land Snails have on the ecosystems, economy, and human health in South Florida?

Background

The introduction and spread of invasive species around the world is a major threat to ecosystems and native species within those ecosystems. Historically, South Florida has become home to several nonnatives that have changed the local flora and fauna. Although some deliberately introduced species have proved beneficial, many can cause ecological and economic harm. Whether deliberately or accidentally introduced, nonnative populations are able to grow exponentially. This is due to the fact that there may be no natural predators, competitors, or parasites that would usually control their populations in their

native homes. As their populations increase, invasive species can crowd out populations of many native species, trigger ecological disruptions, cause human health problems, and lead to economic losses (Miller and Spoolman, 2012). Identifying invasive species, evaluating their impact, and attempting to limit their expansion is key to protecting ecosystems around the world.

The Giant African land snail, *Achatina fulica*, was first discovered in Florida in the 1960s and was thought to have been eradicated. In 2011, the Florida Department of Agriculture and Consumer Services (FDACS) positively identified a population of Giant African land snails in Miami-Dade County. The average lifespan of these snails is 9 years, during which females can release over 10,000 eggs. *A. fulica* is known to eat a wide range of plants, and will also consume stones, bones, or concrete in order to obtain the calcium



necessary for its shell. Giant African land snails are currently listed among the top 100 invasive species and are identified in the United States as a top priority for national quarantine due to their significant potential to damage natural ecosystems or agriculture, human health, and commerce (Cowie, et al, 2009).

Implications

Impact on the South Florida agriculture could be devastating. These herbivorous snails can decrease crop yield through consumption. Plants may also be damaged through the transmission of plant pathogens carried by the snails. Additional economic impacts will be felt due to the cost associated with the control of the snails and there could be opportunities lost with enforced changes in agricultural practice such as limiting crops to be grown in a region to those resistant to snail infestation (Raut & Barker 2002). The South Florida agri-

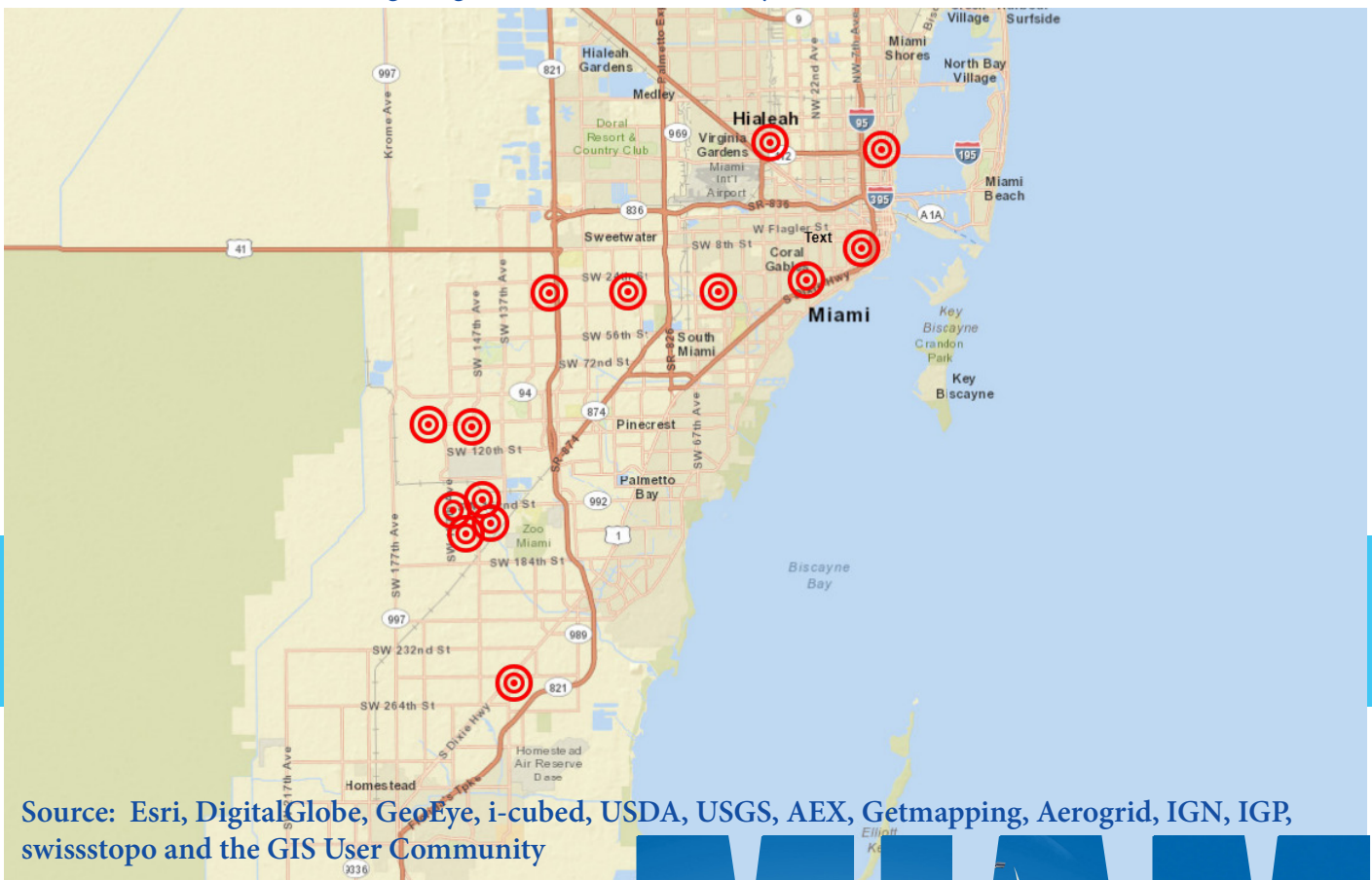
culture industry currently employs approximately 750,000 people who could potentially be affected. Prior to its eradication in the 60s, it was estimated that *A. fulica* would have caused an annual loss of 11 million dollars in 1969 if its population had not been controlled (USDA 1982).

There are human health concerns associated with the invasion of Giant African land snails, as well. As carriers of several pathogens, *A. fulica* could lead to the spread of disease among humans that are exposed to the organisms. *Angiostrongylus cantonesnsis*, commonly referred to as the rat lung worm, is known to cause eosinophilic meningitis. In addition the Giant African Snail can carry the gram-negative bacterium, *Aeromonas hydrophila*, causing a wide variety of symptoms, especially in persons with a weak immune system. Although there have not yet been any reported cases of infection in South Florida, some of the snails that have been captured have been determined to be carrying these parasites.

Conclusions

Current methods of eradication include the use of molluscicides containing metaldehyde. Unfortunately, most molluscicides can negatively impact the soil, plants and beneficial organisms leading to additional ecosystem threats.

Confirmed Giant Land Snail sightings in Miami Dade County.



Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swissstopo and the GIS User Community

