



Didelphis marsupialis Playa Viva, Mexico

Selfies That Count

Gerardo Ceballos and Paul R. Ehrlich

The selfie taken by a possum that is posted above was actually posted by us, but we are sure the possum intended it to be. Technologies gone berserk are one of the main things driving Earth's biodiversity into a mass extinction, but some of the new technologies can at least make small contributions to helping to preserve our only known living companions in the universe. Selfies are a great way to get a sense of closeness to animals. We've long been involved in studies of "countryside biogeography" led by the pioneer in that field, Gretchen Daily. Basically the discipline tries to find ways to make agricultural landscapes more hospitable to biodiversity, while simultaneously preserving or even enhancing the ecosystem service values flowing from biodiversity in those countrysides. One of the great tools made possible by technological advances are highly capable, small (5" L x 3" W x 4" H), relatively inexpensive "camera traps."

The idea of a "camera trap" can be misleading for the uninitiated. Camera traps are digital cameras combined with a trigger to fire when it detects a moving warm-blooded animal. They can be set up in virtually any land habitat and aimed so that they will photograph animals going down a game trail, visiting bait, or just wandering around. They can be set to shoot stills or video, operate only in day or night or both, and to use different settings depending on light conditions.

One recent experience with them came in coastal southern Mexico when we met in part to help the small eco-resort “Playa Viva” develop a field guide to the local flora and fauna. We also were planning a comprehensive study of habitat use of mammals of different sizes in a mixed agricultural landscape that we, with Gretchen Daily’s group, have been studying in southern Costa Rica. We will start with the camera traps and then supplement them with radio-collar methods to compare species composition, relative abundances, habitat use (e.g. open vs forest; close and far from a large forest patch) and behavior. In Mexico we wanted to field test simple, inexpensive Cuddeback camera traps, to see if they were suitable for the study.

We only had 4 traps to test, and were able to deploy them on 3 nights (12 “trap nights.”) We learned some valuable lessons immediately. One night’s effort was ruined by our mis-setting of one trap’s clock 12 hours off. Lesson 1 – always double check the trap setting. Our second lesson was that a camera set up to watch bait should not be programmed to fire each time it detects a movement. That could run down the batteries taking many pictures of the same animal moving around the bait and feeding. We had that problem at a compost heap where we got dozens of pictures of the same black vulture (see one of its selfies below). We also were able to discover some secrets of trap placement. The traps had a function that allowed us to test their area of sensitivity on ourselves, leading us to do some ridiculous crawling around and waving to be sure that small mammals would trigger photos as the cameras were positioned. The coastal test site at Playa Viva, about 30 miles east of Zihuatanejo was very complex. It consisted of a mix of dunes, dry shrubland, deciduous forest, estuary, mangroves, coconut plantation, permaculture gardens, and a small beachside resort complex.



Black vulture (*Coragyps atratus*), Playa Viva, Mexico

We set the traps near and far from water, and used one trap-night trying to see the influence of baits (we tried bananas, peanut butter, a chunk of chicken carcass, and a few shrimp). Five species of mammals provided us with selfies – the Virginia possum (tlacuache), the raccoon (mapache) of which we got the attached video, the coati mundi (tejon), white-tailed deer (venado cola blanca), and the human being (campesino). All of these are common animals in the new world, with one species, human beings, originally an African animal, being by far the most widespread and having reached plague proportions almost everywhere.

[Video of raccoon \(*Procyon lotor*\) from Playa Viva, Mexico captured by camera trap](#)

Both the white-tailed deer and raccoon were originally native to the western hemisphere, both have been introduced elsewhere and both have reached pest status in many areas. The deer is widely hunted but restrictions on hunting of human beings have resulted in vast overpopulation, especially in the United States. In many places of Mexico, however, as in the Playa Viva region the white-tailed deer is very scarce because it has been hunted to almost extinction. Finding it at Playa Viva was a great surprise! Less familiar and thus more interesting is the raccoon's similarly omnivorous relative, the coati. Tejon's range from the southwestern U.S. to Colombia, and three related species fill in most of the rest of South America. Coatis are usually encountered in small bands, consisting of females and young males. Unlike raccoons, they are mostly diurnal, but they seem to share with raccoons complex social behavior and likely their high intelligence. In our single test, they were the mammals attracted to bait, devouring the bananas.

The Virginia possum is a widespread, Costa Rica to Canada, representative of New World marsupials, relatives of the kangaroos and wombats of Australia. They are omnivores, and often scavengers, and are famed for a complex defensive behavior in which they "play possum" (fake death). They have adapted well to the presence of *Homo sapiens* and extended their range northward in response to farming, even though (especially in Mexico), they have a reputation for poultry killing and egg stealing. They are hunted for both food and "sport."

We hope that by using the cameras and other tools in our big Costa Rican study we will be able to better understand the multiple ways in which mammals can be involved in providing ecosystem services to people. A goal is to be able to advise Costa Rican and farmers in other tropical areas on how to avoid the "defaunation" syndrome that can afflict landscapes deprived of various mammal species and thus help maintain the pollination, pest control, bush-meat provisioning, hydrological, and climatological services forest can provide to adjacent crop fields. Stay tuned for results (we hope) in a year or two!

MAHB-UTS Blogs are a joint venture between the University of Technology Sydney and the Millennium Alliance for Humanity and the Biosphere. Questions should be directed to joan@mahbonline.org

MAHB Blog: <http://mahb.stanford.edu/blog/selfies-that-count/>