Invasive alien species – working from brazil to South America

by Silvia Ziller *

Invasive alien species are a worldwide threat to biodiversity not much recognized in South American countries so far, but recognized as the planet's second cause of biodiversity loss. A topic that demands urgent action. For general lack of awareness, scientists who understand this threat have great responsibility upon generating action, awareness, information, cooperation and even policy.

Species in many groups make up the universe of invasives in South America. Most of them are just as invasive somewhere else on the globe, just as many South American species pose problems to other countries where they are not native.

African grasses, especially *Brachiaria* and *Melinis minutiflora*, are spread all over Brazil and very likely in other countries as well. *Eragrostis plana*, weeping grass from South Africa, covers some 10% of the South Brazilian grasslands, equivalent to one million hectares. This grass is not palatable to cattle, and has implied the loss of natural areas used for grazing management and rural income.

Non-native invasive fishes are widely used and promoted even by governmental agencies, often in international cooperation. Tilapia, carp, catfish and many other fishes are each day more common not only in tanks where they are bred, but unfortunately also in natural river systems, to where they escape and prey on native species, disrupt natural ecosystems or compete for food, displacing natives. Other freshwater species such as the golden mussel *Limnoperma fortunei* have traveled over 2,000 km North from Bacia del Plata in Buenos Ayres, and the giant river prawn *Macrobrachium rosenbergii* is established in the Amazon estuaries.

Amphibians have also become a problem, especially the bull frog *Rana catesbeiana* in the Atlantic Forest region in Brazil. The continental lizard species *Tupinambis merianae* was introduced to the national park and island of Fernando de Noronha, in the northeast of Brazil, to control rats, and became a problem on its own. The European hare *Lepus europaeus* was introduced to Argentina for breeding and entered Brazil on its own, so far having reached as far North as Sao Paulo state. The giant african snail was promoted by governmental agencies for many years as an alternative for generating income. The market was not in place and people abandoned breeding facilities, contributing to spread of the species all over Brazil, even in remote areas of the Amazon.

Invasive trees are still the preferred choice in forestry, which is understandable for their fast growth and easy management. Unfortunately, management has not yet included prevention and control of spread, and needs to be adjusted so forestry can be defined not simply as a profitable industry, but also as a qualified profitable industry with responsibility over the environment. Some aggressive species in Brazil are *Pinus elliottii* and *P. taeda*, *Acacia mangium*, and *Acacia mearnsii*.

Other tree species in different uses, even in agroforestry, forage or ornamentals, can pose serious problems as well. Some of these examples are yellow bells *Tecoma stans*, Japanese cherry *Hovenia dulcis*, mock orange *Pittosporum undulatum*, China berry *Melia azedarach*, African tulip tree *Spathodea campanulata*, loquat *Eryobotrya japonica*, tree privet *Ligustrum japonicum*, mesquite *Prosopis* species, *Leucaena leucocephala*, and many more. Neem *Azadirachta indica*, a potentially high risk species, is currently promoted all over Brazil for agroforestry and protection against crop pests. Neem is the most common species in all of subSaharan West Africa today, where it is strongly invasive and implies serious economic losses to rural communities. Even jackfruit *Artocarpus heterophyllus* and mango *Mangifera indica* are invasive in northeastern areas of Brazil, along streams.

Climbers in this list of species are mostly introduced as ornamentals: black-eye susan *Thunbergia alata*, Japanese honeysuckle *Lonicera japonica*, and many others.

The ocean is not privileged to escape this assault, and a few examples are a coral species *Tubastrea coccinea*, white-spotted jellyfish *Phyllorhiza punctata*, and shrimp *Penaeus monodon* and *Litopenaeus vannamei*, deliberately introduced for cultivation.

Unfortunately, examples do abound. What can we do? Everything except sit and watch. It is interesting to mention that our statistics for Brazil show that only about 13% of introductions of invasive species are accidental, and that 87% are deliberate, and usually intended for economic use. This means that, if new introductions undergo proper risk assessment involving environmental variables, and efficient screening systems are set up, a large share of new problems can be avoided.

The basic step for each country is a fast assessment of what species are invading, so the problem can be recognized. Next is the need to officially declare these species invasive, control and eradication programs for existing species, and regulations on those in economic use for proper management. On the side, for proper science, investment in research, and much investment in public awareness at all levels. This is a crowd task, and can only be successful if many people work well coordinated in the same direction of wishing for a clean, healthy environment.

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The Horus Institute for Environmental Conservation and Development, a non-governmental organization, was founded in Brazil in 2002 to address biological invasions, raise awareness, disseminate technical information, do prevention and control work on the ground, and work for the development of legal frameworks to cover the topic. The Institute maintains a bilingual website with a list of species catalogued so far for Brazil, with attached fact sheets on each one, for public access in the Portuguese language: www.institutohorus.org.br.

The Nature Conservancy is an international organization with strong emphasis on invasive species. The Invasive Species Initiative is a solid reference on the subject, being spread over many US states and in the South Pacific and Caribbean (http://tncweeds.ucdavis.edu).

TNC's Science Program in the South America Conservation Region has recognized the menace posed by invasive species and created the South America Invasive Species Program in January, 2005, to broadly address the issue in the continent. The program is based in Brazil and building alliances in other countries to expand action on information systems, management, policy and awareness.

These organizations are closely linked to international programs as the Global Invasive Species Program GISP (www.gisp.org), the Global Invasive Species Information Network (GISIN), the Inter American Biodiversity Information Network (IABIN) - Invasive Species Network (I3N), and the Invasive Species Specialist Group of IUCN.

One of our deliverables is a database structure to be freely offered to other countries which haven't organized data on invasive species so far. This is a joint project of The Horus Institute, the Universidad del Sur, The Nature Conservancy and I3N. This database will be made available in Spanish, Portuguese and English, including operating manuals and tools such as a web interface, easy generation of fact sheets per species, and an XML schema for exporting data to other information systems.