

Socio-economic Considerations for Pre-Screening of Live Animal Imports

Session II: Science and Economics of Pre-Import Screening

Jamie K. Reaser, Senior Science and Policy Advisor, Pet Industry Joint Advisory Council (PIJAC), 1220 19th Street, NW, Washington, DC 20037; direct contact: c/o Ravens Ridge Farm, 1207 Bull Yearling Road, Stanardsville, VA 22973; pjascience@nelsoncable.com.

Introduction

Live animals are intentionally imported for a variety of purposes (Box 1), and may also be unintentionally imported as “hitchhikers” on commodities (e.g., horticulture), in packaging (e.g., solid wood packaging), shipping substrates (e.g., seaweed), or conveyances (e.g., plane wheel wells) (Ruiz and Carlton 2004).

In the United States (US) approximately 90% of the live animal imports are for companion animal/hobby purposes (S. Einsweiler, personal communication). The percentage of households having at least one pet is roughly 63% in Australia and the US and approximately 50% in the United Kingdom. In the US, this equates to more than 360 million individual pets and a \$40.8 billion/year industry (Reaser and Meyers, 2008).

In this presentation I provide an overview of some of the socio-economic considerations for pre-screening of live animal imports. In particular, I place emphasis on socio-economic issues that have rarely been discussed in the scientific literature or policy making processes.

Factors Influencing Demand

Several factors influence the demand in live animal imports as pertains to species diversity and volume. These include the economic status of the importing country (wealthier countries tending to import more animals of more species), trends in popular culture (e.g., types of animals owned by publicly-recognizable people), trends in the animal keeping hobby (e.g., desire for particular color morphs or genetic lines), condition of the animals (e.g., disease and parasite free), and trade status of the exporting countries (e.g., ease of market access). Because many of the factors influencing the demand in live animals are dynamic, the types of species in the trade, volume of trade, and level of influence of export countries can be expected to change over time.

Relationship Between Patterns of Demand and Risk

The characteristics of import country demand have an influence on the risk of biological invasion. In theory, risk levels will correlate with the volume and frequency (propagule pressure) of a species imported, as well as species and genotypic diversity (Reaser et al. 2007). However, other factors may have a stronger, or at least interacting, influence on risk determination. For example, Carrete and Tella (2008) found that wild caught, rather than captive bred, birds accounted for avian invasions and that bird “reproductive origin” was a more significant risk factor than propagule pressure.

Captive breeding, especially of companion animals, often selects for traits (e.g., behavior, color morph) that make progeny ill-suited to survive under natural conditions. Loss of genetic diversity may equate to a reduction in ecological plasticity. Furthermore, captive-bred animals may be less likely to carry pathogens and parasites (Reaser et al., 2008). However, animals propagated in captivity could present a greater risk of biological invasion if traits (e.g., cold tolerance) are being chosen (either through selective breeding or direct gene manipulation) that could increase the likelihood of their survival and reproduction under natural conditions. Animals bred for intentional release (e.g., biological control, recreational fisheries, certain types of aquaculture) need to be carefully evaluated in this regard. The specific location from which a live animal originated (either as a wild caught or captive bred) can influence the likelihood that it could be invasive or facilitate biological invasion. For example, Jakes et al. (2003) found that brown tree snakes (*Boiga irregularis*) from island States were free of *Hepatozoon boigae* parasites, while 44% of those from northern Australia were parasitized. At this time, a duck (likely regardless of the species) would present greater risk of highly pathogenic avian influenza (H5N1) transmission if imported from South-east Asia versus the United Kingdom.

Ecophobia versus Ecophilia

Those conducting and evaluating risk assessments need to ensure that they are science-based, and that “cultural attitudes” toward certain types of animals do not inadvertently influence the assessment outcomes. For example, a mammal (e.g., feral cat; *Felis silvestris catus*) might be a more acceptable risk to the public than a snake (e.g., Burmese python; *Python molurus bivittatus*) despite the fact that there is significantly more scientific evidence of harm by the former.

Level of Demand Influences Cost-Benefit Analysis

Many people would not consider their families complete without a pet and animal hobbyists tend to invest considerable time and expense into animal keeping (Reaser and Meyers, 2008). Furthermore, some cultures have a strong, traditional association with specific species (e.g., food fish). In short, the human-animal bond can be quite strong and species specific. Consequently, some species of live animals have far greater economic implications in the market place (both for exporting and importing countries) than others. Those conducting pre-screening need to consider the costs and benefits of the alternatives to entry of a specific species. In particular, they need to assess the potential socio-economic and biological impact of alternative species in the market place (e.g., one species or variety of lizard versus another), as well as the potential for the demand to be transferred to native, wild caught species (esp. consider conservation and disease status) (Reaser et al., 2008).

Dialogues with law enforcement agencies need to be part of the pre-screening consultation process in order to minimize the potential that prohibition of certain species will facilitate an unenforceable black-market enterprise. In some instances, it may be preferable to admit a species under legal restrictions (e.g., permits, microchipping) rather than to prohibit it in an unenforceable regulatory context.

Finally, the broad-scale, beneficial implications of live animal imports to key stakeholders needs to be adequately considered in pre-screening analyses: for example, numerous studies have shown the benefits of companion animals to human

health and well-being (Barker 1999, Mayon-White 2005) and pets can facilitate human appreciation for wildlife and environmental issues (Reaser and Meyers, 2008).

Large volume importers/distributors have an economic (and typically ethical) incentive for reducing the risk of biological invasion via live animal imports. For this reason, they tend to invest in biosecurity measures, including pre-export health inspection; escape-proof packaging; rapid transport measures; post import inspection, quarantine, and treatment (as necessary) (e.g., Fosså et al. 2007). Increasingly, the pet industry is also investigating in best management accreditation programs and education/outreach campaigns (e.g., the National Reptile Improvement Plan, Bd-Free 'Phibs campaign, and HabitattitudeTM; www.pijac.org).

Patterns of Supply Influence Cost-Benefit Analyses

Although the potential negative consequences of wild animal harvest on native species and ecosystems is widely recognized, comparatively little attention is given to the potential ecological and socio-economic benefits of the trade in live animals. For example, approximately 60% of local communities (many of them indigenous peoples) along the Rio Negro in Brazil depend on the wild harvest of ornamental fish for export. Project Piaba, a program supported by a number of international conservation organizations, promotes the conservation benefits of this sustainable harvest with the slogan, "Buy a fish, save a tree" (www.projectpiaba.org). The Convention on Biological Diversity (CBD), Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the International Union for the Conservation of Nature (IUCN) all include sustainable use mandates/programs as part of their overall conservation mission.

Pre-Import Screening Capacity

Ideally, pre-import screening capacity is built upon a solid foundation of: stakeholder support, education/outreach, a well-enforced legal mandate/framework, standardized risk assessment protocol, credible scientific and economic information, institutional and staff capacity, and adequate financial resources. However, there are vast differences in the ability of governments to conduct or even establish pre-screening programs and, for various reasons (e.g. lack of data, financial limitations) no country will be able to fully pre-screen all species in trade. Therefore, governments need to invest in education/outreach initiatives that encourage voluntary screening by relevant industries, consult with stakeholders in order to build a foundation of support for pre-screening regulations/programs, databases that contain relevant biological and socio-economic data, a strategic phase-in approach that starts with the adoption of best management practices (BMPs), and risk management.

Recommendations

- Build relevant socio-economic factors (as outlined above) into pre-screening processes (including cost-benefit analyses) for live animal imports.
- Within the same species, evaluate populations and animals of different reproductive origin (captive bred versus wild caught) for variations in risk.
- Build pre-screening capacity through a strategic, phased-in approach that promotes education/outreach and best management practices (BMPs) within relevant industry sectors.

- Invest in stakeholder consultation/cooperation in order to identify relevant socio-economic factors, accesses relevant data, and build a foundation for support for best management practices and regulatory frameworks.

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Box 1.

Examples of reasons for live animal import:

- Companion animals/hobby
- Public display (zoos/aquaria/museums)
- Conservation (breeding and reintroduction)
- Biological supply
- Game/recreational fisheries (including bait)
- Biological control
- Livestock/poultry/other food
- Circuses
- Scientific Research
- Medicinal Use/Biomedical Research