Measuring trends in invasive alien species:

An achievement of fifty years of invasion politics?

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Introduction

"*Trends in invasive alien species*" is one of only two Headline Indicators of threat to biodiversity that form part of the Convention on Biological Diversity's framework for monitoring progress towards the 2010 Biodiversity Target. This is testimony in part to the impact of invasion ecology as a field.

However, to date no indicator for monitoring global trends in invasive alien species (IAS) has been widely adopted that combines trends, derived from a standard set of methods, across species groups, ecosystems and regions[1].

Constraints to the development of such an indicator include:
- Lack of a broadly adopted, standard definition of IAS
- Limited quantification of the biodiversity impacts of IAS
- Geographic variation in data availability and quality[2,3]
- Lack of a global database that adopts transparent and standard methods for data inclusion.
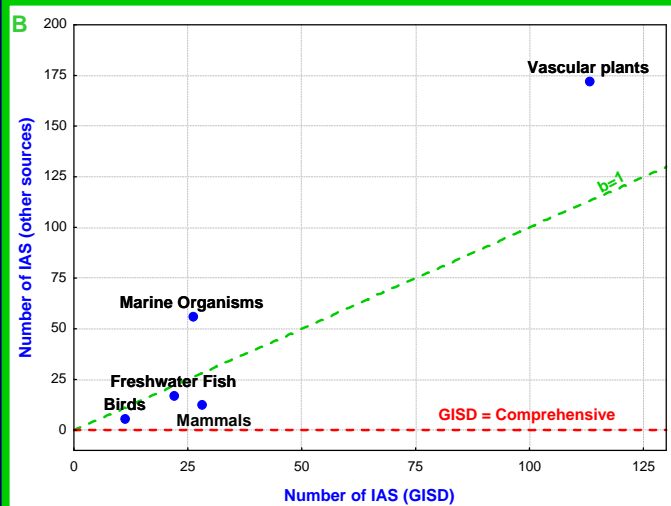
The Global Invasive Species Database (GISD) is generally considered to be the most comprehensive global database for IAS that threaten biodiversity. However, it remains substantially incomplete and geographically and taxonomically biased (Figs A & B).

Geographic bias in GISD
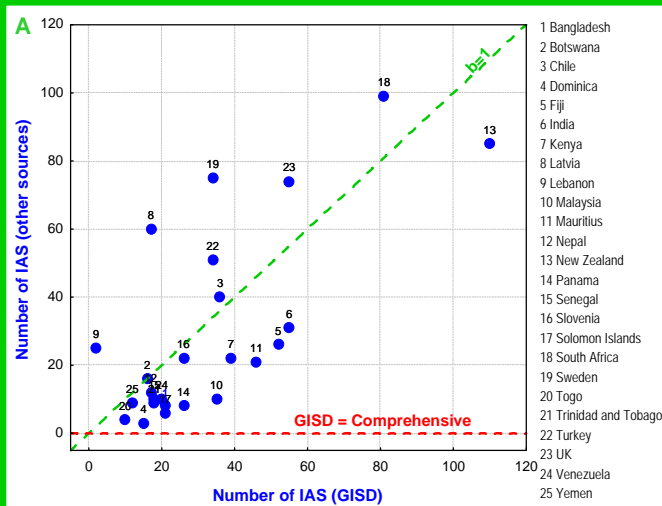
A The total number of IAS (across 5 taxa) obtained from the GISD for a stratified random selection of 25 countries, versus the number of species obtained from other data sources (literature and other databases). Data points above the line (b=1) are countries for which more data were obtained from alternative sources than from GISD.

Country legend:
1 Bangladesh
2 Botswana
3 Chile
4 Dominica
5 Fiji
6 India
7 Kenya
8 Latvia
9 Lebanon
10 Malaysia
11 Mauritius
12 Nepal
13 New Zealand
14 Panama
15 Senegal
16 Slovenia
17 Solomon Islands
18 South Africa
19 Sweden
20 Togo
21 Trinidad and Tobago
22 Turkey
23 UK
24 Venezuela
25 Yemen

Taxonomic bias in GISD

B The total number of IAS for five taxa (25 countries) obtained from GISD is plotted against the number of species obtained from alternative data sources. Data points above the line (b=1) are taxa for which more data were obtained from alternative sources than from GISD.

The way forward…

Fifty years of invasion ecology has done much to inform our understanding of the process of biological invasion and the determinants of invasion success. However, for the reasons outlined above, databases on invasive species remain inadequate for delivering a globally representative indicator of the numbers and impact of biological invaders. Most of these problems could be overcome by consensus amongst invasion biologists and policy makers, along with co-ordinated efforts to fill particular data gaps. Activities underway to produce the 2010 IAS Indicator will narrow the gap between the insight that invasion ecology can provide and the information on invasions that policy makers require.

References:

[1] McGeoch, M.A., Chown, S.L., & Kalwij, J.M. (2006). A global indicator for biological invasion. *Conservation Biology*, 20, 1635-1646.

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[3] European Environment Agency (2007). Halting the loss of biodiversity by 2010: proposal for a first set of indicators to monitor progress in Europe. EEA Technical Report No. 11. European Environment Agency. Copenhagen.

For further information see:
Invasive Alien Species Indicator website: www.sun.ac.za/cib/iasi