

Invasive species data applications and data sharing across the Americas

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Invasive species databases can be effective tools for addressing the threat that non-native invasive species pose to native biodiversity and natural ecosystems. Data are not useful if they are not interpreted fully and shared. Accessible, well-designed databases can help address the difficulties of managing for biodiversity in a heavily invaded reality. In this workshop, attributes of useful databases were described and discussed.

Las bases de datos sobre especies invasoras pueden ser herramientas efectivas para evaluar las amenazas que las especies invasoras no-nativas representan para la biodiversidad nativa y para los ecosistemas naturales. Los datos no son útiles si no son interpretados de manera completa y compartidos. Bases de datos accesibles y bien diseñadas pueden ayudar a resolver las dificultades que se tienen al manejar la biodiversidad en una realidad fuertemente invadida. En este taller se describieron y discutieron las características de las bases de datos útiles.

Front Ecol Environ 2007; 5(4): W15–W16

Invasive, non-native species constitute a major threat to native ecosystems and the biodiversity they contain. Such species can modify and disrupt crucial ecosystem processes, such as fire regimes, hydrology, and nutrient cycling. Furthermore, they can harm native species through direct competition, displacement, and predation or hybridization.

Effective, targeted invasive species databases are useful tools for addressing these stresses on native biodiversity. Such databases can, for example, track the occurrence and spread of invasive species, as well as management strategies for their control and the effectiveness of such actions. The data can help land managers determine the management methods that are most cost effective in stewarding sites for their natural values. The aim of the workshop described here was to discuss different models and formats for databases, as well as ways to obtain data for inclusion in databases.

Useful databases are usually characterized by similar attributes:

(1) The type of data required is carefully planned. It is

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Organized by: M Tu and S Ziller

Ecology in an era of globalization
Ecological Society of America International Conference
Merida, Mexico; 8–12 Jan 2006
<http://abstracts.co.allenpress.com/pweb/esai2006/schedule/>

pointless to gather data that will not be used. Some workers may try to amass data in the hope that someone else will find it useful at some point in the future. While this may seem heroic or noble, it is rare that the luxury of such undirected research is feasible, due to staff and resource limitations. Furthermore, it is critical that data standards are maintained, to increase the likelihood that data can be shared by other users. Common fields, such as genus and species, are examples of fields which must be recorded.

- (2) A useful and efficient method of data extraction and generation is used. The Nature Conservancy has developed a handheld device that is GPS-enabled, and which can be taken into the field to record spatial data, along with information about the spatial scale of weed invasions and the control methods used to slow or stop the invasion (Figure 1).
- (3) The nature of the data is thoroughly documented, so others can interpret the implications at a later time. This documentation is referred to as metadata, and is particularly important, since data tend to become obsolete if they are not updated in a timely manner.
- (4) Data are integrated into a greater whole. Whether the database is a straightforward spreadsheet record, a relational database, or a web-based data-harvesting program that collects data from other databases or multiple users, the integration must be designed to maximize efficiency. Databases that are difficult to work with or contribute to are usually ignored.
- (5) Data are shared. Data held in a proprietary fashion do

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Courtesy of E. Salvia

Figure 1. Recording monitoring information into a database is essential in determining the efficacy of management efforts.

little good when dealing with invasive species; they should be easily available to neighbors. In this context, neighbors might be others who are geographically nearby, but might also be distant stakeholders who share similar climates.

- (6) The temporal nature of databases is clearly indicated. If a database is populated by data taken in a single time period, this must be clearly articulated. If the database is represented as a compendium of “current” data, the database must be actively maintained; otherwise, it will become out of date, and, potentially, misleading.

Examples of useful and easily accessible database systems and tools include:

CONABIO (Comisión nacional para el conocimiento y uso de la biodiversidad): www.conabio.gob.mx/

GISIN (Global invasive species information network): www.gisinetnetwork.org/

Instituto Hórus: www.institutohorus.org.br

I3N (IABIN Invasives information network): www.iabin-us.org/

NBII ISIN (National biological information infrastructure invasive species information node): <http://invasivespecies.nbii.gov/>

WIMS (Weed information management system): <http://tncweeds.ucdavis.edu/wims.html>

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