Why Use GIS for Conservation?

For more information, see also:

Some examples of Conservation GIS
Is GIS right for your organization?

Why Use GIS? *GIS enables conservation planners and managers to:*

1. Access and utilize current, historical and time series information relevant to conservation, including ecosystem management, watershed assessment, species-recovery programs, and land use planning, as just a few examples. The Applications section of this Starter Kit will provide you with an opportunity to explore some of these in more depth.

2. Perform spatial analyses, statistical queries, and predictive modeling of large, complex datasets. The results of this analysis can then be shown using visually intuitive maps, thereby broadening the power and reach of the information.

3. GIS is already used by most land management and regulatory agencies as well as large private landowners. In order to understand the information upon which resource management decisions are based, conservation organizations need to have access to this same public resource. For information on available public data, go to the Public Data Sources section of this manual.

The Many Forms of GIS

A GIS can be as simple as paper or mylar overlays. Such basic systems can provide general answers to many commonly asked spatial questions, but projects that call for highly accurate results or complex analyses typically require the use of computer-based GIS. Platforms range from laptops to desktop PCs to workstations, with capabilities, complexity, and costs (equipment, software, personnel, and time) all increasing respectively. Different GIS software packages also vary considerably in their technical functions and analytical capabilities, ability to interface with different information and data sources, ease of learning, and acquisition and maintenance costs.

Potential costs and drawbacks of GIS must be carefully weighed, but in reality even small conservation groups

can easily develop a GIS capability with minimal costs and greatly enhance their effectiveness. ArcView can be used on a laptop to quickly view and query data received from resource management agencies. More complex analysis can be done using PC ArcINFO software installed on a laptop and if supported by a small printer, digitizer, and peripheral software can be used for most of the analysis needed for conservation work. Costs can be minimized and productivity increased if a thorough investigation of available GIS options and data sources is conducted prior to acquisition of equipment and hiring of personnel. Discussions with colleagues, or with members of the Conservation GIS Consortium, are recommended since vendors may not always present the full range of available options or understand the constraints of conservation programs. For more information about the hardware requirements for ArcView check out the Hardware and Software section in this manual.

Constraints

GIS holds the potential to greatly enhance our understanding of conservation problems and facilitate the implementation of conservation strategies, but careful application of this technology is necessary to avoid wasting limited funds, time, and opportunities. Both software and hardware can be expensive, rapidly eating up project budgets and supplies; and updating and maintenance can represent substantial recurrent costs, particularly for more sophisticated GIS programs. Many older computers configured for basic word processing do not have the disk space or RAM memory sufficient for GIS software and would require upgrades, although most new computers will handle Arcview quite well. Databases can be quite expensive either to obtain or build. Data can be grossly inaccurate or of such varied scales that performing any meaningful analysis is impossible. (Refer to the How to Request Data for Use in ArcView in the Where to get Data section for more information.) Project managers often underestimate the time and effort required to gather and digitize basic information for input into GIS. Satellite imagery can be prohibitively expensive for many projects. The trained personnel required to operate and maintain GIS systems are often difficult to locate or demand substantial salaries, and training itself can be time-consuming and expensive. GIS consultants can be contracted for some project tasks but may not be cost-effective because of high fees and the potential lack of project control and ownership over data, analyses, and final products.

Don't duplicate effort! Before developing a new GIS database, do a thorough search to make sure that no one else has already done it or something similar that you can adapt. Contact public agencies, other conservation groups, search the internet using resources described in Using the Internet to find GIS data. You will save time, money and effort if you can use what has already been developed.

Asking the Right Questions

GIS can be an affordable and invaluable tool for conservation planning and management, but if the questions being asked are inappropriate for GIS analysis then limited conservation resources will have been squandered. Moreover, the kinds of questions that arise from a particular conservation challenge should determine the type of GIS designed and implemented by a project manager. It is essential that project managers educate themselves as to the most appropriate set of questions to be asking for their particular ecosystem or biodiversity issue, both at local and regional scales. For some examples of GIS being used successfully for conservation, see the Examples section .
