



US Army Corps  
of Engineers

# EDYS: Ecological DYnamics Simulation



MWH  
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## Background

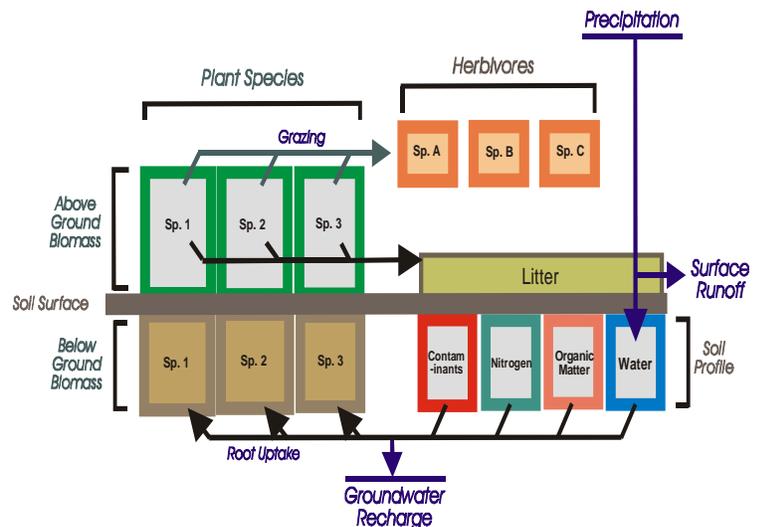
Ecosystem management of public lands is hindered by a lack of predictive tools that assess management alternatives under a wide variety of land/water use and disturbance scenarios. This is especially problematic on lands subjected to multiple land use practices, stakeholders, and regulatory constraints. Tools that adequately accommodate the process complexities of ecological dynamics at various spatial and temporal scales would be of great utility to decision makers. The **Ecological DYnamics Simulation (EDYS)** system was developed to assist managers in selecting defensible strategies to best meet difficult management objectives, given complex regulatory constraints, and variable climatic and disturbance scenarios.

## EDYS Capabilities

EDYS has been applied in a wide variety of land/water management scenarios, including: military training, recreational activities, grazing, natural and prescribed burns, fire suppression, road/trail building and closure, invasive plants inventory and eradication, drought assessment, water quality/quantity, reclamation, restoration and revegetation, land cover design, and slope stability.

EDYS is designed to mechanistically simulate complex ecological dynamics across spatial scales ranging from plots (square meters) to landscape and watershed (square kilometers) levels. Modules include climatic simulators, hydrology, soil profile, nutrient and contaminant cycles, plant community dynamics, herbivory, animal dynamics, management activities, and natural/anthropogenic disturbances. Designation of scenarios and management alternatives for each simulation run is conducted within a Microsoft Windows user interface. Outputs include graphical displays in this interface, as well as extensive tabular files for all ecosystem components.

Typical inputs to each EDYS application include spatial data (e.g., grid-based GIS data sets), historical climatic data, soil profile parameters, plant/animal parameters, management practices, and specifications for user-defined endpoint data. "First pass" calibration of the model is facilitated by the EDYS Database, which contains soil, plant, management, and disturbance parameters compiled from the ecological literature and ongoing EDYS applications nationwide and overseas.



## Software and Hardware Requirements

**Software:** EDYS is distributed as an executable file and associated binary data files, and can reside on Microsoft Windows 97, 98, 2000, or NT platforms. EDYS produces (as an option), a series of comma-delimited text files that can be imported into spreadsheet software packages (e.g., Microsoft Excel or Corel Quatro Pro) for review and reproduction.

**Hardware:** EDYS will run on any PC with a Microsoft Windows 97, 98, 2000, or NT 4.0+ operating system. However, it is advised that the computer have an Intel Pentium II processor or better, with at least 64 MB of random access memory (MB RAM), and at least 500 MB empty space on the hard drive for file swapping during the simulation run to accommodate the intensity of data processing. Any VGA or better graphics card and monitor will provide satisfactory results.

## Status and Availability

Executable versions of EDYS applications developed by MWH personnel and the U.S. Army Corps of Engineers are available on request for evaluation purposes from the authors. Regional applications will be available for general use as they are available.

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