

Briefing:  
AK. Natural  
Heritage  
Trust Program

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*Alaska Natural Heritage Program*

University of Alaska Anchorage • The Nature Conservancy of Alaska



A REPORT

to the

ALASKA STATE LEGISLATURE

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## Introduction

The purpose of this paper is to inform the Alaska State Legislature of a biodiversity database which the U.S. Office of Technology Assessment considers "the most comprehensive of its kind": The Nature Conservancy's Natural Heritage Program biological database. We herein describe the Alaska Natural Heritage Program and provide a context for comparison with other biological information systems in Alaska.

## History and Purpose

The Nature Conservancy (TNC) is a non-profit organization dedicated to the protection of biological diversity and areas of special ecological significance. In 1974, the Conservancy created its first Natural Heritage Program to compile important resource information for making related land management and protection decisions. Subsequent programs have been developed in 78 states, provinces, and nations, including one in every state in the union; most are housed within public resource agencies.

In 1989, the State of Alaska matched a \$216,000 challenge grant from BP Exploration to launch the Alaska Natural Heritage Program at the University of Alaska Anchorage. Our purpose is to identify and inventory plant and animal populations, plant communities, and habitats. The methodological focus is on species and communities that are rare or endangered and habitats that are of critical ecological importance. The information is then used to guide protection of resources which represent the biological and ecological diversity of the state: Alaska's natural heritage.

## Natural Diversity

There are many reasons we place a high value on natural diversity. Maintenance of genetic diversity is vitally important for rare and endangered plants and animals, and in many ecosystems provides structural and functional stability. Species diversity plays significant roles in agriculture by providing hearty food plant varieties and pest control agents. In medicine, nearly one half of U.S. prescriptions contain a wide variety of natural chemical ingredients. The natural diversity of ecosystems also provides baseline information for future lands and resource comparisons offering unlimited opportunities for education and research on environmental topics. Unaltered ecosystems are highly evolved over tens of thousands and millions of years and are not able to be synthesized. For these reasons, our quality of life, aesthetically, culturally, and economically, is dependent on maintenance of biological and ecological diversity.

The identification, protection, and management of outstanding ecological features in Alaska requires an extensive informational framework. Public agencies have developed a number of information systems that directly or indirectly lend a hand in targeting ecologically valuable lands.

Existing Information Systems

Efforts have been made by public agencies to improve the efficiency of natural resource data acquisition and management. From these efforts there has emerged a broad spectrum of information systems which includes regional profiles, habitat management guides, geographic information systems, and multi-resource inventories. They vary in purpose, degree of use, and depth of coverage; some are written compilations while others are computerized. The following list summarizes some of the more recognized biological information systems and reference sources.

Agency	Info System	Product
B.L.M.	-M.O.S.S. database -Resource Library -reference text -inventory -mgmt plans -resource databases	land/water/fire fuels mapping primary/secondary literature wildlife inventory/monitoring A.C.E.C. listing mgmt/special area plans/EIS habitat/fire fuels mapping
M.M.S.	-O.C.S.E.A.P. -library	continental shelf resources marine research/references
N.P.S.	-Common database -inventory -N.N.L.P. files -Grass/SAGIS/ELAS -mgmt plans	park features/T & E species plant collection database natural landmark records/maps veg class/resource mapping mgmt/protection plans
S.C.S.	-soil survey -inventory	soil mapping/agri. analysis river basin/multi-resource info
U.S.F.S.	-T.I.M.S. -inventories -Arc/Info database -reference text -mgmt plans	forest/timber info RNA/sensitive species/timber natural resource info vegetation classification forest/wilderness plans

	-LANDSAT	timber/landcover inventory
U.S.F.W.S.	-ARC/INFO database -inventories -Env. Library -mgmt plans -LANDSAT database	resource info/refuge mapping seabird/waterfowl/wetland info fish & wildlife literature refuge plans/EIS habitat mapping
U.S.G.S.	-LANDSAT/SPOT/AVHRR -ARC/INFO database	landcover/veg classification wildlife/habitat GIS analysis
A.D.F.&G.	-Arc/Info database -A.H.M.G. -Habitat Library -B.G.D.I.F./W.I.D.B. -inventories -A.W.C./ARC/INFO -mgmt plans	resource info/mapping fish & wildlife info/maps primary/secondary literature survey/harvest/research info fish & wildlife info/maps anadromous fisheries database special area plans
C.Z.M.	-mgmt plans	coastal district plans
D.N.R.	-Arc/Info database -inventories -mgmt plans	resource analysis/mapping multi-resource/forest info area/forest/recreation plans
Library	-Alaska State	eco/biological literature
University	-Museum -A.E.I.D.C. -Libraries -Exp. Sta.	plant/animal documentation multidisciplinary info center polar studies/Ak collection ecological reserve files
Borough	-Arc/Info database	N. Slope multi-resource info
Municipal	-A.M.S. database -mgmt plans	resource info/mapping borough/mgmt plans
Native Corp	-mgmt plans	village/regional plans
Private Org	-inventories	species accounts/field records

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A review of these sources of biological information is impressive. Independent systems that organize information on research, management, and inventory efforts are on line, being developed, or projected for the future. However, none of these systems methodically identify the finest examples of Alaska's natural areas nor objectively set management and protection priorities. In review of the above information

sources, we asked the following questions:

- Is information presented in an objective manner without regard to singular management needs?
- Is information easily accessible by all that can benefit by it: public and private?
- Are independent systems compatible between areas, regions, divisions, and agencies?
- Does data acquisition and management promote open information exchange?
- Is the information consolidated from a wide spectrum of inventories and references, including nontraditional sources?
- Does the method of information storage accommodate continual data turnover and changes to budgets?
- Is information fine-grained enough to detect localized patches of habitat: caves, hot springs, staging areas?
- How responsive is each biological information system to urgent management and protection needs?
- Does biological criteria for resource evaluation vary statewide?
- Is there a systematic method to identify, document, and set management priorities for significant habitats?

Information specialists and data managers share the concern for access to information resources. Work groups, such as URISA, CONRIM, and the Arc/Info Users Group, have been formed to facilitate the acquisition and/or management of information. However, the enormity of the task and speed of data turnover demands continuous effort and documentation. Data specialists, as well as resource managers, scientists, land planners, and librarians agree that there remains an immense body of information that is incomplete, missing, disjunct, or continuously becoming obsolete. Could a Natural Heritage Program provide a useful role in further improving access to critical biological information in Alaska?

#### Alaska Natural Heritage Program

The Alaska Natural Heritage Program's goal is to create a continuing process for identifying outstanding biodiversity features and setting priorities for their management and protection. It is a systematic method of information management that links biology, ecology, and management with specific locations on a map. The Heritage database is a permanent tool that is designed for continuous revision and update as new information on plants, animals, and community types is received.

The basic component of the Heritage Program is the natural "element". Elements are species (e.g. peregrine falcon), communities (e.g. patterned convex wetland), or habitats (e.g. salmon spawning bed). The element approach focuses on these biological and ecological entities rather than on sites or tracts of land. One great benefit of this system is that an element's significance does not become diluted by other considerations that are more conspicuous, such as scenic or recreational values. As a result, the status of elements can be objectively ranked according to the scientific understanding of their rarity and significance.

Based upon biology and distribution of elements, the value of different and variable sites are compared so that management priorities are well established. Since the element information is compiled without regard to jurisdictional boundaries, the approach establishes a context within which site-specific data is applied to statewide resource management and protection in a biologically meaningful way.

#### Heritage Data Inventory and Management

The data collection process begins with a comprehensive document search that centralizes a wide variety of information resources. This data survey brings together otherwise disconnected, and sometimes obscure, public and private records on Alaska's natural resources. In turn, the organized database offers the fullest range of information possible to all interest groups. The following list includes information tracking sources that would be utilized in developing a Heritage database.

- government in-house reports
- inventories
- museum and herbarium specimens
- environmental impact statements
- technical papers
- popular literature
- personal communications
- historical archives

Management of the data includes the use of computerized and manual files that are readily accessible by element type, geographic location, endangerment status, and land ownership. The database forms a standard network within and between states that also provides information on population numbers, distribution, geography, ecology, global ranking, and protection status. An extensive and up-to-date bibliography is maintained and topographic maps document all element locations in the state.

The four components of the Heritage database are interdependent and summarized below.

Map File - contains the element locations; recorded on U.S. Geologic Survey topographic quadrangles covering an entire state.

Computerized File - contains abstracts on each element and cross-references it to pertinent element manual files.

Element File - contains life history data, references, illustrations, element location records, and other nonlocation information.

Geographic and Managed Area File - contains detailed information on each mapped element location and data on areas that have some degree of protection.

The information is compiled, reviewed, interpreted, and quality controlled. Entered within the database, it is ready to be distributed to a wide variety of public and private users and provide a broad stable framework with a statewide and global perspective.

#### Heritage Application

The Nature Conservancy's experience in other states indicates a steady increase in the number and variety of information requests from the Heritage information system. Appendix 1 provides a list of Oregon Heritage users as an example. The majority of inquiries come from federal, state, and local government sources for environmental assessment and land management. Private consultants, The Nature Conservancy, universities, individuals, conservation groups, and independent researchers also use the heritage information network for land planning, as well as scientific and educational study. The following summary reflects general categories of the program's application.

- environmental impact assessment
- resource management
- land and resource protection
- endangered species review
- land development planning
- education
- scientific research
- permit review

### Heritage Qualities

A unique collection of qualities sets the Alaska Natural Heritage Program apart from all other programs. The program methodology has evolved over years of refinement to complement and enhance existing systems. It is growing as an intricate network that can speak across arbitrary local, state, and regional boundaries. It is characterized by standards consistent with the needs of public agencies, private interest groups, and industry.

- o Database is a permanent repository.
- o Information is continually revised and ongoing.
- o Scattered sources of information are centralized.
- o Breadth of information search is exhaustive.
- o Facts are presented objectively.
- o Method is efficient and cost effective.
- o Program cost is low; product output is high.
- o Information system is accessible and utilitarian.
- o Information is map-referenced.
- o Ranking criteria set management & protection priorities.
- o Quality control is an integral process.
- o Standard information network between and within states.

In summary, it is anticipated that our Alaska Natural Heritage program will give Alaskans the best possible information with which to make wise land and resource management decisions while at the same time protecting Alaska's natural diversity and our unique natural heritage.

Appendix I

NATURAL HERITAGE DATABASE USERS  
(Oregon example)

Federal Agencies

U.S. Fish & Wildlife Service  
U.S. Forest Service  
U.S. Bureau of Land Management  
U.S. Army Corp of Engineers  
U.S. Department of Agriculture  
U.S. National Park Service  
Bonneville Power Administration  
U.S. Department of Defense  
Environmental Protection Agency  
Bureau of Indian Affairs  
Federal Maritime Commission  
Soil Conservation Service  
Bureau of Outdoor Recreation  
National Oceanographic & Atmospheric Administration

State Agencies

Department of Fish & Wildlife  
Division of State Lands  
Department of Energy  
Department of Land Conservation & Development  
Department of Environmental Quality  
Department of Transportation  
Department of Forestry  
Department of Agriculture  
Department of Economic Development  
Water Resources Department

Miscellaneous Public/Private

61 environmental and other groups  
16 public agencies outside Oregon  
29 counties governments  
14 city governments  
38 colleges and universities  
30 private consultants