

CONVENTION ON WETLANDS OF INTERNATIONAL
IMPORTANCE ESPECIALLY AS WATERFOWL HABITAT

Fourth Meeting of the Conference of the Contracting
Parties June 27 to July 4, 1990
Montreux, Switzerland

TECHNIQUES FOR CONDUCTING VARIABLE INTENSITY
WETLAND INVENTORIES

by Thomas E. Dahl

U.S. Fish and Wildlife Service
National Wetlands Inventory
U.S.A.

Presentation at Workshop E

(English only)

TECHNIQUES FOR CONDUCTING VARIABLE INTENSITY WETLAND INVENTORIES.

WETLAND INVENTORY INFORMATION WITHIN THE CONTEXT OF WISE USE.

Worldwide, there is an growing awareness of the ecological importance of wetland systems. Increasing demands on natural resources of all types, has forced many nations to assess how best to balance economic development with environmental quality. There are a number of international conservation documents and strategies that discuss wetlands and all water related resources in terms of "sustainable utilization" and "wise use." The Brundtland Report (1989) has thrust this idea into the international spotlight.

The Working Group on wise use (formed at the Regina Conference of Parties in 1987), has attempted to expand upon priority actions countries may consider in undertaking formulation of policies relating to the wise of wetland habitats. As has been pointed out in the overview paper for this workshop many wetlands are converted to other uses because there is no adequate national wetlands inventory (Dugan, 1990).

It is essential that decision makers, whether at the ministry level of governments, or local resource managers, have baseline data on the location and extent of their wetland resources. In other words, there needs to be an accurate accounting or inventory of wetlands resources within national borders.

DEFINING INVENTORY OBJECTIVES

Once the need for inventory information is recognized, ministries often face hard choices about further defining the goals and objectives of such an inventory. Questions frequently arise about who will perform the inventory? What should an inventory include? And what are the priorities or where to begin?

Defining inventory objectives involve identifying what wetlands or wetland types are to be inventoried. If the objectives are to locate and monitor migratory bird habitats, there may be a subset of all wetlands that are to be included. Initially, the United States took this approach in the mid-1950's and conducted an inventory of only those areas important to migratory waterfowl. The disadvantage of this approach was that it was not a comprehensive inventory and was of limited value for other purposes (e.g. fisheries).

Consequently, the U.S. Fish and Wildlife Service, decided in the

Waterfowl Research Bureau, University College London, and U.S. Fish and Wildlife Service cooperated on a national wetland inventory, specific efforts were made to separate the inventory process from the identification of values and benefits. It was only after these two phases were complete that a definition of management options was developed for each site.

The reasons for undertaking a national inventory of wetlands are as varied as those for implementing wise use concepts. Establishing objectives for what the inventory will be is absolutely essential. All of the individuals or organizations involved from the political levels to the on-the-ground managers, and the potential users of the inventory data should be informed of what the inventory products will yield.

MATCHING METHODOLOGIES WITH OBJECTIVES

As can be surmised, setting objectives can be a two-edged blade. While it is essential to predetermine the end uses (and users) for a wetlands inventory, establishing objectives can also help determine methodologies to be used to achieve the desired results.

In some instances the costs of those methodologies may be prohibitively high, necessitating reevaluation of objectives. Inventory methods and techniques must be designed to meet technical requirements. For example, less rigorous inventory procedures might be used if the minimum size wetland included in the inventory is 100 hectares. If however, more intensive survey techniques are used to inventory all wetlands greater than 0.5 hectares, technical methods and costs are major considerations.

Currently the U. S. produces wetland inventory data for 5 percent of the conterminous land area every year. Staff capabilities, and budget constraints determine this pace. Mapping priorities are based principally on the needs of the Fish and Wildlife Service and other Federal and State agencies. High priority areas have included the coastal zone (including the coastline of the Great Lakes), prairie wetlands, playa lakes, floodplains of major rivers and other areas that support the goals of the North American Waterfowl Management Plan. The actual priority of mapping depends on the availability of funds and the existence of good quality aerial photography. Obtaining acceptable photographs for the Prairie Pothole Region has been particularly difficult because of the need to capture optimum water conditions. Consequently, the inventory has established a special agreement with the National Aeronautics and Space Administration to obtain this photography.

The Tunisian inventory was designed to cover the entire country. Following desk studies of relevant data, actual ground truthing was conducted. Functional analyses were made with the objective of

Table 1. Estimated costs of various remote sensing imagery.

TYPE OF IMAGERY	COST (\$ U.S.)	
Black and White aerial photographs (Variable Scales)		\$5-12/frame
Color Infrared aerial photographs (1:40,000-1:70,000 Scale)		\$12-24/frame
Satellite imagery* Landsat, Spot		
	Area (sq. km.)	
Digital		
TM full scene	31,450	3600
TM subscene	10,000	2600
TM quarter scene	7,862	1800
TM miniscene	5,000	2000
Geocoded full scene	31,450	4900
Geocoded quarter scene	7,862	2900
Geocoded map sheet	5,078	2300
MSS	31,450	660
Film		
TM full scene color		
1:1,000,000 film positive	31,450	1000
1:1,000,000 paper	31,450	700
1:500,000 paper	31,450	750
1:250,000 paper	31,450	975
TM quarter scene color		
1:500,000 positive	7,862	750
1:500,000 paper	7,862	570
1:250,000 paper	7,862	650
1:100,000 paper	7,862	850
Specialized imagery such as side-looking airborne radar		Variable
Shuttle imagery/photos		Variable (limited coverage)

* Specifications and prices from Earth Observation Satellite Company, Lanham, MD, U.S.A.

information, and monetary cost. Consequently, an inventory of wetlands can be many things. It may be a listing of sites of national or international importance; it could be a report on the ecological characteristics of wetland types or; a map showing size and location. All of these products are valuable tools. In many instances highly detailed inventory information may not be necessary or desirable given the objectives and monetary constraints.

Additional information on the inventory procedures and techniques used in the U. S. is available by contacting the following:

National Wetlands Inventory
U.S. Fish and Wildlife Service
9720 Executive Center Drive
Suite 101, Monroe Building
St. Petersburg, Florida 33702
U.S.A.

REFERENCES

- Beets, M.L. 1982. A wetland classification system that just might work. In H.A. Stelfox and G.R. Ironside (eds). Proceedings of a technical workshop to discuss the incorporation of wildlife information into ecological land surveys. Land/Wildlife Integration No. 2. Ecological Land Classification Series No. 17. Lands Directorate, Environment Canada.
- Brundtland, G.H. 1987. Our Common Future. Report of the World Commission on Environment and Development. Norway.
- Dahl, T.E. 1985. Use of National Wetlands Inventory data for wetland assessment. In J.A. Kusler and P. Riexinger (eds). Proceedings of the National Wetland Assessment Symposium, Portland, Maine.
- Dugan, P. 1990. Overview Paper for Workshop E: Wise Use. Convention on Wetlands of International Importance Especially as Waterfowl Habitat. Montreux, Switzerland, June 27 - July 4, 1990. 7 pp.
- Haapanen, A. and P. Rassi. 1982. National inventory of wetlands in Finland. In H. Boyd (ed.) First Western Hemisphere Waterfowl and Waterbird Symposium, Proceedings of the International Waterfowl Research Bureau Symposium. Edmonton, Canada. May 1982. pp. 38-44.
- Heliotis, F.D. 1988. An inventory and review of the wetland resources of Greece. Wetlands, Vol. 8.
- Ontario Ministry of Natural Resources and Environment Canada. 1985. An evaluation system for wetlands of Ontario. Second ed. Ottawa.
- Ritter, B. 1990. A comparison of a Landsat Thematic Mapper derived waterfowl habitat inventory to digital National Wetland Inventory data. Open File Report. Ducks' Unlimited, Inc. Long Grove, IL. 17 pp.
- Wilén, B.O. 1984. National Wetlands Inventory Mapping. In A.W. Voss (ed). Remote Sensing and Land Information Systems in the Tennessee Valley Region. Chattanooga, TN.