MONITORING COASTAL WETLAND ACREAGE CHANGES

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Wetland Status and Trends - Background

In 1982, the National Wetlands Inventory completed a study of the status and trends of wetlands and deepwater habitats for the conterminous United States. The study estimated the total acreage of wetlands for the lower 48 States and the rate of change from the mid-1950's to the mid-1970's. This constituted the first comprehensive statistically valid effort to estimate the Nation's wetland acreage. The information generated from that initial report has had a major role in the development of Federal policies and legal mandates regarding wetland conservation.

The Emergency Wetlands Resources Act of 1986 requires updated wetlands status and trends information on a ten year cycle beginning in 1990. The study now in progress is the first national update of the initial study findings and is produced to fulfill those statutory requirements. It will present estimates of wetland acreage by key habitat types for the conterminous United States and estimates the rates of gain or loss between the 1970's and the 1980's. The report, to be generated by September 30, 1990, will present findings on wetland acreage status primarily at the national level. Where statistical reliability permits, some data for regional trends will be presented. The study design is such that, with additional data collection, reliable estimates could be made at the state or regional levels.

Study Design

The design for the national status and trends study was developed by an interagency group of statisticians. Technical aspects of that design have been described by Frayer et al. The sample design for the study consisted of a stratified random sample of 3,629 plots distributed within strata formed by state boundaries and 35 physical subdivisions described by Hammond (1970). Additional strata were added to include a coastal zone stratum encompassing wetlands in coastal areas and a stratum encompassing the Great Lakes. Sample plots were allocated to strata in proportion to the expected amount of wetland acreage as estimated by the earlier work of Shaw and Fredine (1956). Each sample plot was a four square mile area, selected at random within each stratum. U.S. Geological Survey topographic maps, and existing aerial photography (target years mid-1970's and mid-1980's) were acquired and stereoscopically interpreted to determine wetland area in the 1980's and changes between the 1970's and 1980's. All changes were recorded as either natural (e.g.,emergent to shrubs) or man-induced (e.g.,emergent to agriculture). Typically, the imagery used for the 1970's was black and white photography. Conversely, the imagery used for the 1980's was color infrared photography. To reduce errors, rigorous quality control checks were routinely administered.

The mid-1980's photography was interpreted and annotated using the procedures and the classification scheme developed by the National Wetlands Inventory (Table I). Once the interpretation was complete the data were transferred to an overlay on a U.S. Geological Survey

1:24,000 scale topographic map using a zoom transfer scope. Interpreted information from aerial photography from the 1970's was examined using a stereo zoom transfer scope, and changes in wetlands were recorded. Quality control checks were built into the process to prevent false changes from being recorded and to provide confirmation of photo interpretation work. Acreage determinations and data entry provided further quality assurance to the raw plot data. The project is designed to generate statistical estimates on wetland acreage gains or losses and does not provide information on wetland quality.

Results

Analysis of the data is currently in progress. In coastal areas acreage estimates for the following categories will be produced:

- All Estuarine Wetlands
- Estuarine vegetated categories to include those found in Table 1.
- Estuarine non-vegetated categories from Table 1.
- Rate of gain/loss of Estuarine wetlands from the 1970's to the 1980's.
- Indications on the fate of Estuarine categories being converted.

Status and Trends - Future Activities

The U.S. Fish and Wildlife Service has made plans to expand it's monitoring of wetland status and trends beginning in FY 1991.

Specifically the National Wetlands Inventory will undertake the following:

1) Convert the status and trends effort to a continuous monitoring mode.

   The first increments to the continuous process will be coastal areas of South Carolina and Georgia.

2) Intensify status and trends work to determine wetland acreage change in the following priority areas:

   - Atlantic, Gulf Coasts and Shoreline areas of the Great Lakes.
   - Lower Mississippi Alluvial Plain
   - Prairie Pothole Region of the Dakotas and Minnesota

3) Actively seek state and/or Federal cooperators to produce

statewide or regional wetland trend intensification studies.

Table 1. Wetland, deepwater, and upland habitat categories used in determining wetland status and trends.

SALT WATER HABITATS*	COMMON DESCRIPTION
Marine Intertidal	Nearshore
Estuarine Subtidal	Open water/bay bottoms
Estuarine Intertidal Emergents	Salt marsh
Estuarine Intertidal Forested/Shrub	Mangroves or other estuarine shrubs
Estuarine Intertidal Unconsolidated Shore	Beaches/bars/flats
Estuarine Intertidal Unconsolidated Bottom	Floating aquatic or submerged vegetation
Riverine** (may be tidal or non-tidal)	River systems
FRESHWATER HABITATS*	
Palustrine Forested	Forested swamps/bogs
Palustrine Shrub	Shrub wetlands
Palustrine Emergents	Inland marshes/wet meadows
Palustrine Unconsolidated Shore	Beaches/bars/flats
Palustrine Unconsolidated Bottom	Open water ponds
Palustrine Aquatic Bed	Floating aquatic or submerged vegetation
Lacustrine**	Lakes/reservoirs
UPLAND LAND USE	
Agriculture	Crop producing agriculture/pasture
Urban	Built-up/developments
Other Uplands	Areas not included in the agriculture or urban land use categories

* Adapted from Cowardin et al. (1979)
** Deepwater habitats