Wetland Functions and Values

Function vs. Value
- Value: Human perception of the worthiness of that function.

Wetland Functions
- ABIOTIC
  - Flood Mitigation
  - Storm Abatement
  - Aquifer Recharge
  - Water Quality
    - Nutrient Retention
    - Sediment Trapping
  - Bank Stabilization
- BIOTIC
  - Wildlife Habitat
  - Aquatic Habitat
  - Downstream /In-Basin Food Chain Support
- HUMAN
  - Active Recreation
  - Passive Recreation
  - Resource Harvests
General Effects on Stream Flow

Flood Storage

General Effects on Flooding
Water Quality Improvement

Nutrient Removal  Chemical Detoxification  Sediment Trapping

Bank Stabilization/Erosion Control

Wildlife Habitat

Amphibians and Reptiles  Mammals  Birds
Habitat Provided by Prairie Potholes

![Graph showing ducks and ponds over years](image)

Figure 15-5. Estimated number of total ducks and ponds in May in prairie pothole region, 1953-1983. (From Bell et al., 1989; copyright © 1989 by Iowa State University Press, reprinted with permission.)

Rare Species Associated with Wetlands

<table>
<thead>
<tr>
<th>TAXON</th>
<th>NUMBER SPECIES ENDANGERED</th>
<th>NUMBER SPECIES THREATENED</th>
<th>% U.S. TOTAL THREATENED OR ENDANGERED</th>
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<td>TOTAL</td>
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General Functions of Estuarine Wetlands

![Diagram of estuarine wetlands](image)

Figure 6-4. Fish and shellfish, as well as freshwater fishes can be classified into four groups: freshwater, estuarine, anadromous and catadromous, and estuarine marine.
Relationship Between Wetlands and Fish Harvest

Figure 15-3. Relationships between wetland age and fish harvest. The line of best fit describes the area of about 60 high yield. These fisheries are managed pools in Catcheshine River. African fisheries can harvest to 30% of fish potential. Wetlands (1998) and Williams (1997) are generally less than high productivity ecosystems. Other Turner, 1997.

General Functions of Riparian Wetlands

Aquatic Habitat

Overhanging trees and shrubs offer shade for fish habitat.
Food Chain Support

Passive Wetland Use

Recreation
Difficulty with Wetland Evaluations

- Multiple Values
- Public Values vs. Commercial
- Values in Relation to Uplands (Mosaic)
- Long-Term
- Biased by Society

Wetland Evaluation Methods

- Habitat Evaluation Procedure (HEP) - U.S. Fish and Wildlife Service
- Wetland Evaluation Technique (WET) - Federal Highway Administration
- Hydrogeomorphic Approach (HGM) - U.S. Army Corps of Engineers
- Economic Approach
  - willingness to pay
  - replacement costs

Habitat Evaluation Procedure (HEP)

- US Fish and Wildlife Service
- Objectives
  - Quantitatively Assess Existing Habitat Condition
  - Predict Impacts
  - Compare Alternatives
  - Consensus Effort
- Value of Habitat
  - Habitat Suitability Indices (HSI) - relate to carry capacity
  - Evaluation Species
    - 4 - 6 Species
    - Representative of Guild/Niche With Models
  - Suitability Indices (0 - 1)
    - Cover Requirements
    - Minimum Habitat Area
    - Food
    - Water
  - Data Collection
    - Calculation of HSI
HEP (cont.)

- **Value of Study Area**
  - Habitat Units = HSI * Area

- **Years of Analyses**
  - Baseline
  - Intermediate
  - Life of Project

- **Impact Assessment**
  - Average Annual Habitat Units (with and without project)

- **Mitigation**

HEP Model

HEP Suitability Indices
HGM Computations

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<th>Variables</th>
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<th>After</th>
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</table>

Output:

1.1

HGM Output

Table of results...