



THE UNIVERSITY  
*of* NORTH CAROLINA  
at CHAPEL HILL

- I. Features, Functions, Services, Values**
- 2. Bergstrom Wetland Case Study**

**Wetland Assessment**

Todd BenDor

[bendor@unc.edu](mailto:bendor@unc.edu)

Wuhan 2017

# Wetland Functions and Services

## Functions

1. Hydrologic flux and storage
2. Biological productivity
3. Biogeochemical cycling and storage
4. Decomposition
5. Wildlife habitat

## Examples of Services

- Flood control & storage (1, 2)
- Waste water treatment (3, 2)
- Runoff Nutrient removal (3, 2)
- Open space (1, 2, 5)
- Medical (5, 4)
- Education & research (1-5)
- Food production (2, 5)

Source: Richardson (1995)



# General Principles of Wetland Evaluations

- All wetlands are not of equal function and value.
- Wetland functions and values are coupled to other systems.
- Wetlands often provide functions and values beyond their boundaries.



# Wetland Evaluation Methods

- Over 200 wetland evaluation methodologies
- Most common
  - WET (US Army Corps of Engineers)
    - <http://water.usgs.gov/nwsum/WSP2425/functions.html>
  - HEP (Habitat Evaluation Procedure)
    - <http://www.fws.gov/policy/esmindex.html>
  - Wisconsin Department of Natural Resources
    - <http://dnr.wi.gov/topic/wetlands/methods.html>
- North Carolina Division of Water Quality
  - Flowchart technique
  - Boolean calculator

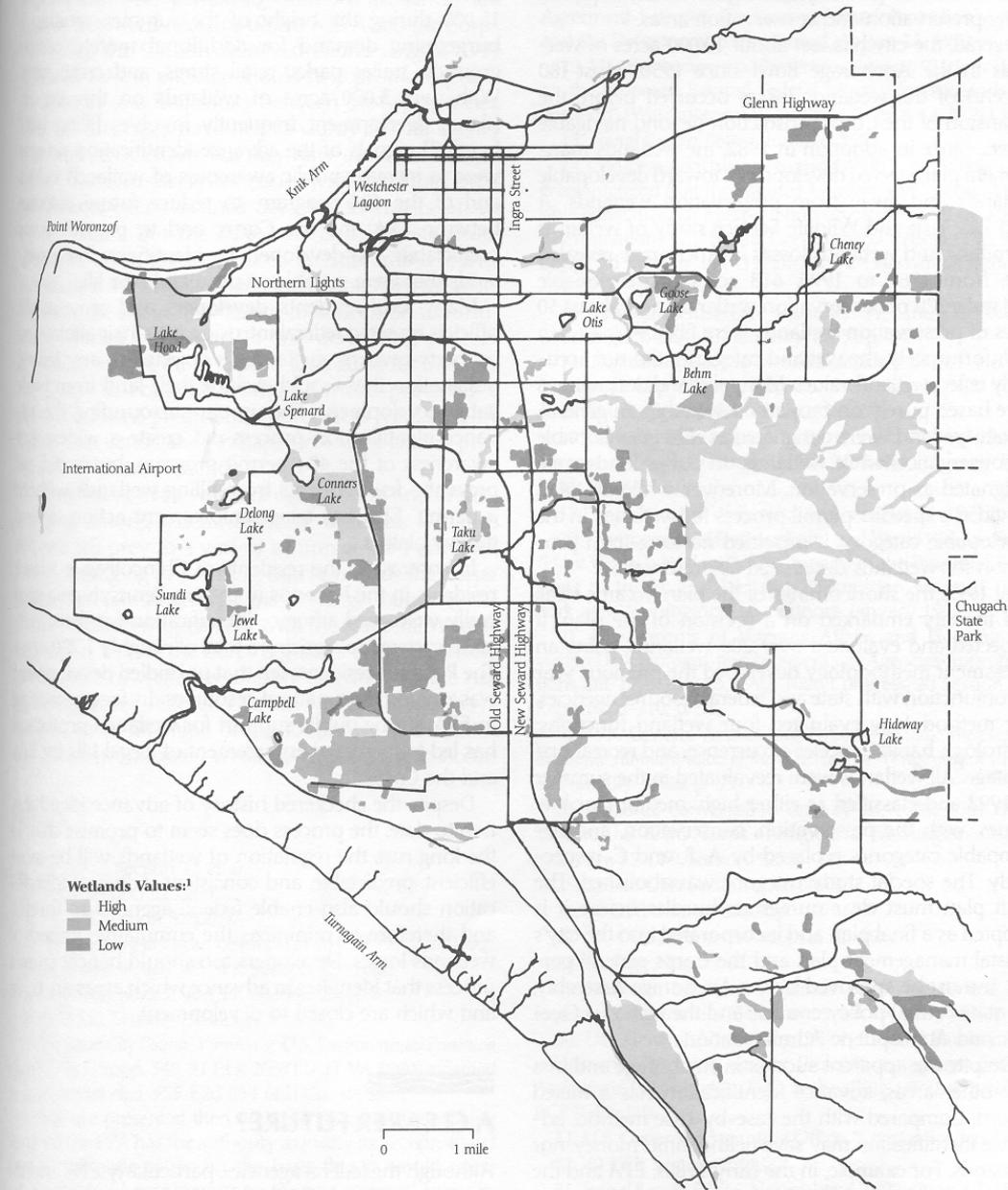


- What are the advantages of wetland evaluation over case-by-case permitting?



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

Figure 3.2  
CLASSIFICATION OF WETLANDS IN ANCHORAGE, ALASKA (ANCHORAGE BOWL)



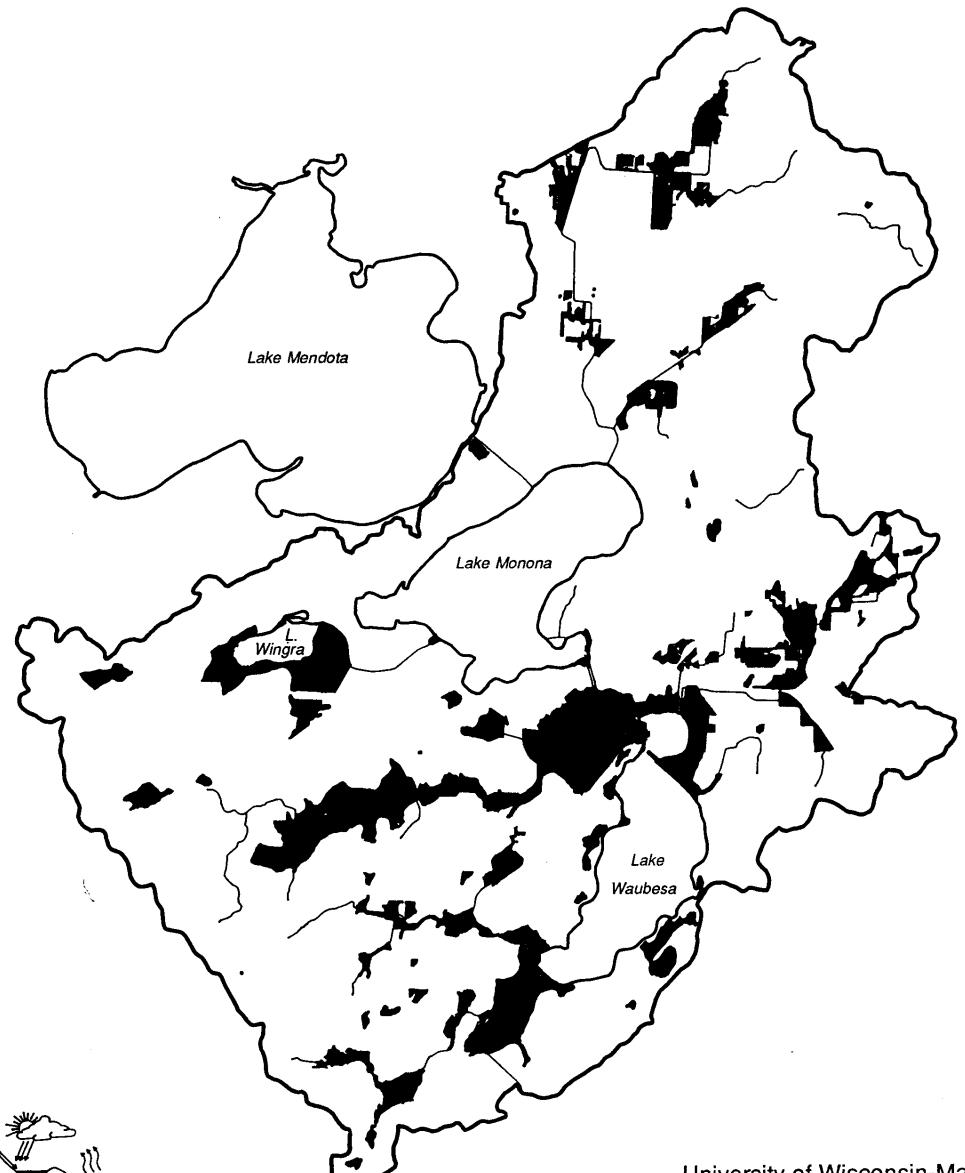
<sup>1</sup> See p. 52 for discussion.

Source: Municipality of Anchorage, Department of Community Planning and Development, "Anchorage Wetlands Management Plan Revision, Public Hearing Draft" (Anchorage: author, July 1995).

# Wisconsin's Evaluation Checklist

## 9 Functions (54 items)

- A. Fauna
- B. Flora
- C. Corridor/Contiguity with other open spaces
- D. Flood storage/sediment trapping potential
- E. Nutrient trapping
- F. Aesthetic/scenic beauty
- G. Shoreline anchoring/erosion dissipation
- H. Groundwater recharge and discharge
- I. Special features

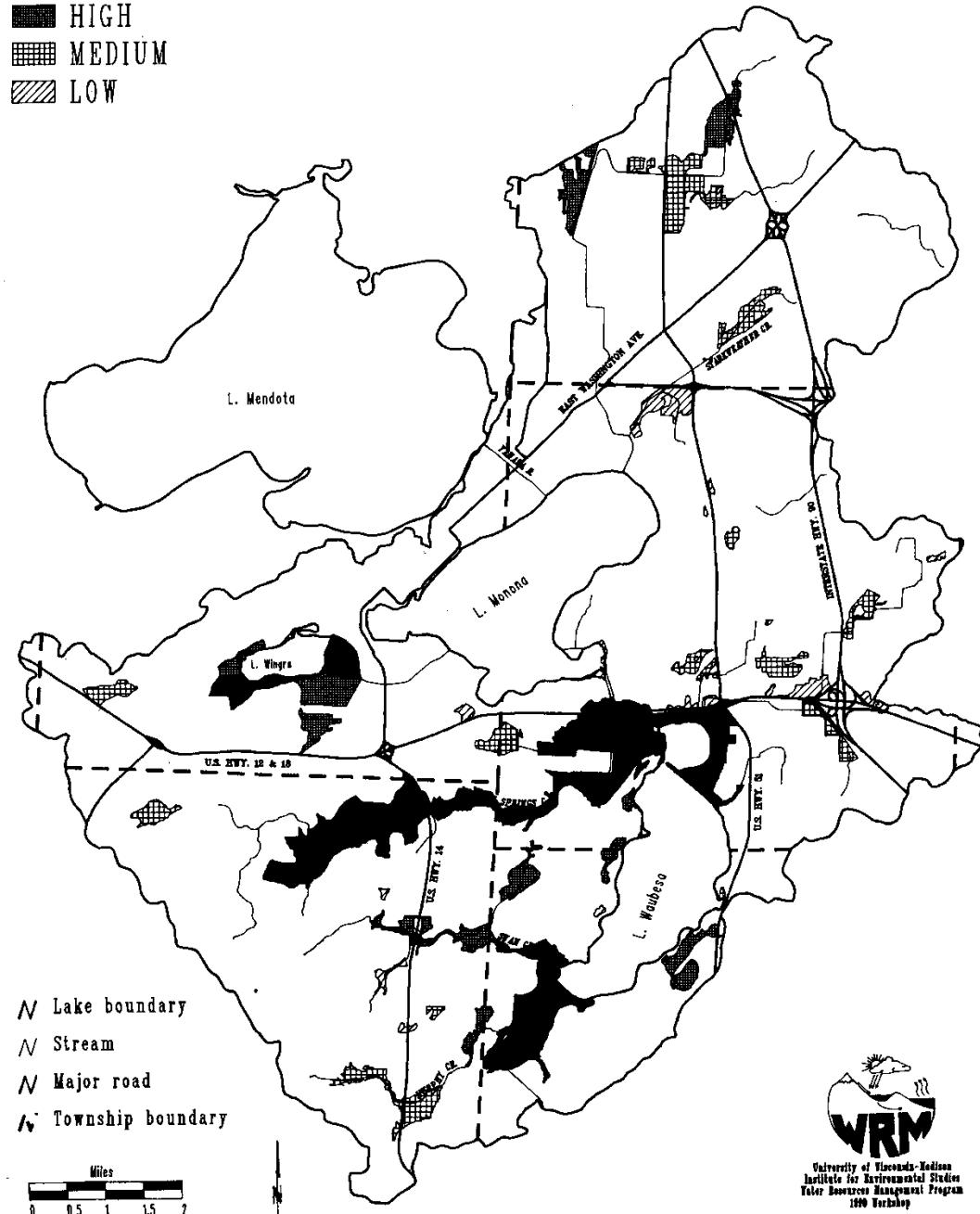


# 3 Items for Contiguous Corridor Potential

1. Does wetland maintain continuous stretch of undeveloped area?
2. Are there other wetlands within this undeveloped zone?
3. Overall Total: Based answers to 1 and 2, is wetland located in existing, planned or potential greenway, corridor, buffer, or open space zone to a low, medium, high, or exceptional degree?

Corridor Contiguity Functional Class

- EXCELLENT
- HIGH
- MEDIUM
- LOW



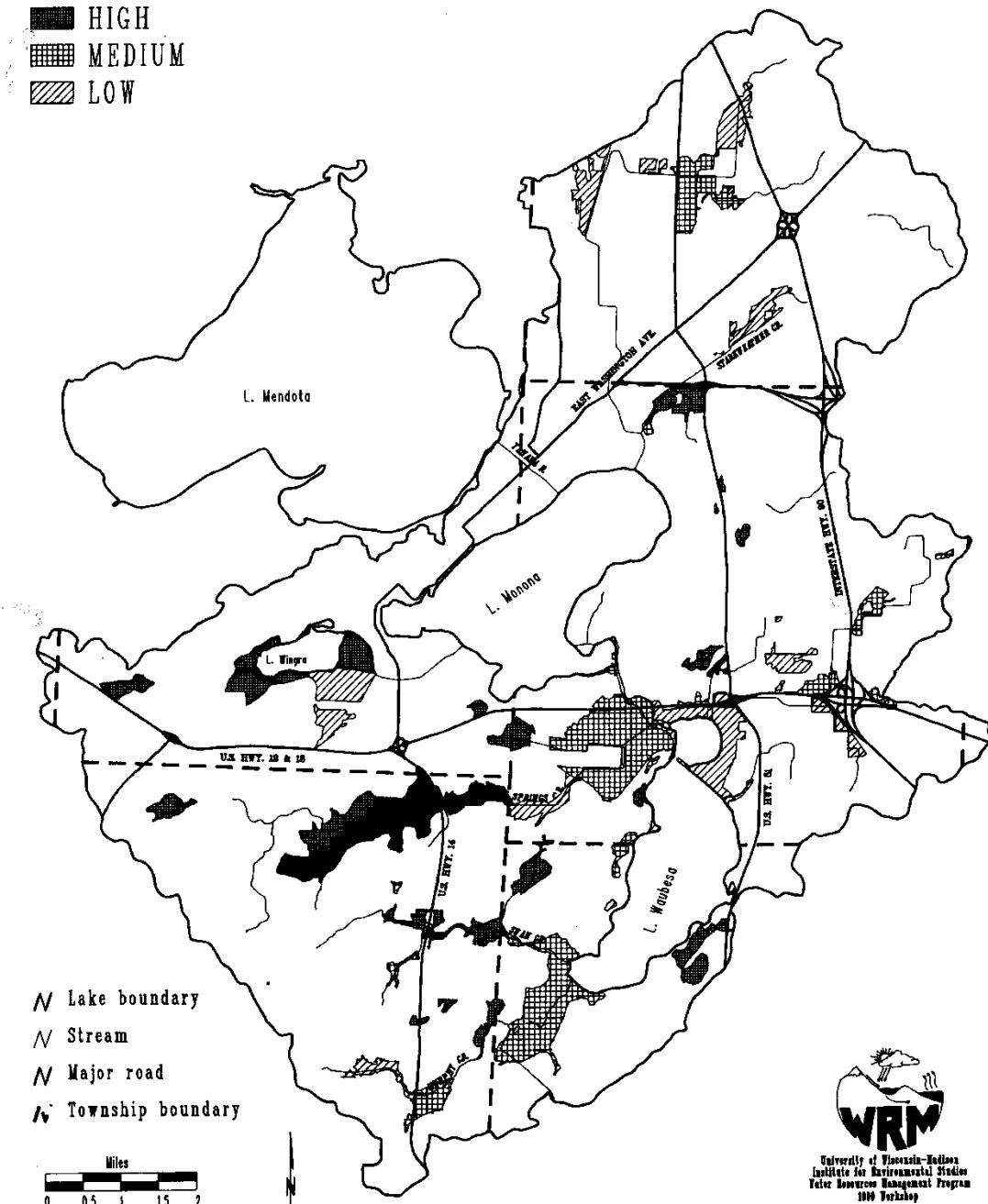
THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

# 8 Items for Flood Storage Potential

1. What are the land uses within watershed?  
(industrial, commercial, residential, farm, forest, grassed, etc.)
2. Are steep slopes, highly erodible soils or large impervious areas within watershed?
3. Does the wetland significantly reduce run-off velocity because of its size or vegetation type and density?
4. Does wetland show evidence of flashy water-level responses to storm events?
5. **Overall Total:** Based on your answers above, does the wetland provide, low, medium, high, or exceptional flood storage potential and/or sediment trapping capacity?

Flood Storage Functional Class

- EXCELLENT
- HIGH
- MEDIUM
- LOW



THE UNIVERSITY  
of NORTH CAROLINA  
at CHAPEL HILL

# NC's Evaluation Flowcharts

- Flowchart for each of 6 criteria (weights)
  - Water storage (4)
  - Bank/shoreline stabilization (4)
  - Pollutant removal (5)
  - Wildlife habitat (4)
  - Aquatic life value (1)
  - Recreation and education (?)
  - <https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-quality-program-development/ncwam-manual>



# Instructions using flowcharts

The charts are designed so that each horizontal row has a number of choices that are arranged in columns. Each column represents a different factor that is important for that particular value. In some cases the evaluator may reach a point on the chart where the wetland does not meet the criteria stated but meets all of the previous criteria. At this point, the evaluator should:

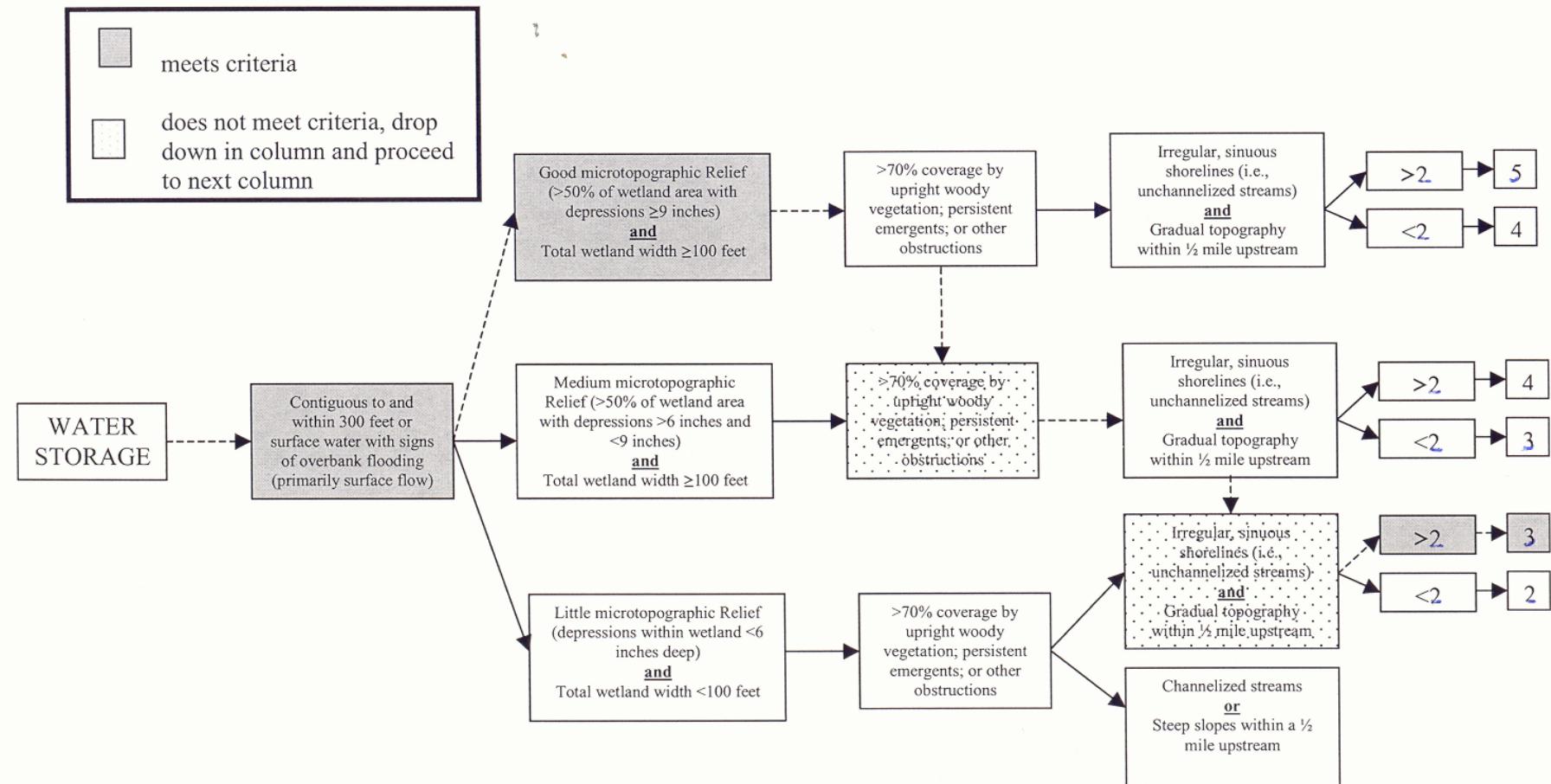
- 1) drop to the next lowest box within the same column;
- 2) ignore the description within this box and follow the arrows to the next column;
- 3) select the description which best represents the wetland being evaluated; and
- 4) continue on the new level until another criterion is not met or a rating is reached.



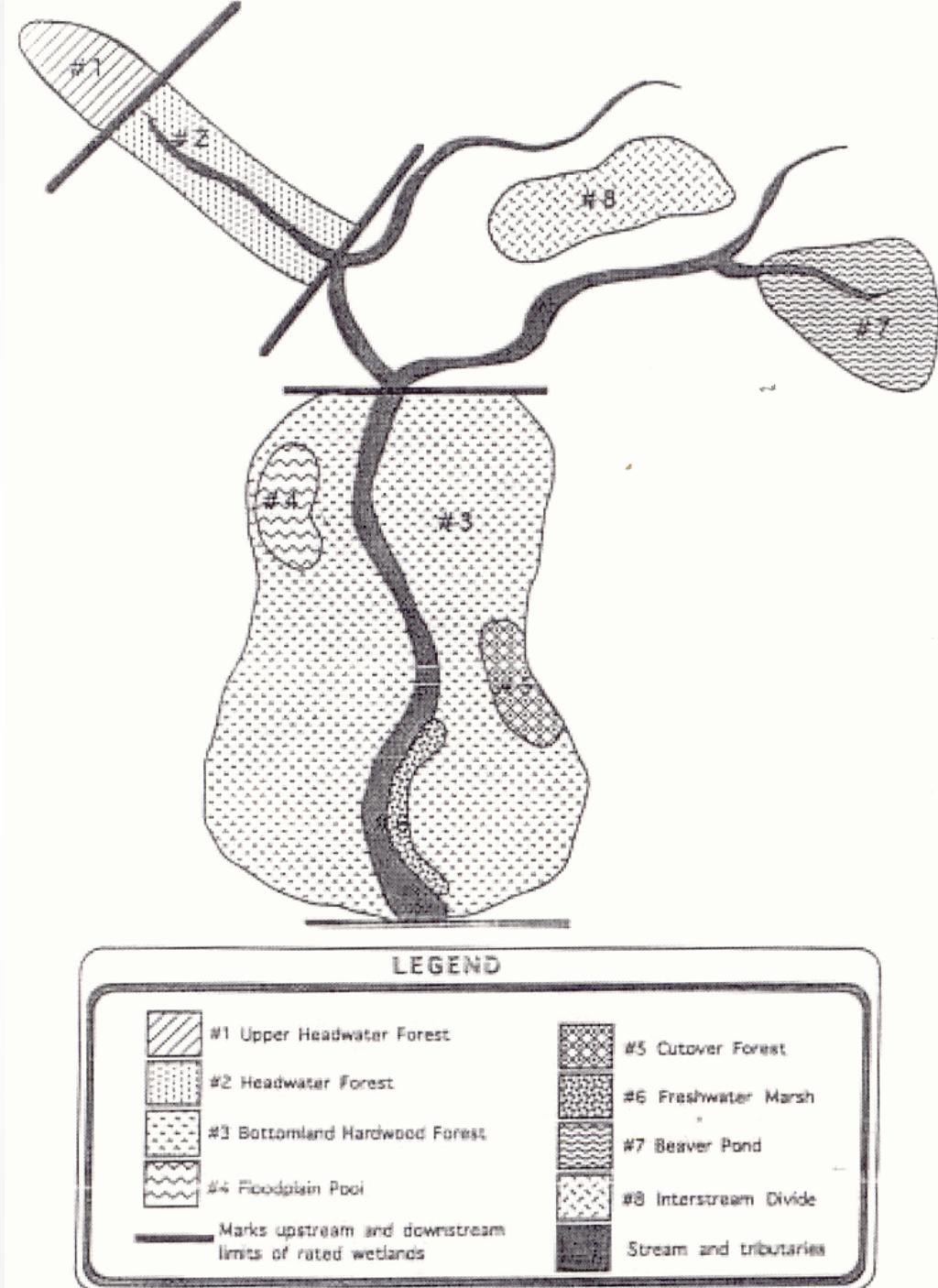
## EXAMPLE

A wetland with the following characteristics would receive a score of 3 for water storage (follow the dashed arrows):

- 1) Contiguous to and within 300 feet of surface water with signs of overbank flooding;
- 2) Good microtopographic relief and wetland width  $\geq 50$  feet;
- 3)  $<70\%$  coverage by upright, woody vegetation;
- 4) Channelized streams or steep slopes within  $\frac{1}{2}$  mile upstream;
- 5)  $\geq 2$  acres in size.



- Boundaries for wetland evaluations with varying types of wetlands



# Bergstrom Wetland Case Study



THE UNIVERSITY  
*of* NORTH CAROLINA  
at CHAPEL HILL