

# Biological Assessment Methods for Birds

Christopher Swarth  
Jug Bay Wetlands Sanctuary  
Lothian, Maryland

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## Why Survey Birds?

- Presence or absence of birds provides information about wetland health.
- Bird presence can reveal the integrity of a wetland and the surrounding watershed.
- Birds are relatively conspicuous and are easy to survey.
- The public has a great interest in birds.

## Advantages of Using Birds as Environmental Indicators

- Longer life spans than most bioindicators.
- Some species accumulate toxic substances.
- Many well-established survey protocols exist.
- Extensive data-bases are available on trends, habitat needs and geographical distribution.
- Experienced birders are often available to assist in surveys.

## Disadvantages of Using Birds as Environmental Indicators

- Often absent from wetlands in winter.
- Mobility means they can travel between wetlands.
- Not all individuals present in the breeding season may actually nest locally.
- Non-systematic biases in detection exist.
- Human disturbance can affect wetland use.

## Index of Biological Integrity

### What Can a Bird IBI Tell Us?

- Relative condition of a wetland
- Integrative information
- Population trends
- Protection priorities
- Progress of a restoration project

## What Does a Bird IBI Estimate?

Birds are sensitive to these conditions:

- Vegetation extent and patterns
- Water extent, depth, and seasonal duration
- Salinity
- Water quality (DO, temp., nutrient & sedimentation loads)
- Human disturbances (roads, paths, pets, etc.)

## Developing an IBI

### 1. Wetland Classification

- Classify your wetlands based on Cowardin (NWI maps) or Brinson (HGM).
- Restrict bird surveys to one class of wetland. This constrains the natural variation that exists among different types of wetlands.

## Developing an IBI

### 2. Identify Survey Sites

- Choose 5-10 sites that appear to be “most altered”; 5-10 sites that are “least altered”; and 5-10 sites that are intermediate.
- Survey sites must be accessible.
- Collect survey data pre- and post-alteration, if appropriate.
- Identify existing sources of bird data.

Survey sites must fall in three categories  
along a continuum of human alteration\*

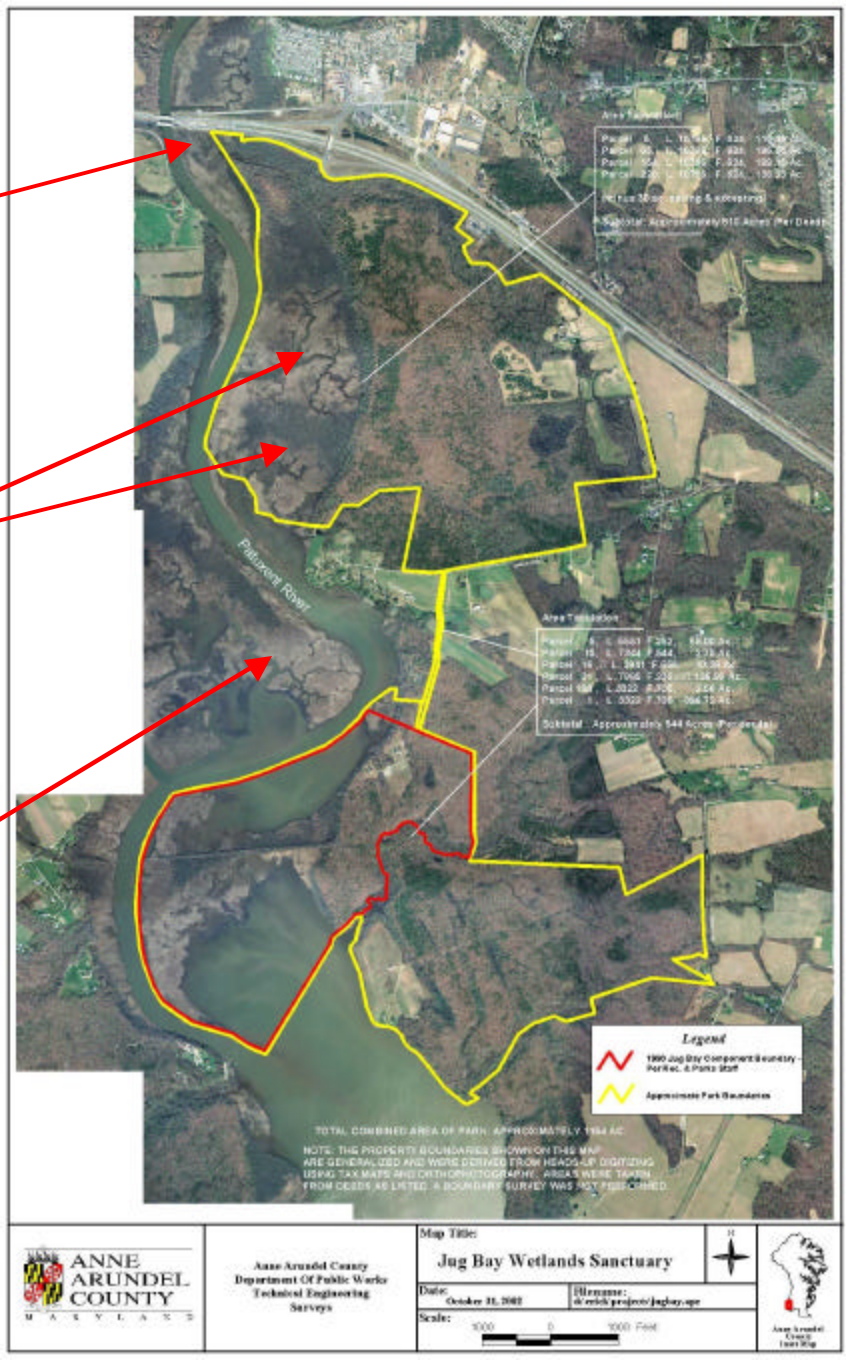


\* choices are somewhat subjective

“Most-altered” site

Intermediate sites

“Least-altered” site





“Most-altered”  
site



“Least-altered”  
site

## Developing an IBI

### 3. Conduct Equal-effort Bird Surveys

- Area searches
  - direct counts: all species **seen** are counted
  - use where visibility is not limited or obstructed
    - open water
    - mudflats and shorelines
    - short grass flats
- Point counts
  - all species **seen** or **heard** are counted
  - use where visibility is limited by vegetation

## Area Searches

- Best suited for waterbirds; not songbirds.
- Use binoculars and spotting scope.
- Counts made from fixed points with unobstructed view.
- Can be done on foot, by boat or by airplane.
- Census time and duration must be recorded.
- Regular, multiple censuses are advantageous.



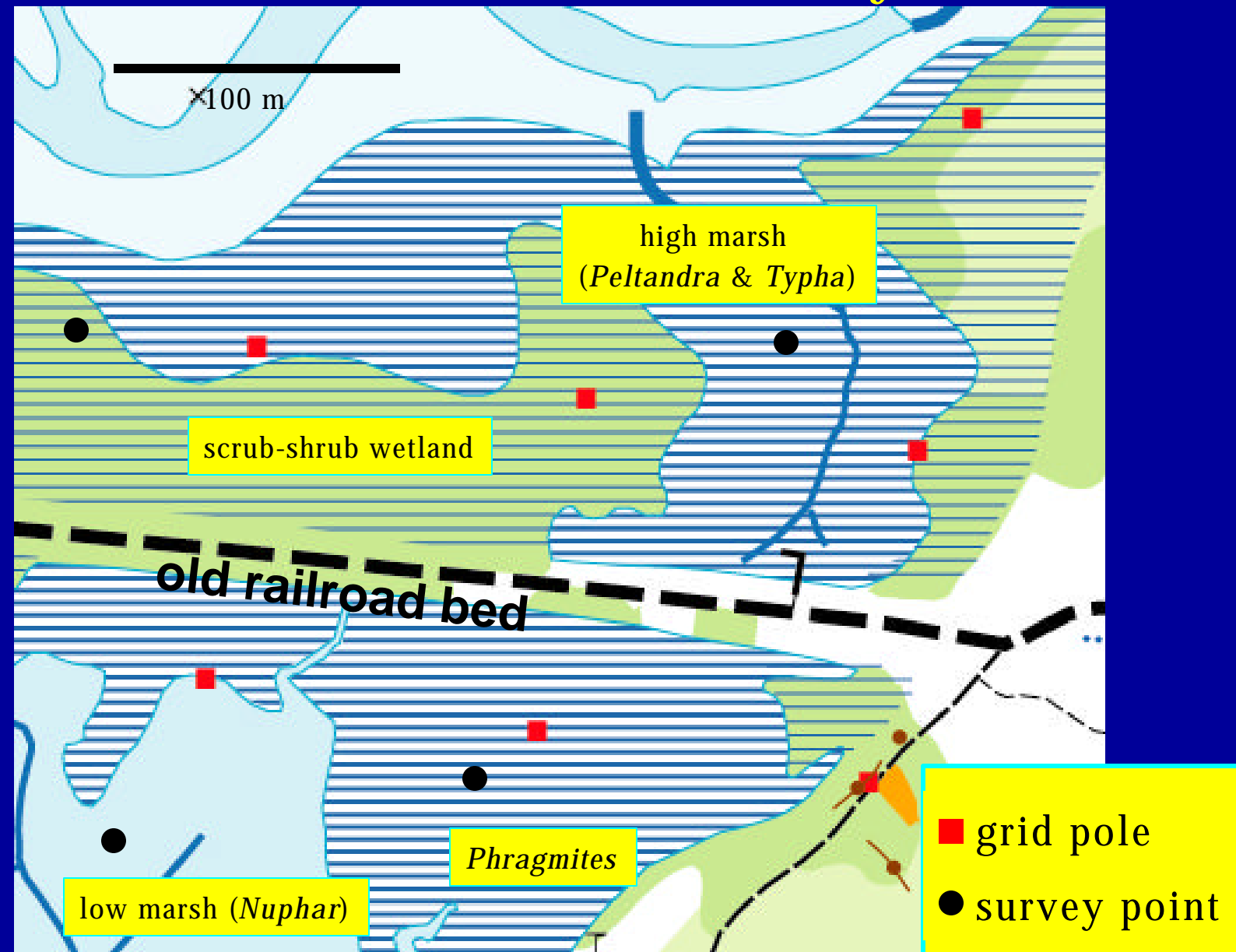




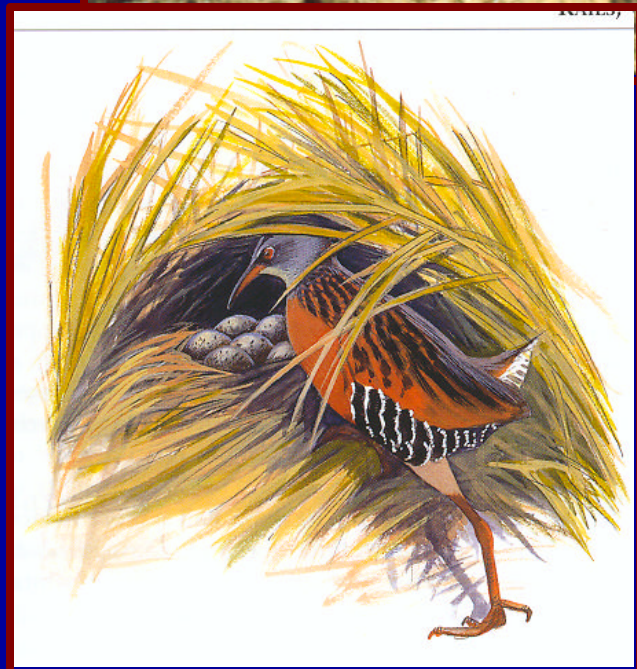
## Point Counts

- Best suited for songbirds.
- Use binoculars only.
- Birders must be proficient at calls and songs.
- Counts also made from fixed points.
- Space points at least 200 m apart.
- Surveys should take place in the morning.
- Transects may be used.
- Tally all birds seen or heard for 5 minutes.
- Number of points depends on wetland size.

## Location of Point Count Survey Points





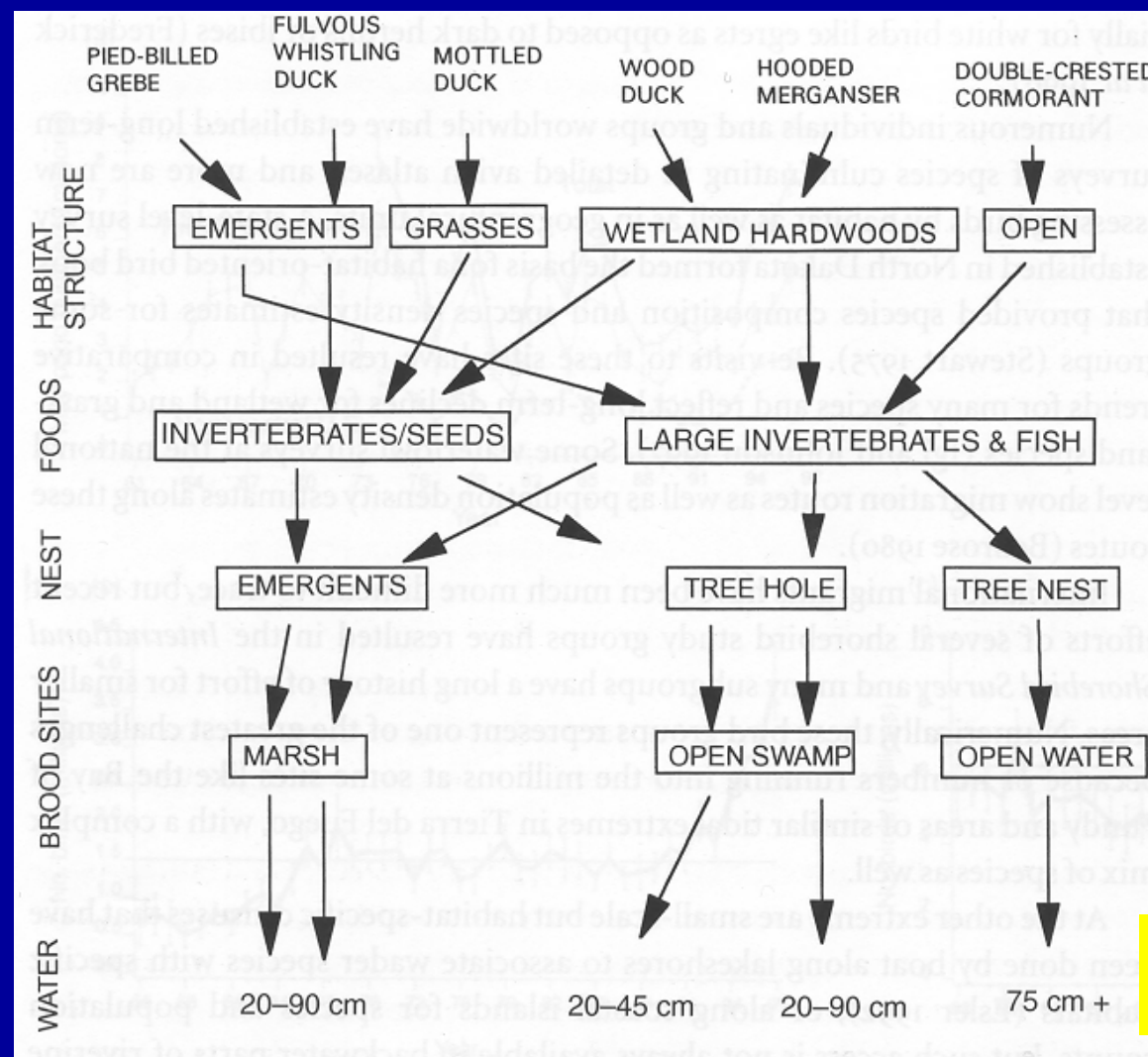


## Developing an IBI

### 4. Estimate the Extent of Bird Habitat

- Permanent water
- Riparian woody vegetation
- Adjacent agricultural fields and meadows
- Proximity of similar wetlands
- Cumulative length of roads, streams & ditches
- Presence of fish & invertebrates
- Number of nearby dwellings

# Influence of Habitat Resources on Swimming Waterbirds



from, Wetland Birds  
by M.W. Weller

## Developing an IBI

### 5. Identify Bird Groups

- From field survey data, compare attributes of species or species-groups that are common or exclusive to the least-altered or most-altered wetland sites.
- Keep attributes simple: presence-absence, etc.
- Examine the proportional distribution (evenness) of species.

## Developing an IBI

### 6. Create Metrics

- Metrics are attributes that change along a gradient of human disturbance.
- Form “species groups” and pool survey data from these groups to create metrics.
- Examine metric characteristics to avoid biases caused by inherent wetland characteristics like moisture content, size or canopy closure.

## Examples of Wetland Bird Metrics

Attribute	Relationship to Environmental Degradation
% of neotropical migrants	Decreases
% of regionally rare species	Decreases
Species that feed on SAVs	Decreases
% of species that are also on > 90% of BBS routes	Increases
Proportional abundance of 3 most abundant species	Increases
Proportional abundance of starlings and blackbirds	Increases

## Developing an IBI

### 7. Data Analysis & Verification

- Verify that habitat alteration categories - not wetland habitat features - are associated with apparent affinity of some birds for the least- or most-altered sites.
- If no species or species group exhibit regular affinity for end-member sites, more sites may need to be surveyed.

## Developing an IBI

### 8. Combine Metrics into the IBI

- Standardize metrics.
- Combine at least 6 metrics into an index.
- Experiment by creating simple formulas.
- All metrics should reflect human disturbance.
- Metrics do not need to be interrelated.
- Identify the most sensitive and accurate indices.