Bioassessment - Wetlands Program

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Overview

- Historical Overview of Wetland Bioassessment in OK
- Current efforts
- Future endeavors

MEASURING HUMAN IMPACTS:

- biological indicator: groups or types of biological resources that can be used to assess environmental condition.
- biological monitoring: the study of organisms and their responses to environmental condition
- biological assessment: an evaluation of the biological condition of a water body using biological monitoring data and other direct measurements of resident biota in surface waters

Biological Integrity

"the ability to support and maintain a balanced, integrated, and adaptive community of organisms having a species composition, diversity, and functional organization comparable to those of natural habitats within a region" †

†(Karr,1981)

Wetland Bioassesment - Types

- Macroinvertebrate Index of Biotic Integrity (MIBI)
- Vegetation Index of Biotic Integrity (VIBI)
- Floristic Quality Assessment

History of Wetland Bioassessment Efforts in OK

- Level 3 Wetland Assessment
  - Oxbow System Assessment
  - Floristic Quality Assessment
  - The developing Oklahoma Rapid Assessment Method for Wetlands (OKRAM)
  - National Wetland Condition Assessment

Oxbow System Assessment and Protocol Development

- Joint project with OSU, OCC, and OWRB
- MIBI – seems to have demonstrated that seemingly healthy oxbows would be deemed impaired based on currently accepted stream and lake metrics
  - Current IBIs do not clearly agree with Level 1 assessments (landscape/landuse) and water quality assessments

Oxbow System Assessment and Protocol Development

- Some states have developed wetland specific MIBIs
  - Difficult to develop due to wetlands natural stressful environment
  - Oklahoma may prove especially difficult due to landscape/ecoregion variation (temporal and spatial variability)

Floristic Quality Assessment

- Joint effort between OCC and Dr. Bruce Hoagland of OU – Dr. Hoagland as PI
- Vegetation-based ecological assessment approach
  - Based on the Coefficient of Conservatism (C)
    - A numerical rating (0-10) of an individual plant species' fidelity to specific habitats and tolerance to disturbance

Floristic Quality Assessment

- Similar to IBI's
  - Have been found to be effective indicators of wetland quality
- Components can be used in other assessment efforts

OKRAM

- Joint project – OSU, OCC, and OWRB
- OSU lead in development/refinement, application, verification, and validation with consultation from OCC and OWRB, as well as the Oklahoma Wetland Technical Work Group

OKRAM

- Rapid assessment method for monitoring the conditions of wetlands
  - level 2 effort
- Can be used as a tool to assess the performance of compensatory mitigation and restoration projects

OKRAM

- Development Phase
  - definition phase;
  - basic design phase;
  - verification phase;
  - validation phase.
    - Utilizes level 3 (intensive site data)
      - Water quality
      - Macroinvertebrate
      - Vegetation

National Wetland Condition Assessment (NWCA)

- Portion of the National Aquatic Resource Survey (NARS)
- Incorporates a vegetation component
- Assists in method development
- Random sites across the nation
  - 2011 – 12 sites and 2 revisits in OK
  - 2016 – 17 sites and 2 revisits in OK

Future Endeavors

- Continue to explore uses of the FQA
- Continue the development/refinement and validation of the OKRAM
- Explore additional bioassessment opportunities
- Utilize bioassessment tools to confirm reference sites/conditions

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