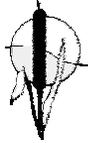


# Environmental Considerations for Wind Farm Locations

By Peter J. Kailing, Project Manager

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## Purpose of the Study

“Preliminary Environmental Study”

or

“Fatal Flaw Analysis”

Long Definition: “*an analysis of the project area environmental features to determine whether or not any exist that might hinder or prevent construction of the proposed facility*”

Short Definition: “*do we have a show stopper?*”

## **KME Involvement**

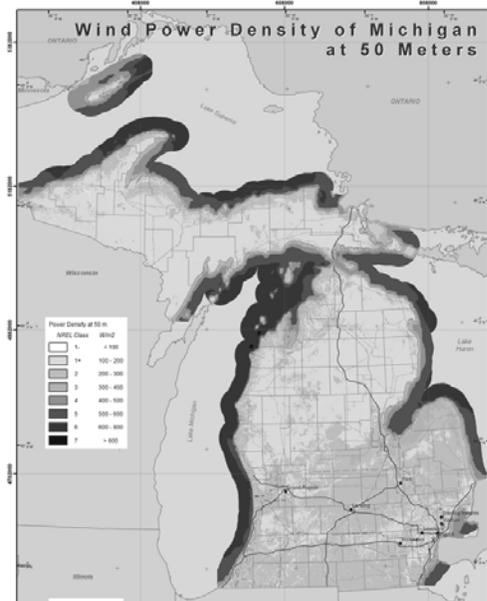
- T & E Surveys
- Client base (e.g., energy providers, mines, etc.)
- Regulatory expertise (state, federal, FERC, NEPA)



## **Assumptions Made**

- Wind developer has already identified one or more potential locations based upon wind availability

## Wind Availability



## Assumptions Made

- Wind developer has already identified one or more potential locations based upon wind availability
- Access to grid and agreements to sell/produce electricity available
- Zoning appropriate for facility construction
- General turbine size, array known
- Site may be a few acres or hundreds of square miles

## **Geology, Soils, Topography**

- **Earth quakes**
- **Subsidence from mining, natural formations**
- **Unstable soils (e.g. organic)**
- **Protected soils (e.g. prime farmland)**
- **Contaminated soils**
- **Flood zones, floodplains**
- **Historical significance**
- **other**

## **Water & Wetland Resources**

- **Groundwater: contaminated (e.g. dewatering needed for turbine footers)**
- **Surface water: lakes or streams (e.g. permits for impacting surface waters, fill roads, foundations)**
- **Wetlands: impacts from building, maintaining or accessing construction sites**
- **Rare aquatic species habitat**

## **Threatened & Endangered Species**

- **Check existing sources for known occurrences**
  - MNFI (includes MI and federal spp.)
  - Michigan Breeding Bird Atlas
  - Local agency field staff (DNR,FWS)
- **Check for project area and surrounding adjacent areas**
- **Impacts from Construction**
- **Impacts from Operation of facility**

## **Primary Concerns: Birds and Bats**

- **Assess project area for habitat features**
  - Known migration pathways, shoreline, mountain passes, wooded mountains
  - bat hibernacula
  - breeding, loafing feeding habitat
  - IBAs (important Bird Areas)
- **Review existing wind facilities in similar habitats in Michigan: or other Great Lake states.**
- **Design and conduct appropriate survey for species that may occur in the project area.**
- **Utilize findings to design facility to minimize impacts**

## **Existing Land Use in Project Area**

- **Rural/Agriculture: is the wind facility compatible?**
  - Construction sequencing interference
  - “foot print” of turbines acceptable
  - Wiring between towers: buried or above
  - Crop dusting, aerial seeding
  - Tax credit, open space, CRP,
  - Grid availability
  - Road system suitable for heavy trucks

## **Forested & Natural Areas**

- **Impacts to wooded areas (esp. on wooded hills, bats)**
- **Public Lands adjacent to project area (resulting in facility review):**
  - State
  - USFS,
  - Natl. Wildlife Refuges
  - National Parks
  - Scenic Rivers,
  - Historical Sites: (Federal, State , Local)

## **Urban Areas**

- **Existing airports, flight paths**
- **Proposed airport expansions**
- **Existing stationary towers**
  - **Cell phones**
  - **Microwave**
  - **Secure systems**
  - **FAA concerns**
  - **Michigan Tall Structures Act**

## **Aesthetic Considerations**

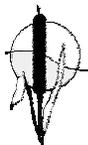
- **What is a “view shed?”**
- **“the entire area an individual can see from a given point”.**
- **“Beauty is in the eye of the beholder” some people love the look of wind turbines, other don’t.**
- **Public perception and acceptance**
- **Visual concerns**
- **Noise concerns**

## **Aesthetic Considerations**

- **Minimize Visual Impacts**
  - Minimal tower lighting per FAA regs
  - Paint gray or off white to blend with skyline
  - Minimize commercial advertising
  - Generous set-back requirements from existing buildings, roads, other rights-of ways.
  - Improved turbine designs to minimize noise and visual impacts

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