Vesper Sparrow
Pooecetes gramineus

Western Meadowlark
Sturnella neglecta

Killdeer
Charadrius vociferous

Generalist species

USGS

Northern Pintail
Anas acuta

Blue-winged Teal
Spatula discors

Northern Shoveler
Spatula clypeata

Gadwall
Mareca strepera

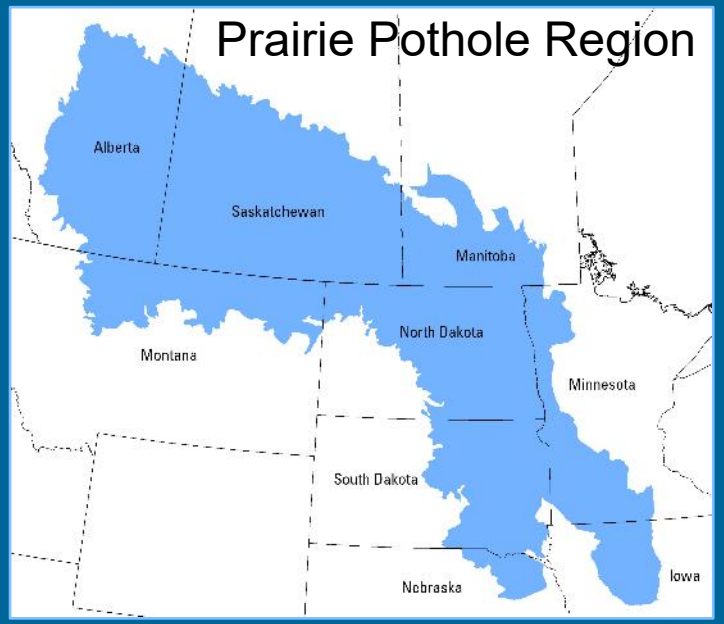
Mallard
Anas platyrhynchos

Tool 2: Series of 4 PowerPoint Tutorials

Each PowerPoint explores a specific aspect of behavioral displacement

1

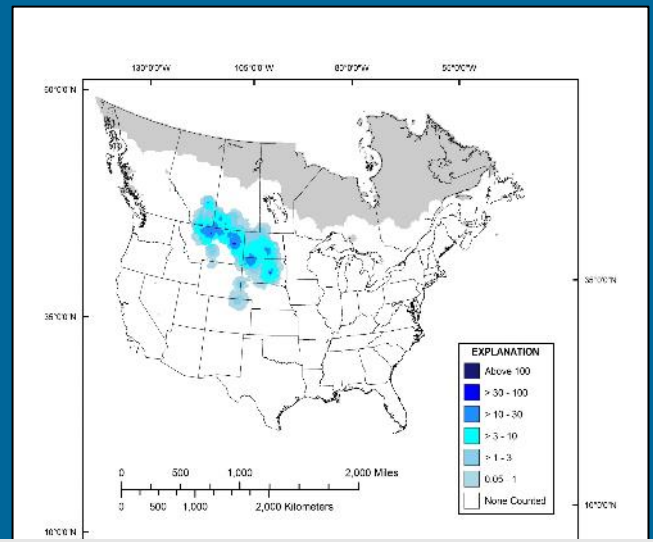
Importance of ecoregion to grassland birds and waterfowl



Species Status

Importance

Population Trends



Chestnut-collared Longspur
Grassland-obligate
PPR-specialist

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2

- Study Design
- Field Methods
- Definitions & Analysis
- Detailed Results

Shaffer, J.A., and Buhl, D.A., 2016. Effects of wind-energy facilities on breeding grassland bird distributions. Conservation Biology 30: 59–71.

Loesch, C.R., Walker, J.A., Reynolds, R.E., Gleason, J.S., Niemuth, N.D., Stephens, S.E., and Erickson, M.A., 2013. Effect of wind energy development on breeding duck density in the Prairie Pothole Region. Journal of Wildlife Management 77: 587–598.

USGS

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2

- Study Design

Before-After, Control-Impact

Before: Conduct bird surveys in areas where wind turbines will be constructed, before they are constructed

After: Conduct surveys in the same locations in the years after construction

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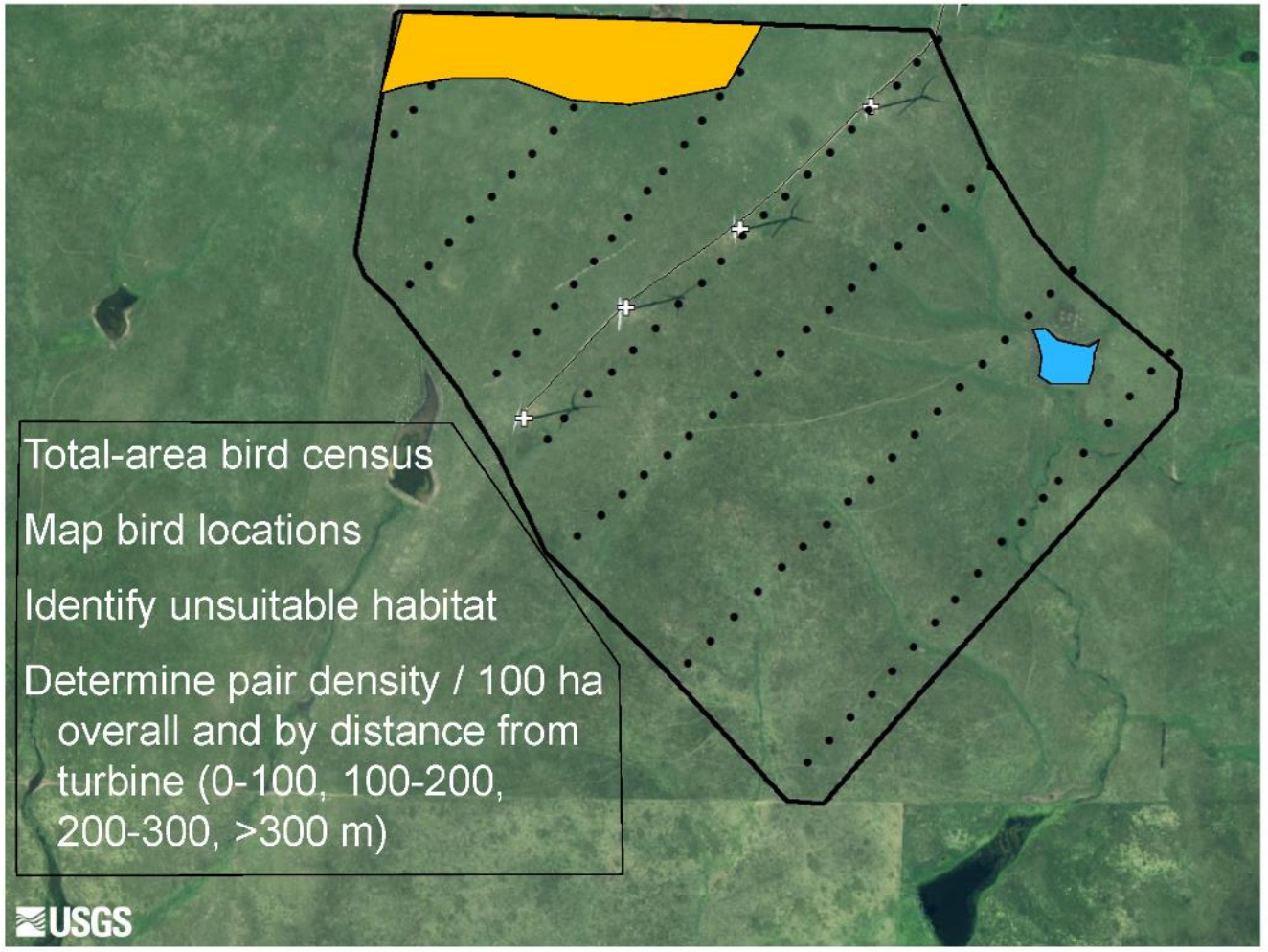
2

- Field Methods



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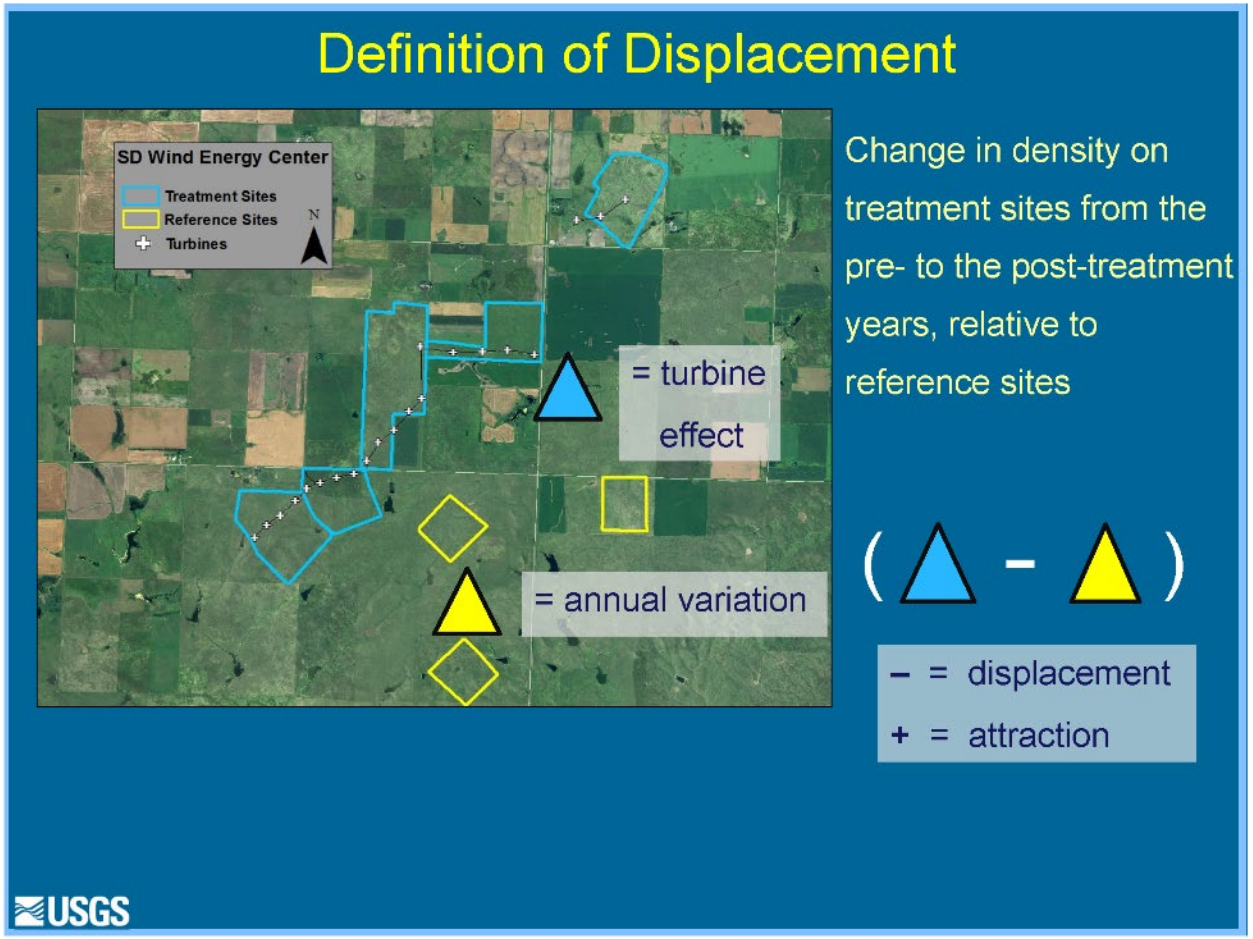
2

- Definitions & Analysis



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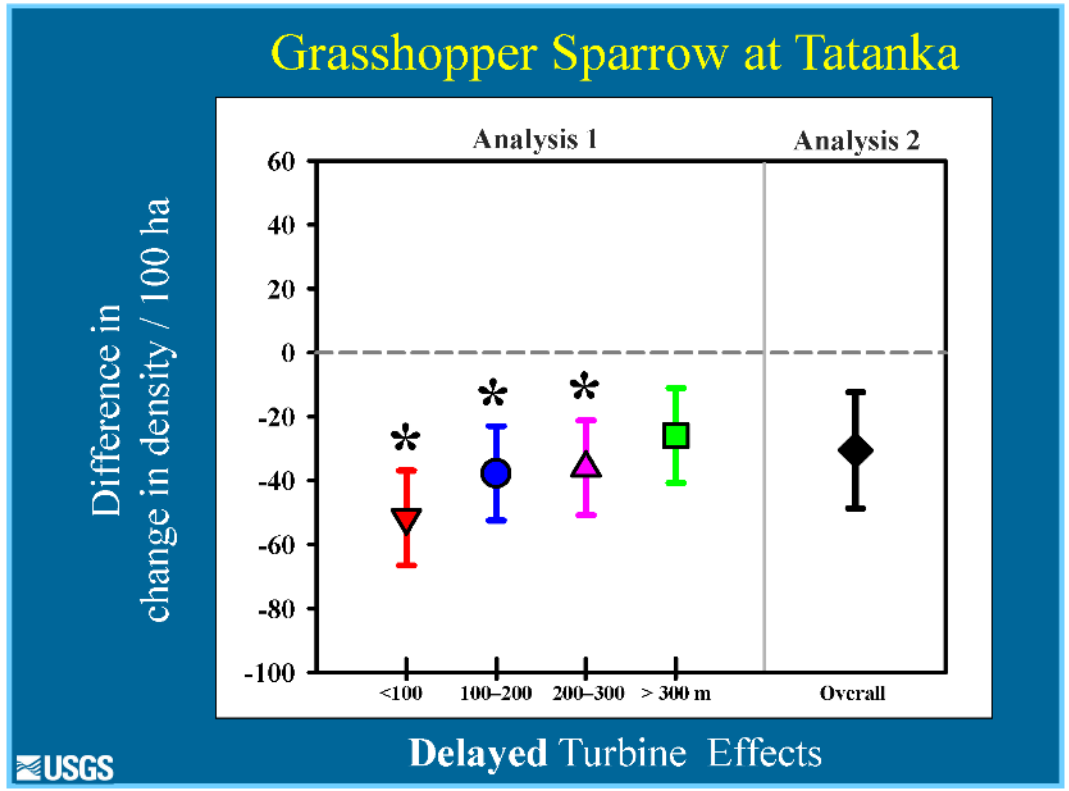
2

- Detailed Results



Conclusion for Grasshopper Sparrow

No significant immediate displacement; however, large negative effects within 100 m of turbines may be biologically important

Significant negative delayed effects were observed within 200 m of turbines and usually extended out to 300 m

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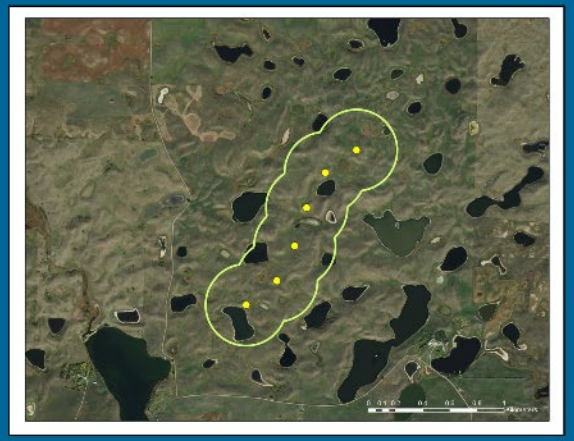
3

- Step-by-step Demonstration of Avian-Impact Offset Method (AIOM)

Computation of area needed to support displaced pairs of grassland birds



Impact Distance = 300 m

Impact Area (a) = 112 ha, or 277 ac

Pre-Impact Density (d_1) = 1.9 pairs / ha

Percent Displacement (r) = 53%

Step 1

Calculate number of breeding pairs within impact area

p = no. pairs within 300-m buffer zone

$= a \times d_1$

112 ha x 1.9 pairs / ha =

213 pairs

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3

- Step-by-step Demonstration of Avian-Impact Offset Method (AIOM); 4 Examples

Example 1. Grassland Birds & Wind—Impact site & offset site are of equal biological value.

Example 2. Grassland Birds & Wind—Impact site & offset site are NOT of equal biological value.

Example 3. Grassland Birds & Oil/Gas

Example 4. Waterfowl & Wind

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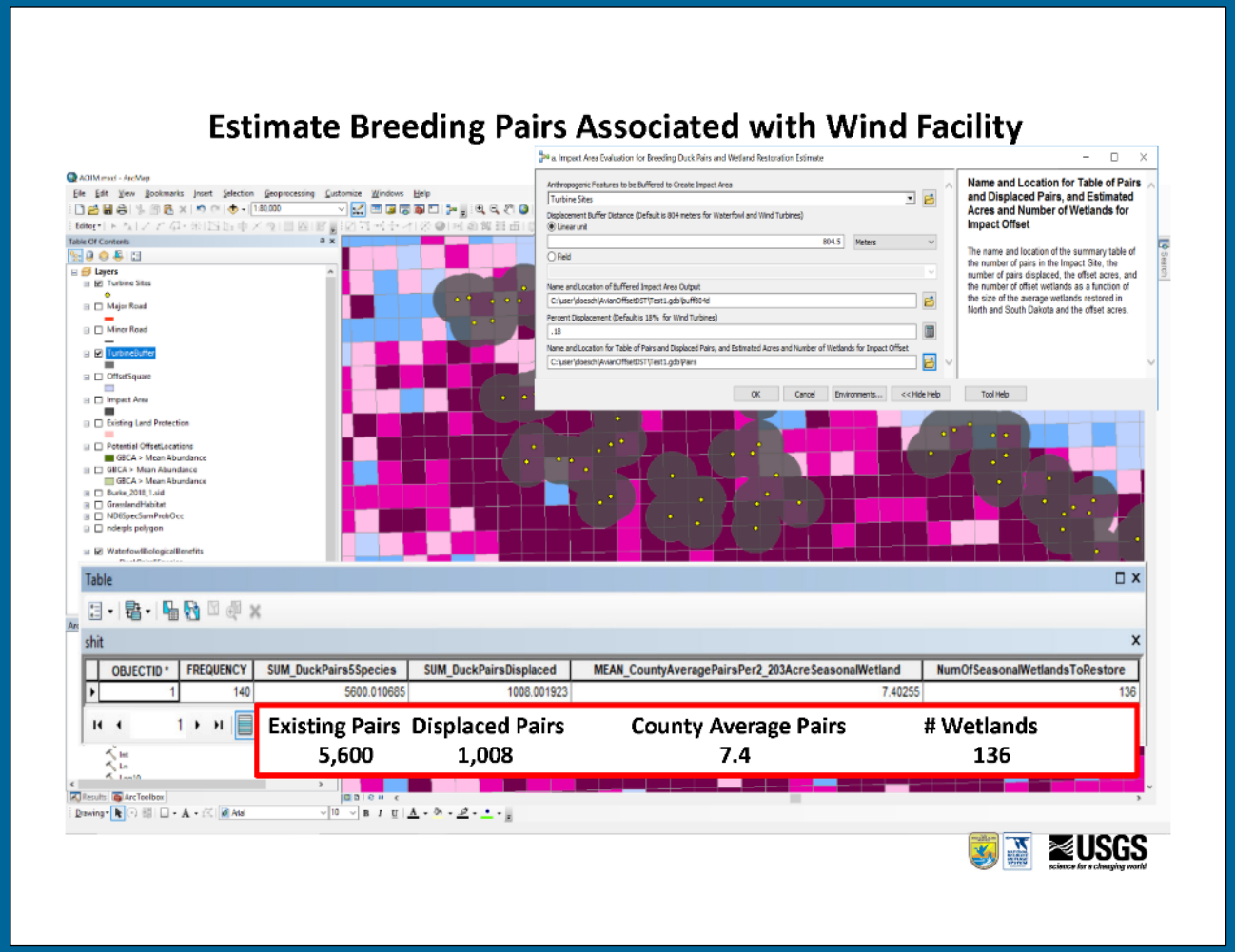
4

- Demonstration of Decision Support Tools



Tool 3: Worksheets

Example Worksheets

Blank Template