

Wind Energy's Subtle Effect – Habitat Fragmentation

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and Wildlife Impacts
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**Wind energy is
a renewable
energy source.**

It's emission free.

**It reduces carbon
emissions from
fossil fuels.**

**It provides local
and land owner
revenue.**



**The Nature Conservancy
supports
the development
of wind energy!**



However...

the siting
of wind farms
can create significant **threats** to
wildlife species and
to **conservation** efforts
if done inappropriately



During construction



Permanent facilities



Direct impacts:

mortality
from wind
turbines



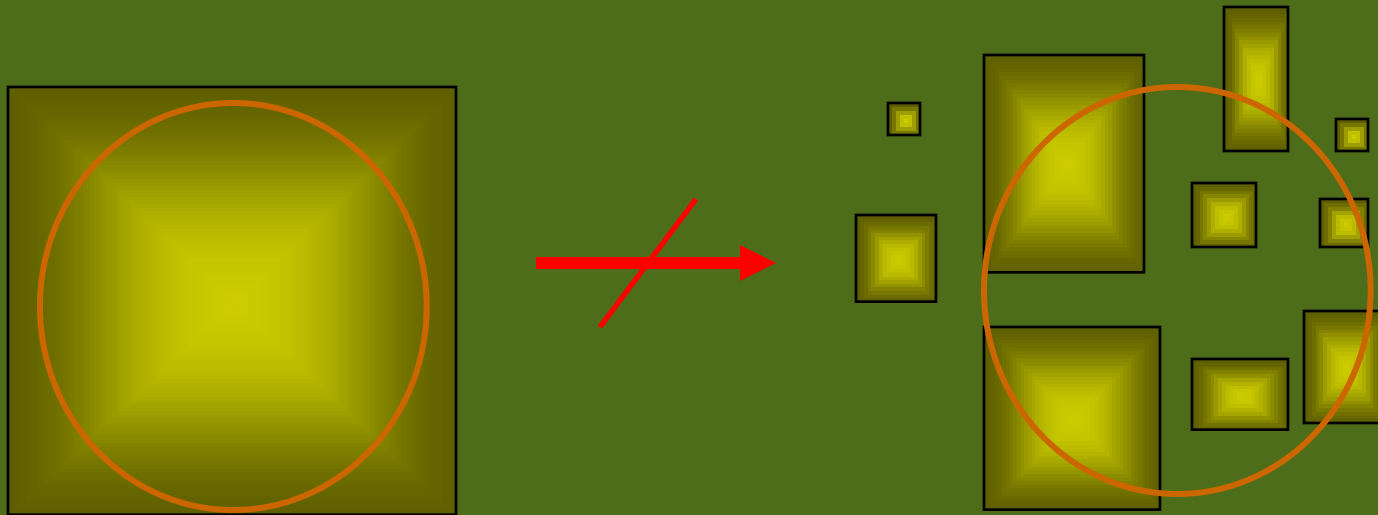
Direct habitat loss by displacement

**< 5% of
project
area**



Indirect impacts:

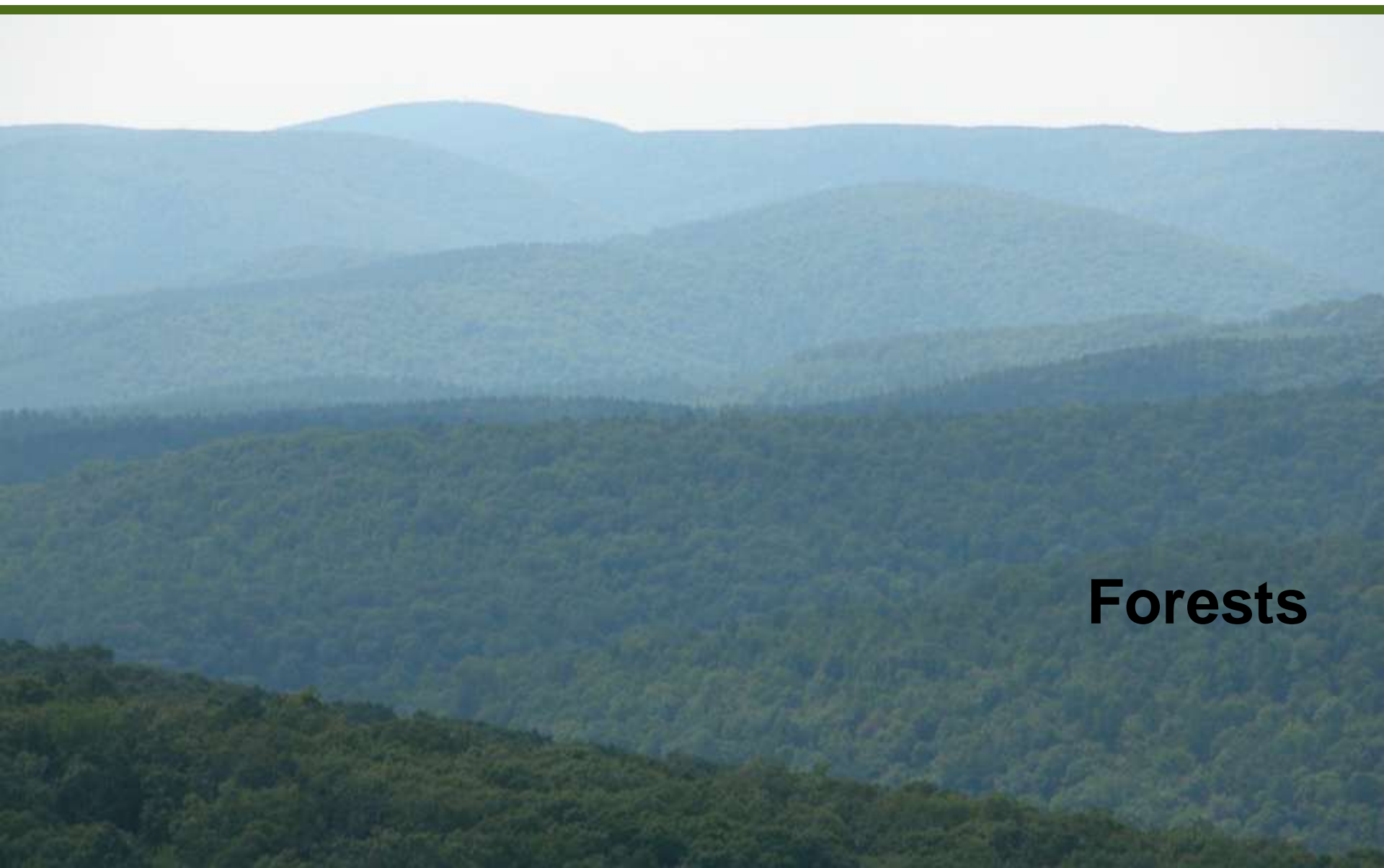
A more subtle issue: **Habitat Fragmentation**



Causes:







Forests



Grasslands

In Oklahoma...

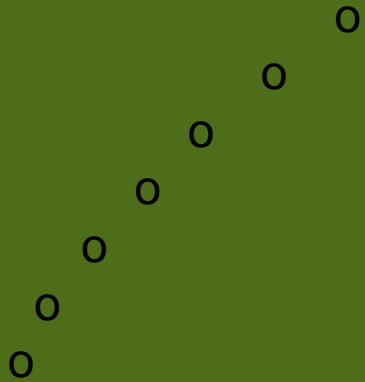


Lesser Prairie Chicken



**Populations down 92% since 1800s
Currently only 43,000 birds in a fragmented 8%
of original range**

V
E
R
T
I
C
A
L
= ***FEAR!***
Structures



Why?

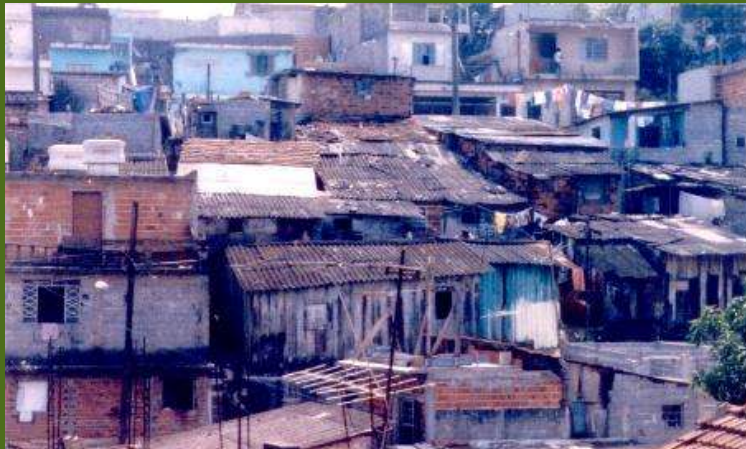


“Behavioral Avoidance”



**Your neighborhood
or home town**

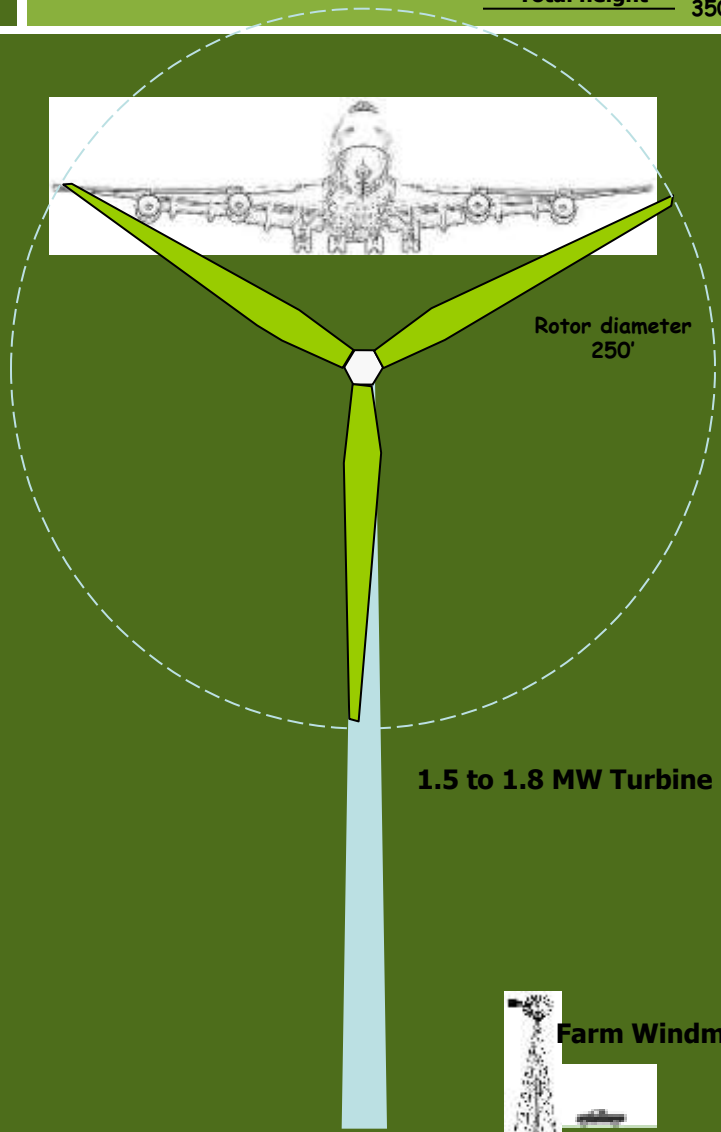


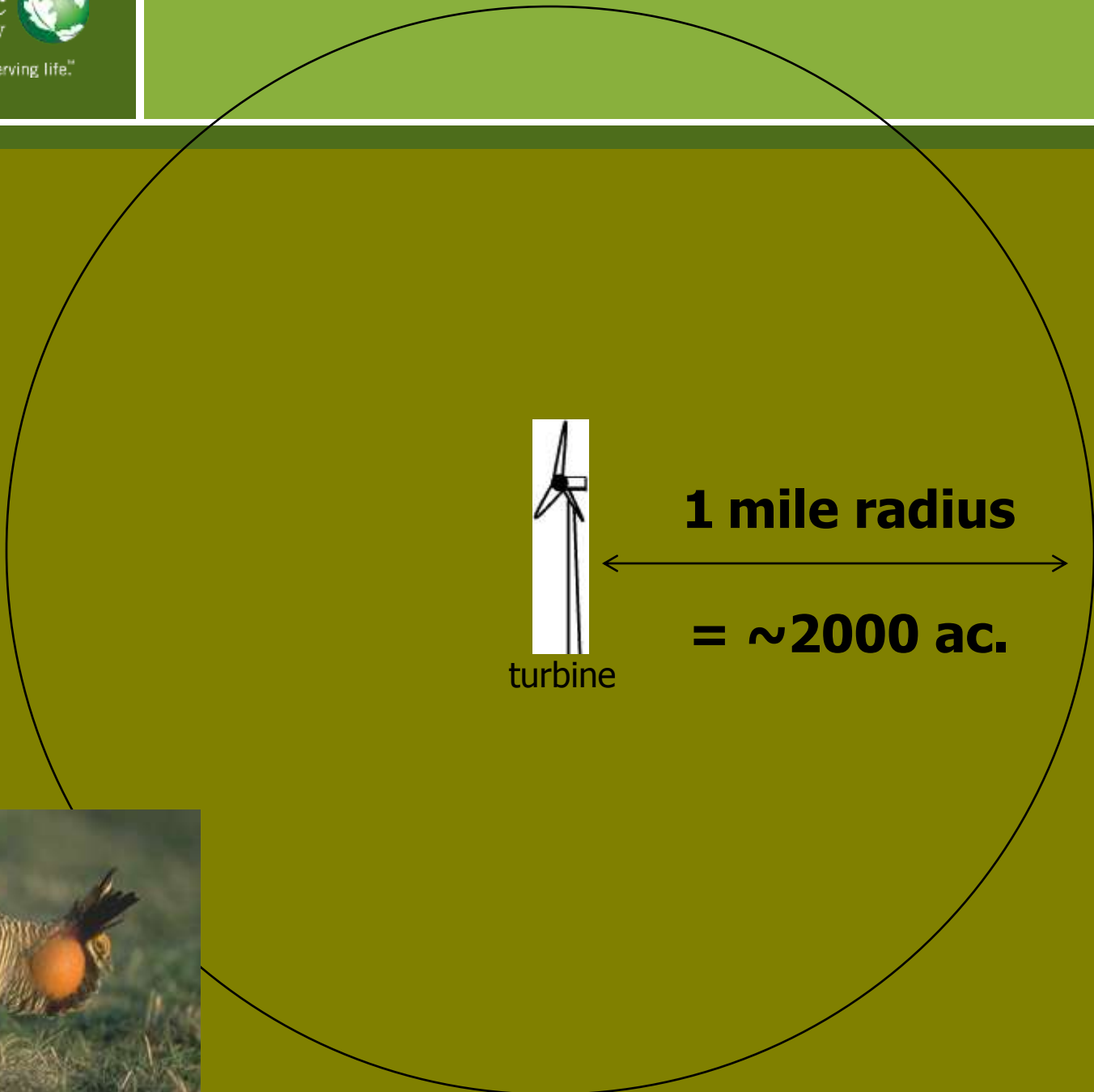


Relocate!



Total height 350 to 400'





turbine





Habitat Fragmentation

**Subtle and little
known:**

Not easily seen

**No dead birds or
bats to stir
emotions**

Hard to measure

**Not a lot of
research**



Species other than the prairie chickens that show avoidance?

Yes...

- Grasshopper sparrow and some other grassland birds
- Mule deer
- Other songbirds, shorebirds and waterfowl
- Some nesting raptors

Some species show no avoidance after construction...

- Elk
- Meadowlarks
- Canada geese
- Some song birds

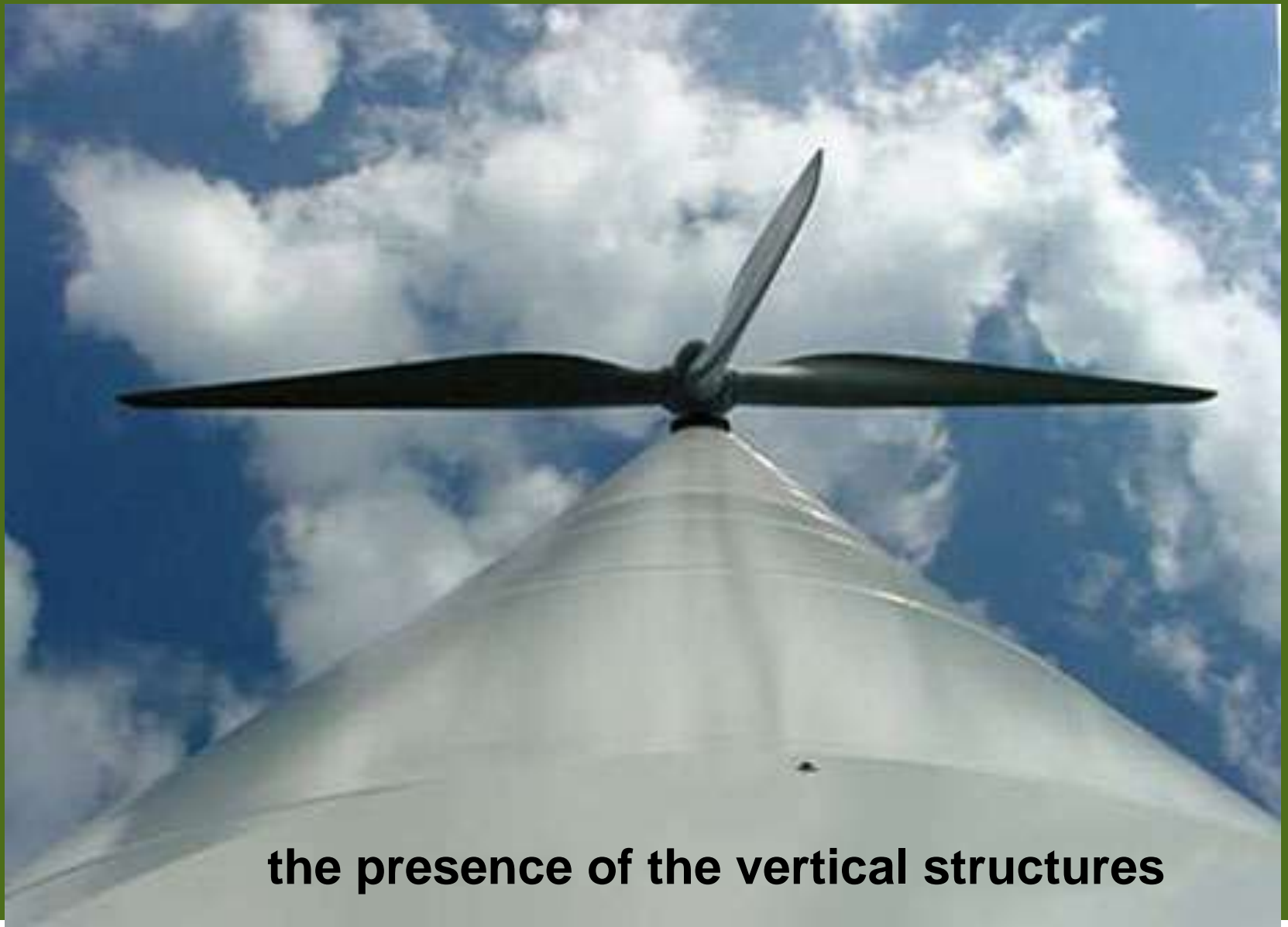
- Many other species...effects unknown



**Habitat fragmentation from wind farms
may be caused by:**

the footprint and activity





the presence of the vertical structures

the movement of the blades ("flicker effect")



**the noise of the blades
cutting through the air**



Wind energy facility impacts, with regard to wildlife habitat, are all about...

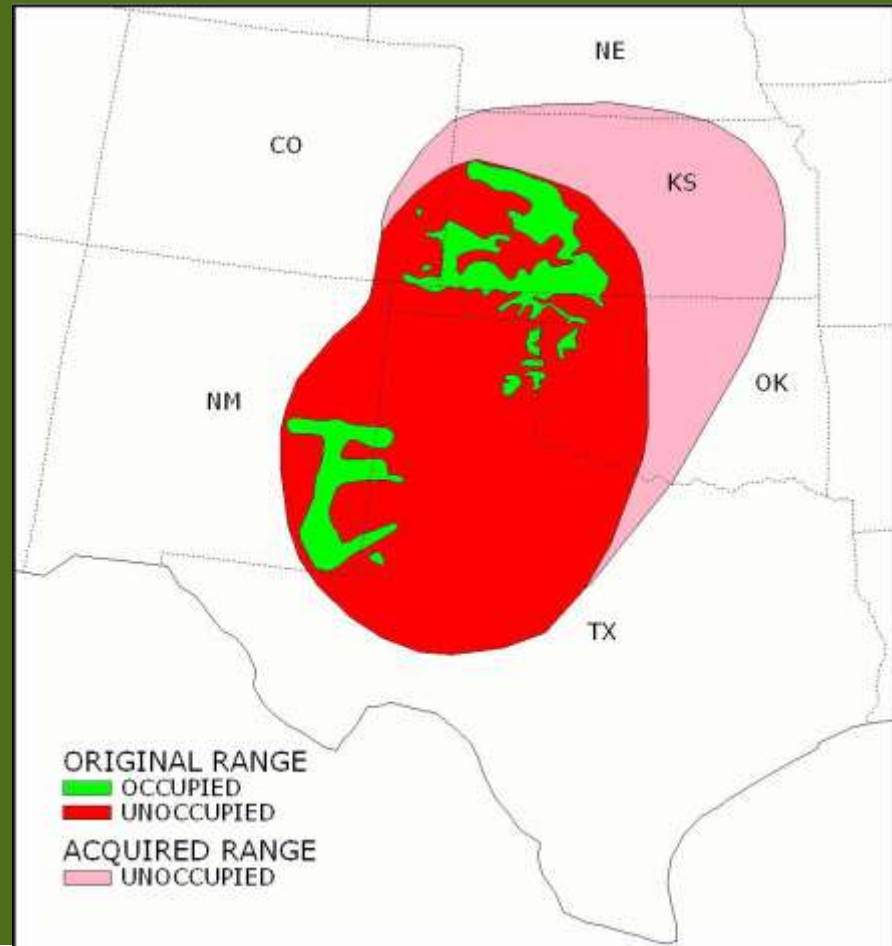
location...location...**location**

!

Lesser prairie chicken range

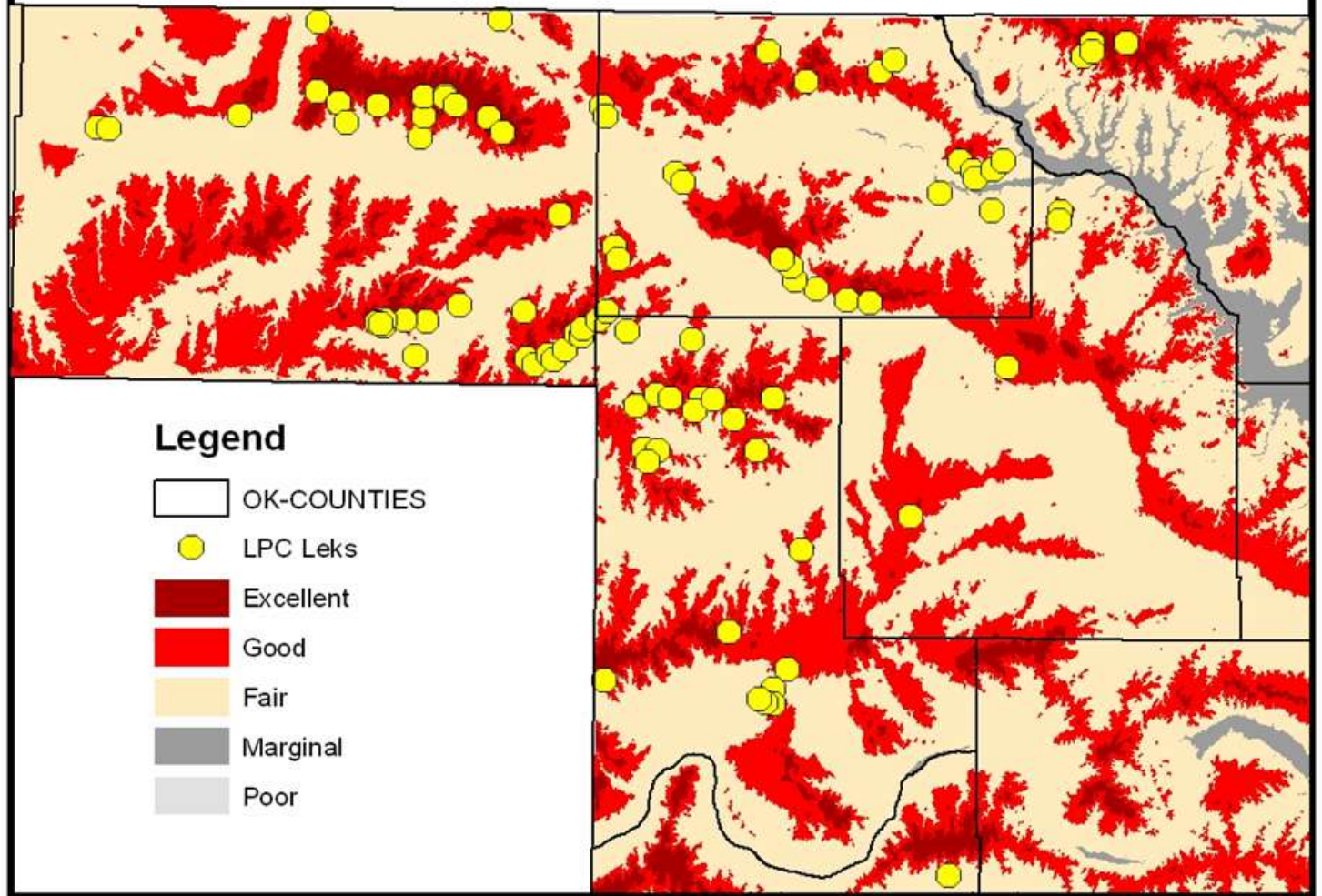
red = historical

green = current



Lesser Prairie Chickens & Wind Resources

Oklahoma Wind Power Assessment Initiative - Neural Network Model





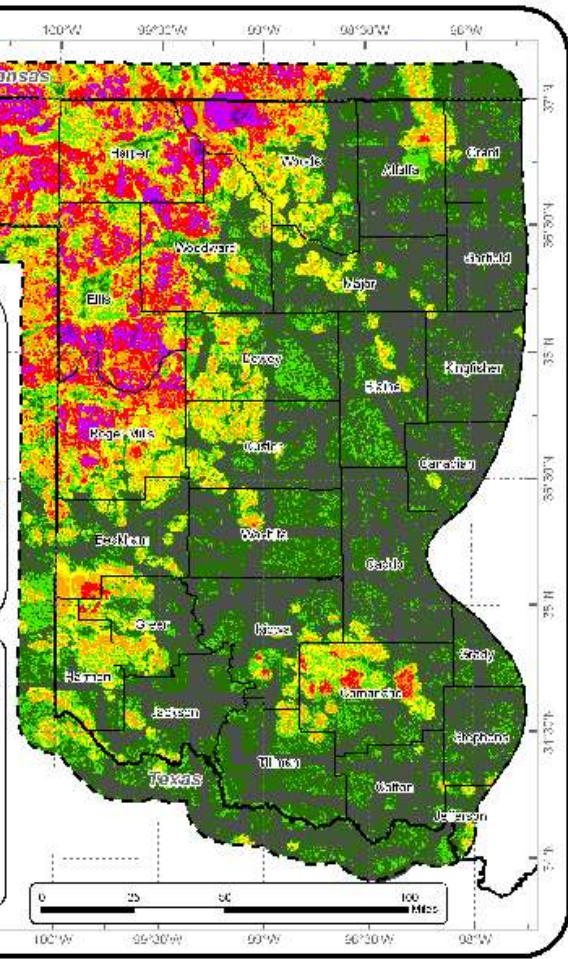
Oklahoma Lesser Prairie-Chicken Spatial Planning Tool

The lesser prairie-chicken (LEPC) model is a multiscale, spatially-based planning tool designed to evaluate anthropogenic impacts, promote voluntary mitigation and targeted conservation actions for an area sensitive species. It combines eight factors, including biological and ecologically relevant spatial data (e.g., tick locations, suitable and potentially suitable land use/land cover) and fragmenting features (e.g., oil and gas well locations, etc.) that exist within the current and historical range of the LEPC. The LEPC model is a relative valuation of the lands within the historical range of the LEPC in Oklahoma.



LEPC Model Version 1.0, May 1, 2009. Valid through April 30, 2010; Update available March 1, 2010.
www.wildlifedepartment.com/lepcdevelopmentplanning.htm; 05.01.2009. Projected coordinate system NAD83, UTM Zone 14N

	State Boundary		3
	County Boundary		4
	Modeled Area		5
LEPC Model Rank			6
	1 - Lower Importance		7
	2		8 - Higher Importance



Solutions:

- encourage the siting of wind energy facilities, including transmission lines, away from sensitive wildlife habitat areas
 - Away from lesser prairie chicken habitat
 - Away from large blocks of native habitat
 - Away from unfragmented landscapes
- Seek mitigation compensation

alternative siting suggestions






Oklahoma Lesser Prairie-Chicken Spatial Planning Tool

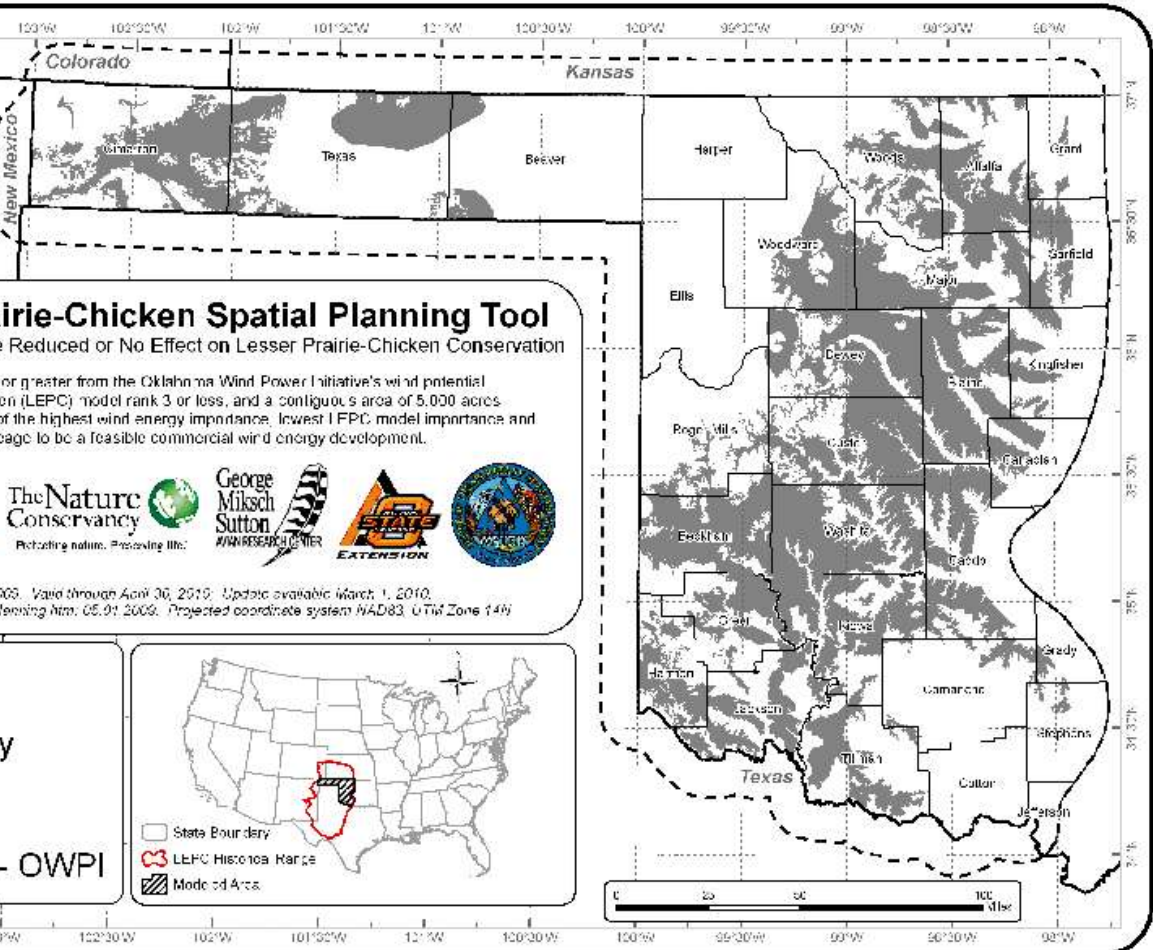
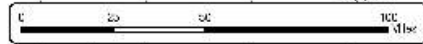
Where Wind Energy Could Go and Have Reduced or No Effect on Lesser Prairie-Chicken Conservation

This map uses a criteria of wind class 3 or greater from the Oklahoma Wind Power Initiative's wind potential neural network model, lesser prairie-chicken (LEPC) model rank 3 or less, and a contiguous area of 5,000 acres or more to show representative areas that are of the highest wind energy importance, lowest LEPC model importance and are of sufficient contiguous acreage to be a feasible commercial wind energy development.



LEPC Model Version 1.0, May 1, 2009. Valid through April 30, 2010. Update available March 1, 2010.
www.wildlifedepartment.com/lepcdevelopment/spatialplanning.htm, 05.01.2009. Projected coordinate system NAD83, UTM Zone 14N

-  State Boundary
-  County Boundary
-  Modeled Area
-  LEPC WVECG - OWPI



As with everything, wind energy development has pluses and minuses.

**We should maximize the positives...and
manage the negatives.**



**Wind energy
and wildlife
CAN co-exist!**

**They are not
exclusive of
one another.**

Consider wildlife issues early in planning.

Avoid sensitive wildlife habitat areas.

**It's our
responsibility
to help make
that happen!**

