

The Nature  
Conservancy



[nature.org](http://nature.org)

## Site Renewables Right

*Holly Neill, The Nature Conservancy of Missouri*



# Energy Diversification

## Climate



Optimizes carbon impact



© Rick Wilking/Reuters

## Conservation



Protects wildlife and habitat



© Barth Bailey

## Community



Supports an equitable transition



© Diyana Dimitrova | 2

# Diversification Energy Strategy: **What We Do**



## **Plan**



*Create the  
Vision*



## **Policy**



*Incentivize  
Clean, Green,  
& Equitable*



## **Site**



*Inform with  
Science, Tools, &  
Demonstration*



## **Markets**



*Influence  
Buyers and  
the Buildout*





OPEN ACCESS Freely available online 

## Win-Win for Wind and Wildlife: A Vision to Facilitate Sustainable Development

Joseph M. Kiesecker<sup>1</sup>, Jeffrey S. Evans<sup>1</sup>, Joe Fargione<sup>2</sup>, Kevin Doherty<sup>3</sup>, Kerry R. Foresman<sup>4</sup>, Thomas H. Kunz<sup>5</sup>, Dave Naugle<sup>6</sup>, Nathan P. Nibbelink<sup>6</sup>, Neal D. Niemuth<sup>6</sup>

<sup>1</sup> Global Conservation Lands Program, The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>2</sup> North America Conservation Region, The Nature Conservancy, Minneapolis, Minnesota, United States of America, <sup>3</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>4</sup> The Nature Conservancy, University of Massachusetts Lowell, Lowell, Massachusetts, United States of America, <sup>5</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>6</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America

OPEN ACCESS Freely available online 

## Wind and Wildlife in the Northern Great Plains: Identifying Low-Impact Areas for Wind Development

Joseph Fargione<sup>1</sup>, Joseph Kiesecker<sup>2</sup>, M. Jan Slaats<sup>1</sup>, Sarah Olimb<sup>3</sup>

<sup>1</sup> The Nature Conservancy, Minneapolis, Minnesota, United States of America, <sup>2</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>3</sup> World Wildlife Fund, Boulder, Montana, United States of America

### Abstract

Wind energy development is projected to be a major component of the energy mix in the Northern Great Plains region. Sites within large areas of roughly 20 GW development of energy available. Policies and siting strategies that avoid or minimize disturbance to wildlife and other resources are needed to ensure that wind energy development is sustainable.

### Citation:

Fargione J, Kiesecker JM, Slaats MJ, Olimb S (2012) Wind and Wildlife in the Northern Great Plains: Identifying Low-Impact Areas for Wind Development. *PLoS ONE* 7(10): e45000. doi:10.1371/journal.pone.0181002

### Introduction

The winds on the central, making development (Fig. 1) all GW, members of the NCP (include South Dakota, North Dakota, South Dakota proposed wind energy Energy (DOE) set a goal of 20 GW of wind energy by the year 2020. This would require development. In the require 25 GW of capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity.

### Conclusion

Concerns over accelerated the development of wind energy (DOE) set a goal of 20 GW of wind energy by the year 2020. This would require development. In the require 25 GW of capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity.

PLoS ONE | www.plosone.org

PLOS ONE

## Energy Sprawl Is the Largest Driver of Land Use Change in United States

Anne M. Trainor<sup>1,2,3\*</sup>, Robert L. McDonald<sup>1</sup>, Joseph Fargione<sup>2,4</sup>

<sup>1</sup> The Nature Conservancy, Arlington, Virginia, United States of America, <sup>2</sup> Central Region, The Nature Conservancy, Minneapolis, Minnesota, United States of America, <sup>3</sup> Rocky Mountain Region, The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>4</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America

OPEN ACCESS Freely available online 

## Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America

Robert L. McDonald<sup>1</sup>, Joseph Fargione<sup>2</sup>, Joe Kiesecker<sup>3</sup>, William M. Miller<sup>4</sup>, Jimmie Powell<sup>5</sup>

<sup>1</sup> Wildlife Office, The Nature Conservancy, Arlington, Virginia, United States of America, <sup>2</sup> Central Region, The Nature Conservancy, Minneapolis, Minnesota, United States of America, <sup>3</sup> Rocky Mountain Region, The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>4</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>5</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America

### Abstract

Concern over climate change has led to the implementation of energy efficiency and renewable energy policies. These policies have the potential to reduce greenhouse gas emissions and improve air quality. However, they also have the potential to impact natural habitats. This study examines the potential impacts of energy efficiency and renewable energy policies on natural habitats in the United States.

### Citation:

McDonald RL, Fargione J, Kiesecker J, Miller WM, Powell J (2012) Energy Sprawl or Energy Efficiency: Climate Policy Impacts on Natural Habitat for the United States of America. *PLoS ONE* 7(10): e45000. doi:10.1371/journal.pone.0181002

### Introduction

Climate change is now acknowledged as a global threat. Reducing greenhouse gas emissions is essential to mitigate its impacts. Energy efficiency and renewable energy are key strategies for reducing emissions. However, these strategies also have the potential to impact natural habitats. This study examines the potential impacts of energy efficiency and renewable energy policies on natural habitats in the United States.

OPEN ACCESS Freely available online 

## Development by Design: Mitigating Wind Development's Impacts on Wildlife in Kansas

Brian Obermeyer<sup>1</sup>, Robert Manes<sup>2</sup>, Joseph Kiesecker<sup>3</sup>, Joseph Fargione<sup>4</sup>, Kei Sochi<sup>5</sup>

<sup>1</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>2</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>3</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>4</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America, <sup>5</sup> The Nature Conservancy, Fort Collins, Colorado, United States of America

### Abstract

Wind energy development is projected to be a major component of the energy mix in the Northern Great Plains region. Sites within large areas of roughly 20 GW development of energy available. Policies and siting strategies that avoid or minimize disturbance to wildlife and other resources are needed to ensure that wind energy development is sustainable.

### Citation:

Obermeyer B, Manes R, Kiesecker J, Fargione J, Sochi K (2012) Development by Design: Mitigating Wind Development's Impacts on Wildlife in Kansas. *PLoS ONE* 7(10): e45000. doi:10.1371/journal.pone.0181002

### Introduction

Concerns over accelerated the development of wind energy (DOE) set a goal of 20 GW of wind energy by the year 2020. This would require development. In the require 25 GW of capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity. The NCP has 5 MW of wind capacity.

PLoS ONE | www.plosone.org

land 

## Site Wind Right: Identifying Low-Impact Wind Development Areas in the Central United States

Chris Hise<sup>1</sup>, Brian Obermeyer<sup>2</sup>, Marissa Ahlering<sup>3</sup>, Jessica Wilkinson<sup>4</sup> and Joseph Fargione<sup>5\*</sup>

<sup>1</sup> The Nature Conservancy, Annet, OK 78032, USA, <sup>2</sup> The Nature Conservancy, Cottonwood Falls, KS 66045, USA, <sup>3</sup> The Nature Conservancy, Moorhead, MN 56501, USA, <sup>4</sup> The Nature Conservancy, Amherst, MA 01002, USA, <sup>5</sup> The Nature Conservancy, Minneapolis, MN 55415, USA

### Abstract

To help avoid the most catastrophic effects of climate change, society needs to achieve net-zero greenhouse gas emissions by mid-century. Wind energy provides a clean, renewable source of electricity; however, improperly sited wind facilities pose known threats to wildlife populations and contribute to degradation of natural habitats. To support a rapid transition to low-carbon energy while protecting imperiled species, we identified potential low-impact areas for wind development in a 10-state region of the central U.S. by excluding areas with known wildlife sensitivities. By combining maps of sensitive habitats and species with wind speed and land use information, we demonstrate that there is significant potential to develop wind energy in the region while avoiding significant negative impacts to wildlife. These low-impact areas have the potential to yield between 300 and 1500 GW of name-plate wind capacity. This is equivalent to 8–13 times current U.S. installed wind capacity. Our analysis demonstrates that ambitious low-carbon energy goals are achievable while minimizing risks to wildlife.

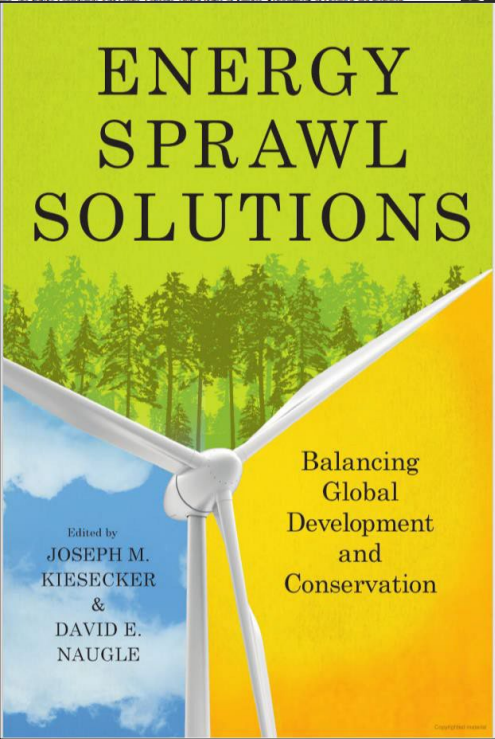
### Keywords:

wind energy; turbine; conservation; biodiversity; siting; land use; mitigation; avoidance

### 1. Introduction

A dramatic shift towards renewable energy is necessary to limit global warming to 1.5 °C and to avoid the major threats from climate change, including threats to biodiversity [1,2]. For example, 389 species of birds in North America are estimated to have an increased risk of vulnerability due to climate change [3]. This change in energy sources will require rapid transitions in global energy production and land use by mid-century [4]. In the U.S., meeting ambitious targets for greenhouse gas (GHG) emission reductions will necessitate a large increase in renewable energy [5–7]. Fortunately, policy and markets have aligned to support the build-out of renewable energy. Thirty-eight states have either renewable energy standard portfolios or voluntary targets [8]. In addition, the price of renewable energy has fallen dramatically in the past decade and building wind and solar are now often the most economical ways to increase energy production [9], particularly when combined with renewable energy tax incentives.

### 2. While wind energy is abundant, renewable and economic siting can be challenging. Utility-scale wind facilities require much larger areas of land than conventional forms of electrical generation [10], and renewable energy projects can have significant negative impacts on wildlife and high-priority conservation habitats [11,12]. One concern is direct mortality for migrating bats and birds. Turbines kill hundreds of thousands of bats each year [13]. While direct mortality of songbirds is lower, it still accounts for well over 100,000 bird deaths annually across the U.S. and Canada [14,15]. This is a relatively small number of birds killed compared to other sources of direct mortality [16]; however, direct mortality from collision with wind turbines may be high enough to have



**ENERGY SPRAWL SOLUTIONS**

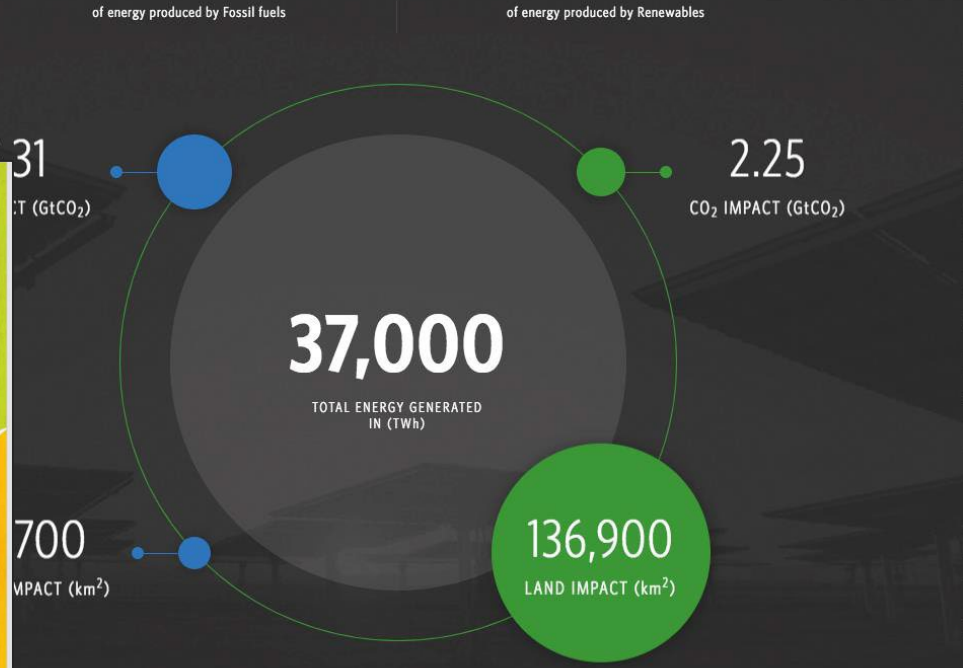
Balancing Global Development and Conservation

Edited by JOSEPH M. KIESECKER & DAVID E. NAUGLE

## Energy Sprawl Solutions

*a Global Solutions special feature*

About Interactive Tool Case Studies Insights Resources

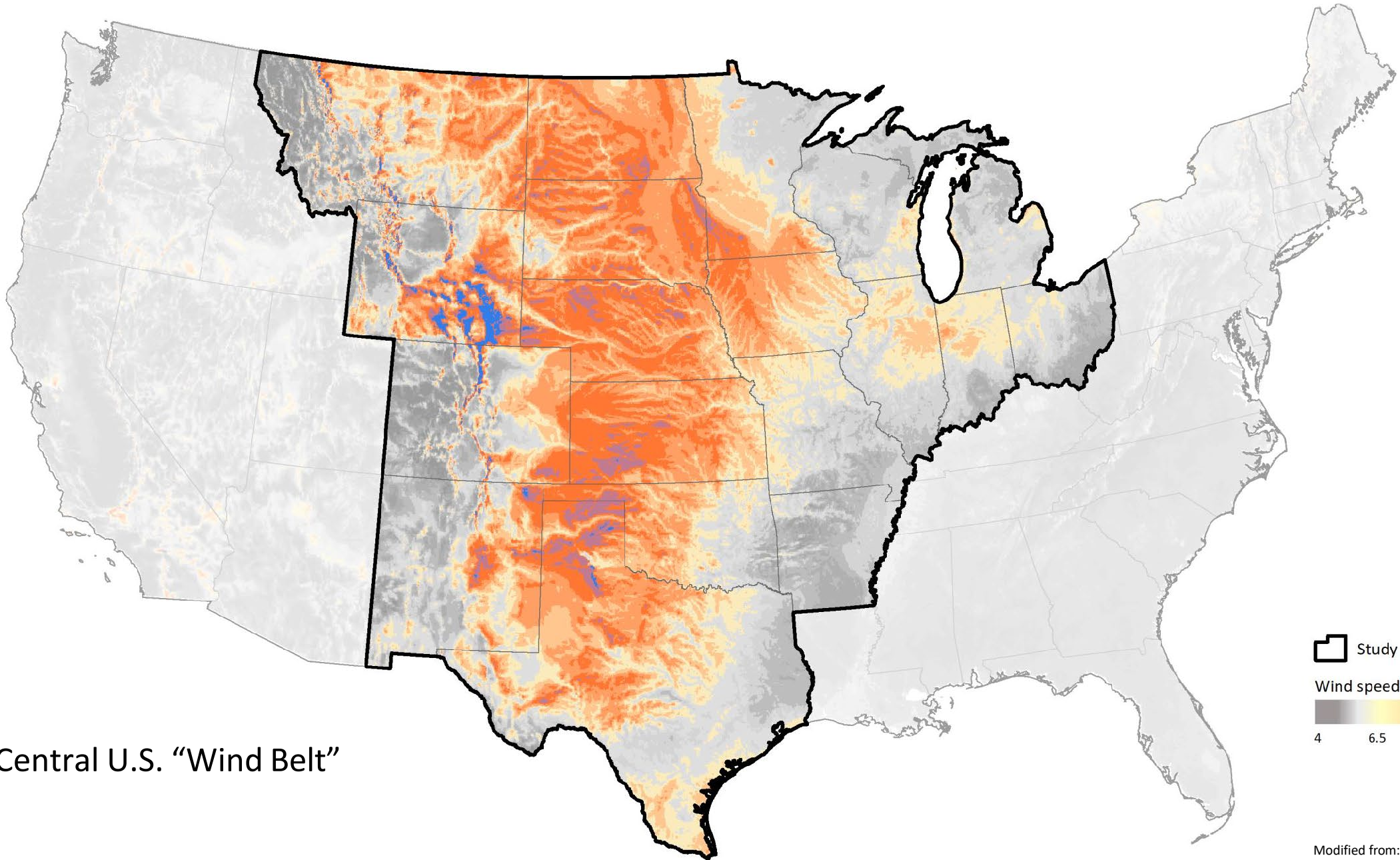




## Site Renewables Right:


- A source of information for early screening
- Not intended to replace the Wind Energy Guidelines or consultation with state, federal, and tribal agencies
- Not a “go/no go zone” map
- Emphasizes the *avoid first* position



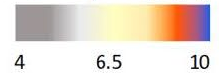


Central U.S. "Wind Belt"

500 km

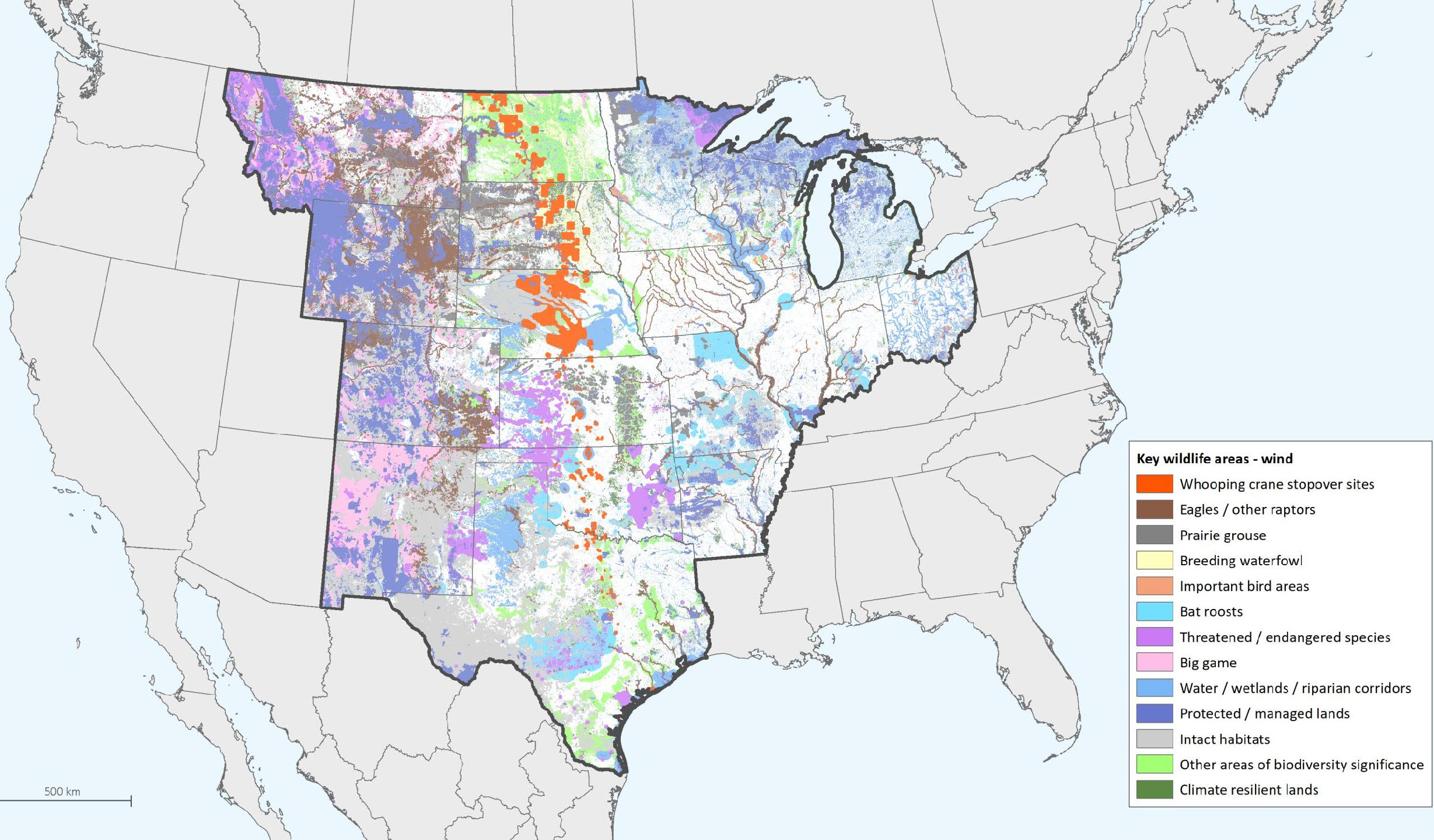
 Study boundary

Wind speed (m/s)



Modified from:  
NREL / AWS Truepower 80 m wind maps  
<http://energy.gov/eere/wind/windexchange>





500 km





Low-impact wind development areas

**935-1,559 GW add'l capacity**  
*(range 3-5 MW/km<sup>2</sup>)*

500 km



# Site Renewables Right Outreach in Action



Integrated in **industry-leading renewable energy development & purchasing platforms**



TNC foundational partner on **“Beyond the Megawatt”** initiative by CEBA, who represent **90% of RE market**



# TNC & ORSTED: MOCKINGBIRD SOLAR

## COLLABORATION BACKGROUND

- Orsted, leading renewable energy developer with a net-positive biodiversity goal for projects by 2030
- TNC and Orsted announced a collaboration in January, 2023 to protect 1,000 acres of native prairie in Northeast Texas – adjacent to a 471-MW solar development by Orsted that will come online in 2024.
- This will be the largest preservation effort on record for this type of rare, native prairie
- It will also be Orsted's largest, onshore solar project in the United States
- TNC and Orsted will use the project as an opportunity to implement and study BMP's on biodiversity impacts and opportunities with solar energy development and grasslands

### Ørsted and The Nature Conservancy to Protect Threatened Texas Prairie at Mockingbird Solar Center

01.13.2023 07:24AM



Nearly 1,000 acres of tallgrass prairie will be preserved with Ørsted's gift to The Nature Conservancy



The Ørsted-TNC conservation effort at The Smiley-Woodfin Native Prairie Grassland is the largest preservation effort on record for this type of native prairie.



# Global Recognition

**AWARD** GOOD PRACTICE OF THE YEAR

Renewables Grid Initiative

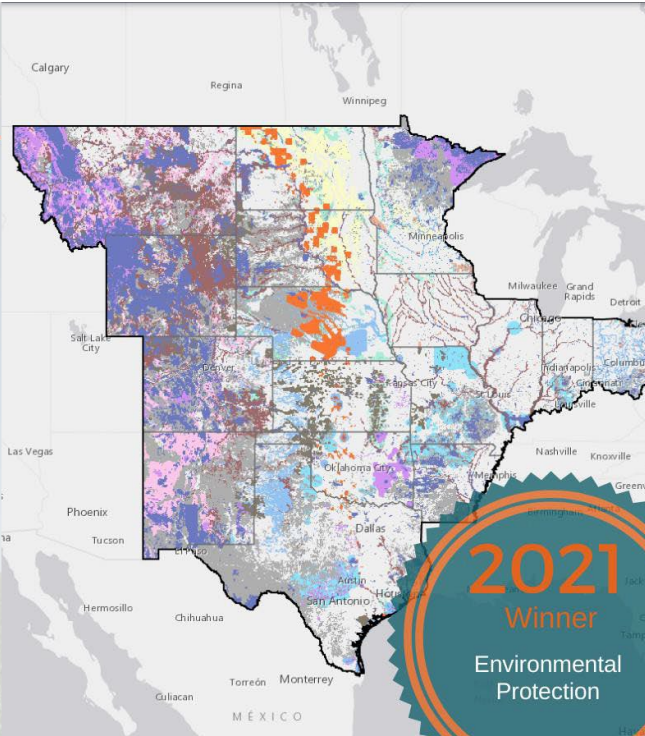
## SITE WIND RIGHT

by The Nature Conservancy

The Nature Conservancy

“Site Wind Right is a science-based tool built through many years of collaboration across the Central US to assist energy buyers and planning authorities incorporate nature into renewable energy siting decisions. Through utilizing it, we can accelerate a clean and green energy future. We are humbled to receive this award.”

**Nathan Cummins**  
Great Plains Renewable Energy Strategy Director



2021 Winner  
Environmental Protection



**GREAT PLAINS INSTITUTE**

Better Energy.  
Better World.



*Learn More* [nature.org/siterenewablesright](https://www.nature.org/siterenewablesright)



The Nature  
Conservancy 

© Chris Helzer