

# Half-Earth Design Challenge

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## The Power of Mapping to Save Biodiversity





**“It is reckless to suppose that biodiversity can be diminished indefinitely without threatening humanity itself.”**

**– E.O. WILSON**



# HALF-EARTH PROJECT SHORT VIDEO

Introduce students to the Half-Earth Projects mission and the importance of mapping by showing this short video found at our website:

<https://www.half-earthproject.org/>

**The Half-Earth Project**

ANIMAL ZORA

19°38'39.8"S 22°53'00.4"E  
20°36'45.0"S 22°55'28.8"E  
19°35'49.5"S 22°50'03.8"E  
20°34'29.5"S 22°50'52.7"E  
19°31'54.5"S 22°32'24.0"E  
19°30'58.9"S 22°33'51.3"E  
19°29'40.3"S 22°32'51.8"E  
18°43'30.9"S 23°06'04.4"E  
18°56'10.5"S 22°26'31.0"E  
19°18'32.6"S 22°46'31.1"E  
20°11'35.2"S 23°04'39.3"E  
18°50'53.2"S 22°49'03.9"E

Half-Earth  
15%  
EARTH  
CONSERVED

Current Protected Area Not Protected

02:47

CC

vimeo

# Why Half?



**SURVIVING  
SPECIES**

**85%**



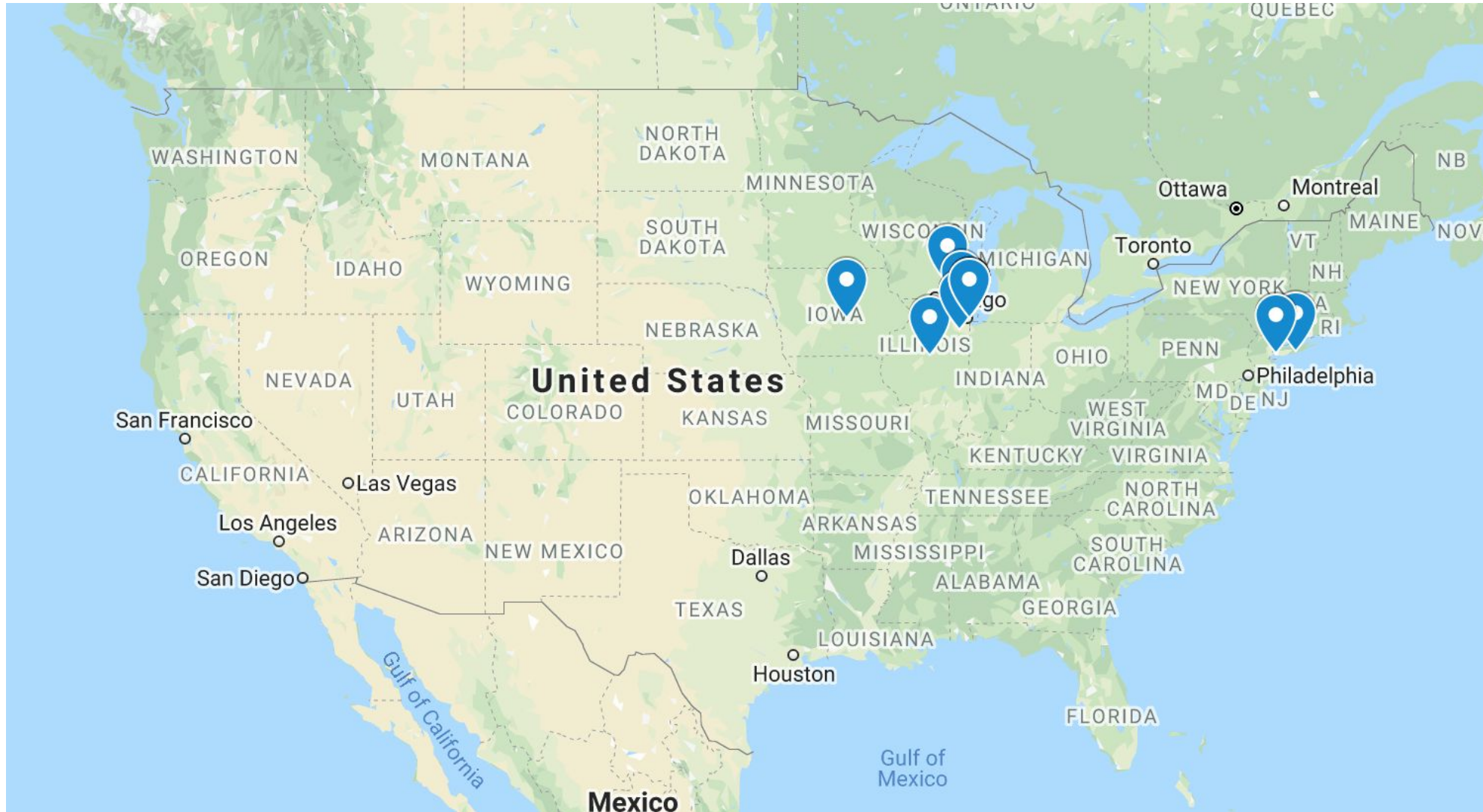
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# MAPS ICEBREAKER

The following two slides are examples that were created using MyMaps on Google (<https://www.google.com/maps/about/mymaps/>)

- Prior to creating the maps (in the previous lesson or for homework), poll your students on the city/state they were born (Origins Map) and the city/state that they consider their favorite place (Favorite Places Map).
- Use MyMaps to create two separate maps depicting students responses.
- During your lesson, SHOW MAP #1 Origins → ASK: How would you predict this map to change when considering all of our favorite places?
- SHOW MAP #2 Favorite Places → Discuss differences between the two maps. ASK: Why do you think the map changed/stayed the same? Have students share WHY they chose their favorite places.
- Use students responses as a jumping off board for the different reasons we have favorite places (to connect later to the different stakeholders involved) and how so many people favor places that are natural (protected areas)

# ICEBREAKER MAPS: Origins



- Chicago
- Chicago
- Chicago
- Joliet
- Long Island
- New York
- Chicago
- Iowa
- Illinois
- Chicago
- Sullivan
- Chicago
- Buffalo Grove
- Joliet
- Chicago
- Chicago

# ICEBREAKER MAPS: Favorite Places





“...the only solution to the sixth extinction is to increase the area of inviolable natural reserves to half the surface of Earth or greater.”

– E.O. WILSON

## A HOPEFUL FUTURE

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What comes to mind  
when you hear  
“protected area” or  
“protection”?

Type 3 words/phrases in  
the menti

\*note to teachers → set up a menti at  
mentimeter.com and share your screen so  
students can watch their word cloud being  
created





# IUCN — INTERNATIONAL UNION FOR THE CONSERVATION OF NATURE

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A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values.



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# IUCN PROTECTED AREA PARAMETERS

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Valuing and conserving biodiversity

Governing nature's use and sharing its benefits equitably

Deploying nature-based solutions to global challenges

Respecting people



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## PROTECTED AREAS INCLUDE

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- Nature Reserves
- Wilderness Areas
- National Parks
- Natural Monument
- Habitat or Species Management Area
- Protected Landscape or Seascape
- Protected area with sustainable use of natural resources



# Exploring Biodiversity and Land Use: A Hands-on mapping activity



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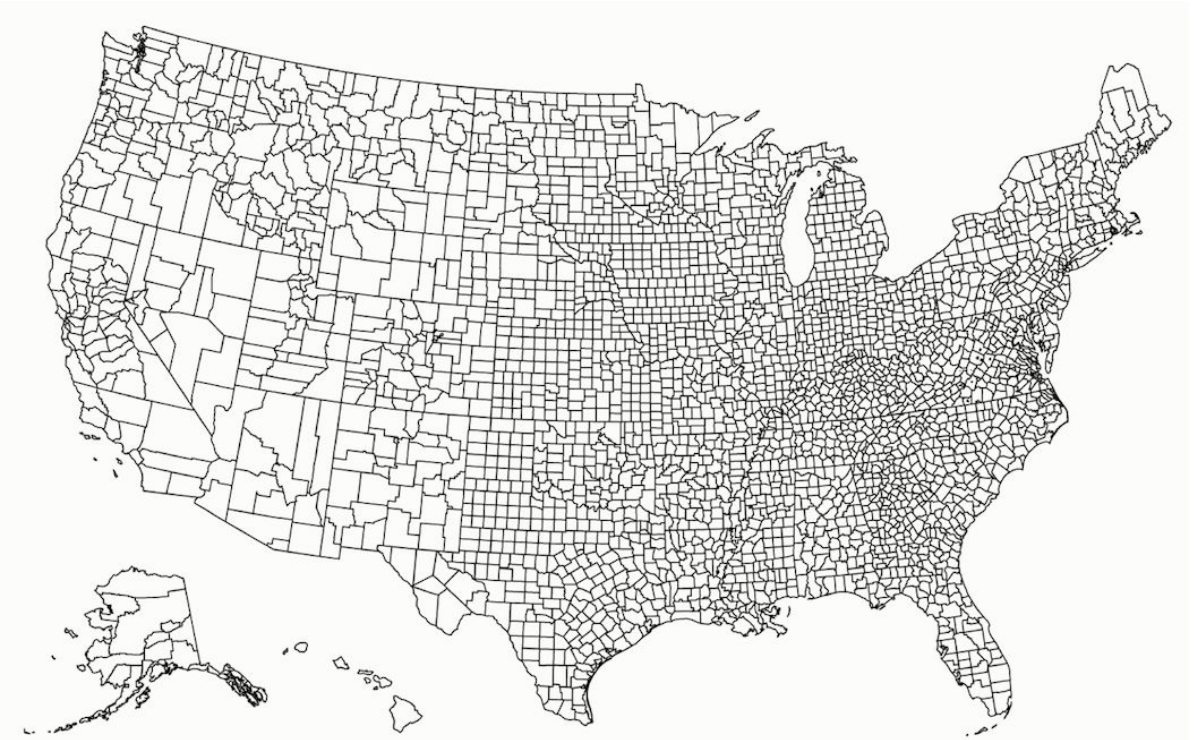
 **half-  
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project**

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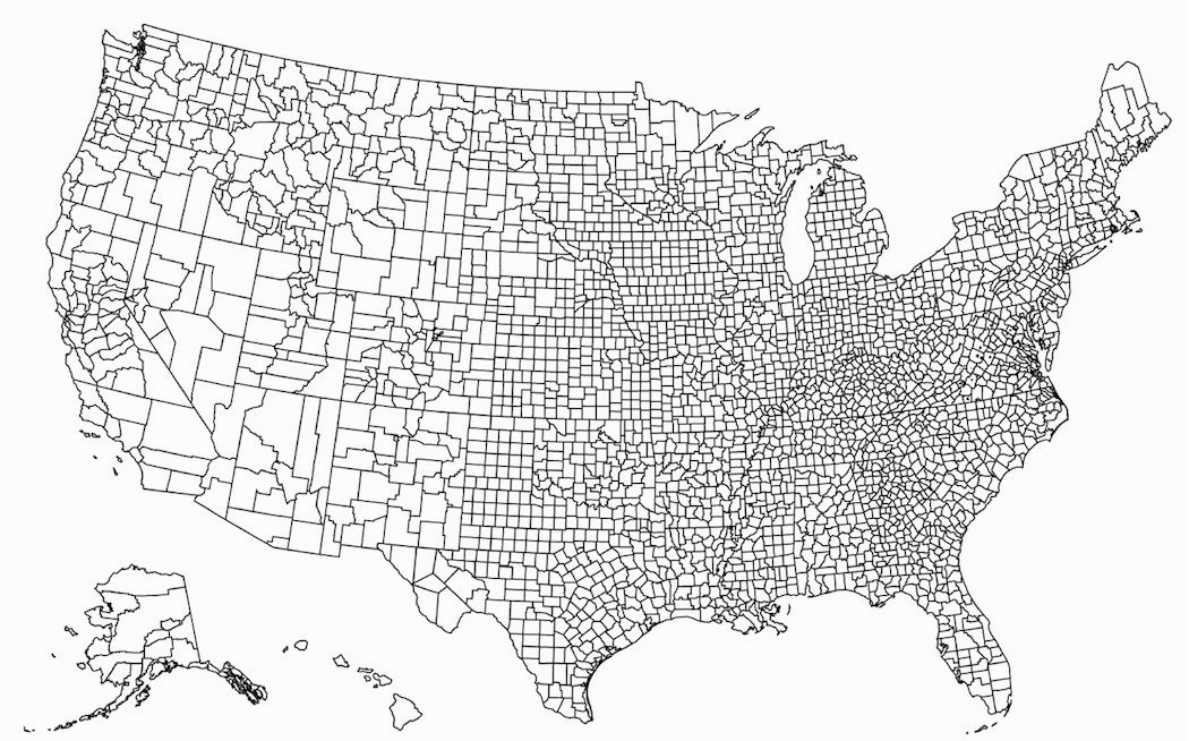
TASK: In your break-out teams decide which challenge think is better. Put half of the US states into protection for biodiversity, or conserve half of US counties for biodiversity. Choose a team member to make notes on your conversation. List at least one advantage of your decision and prepare to defend it. List at least one con of your decision.

## WHICH MAP IS MORE USEFUL?



# WHICH MAP IS MORE USEFUL?

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## US STATE MAP



BREAK OUT GROUP: Pick 2 states in protection and 2 states that are not? Defend why?

DISCUSS:

- Which states did you choose? Why?
- Which areas of the country did you tend toward? Why?
- How does what you chose to protect align with the goal of conserving biodiversity and half-earth?
- What are issues/problems you faced?

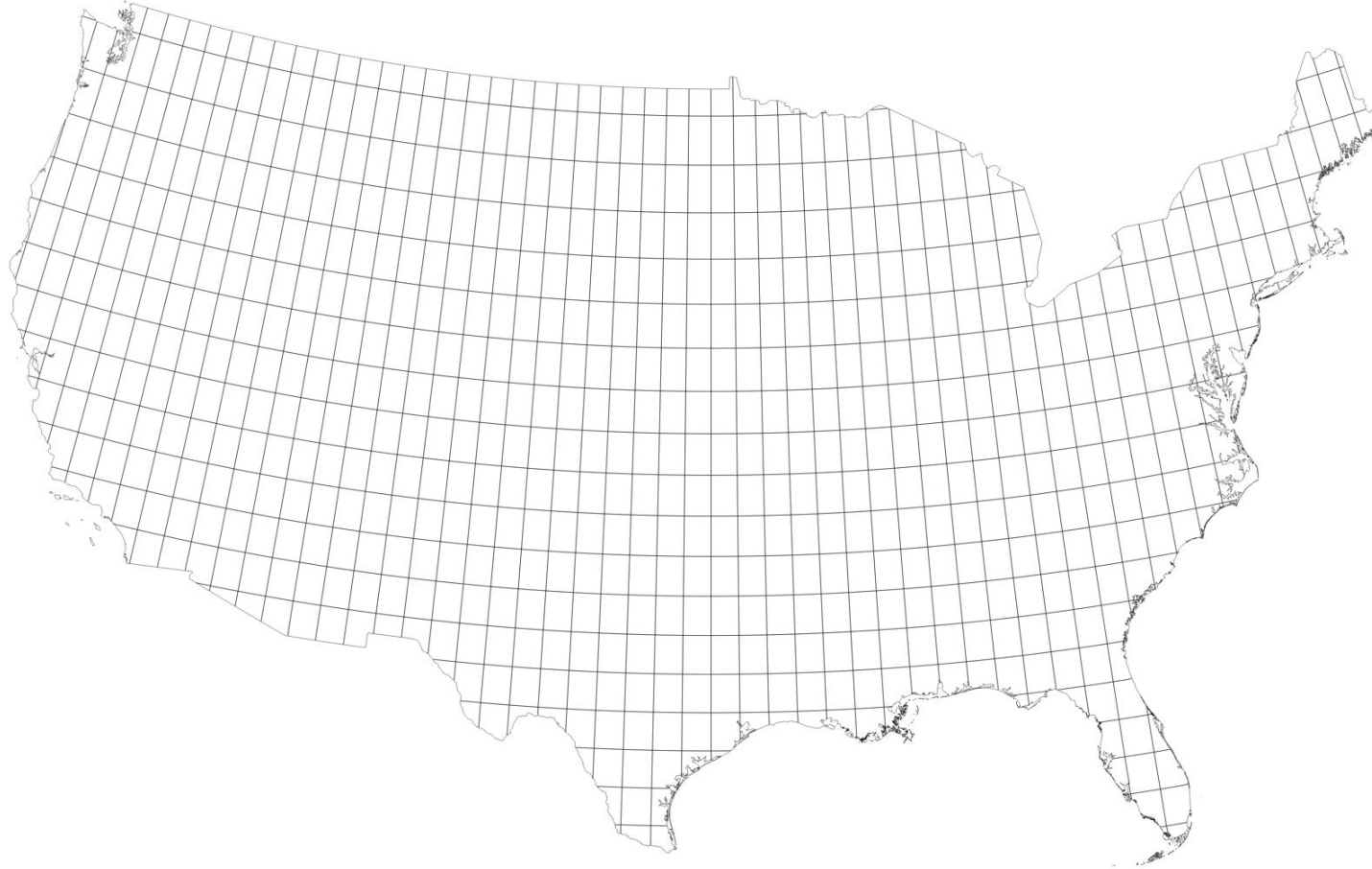


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# US Grid

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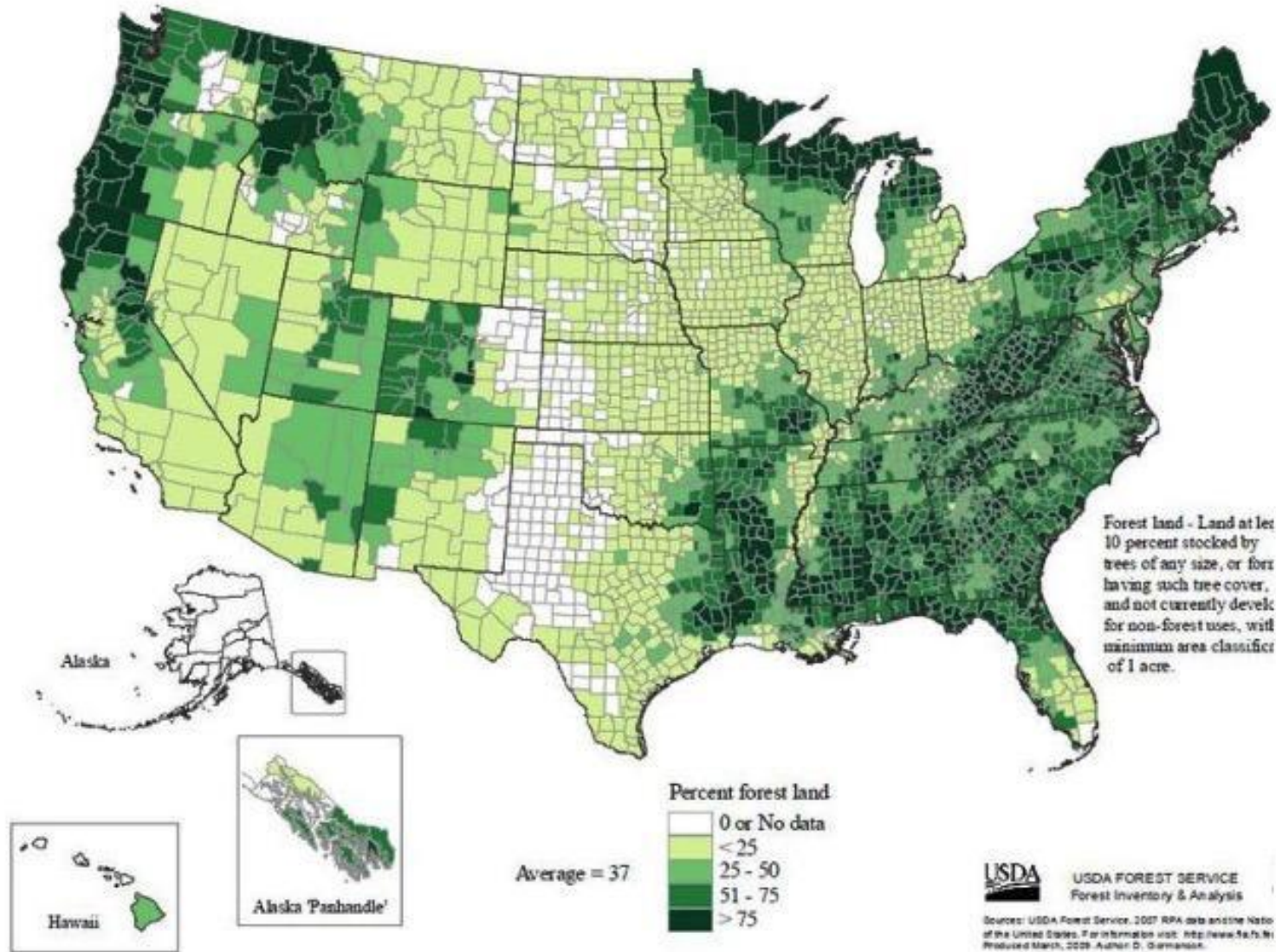
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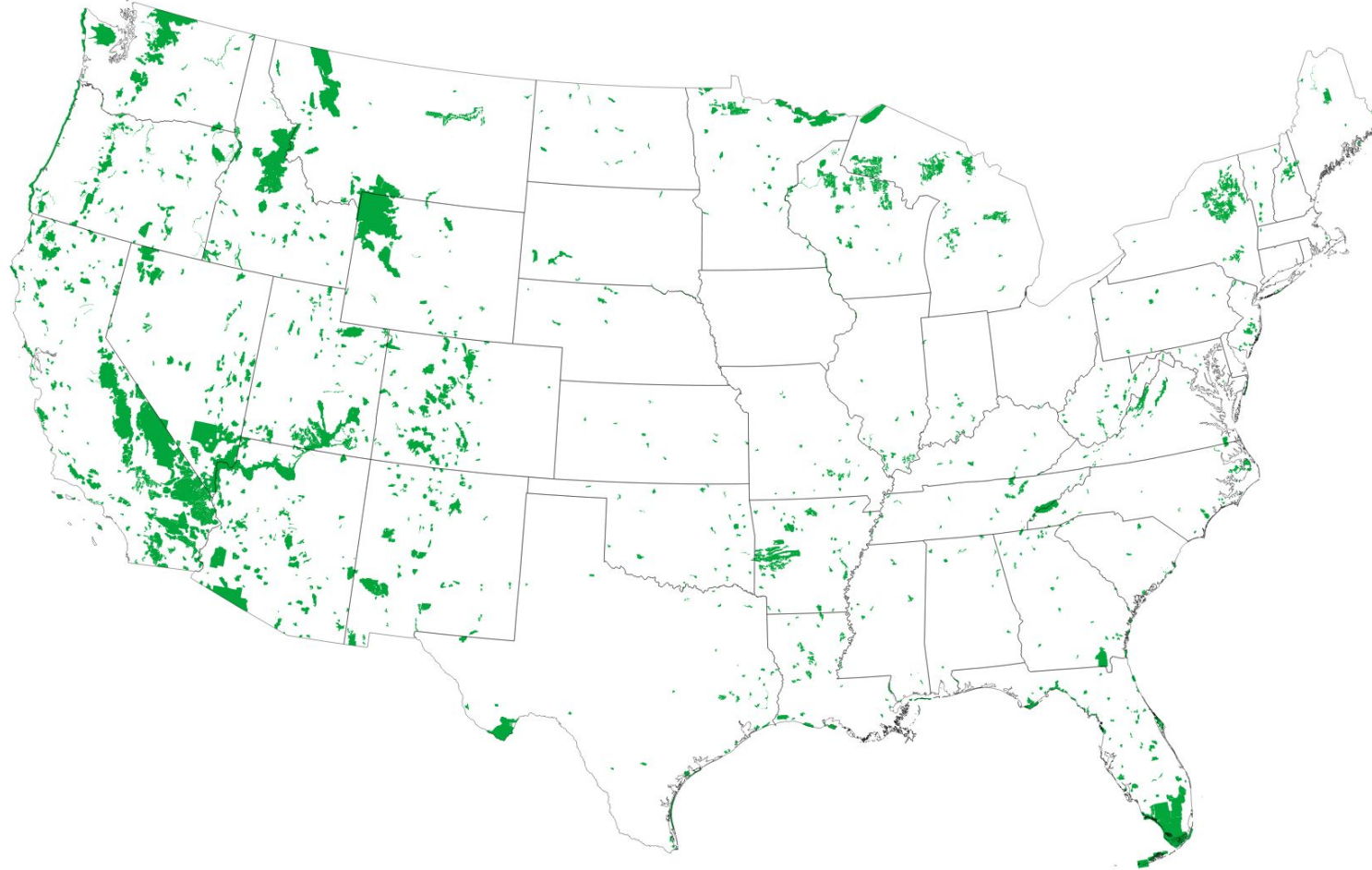
# PROPORTION OF LAND THAT IS FORESTED



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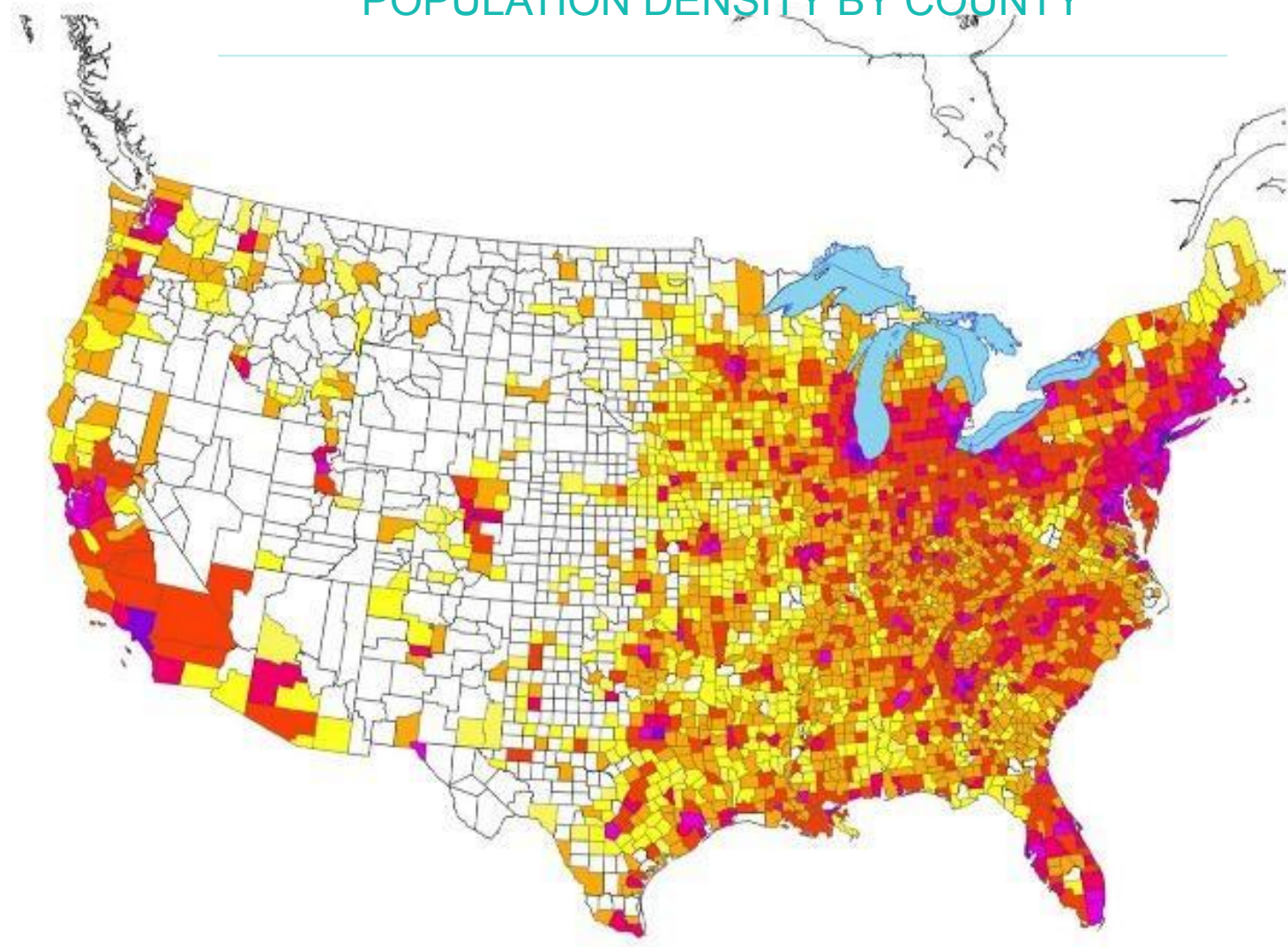


# PROTECTED AREAS





## POPULATION DENSITY BY COUNTY



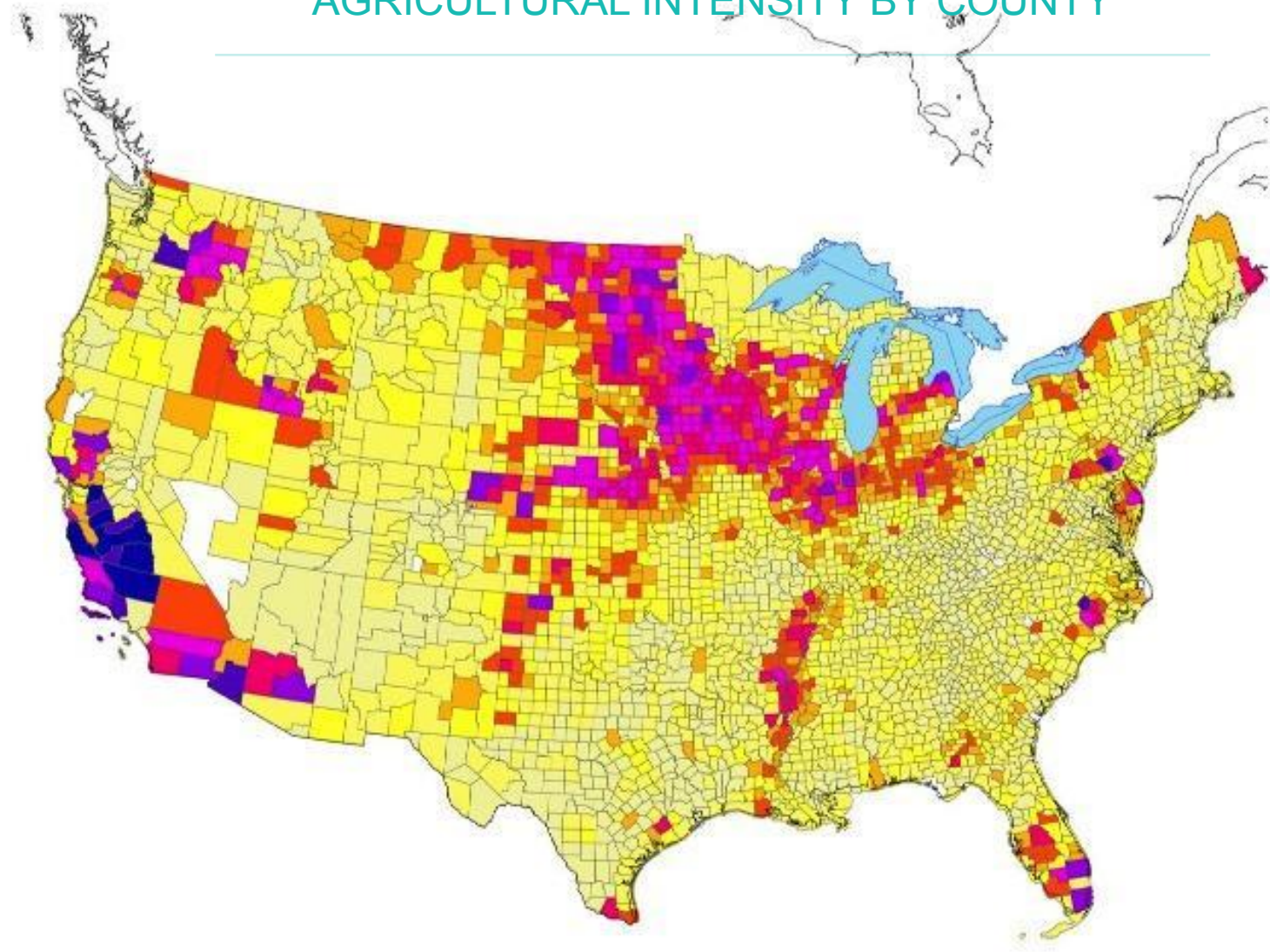
Source: 2000 US Census



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# AGRICULTURAL INTENSITY BY COUNTY



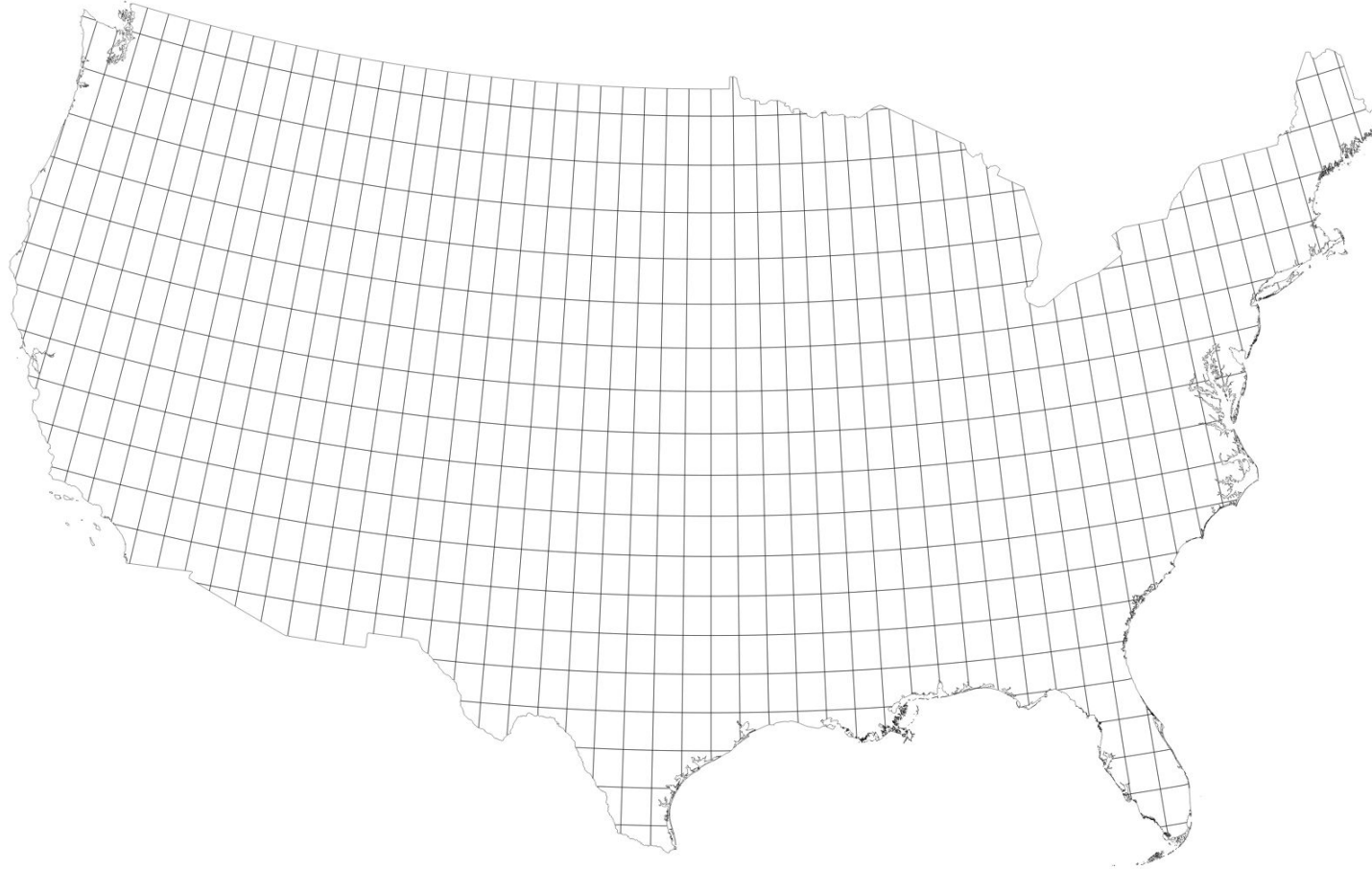
Source: 2012 USDA





# US Grid

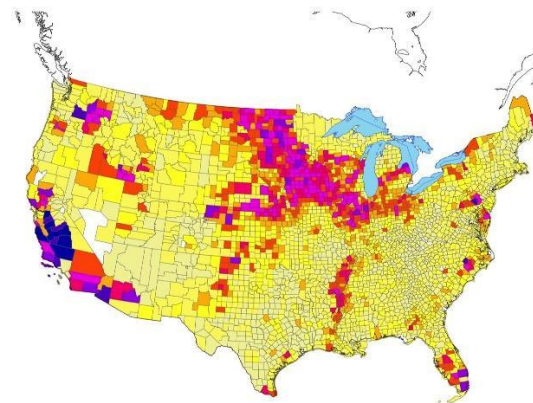
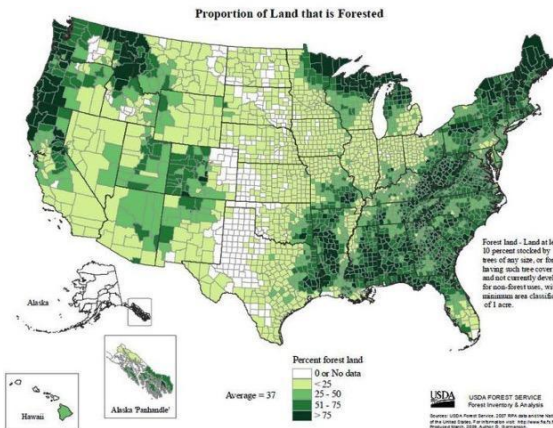
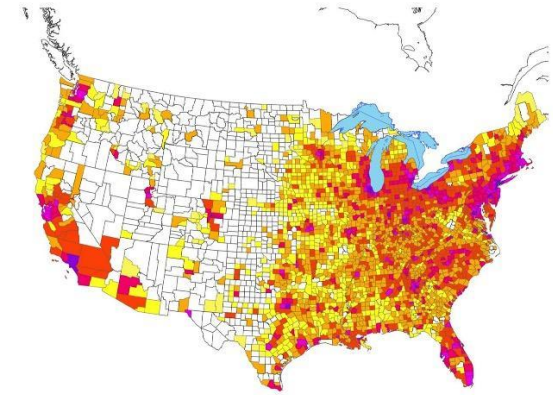
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**Design Challenge** – work as a team to place half of US land into protected status

**Design Constraints** – maximize biodiversity and sustainability



Look at your maps, and think about how they address biodiversity and human needs.

Highlight the cells you want to protect.

Challenge Time: 10 minutes

## A HOPEFUL FUTURE: DISCUSSION

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What experiences did you have in trying to protect half the US?

What issues came up?

How did you prioritize?

How did you compromise and why?

What trends did you notice?



## CREATIVE SOLUTIONS

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What are things you can do besides acquiring new land/setting up boundaries of protection/removing humans?

Can you think of **ACTIONS** we can take to help promote biodiversity in our own areas (including yard, park, etc.)?





**“...the only solution to the sixth extinction is to increase the area of inviolable natural reserves to half the surface of Earth or greater.”**

**“... species is the unit of biodiversity that can and must be studied most thoroughly with the practical aim of saving the whole.”**

**– E.O. WILSON**