

## Saving the Planet One Plant at a Time

How a community's renewed love of native plants can contribute to large-scale biodiversity conservation

A few slides have been removed from the original presentation, as they could not stand alone without narration.

We are living in an era of unprecedented environmental change, largely attributed to human activity, coined the “Anthropocene.” Conservation scientists are seeking solutions that can be rapidly applied and effective at large spatial scales. Scientists’ reliance on the latest technology and advanced methods may make these solutions seem “out of reach” for much of the public. But, the truth is the application of this work is local, relies on active community participation, and is easy to integrate. By focusing on what we love, in this case through the creation of native plant gardens, we can literally bridge neighbors together, connecting ourselves to the greater landscape and providing invaluable contributions to wildlife conservation efforts.





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How a community's renewed love of native plants can contribute to large-scale biodiversity conservation

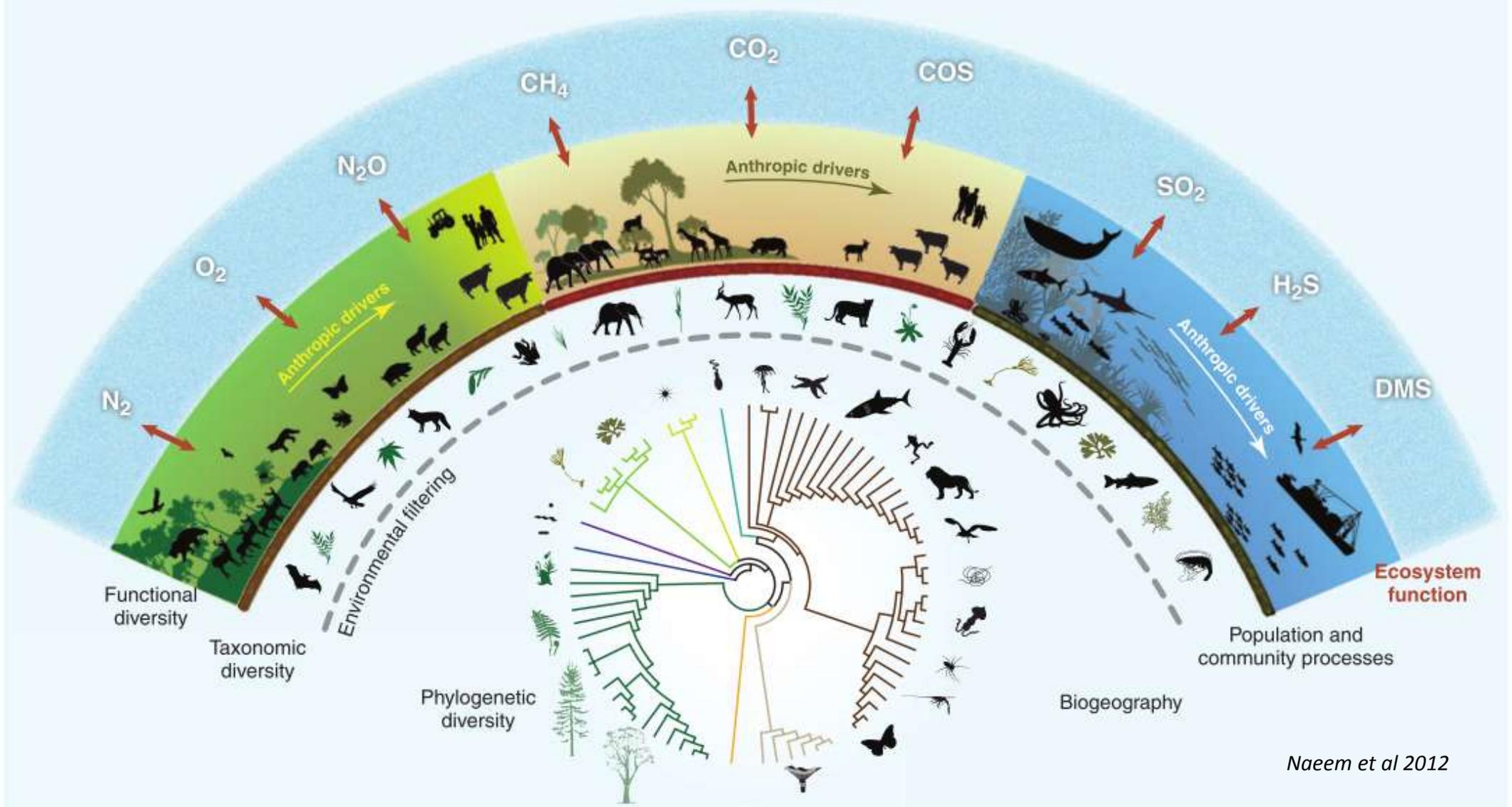


Iara Lacher, PhD | Landscape Ecology  
Smithsonian Conservation Biology Institute

# Legacy of Life

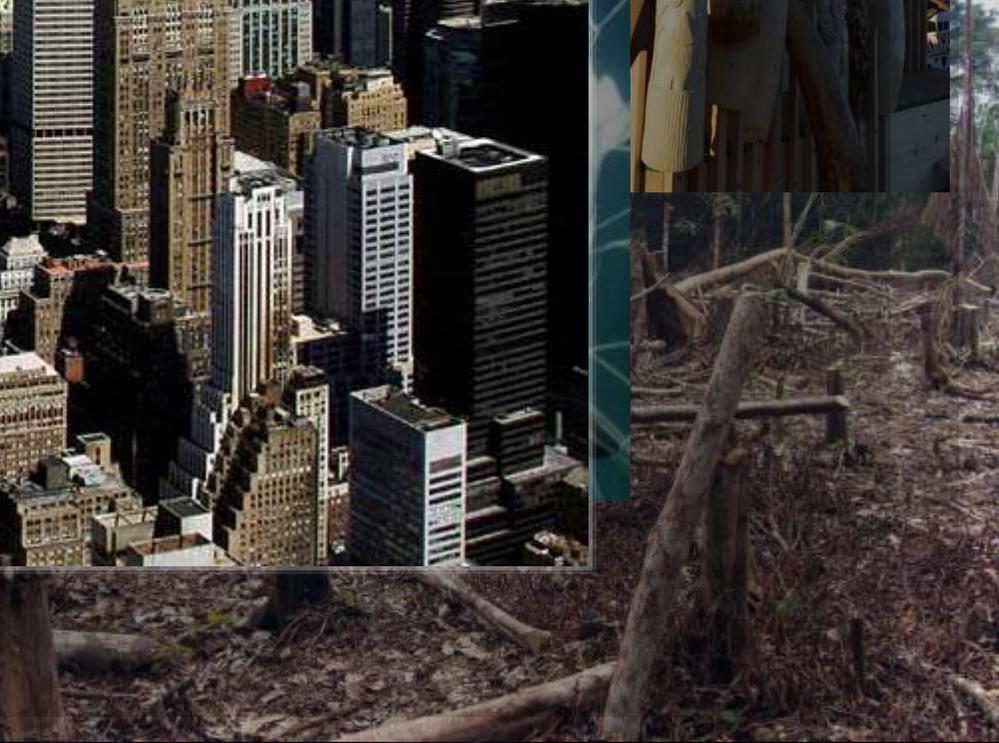


# And Biodiversity is Necessary

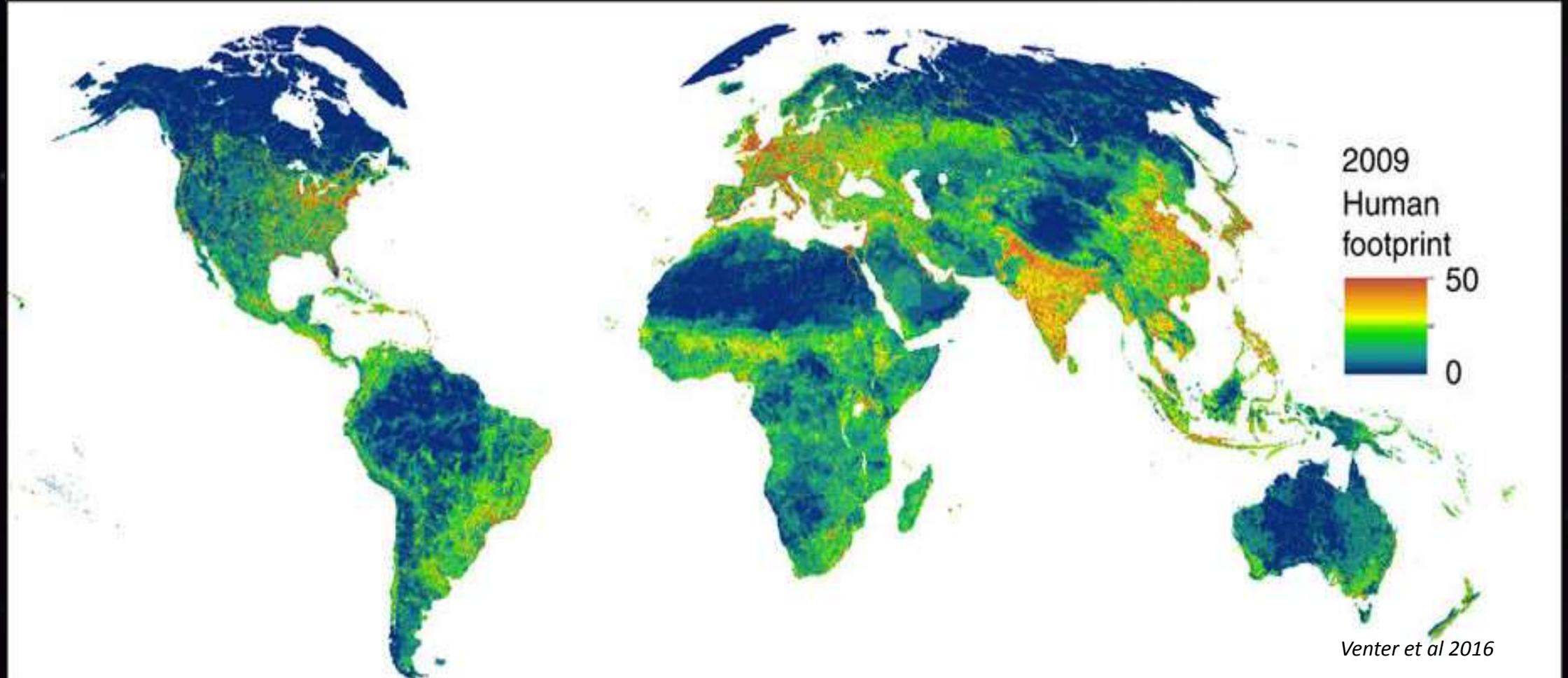


Naem et al 2012



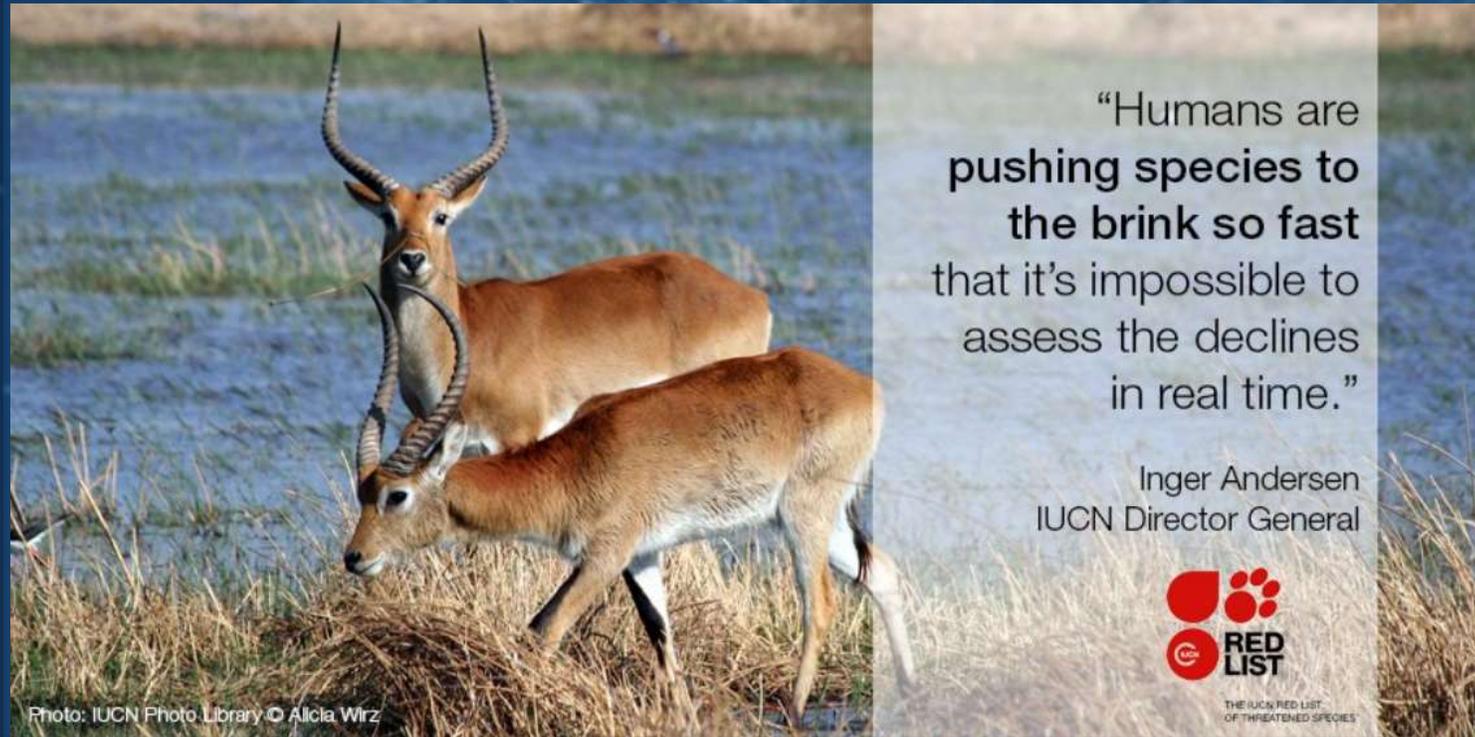


# The Anthropocene



# Massive Biodiversity Losses

We are losing biodiversity... Fast



“Humans are pushing species to the brink so fast that it’s impossible to assess the declines in real time.”

Inger Andersen  
IUCN Director General



THE IUCN RED LIST OF THREATENED SPECIES

Photo: IUCN Photo Library © Alicia Wirz

## LOSS OF SPECIES BIODIVERSITY

EVERY **20** MINUTES THE WORLD ADDS **3,500** HUMAN LIVES AND LOSES **1 OR MORE SPECIES**

27,000 SPECIES LOST A YEAR

EVERY **60** MINUTES **240 ACRES** OF NATURAL HABITAT ARE DESTROYED

**70%** OF THE WORLD'S KNOWN SPECIES RISK EXTINCTION IF THE GLOBAL TEMPERATURE RISES BY MORE THAN 5.5°C

75% OF GENETIC DIVERSITY IN AGRICULTURAL CROPS HAS BEEN LOST

**20%** OF THE WORLD'S SPECIES COULD BE GONE IN 30 YEARS

**80%** OF THE DECLINE IN BIOLOGICAL DIVERSITY IS CAUSED BY HABITAT DESTRUCTION

**1** OUT OF **4** AMPHIBIANS

**BIRDS**

**CONFERS**

**MAMMALS &**

**6** OUT OF **7** MARINE TURTLES

**ARE THREATENED BY EXTINCTION**

**75%** OF THE WORLD'S FISHERIES ARE FULLY OR OVER EXPLOITED

**BIODIVERSITY IS NECESSARY FOR HUMAN SURVIVAL**  
**HUMANS HOLD THE POWER TO STOP THE LOSS**

# Why does this matter to HUMANS?



## *Ecosystem Function*

*The capacity of ecosystems to provide goods and services that satisfy human needs, directly and indirectly*

## *Ecosystem Services*

*Contributions to human well-being*



# What are Ecosystem Function and Ecosystem Services?

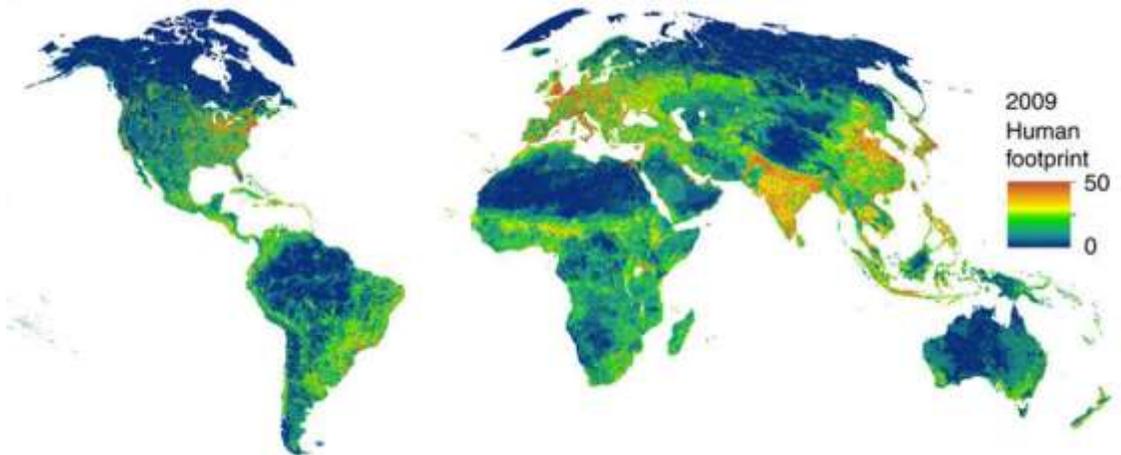
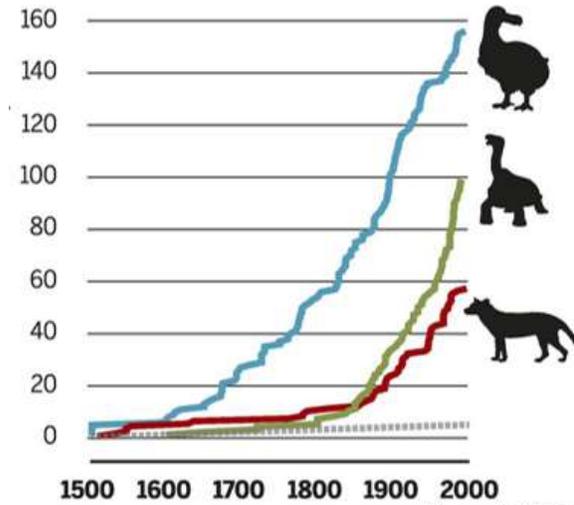


*Ecosystem  
Function*

*Ecosystem  
Service*



# Conserve species <-> Conserve services



**Our quality of life is tied to the environmental health of  
where we live.**



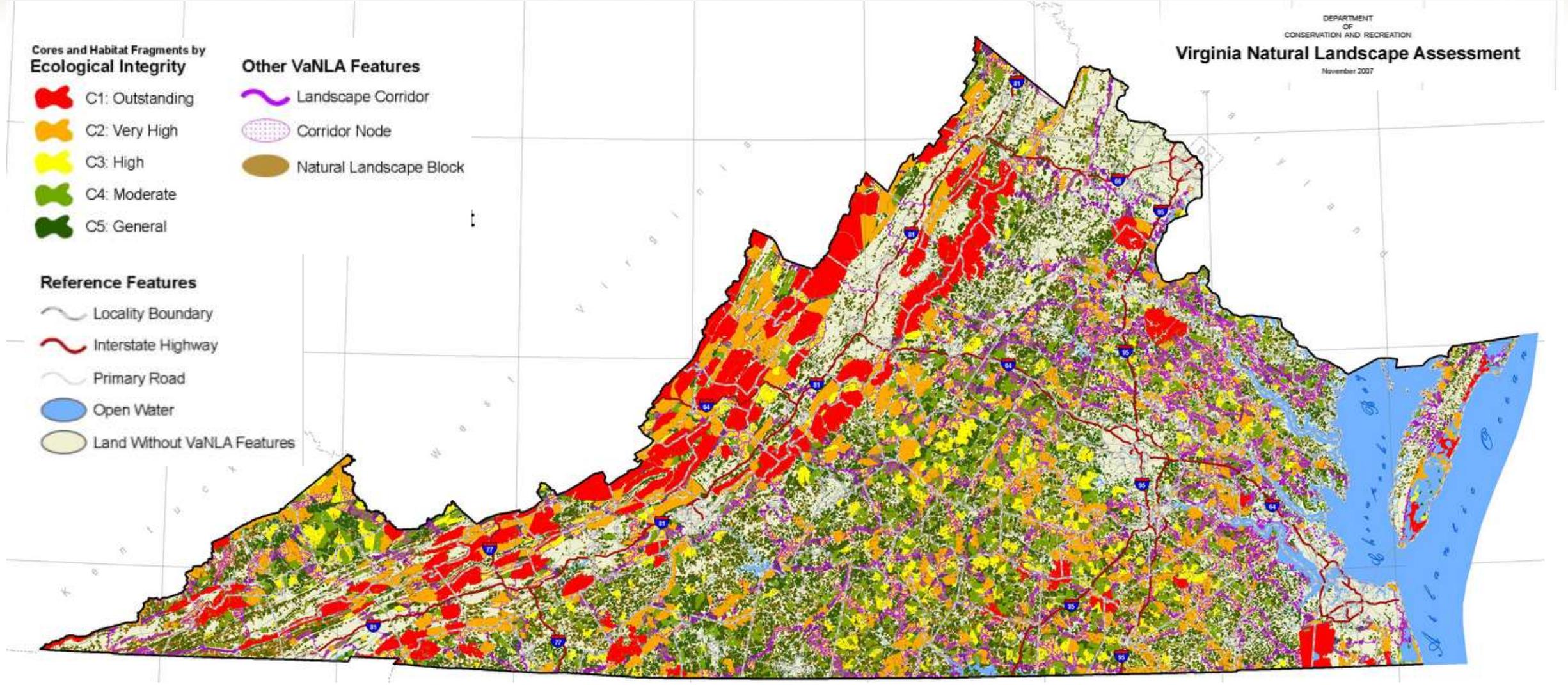
**9 BILLION  
PEOPLE**

**WILL SOON SHARE OUR PLANET.  
WE ALL SHOULD EAT WELL AND HAVE  
CLEAN WATER TO DRINK.**

<https://oneplanetincommon.com/>



# Our Reality



# Innate Curiosity & Love of Nature



# Obstacles to Conservation – Related Action

***Conversion of natural land to residential and commercial development is the primary mechanism by which habitat is lost permanently in Virginia.***



## Call to Action

**Hope springs eternal in the human breast;  
Man never is, but always to be blessed:  
The soul, uneasy and confined from home,  
Rests and expatiates in a life to come.**

***—Alexander Pope, An Essay on Man***



# Obstacles to Conservation – Related Action

- *No longer supports functioning ecosystems*
- *Remaining habitat isolated, not large enough*





Eric Edward added 8 new photos.

...

January 6, 2015 · iPhoto · 11

We went hiking and saw some amazing things in Brazil! Here's just a small taste.

# Do What you LOVE!



# Why "go Native"?



# What is a Native Plant?



***What is the source of this plant?***



***Is this plant native to my region?***



***Was this plant grown from local stock or does the plant have a local origin?***



***Am I gardening in close proximity to a natural area?  
Is my planting for restoration?***



# Science!

## Nonnative plants reduce reproductive success of an insectivorous bird

Desiree L. Narango, Douglas W. Tallamy, University of Delaware  
Peter P. Marra, Smithsonian Migratory Bird Center



Smithsonian Conservation  
Biology Institute



@DLNarango



Smithsonian  
Conservation Biology Institute

# Making Connections...

## Insects on nonnative plants

Photo: S. Jaffe



### Nonnative plants support:

Lower Diversity, fewer specialists

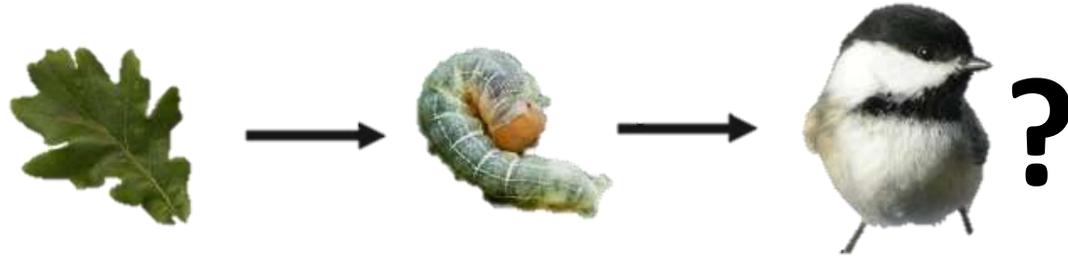
*Burghardt and Tallamy 2015 Ecosphere*

[ Lower Abundance  
Lower Biomass ]

*Narango et al. 2017 Biological Conservation*



# How do nonnative plants affect the relationship between plants, insects, & breeding birds?



Nonnative plants support fewer **high quality prey (caterpillars)**

Nonnative plants **reduce population growth** in chickadees

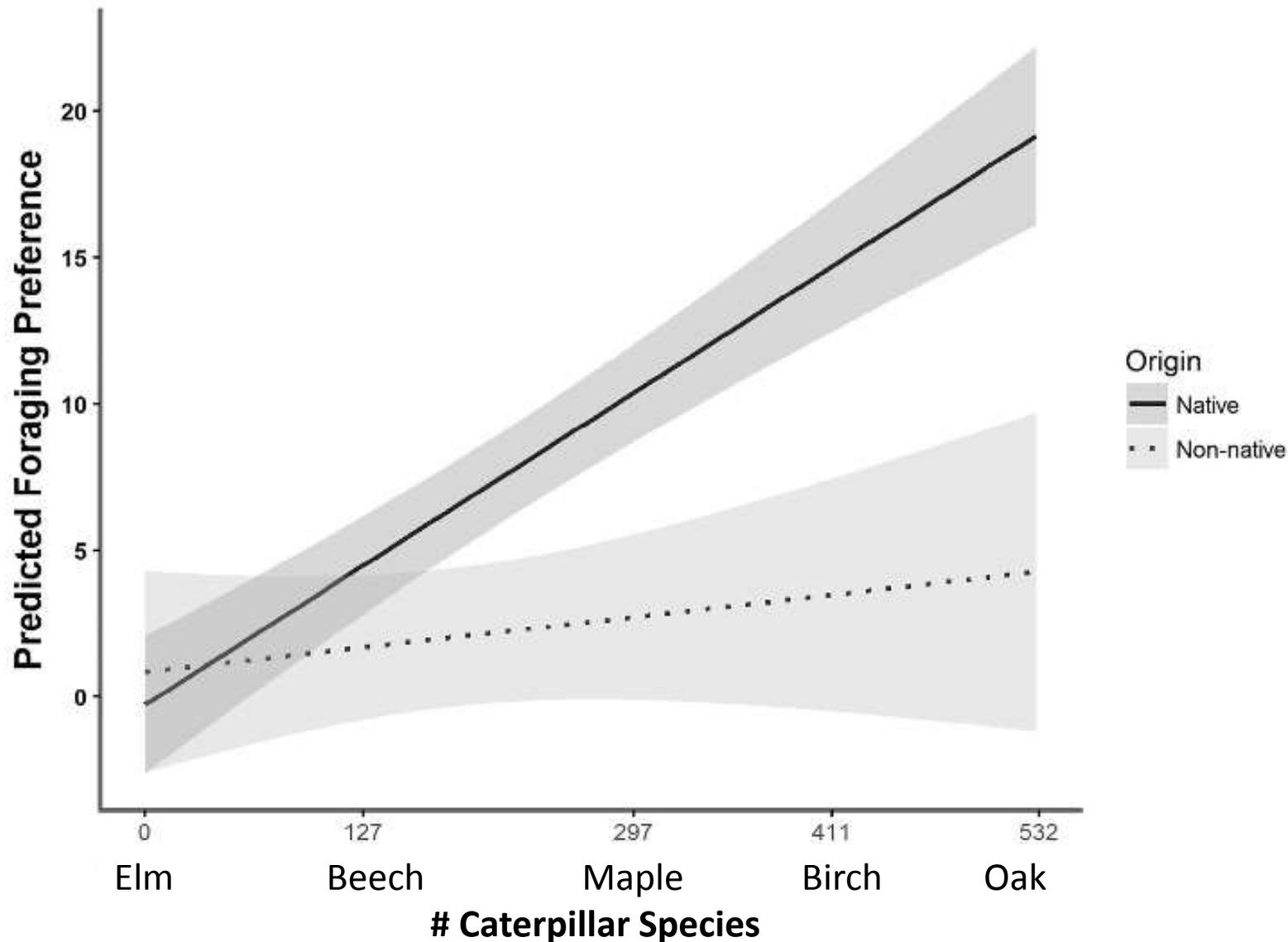
- Low reproduction but not survival

Neighborhood Nestwatch

To support avian populations, homeowners should plant and retain native, insect producing plant species



# Native Preferences



*Relationship between*

- *total number of caterpillar species and*
- *foraging preference of chickadees*

*in Washington D.C. residential yards.*

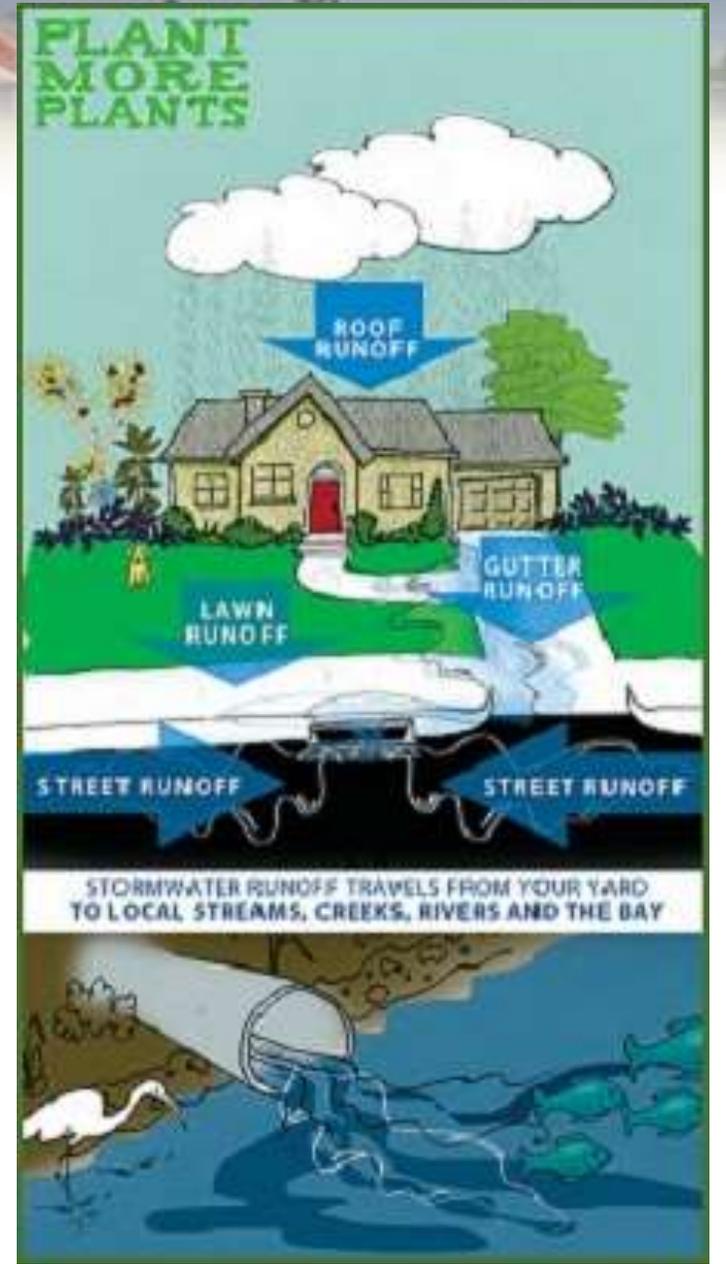


It's catching on!



**Better Homes & Gardens.**

Benefits of Native Plants



# It's catching on!



- ***Seeds for Education Grant Program***
- ***Virginia Conservation Assistance Program***
  - Conservation Landscaping.
  - Rain Gardens
  - Dry Well
  - Vegetated Swales
  - Bioretention
  - Infiltration Trench
  - Impervious Surface Removal
  - Porous Pavement/Pavers

# Address the problem at a bigger level.

## Find my Landscape Conservation Cooperative





# A Paradigm Shift

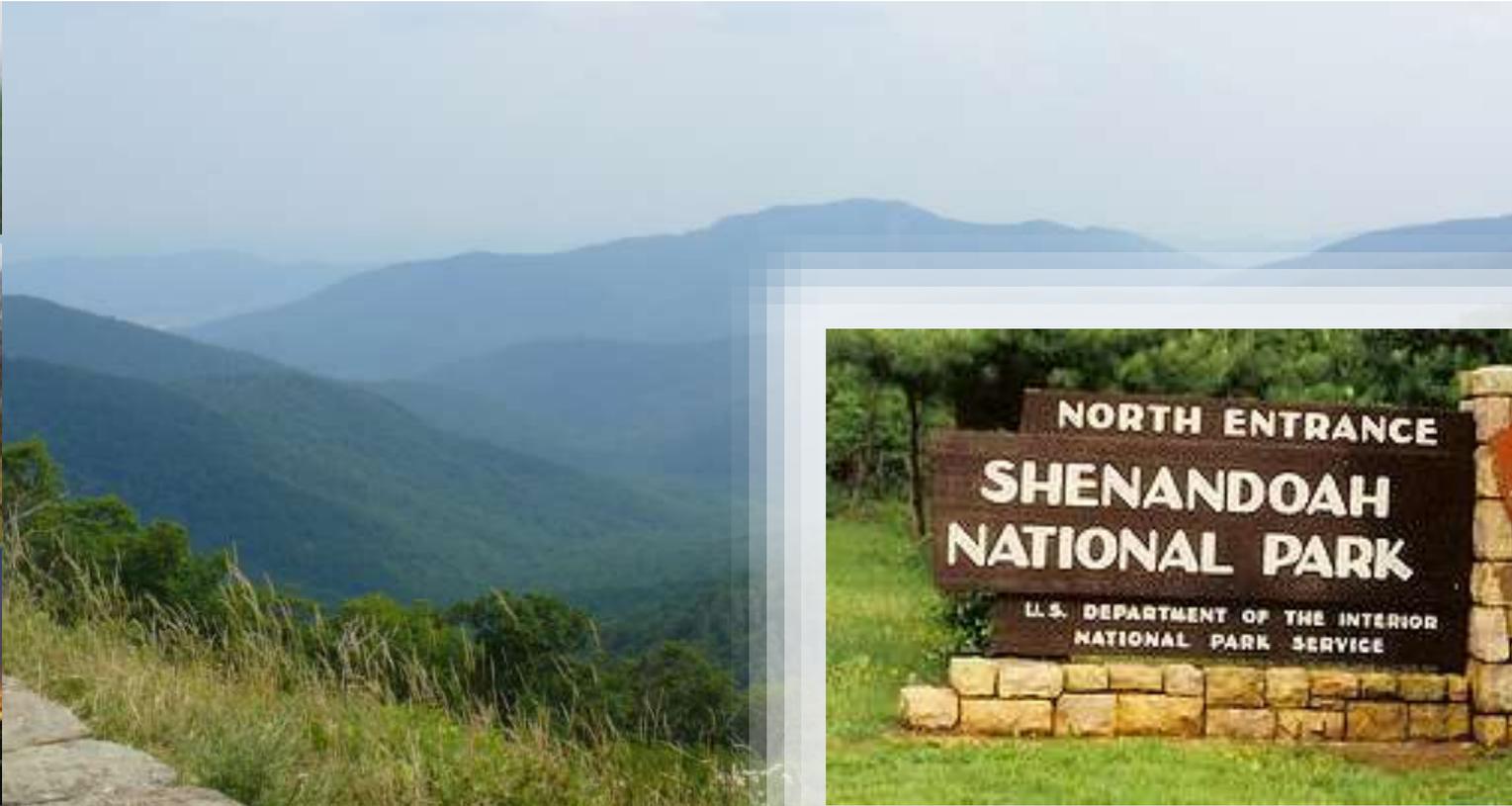




# The Wildlife Value of A Messy Garden



# The Changing Landscapes Initiative



**Our goal:** To preserve northwestern Virginia's natural areas and cultural heritage and their contribution to quality of life for current and future generations of people and wildlife.

# Obstacles to Conservation – Related Action

*Science informed policy change requires the sharing of knowledge across disciplines, geography, and jurisdiction*

**CREDIBILITY**



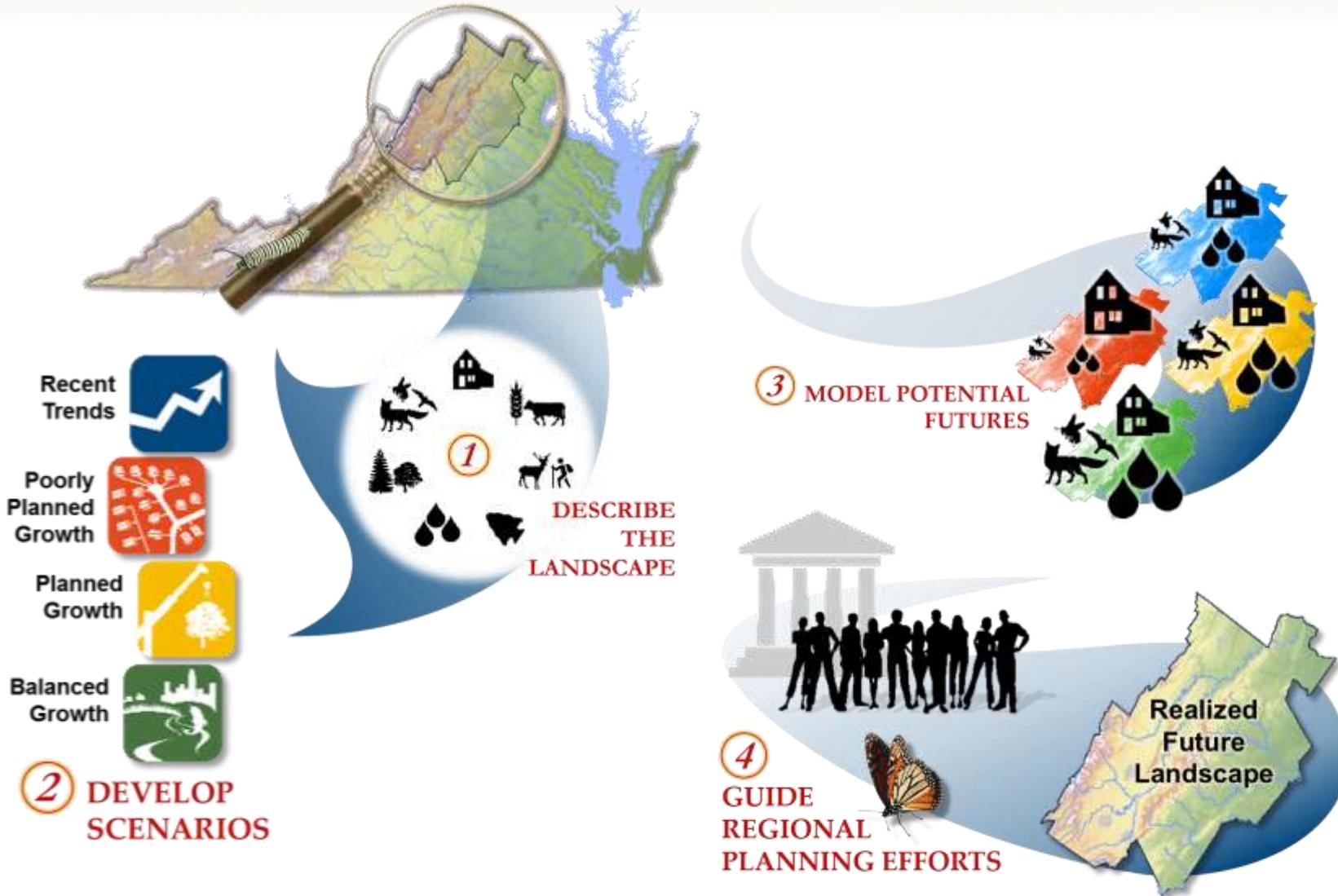
**SALIENCE**



**LEGITIMACY**



# Our Process

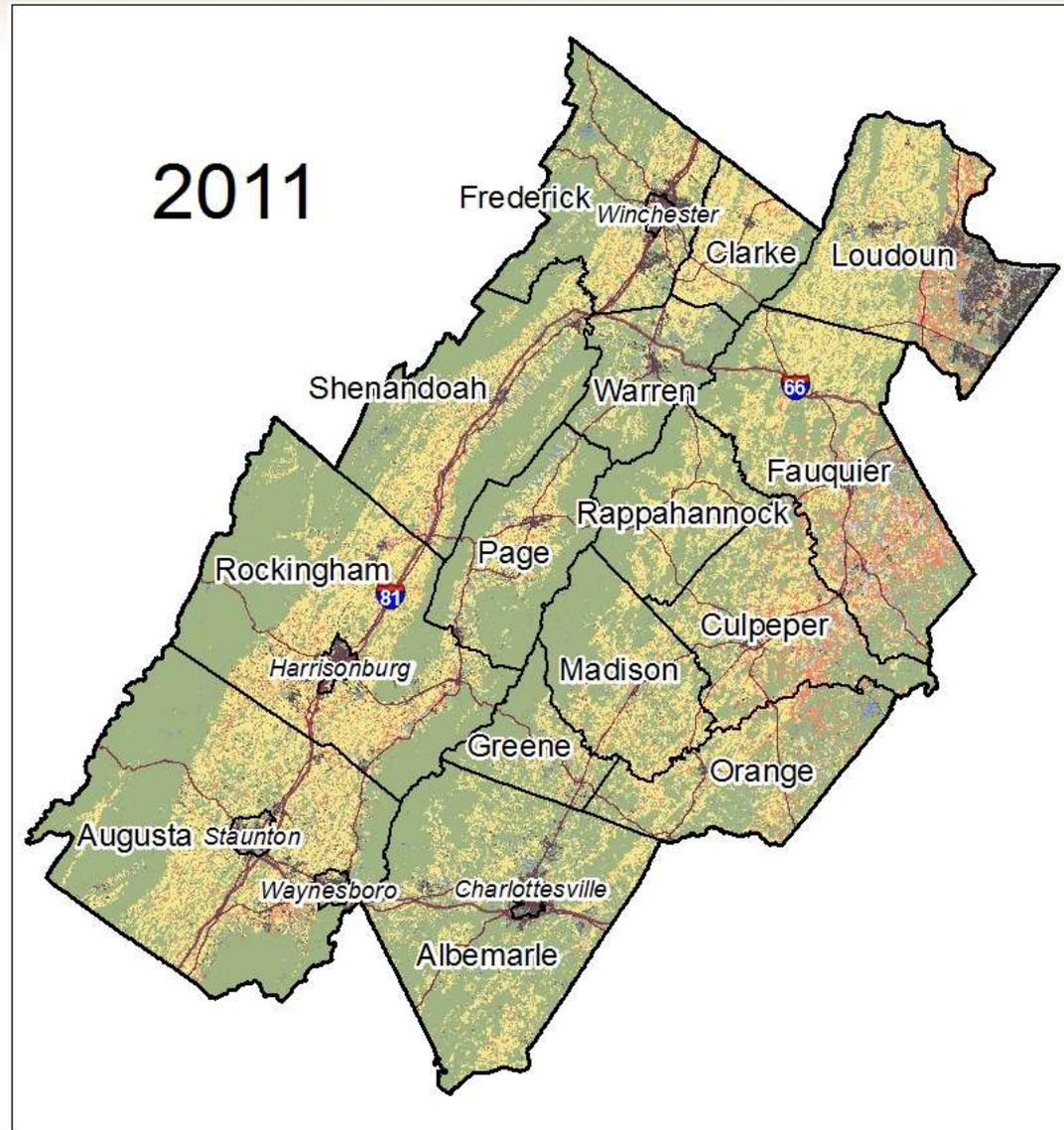


Stakeholder informed scenarios

*Visualizing potential futures*

Land Use Change Modeling

# Understanding Potential for Change



# The responsibility is on us as individuals



# My Place



# Yardmap.org

## ANATOMY OF A HABITAT MAP

### OBJECTS

Trees, flowers, rocks, compost bins, and other key habitat objects. Place these, share the species and other characteristics.

### HABITATS

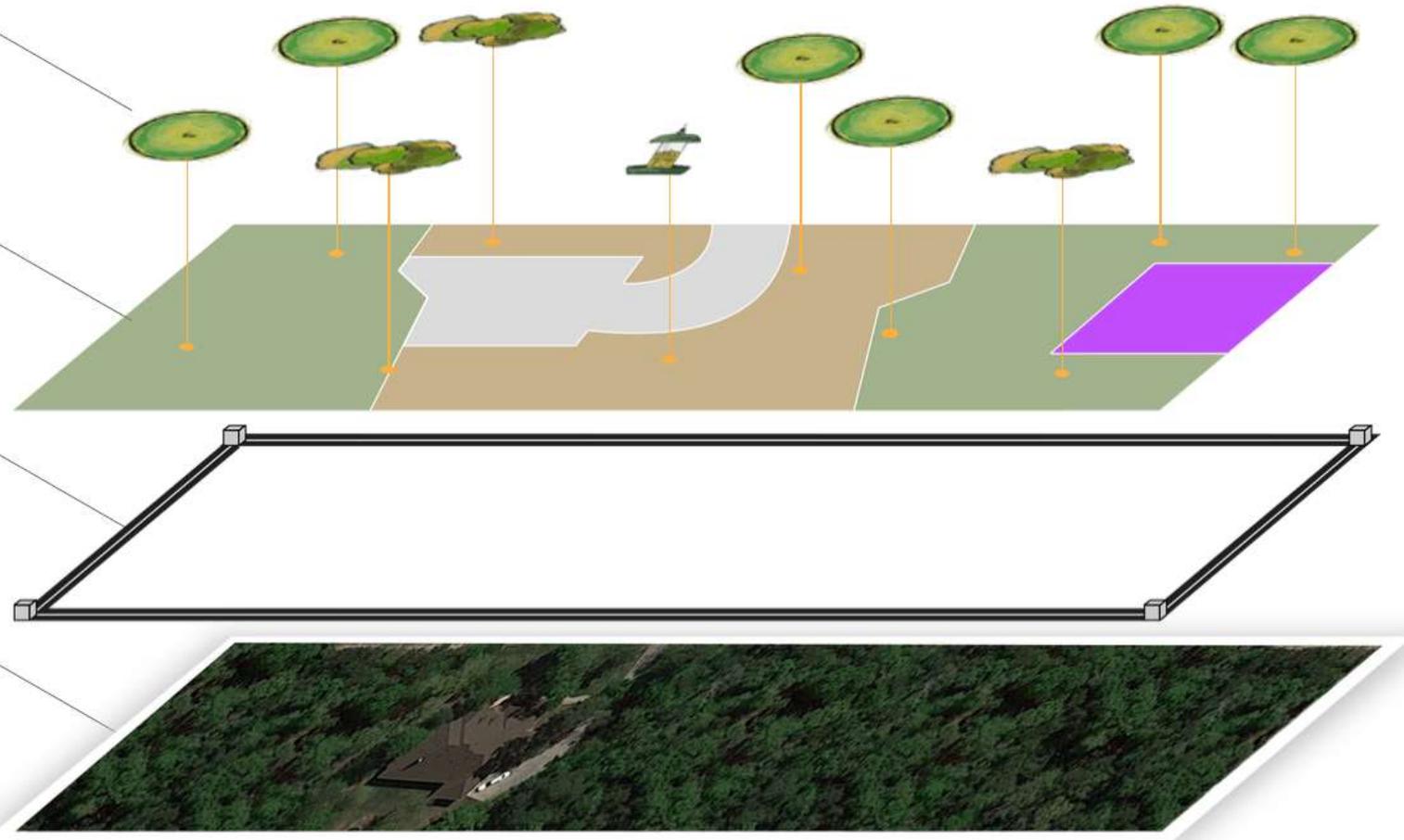
Split your site into the various habitats found there. This is some of the most important data for research.

### SITE LINE

Put in the boundaries of your site. For instance, an entire home property.

### REFERENCE MAP

Use satellite imagery to find your site and as a reference for creating your YardMap.



1+1

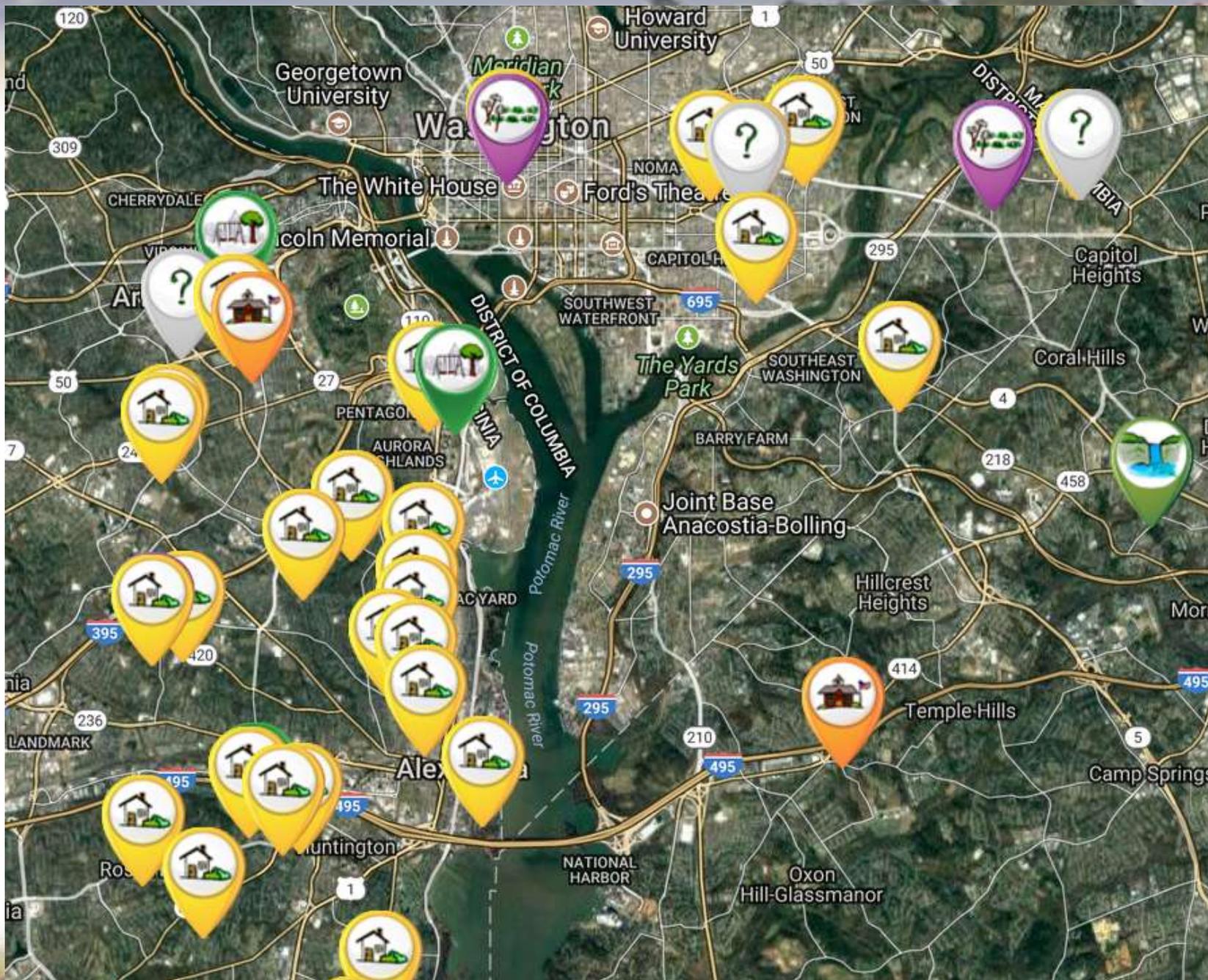
***By nurturing what we love, native plants, we can begin a paradigm shift.***

***\*Build bridges***

***\*Connect people.***

***\*Connect landscapes***





***"By creating a native plant garden, each patch of habitat becomes part of a collective effort to nurture and sustain the living landscape for birds and other animals."***

- Audubon.org



Smithsonian  
Conservation Biology Institute

# Sources

- Yard Map
  - <http://content.yardmap.org/learn/wildlife-value-of-a-messy-garden/>
  - <http://app.yardmap.org/map#!/map//siteexplorer/my-sites-list/0/habitat/list>
- My habitat at home
  - <https://www.youtube.com/watch?v=VDiTMcxCp0s>
- PhD student met at Emerging Scientists
  - <http://desireelnarango.weebly.com/research.html>
- Timelapse of region since 1984
  - <https://earthengine.google.com/timelapse/>