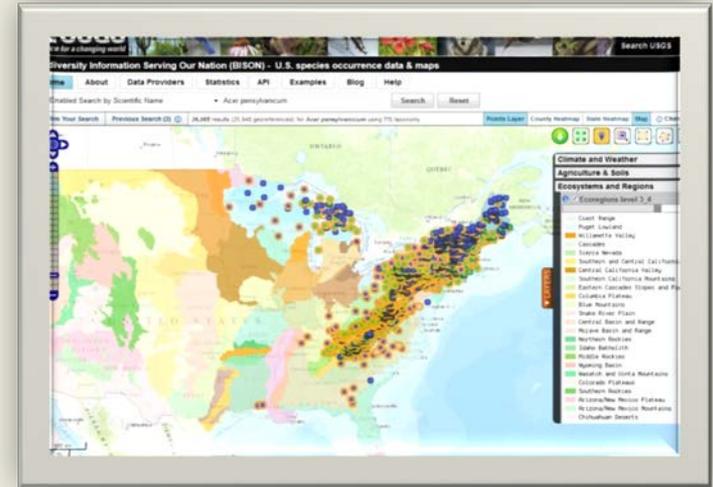




# BISON

## Biodiversity Information Serving Our Nation



 **GBIF** & other connections

# (BISON.USGS.GOV)

- **US National Clearinghouse for occurrence data**
- **375+ million records & growing**
- **US Node Application of GBIF**
- **Relies on GBIF for 275M records**
- **Nearly all species in US**
- **Taxonomic standardization**
- **Every state and county**
- **55 environmental layers**
- **Who, what, when, where for every record (at a minimum)**
- **Promoting (*forcing*) properly formatted occurrence data mobilization**



*"I have been spending a lot of weekends using BISON and the data have been extremely helpful in my analyses. I am very grateful to have this resource - thank you for all you've done to make this what it is."*

September 14, 2016. Laura T. Bortolin, Harvard Medical School, Dept. of Genetics, Boston, MA

*"...I am very impressed with BISON and am happy the USGS is making biodiversity data available as it is desperately needed. Keep up the good work!"*

December 14, 2015. Robert Irwin, Resource Conservationist, Sacramento River Forum, Red Bluff, CA.

*"...thanks a million for this application. It is really adding to the number of records I have been able to acquire for numerous amphibian and reptile species."*

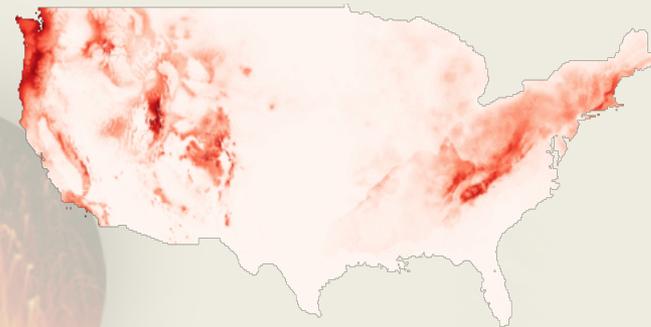
April 29, 2013. Bill Sutton, Ph.D., Postdoctoral Research Associate, Clemson University, School of Agricultural, Forest and Environmental Sciences.

*"...we're really excited at its performance in producing and mapping extremely large search-result sets (I generated one with 1.8 million hits in a matter of seconds)."*

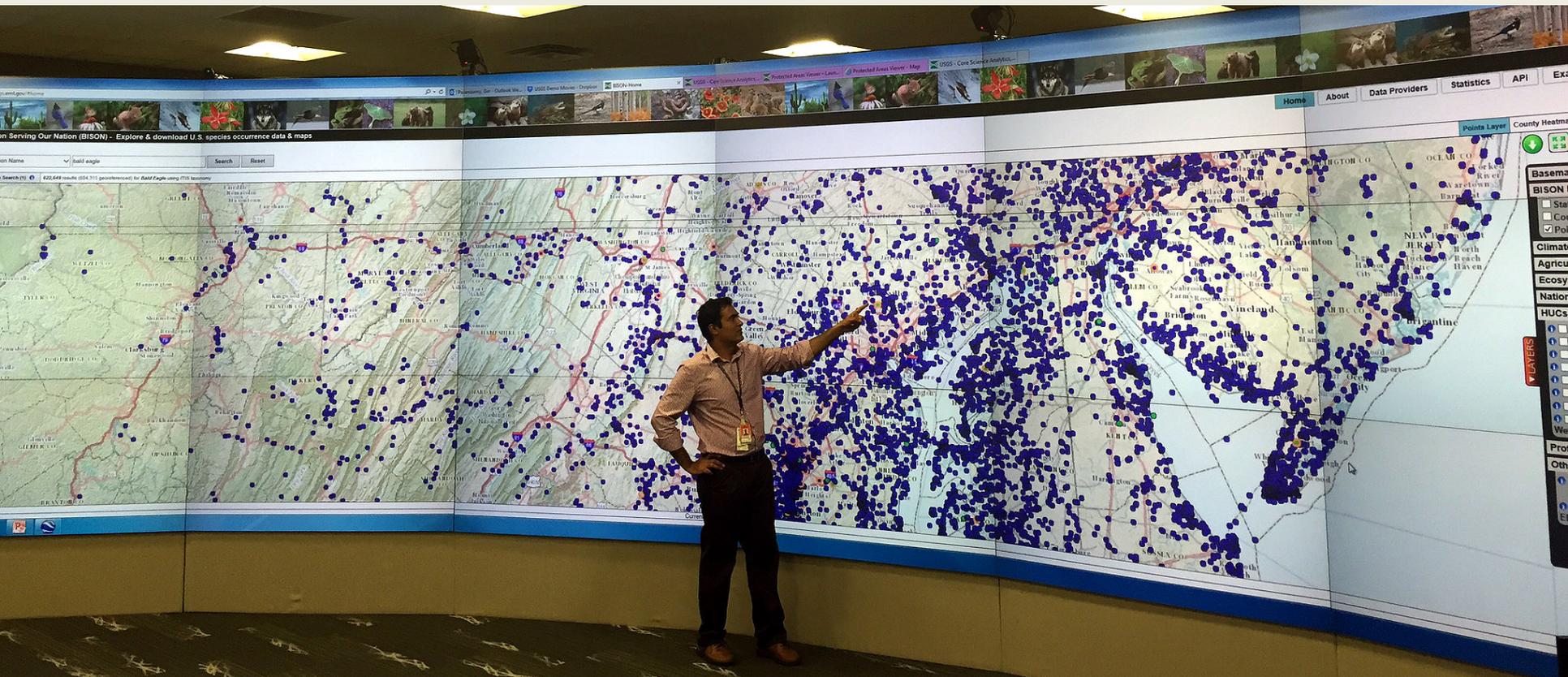
April, 22, 2013. Scott L. Cross, Ph.D.. NOAA National Oceanographic Data Center/National Coastal Data Development Center, Charleston, SC.

# What BISON does for the US

- Provides the only fully integrated and comprehensive clearinghouse for US species occurrence data with extensive Web Services to power other applications.
- Delivery of Federal data sets increasing usage and visibility.
- Identification and mobilization of targeted data sets (Federal and Non-Federal) to produce comprehensive coverages.  
Current emphasis groups are: Birds, Plants, Pollinators, & Invasives
- US relevant taxonomic and geospatial binning (e.g. ITIS, Counties, States)
- Data discovery, cleaning, formatting, quality control.
- Community training and support.
- It is the foundational engine for a new comprehensive species modelling effort.
- The Federal counterpart to iDigBio by MOU with NSF.



# Big Data



*An open source framework to add spatial extent and geospatial visibility to Big Data*  
Proceedings - 2014 IEEE International Conference on Big Data, IEEE Big Data (2015)  
DOI: [10.1109/BigData.2014.7004495](https://doi.org/10.1109/BigData.2014.7004495)



**Everyone's data online  
helping to save our  
environment**

Species occurrence data & maps

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Refine Your Search Map Checklist

**Basemap Layers**

- USGS Base Map
- USGS Small Scale Base Imagery
- USGS Large Scale Base Imagery
- USGS Vector Map
- USGS Transportation

**BISON Layers**

- State Heatmap
- County Heatmap
- Points Layer

**Climate and Weather**

**Agriculture & Soils**

**Ecosystems and Regions**

- National Atlas & Demographic
- HUCs, Catchments, Land Cover

**Protected Areas**

- Protected Areas of the US Database - Owner
- Protected Areas of the US Database - Status

**Other**

**Location Records: 3**

[Download All](#)

[Show Details](#) | [Download](#)

**3. Dumetella carolinensis**

Processed Scientific Name: Dumetella carolinensis

ITIS Common Name: Gray Catbird; Grey Catbird; Maullador gris; moqueur chat

ITIS TSN: 178625

Basis of Record: Observation

Occurrence Date: 2011-09-10T00:00Z

500 km  
200 mi

Let: -83.677431, 30.01501

**More than a million  
professional and  
citizen scientists  
have gathered the  
data that is in BISON**



## Selected Larger Data Sets Hosted by BISON

**BLM - National Invasive Species Information Management System - Plants - 2010-2014 (62,317)**

**BugGuide (45,8259)**

**Butterflies and Moths of North America BAMONA (701,186)**

**iMapInvasives - NatureServe - New York (89,137)**

**International Biological Information System - US - Nonnative Species (299,222)**

**Los Angeles Street Tree Census - 2015 (63,326)**

**Maui Invasive Species Committee - Pest Surveys - 1996-2011 (106,859)**

**Multistate Aquatic Resources Information System - MARIS - Fish (961,352)**

**NPS - Inventory and Monitoring Program - NPSpecies Park Species Lists (256,073)**

**San Francisco Street Tree Census - 2015 (71,170)**

**USDA - PLANTS Database (2,390,439)**

**USFS - Forest Inventory and Analysis - Trees (Private Lands) (13,357,746)**

**USFS - Forest Inventory, and Analysis - Trees (Public Lands) (4,812,960)**

**USFS - New York City Tree Census - 1995 (516,989)**

**USGS GAP - Alaska - Vertebrates - 1867-2009 (1,193,488)**

**USGS NAWQA - BioData - USA (1,154,963)**

**USGS PWRC - Bird Banding Lab - Canada Province Centroid (12,003,422)**

**USGS PWRC - Bird Banding Lab - Encounters (433,847)**

**USGS PWRC - Bird Banding Lab - US 10min Block (36,846,665)**

**USGS PWRC - Bird Banding Lab - US State Centroid (13,574,499)**

**USGS PWRC - Bird Phenology Program (585,541)**

**USGS PWRC - Native Bee Inventory and Monitoring Lab (BIML) (329,917)**

**USGS PWRC - North American Breeding Bird Atlas Explorer (2,726,852)**

**USGS PWRC - North American Breeding Bird Survey - 1966-2013 (2,288,254)**

**VegBank - Carolina Vegetation Survey (438,861)**

**VegBank - Vegetation Plot Database (1,029,948)**

**97,088,747**  
**DWCII records in**  
**61 data sets**  
**originating in**  
**BISON.**

# Custom Maps & Checklists

For Any Area  
Including  
User  
Polygons



# Documentation with a Click & Download



USGS Home  
Contact USGS  
Search USGS

Biodiversity Information Serving Our Nation (BISON) - Explore & download U.S. species occurrence data & maps

Home About Data Providers Statistics API Examples Blog Help

ITIS Enabled Search by Scientific Name

Found 9,884 matches for *Ailanthus altissima* using ITIS taxonomy from the specified provider(s) Refine Your Search

9,883 georeferenced

Record Details generated with ITIS taxonomy.

**Summary Details**

Processed Scientific Name: *Ailanthus altissima*

Name:

ITIS Common Name: copal tree;tree of heaven;tree-of-heaven

ITIS TSN: 28827

Basis of Record: specimen

Occurrence Date: 7-16-2011

Provider: BISON

Resource: [Towson University - Midatlantic - Ailanthus altissima - 2011](#)

**Taxonomic/Occurrence Details**

Collector: Matthew S. Hansen and Roland P. Roberts

Collector Number: MSH405

Valid/Accepted Scientific Name: *Ailanthus altissima*

Valid/Accepted ITIS TSN: 28827

As Provided Scientific Name: *Ailanthus altissima* (Mill.) Swingle

**Spatial Details**

Latitude/Longitude: 37.12995/-78.51189

Calculated County or Equivalent/State: Prince Edward County/Virginia

Calculated FIPS: 51147

**Associated Media**



twsnalth\_hansen\_and\_roberts\_2011\_417.jpg  
9

**General Comments:** GPS Unit: GPSmap76CSx; Individuals sampled: 688; Photo vouchers taken: 683; collector\_number = Unique DNA sample identifier

For more information, or to make comments on this occurrence, please contact the provider.

Location Records: 17

1. *Ailanthus altissima*

Processed Scientific Name: *Ailanthus altissima*

ITIS Common Name: copal tree;tree of heaven;tree-of-heaven

ITIS TSN: 28827

Basis of Record: Specimen

Occurrence Date: 7-16-2011

Provider: BISON

Resource: Towson Ailanthus

**Downloading Options**

1 *Ailanthus altissima* occurrences

File Type:

- Comma Separated Values (.CSV file)
- Google Earth KML file (.KML file)
- Zipped Shapefile bundle (.ZIP file)

Search time: 3.338 seconds

Current Zoom Level: 6

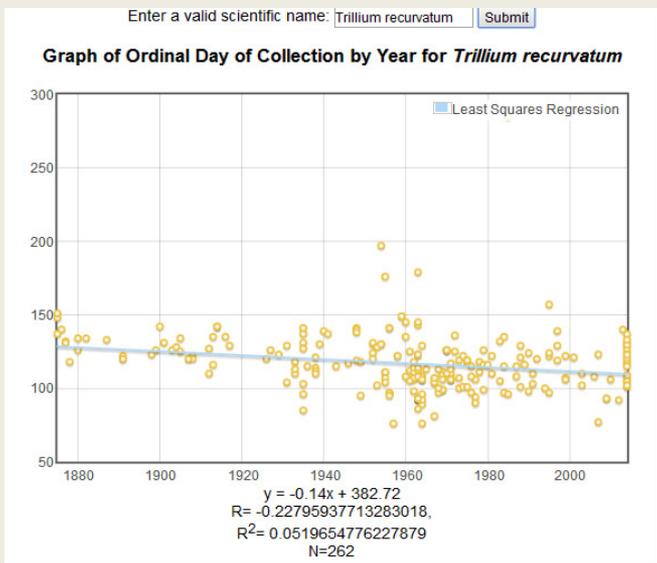
Lat: 38.54078 Long: -74.59815

# Individual Statistics

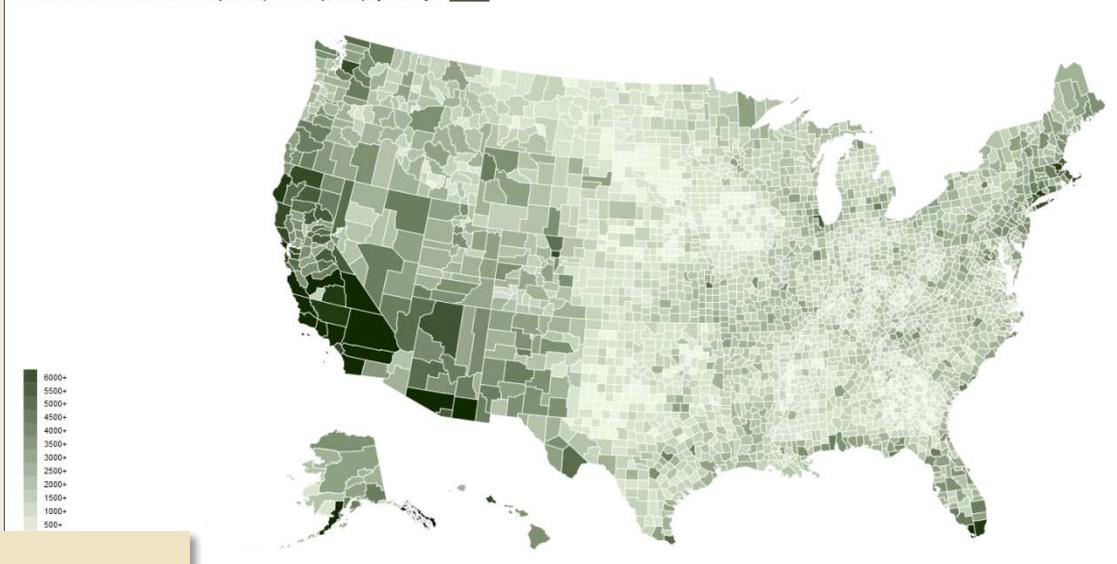
USGS ASC - Changing Arctic Ecosystems - Birdlist - 2011-2013	130	3903	17093	63336
USGS ASC - Copper River Delta - Birds - 1997-2005	125	3844	16523	77453
USGS BISON Team - Species Recognizable in Images and Video	138	4411	23127	116840
USGS FORT - Mesa Verde NP - Bats - 2006-2007	14	3732	17036	78407
USGS FORT - Ouray NWR - Bats - 2010	14	3732	16640	76238
USGS FORT - Rocky Mountain Arsenal NWR - Bats - 1997-1998	14	3732	17062	77941
USGS GAP - Alaska - Vertebrates - 1867-2009	152	4346	20145	109212
USGS LSC - Northern Appalachian Research Lab - Delaware River Mussel Survey	14	3834	16420	78154
USGS NAWQA - BioData - USA	26	4565	23774	142561
USGS NRP - Submerged Aquatic Plants - 1966-2009	14	4254	18417	98865
USGS NWHC - Laboratory Information Management System - Eastern US - Avian Cholera and Pasteurella multocida	262	4173	17998	95224
USGS NWHC - Laboratory Information Management System - Texas - Avian Cholera	262	4005	16964	78635
USGS NWHC - Laboratory Information Management System - US - Avian Pox and Pox Viruses	277	4778	20946	114656
USGS PIERC - Hawaii Forest Bird Survey Database	22	4002	18040	85010
USGS PWRC - Bird Banding Lab - Canada - 1960-2010	46	607	3728	28560
USGS PWRC - Bird Banding Lab - US 10min Block - 1960-2010	38	4922	24580	157897
USGS PWRC - Bird Banding Lab - US State Centroid - 1960-2010	30	514	3142	25368
USGS PWRC - Bird Phenology Program	295	5296	25583	166191
USGS PWRC - Colonial Waterbirds - US	18	4468	21903	126522
USGS PWRC - Native Bee Inventory and Monitoring Lab - US-CA-MX - Bees	16	4806	21976	130903
USGS PWRC - North American Breeding Bird Atlas Explorer	290	4878	23165	143996
USGS PWRC - North American Breeding Bird Survey - 1966-2013	160	5163	25320	167564
USGS SESC - Big Cypress - Herpetofauna - 2002-2003	58	4045	17525	80259
USGS SESC - Biscayne - Herpetofauna - 2002-2003	58	3818	16624	78513
USGS SESC - Everglades - Herpetofauna - 2000-2002	58	4044	17517	80396
USGS SESC - Everglades - Herpetofauna - 2005	16	3961	16848	78479
USGS SESC - Virgin Islands - Herpetofauna - 2001-2002	14	3737	16262	75091
USGS WERC - SDFS Fisher Lab - Vertebrates - 1999-2009	20	4244	19006	95861



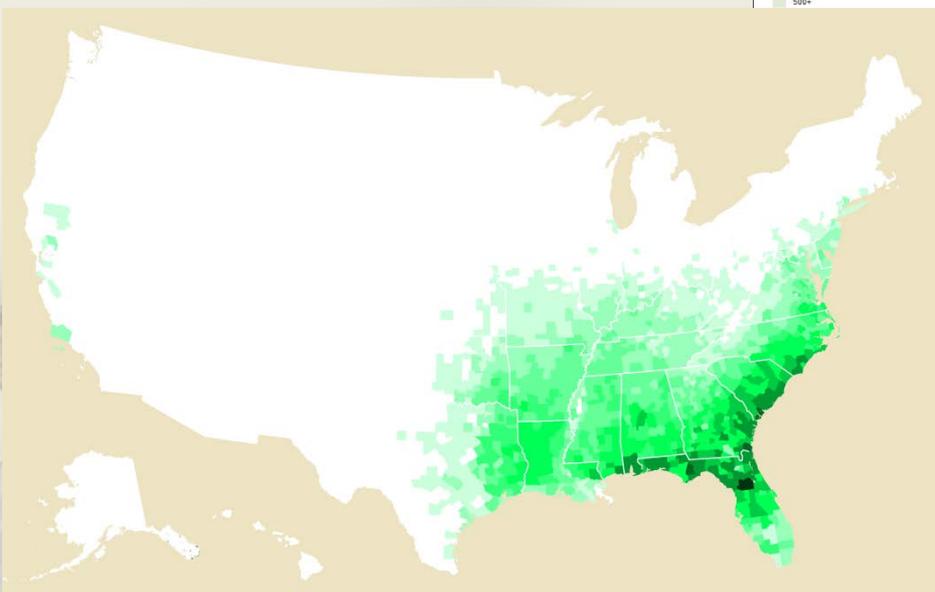
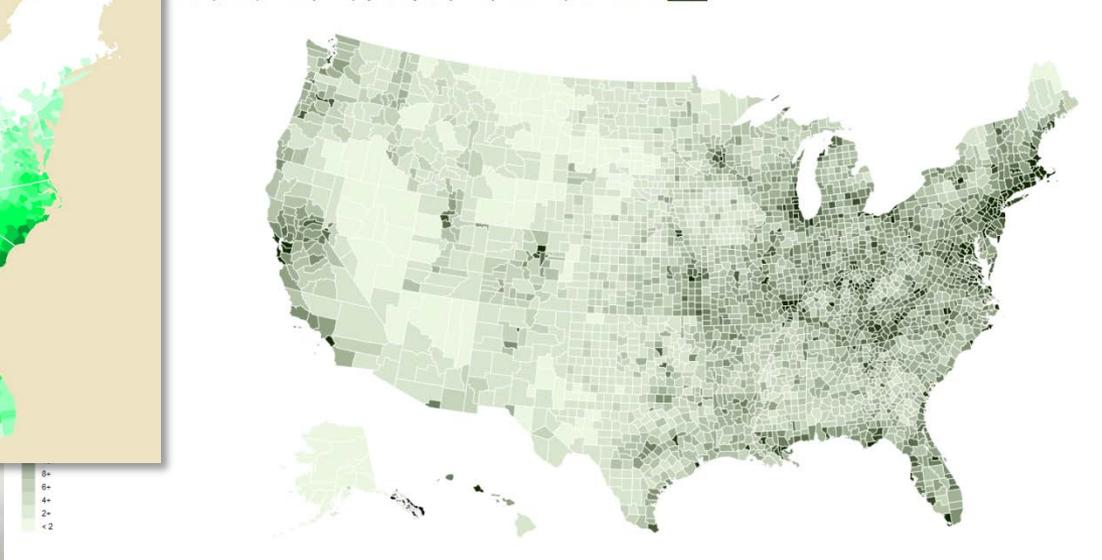
# More ways to use BISON's extensive services



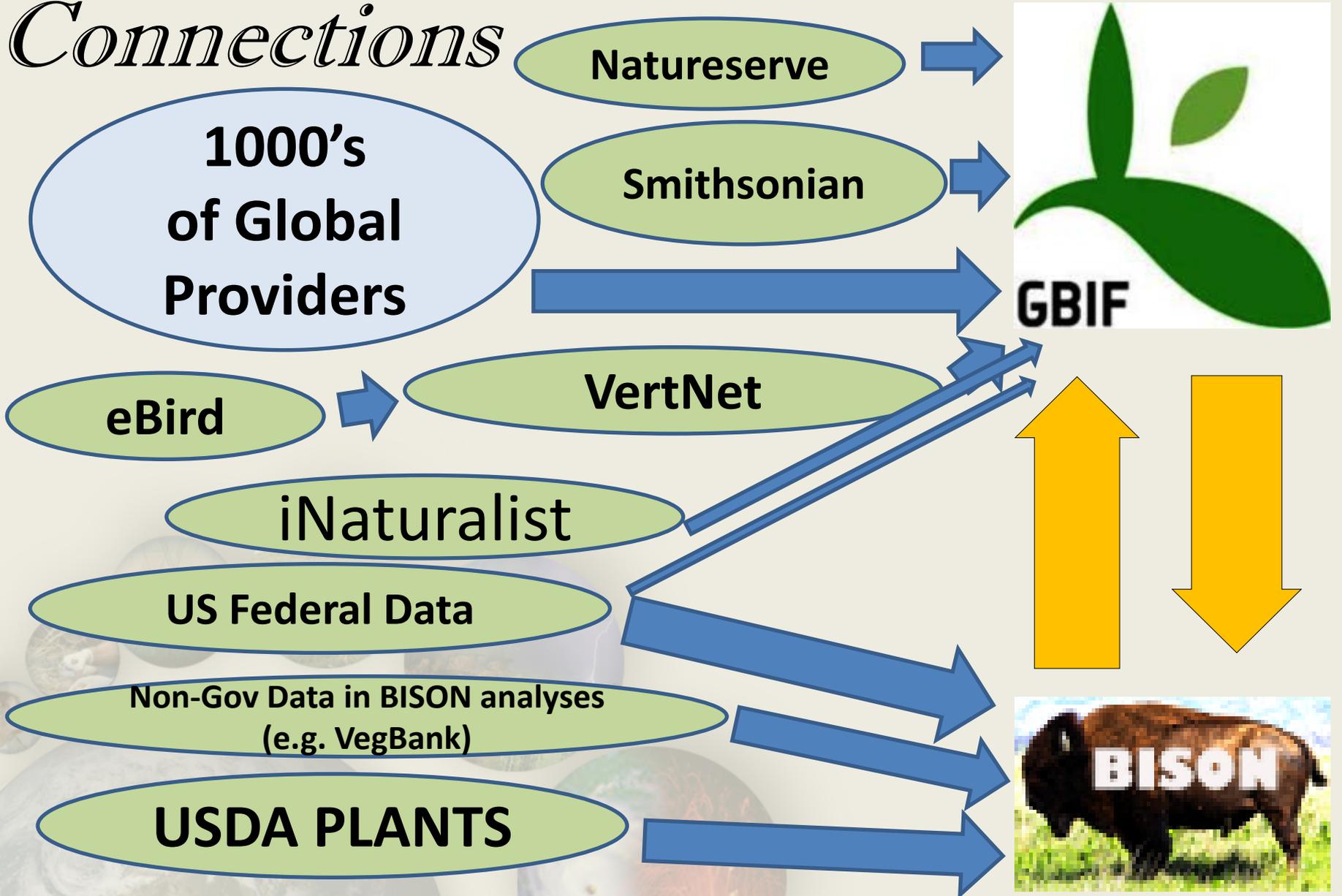
Total Number of All Documented Species (and subspecies) by County in BISON



Documented Species (and subspecies) by County as Species per 10Km Sq. of Land Area in BISON



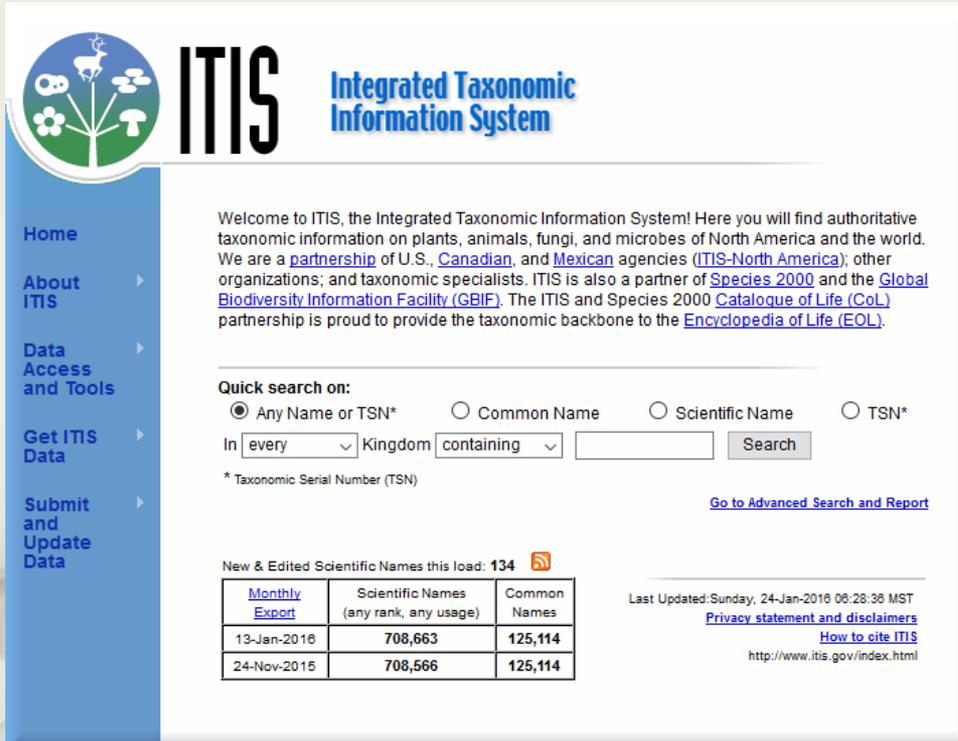
# Connections



# What BISON does for GBIF

- **100 million new records online** (*OK 97M actually*)
- **Another 150 million in the pipeline** (*very conservatively*)
- **Far more potentially** (*with continued BISON facilitation*)
  
- **Demonstrated value added for the largest GBIF funder** (*the US Government*)
  
- **Identification and mobilization of comprehensive data sets** (*current emphasis: Birds, Plants, Pollinators, Invasives*)
  
- **Multiple custom Web Services supporting an extensive ecosystem of supportive users**
  
- **Data discovery, cleaning, formatting, quality control.**
  
- **Community training and support.**

# Integrated Taxonomic Information System



The screenshot shows the ITIS website homepage. At the top left is the ITIS logo, which includes a stylized tree with various organisms (a deer, a flower, a mushroom, and a globe) and the text "ITIS Integrated Taxonomic Information System". Below the logo is a navigation menu with links for Home, About ITIS, Data Access and Tools, Get ITIS Data, and Submit and Update Data. The main content area features a welcome message, a "Quick search on:" section with radio buttons for "Any Name or TSN\*", "Common Name", "Scientific Name", and "TSN\*", and a search form with dropdown menus for "In" (set to "every") and "Kingdom" (set to "containing"), followed by a "Search" button. Below the search form is a table titled "New & Edited Scientific Names this load: 134" with columns for "Monthly Export", "Scientific Names (any rank, any usage)", and "Common Names". The table shows two rows of data: 13-Jan-2016 with 708,663 scientific names and 125,114 common names, and 24-Nov-2015 with 708,566 scientific names and 125,114 common names. To the right of the table is a "Last Updated" timestamp and links for "Privacy statement and disclaimers" and "How to cite ITIS".

Welcome to ITIS, the Integrated Taxonomic Information System! Here you will find authoritative taxonomic information on plants, animals, fungi, and microbes of North America and the world. We are a [partnership](#) of U.S., [Canadian](#), and [Mexican](#) agencies ([ITIS-North America](#)); other organizations; and taxonomic specialists. ITIS is also a partner of [Species 2000](#) and the [Global Biodiversity Information Facility \(GBIF\)](#). The ITIS and Species 2000 [Catalogue of Life \(CoL\)](#) partnership is proud to provide the taxonomic backbone to the [Encyclopedia of Life \(EOL\)](#).

Quick search on:

Any Name or TSN\*     Common Name     Scientific Name     TSN\*

In  Kingdom

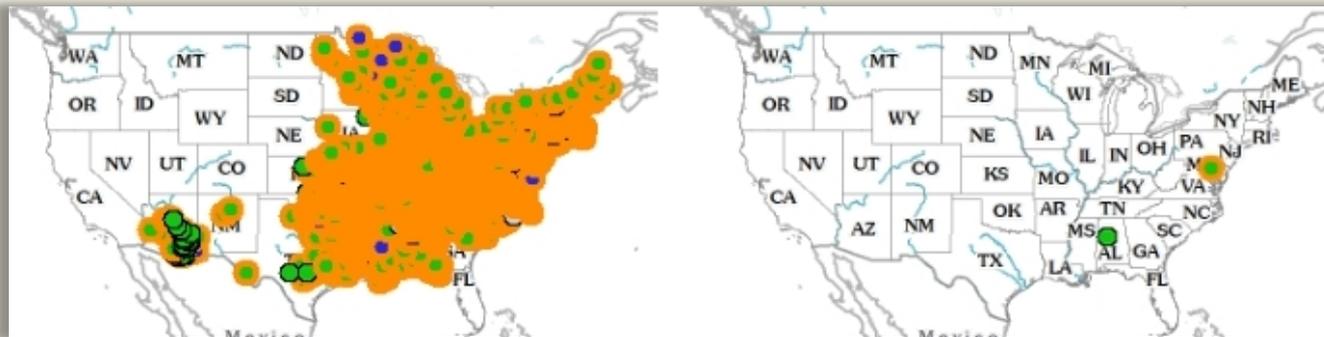
\* Taxonomic Serial Number (TSN)    [Go to Advanced Search and Report](#)

New & Edited Scientific Names this load: 134 

<a href="#">Monthly Export</a>	Scientific Names (any rank, any usage)	Common Names
13-Jan-2016	708,663	125,114
24-Nov-2015	708,566	125,114

Last Updated: Sunday, 24-Jan-2016 08:28:38 MST  
[Privacy statement and disclaimers](#)  
[How to cite ITIS](#)  
<http://www.itis.gov/index.html>

- Authoritative standard for names of biological organisms in Federal agencies
- Federal Partnership: 9 agencies
- Complete hierarchy of life and extensive synonymy allows data integration across biology
- Taxonomic Serial Numbers serve as the only truly reliable standard for Globally Unique Identifiers on species names
- Foundation for most other broad taxonomic databases
- International partnership produces the *Species2000 & ITIS Catalogue of Life* every year.



[Go to Print Version](#)

**Rubus flagellaris Willd.**

Taxonomic Serial No.: 24921

[Download data](#) ([Download Help](#)) *Rubus flagellaris* TSN 24921

**Taxonomy and Nomenclature**

Kingdom:	Plantae
Taxonomic Rank:	Species
Synonym(s):	<a href="#">Rubus scambens</a> L.H. Bailey <a href="#">Rubus aboriginum</a> Rydb. <a href="#">Rubus apogaeus</a> L.H. Bailey <a href="#">Rubus aptatus</a> L.H. Bailey <a href="#">Rubus arenicolus</a> Blanch. <a href="#">Rubus arizonensis</a> Focke <a href="#">Rubus arundelanus</a> Blanch. <a href="#">Rubus ashei</a> L.H. Bailey <a href="#">Rubus baileyanus</a> Britton <a href="#">Rubus cacaponensis</a> H.A. Davis & T. Davis <a href="#">Rubus celer</a> L.H. Bailey <a href="#">Rubus centralis</a> L.H. Bailey <a href="#">Rubus clarus</a> L.H. Bailey <a href="#">Rubus curtipes</a> L.H. Bailey <a href="#">Rubus deamii</a> L.H. Bailey <a href="#">Rubus decor</a> L.H. Bailey <a href="#">Rubus depavitus</a> L.H. Bailey <a href="#">Rubus enslenii</a> Tratt. <a href="#">Rubus exsularis</a> L.H. Bailey <a href="#">Rubus fecundus</a> L.H. Bailey <a href="#">Rubus felix</a> L.H. Bailey <a href="#">Rubus grimesii</a> L.H. Bailey <a href="#">Rubus hancinianus</a> L.H. Bailey <a href="#">Rubus ininunctus</a> L.H. Bailey <a href="#">Rubus invisus</a> (L.H. Bailey) Britton <a href="#">Rubus ithacanus</a> L.H. Bailey <a href="#">Rubus kentuckiensis</a> L.H. Bailey <a href="#">Rubus leviculus</a> L.H. Bailey <a href="#">Rubus meracus</a> L.H. Bailey <a href="#">Rubus michiganensis</a> (Card ex L.H. Bailey) L.H. B. <a href="#">Rubus multifer</a> L.H. Bailey <a href="#">Rubus mundus</a> L.H. Bailey

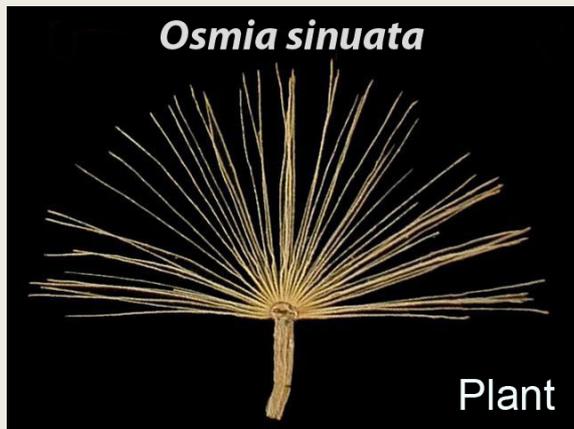
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<a href="#">Rubus etlagellaris</a> L.H. Bailey <a href="#">Rubus exemptus</a> L.H. Bailey <a href="#">Rubus exutus</a> L.H. Bailey <a href="#">Rubus fandus</a> L.H. Bailey <a href="#">Rubus florenceae</a> L.H. Bailey <a href="#">Rubus foliaceus</a> L.H. Bailey <a href="#">Rubus folioflorus</a> L.H. Bailey <a href="#">Rubus frustratus</a> L.H. Bailey <a href="#">Rubus fuscus</a> Weihe & Nees ex Bluff & Finge <a href="#">Rubus geophilus</a> Blanch. <a href="#">Rubus gordonii</a> L.H. Bailey ex Core <a href="#">Rubus housei</a> L.H. Bailey <a href="#">Rubus ignarus</a> L.H. Bailey <a href="#">Rubus imperiorum</a> Fernald <a href="#">Rubus indianensis</a> L.H. Bailey <a href="#">Rubus inobvius</a> L.H. Bailey <a href="#">Rubus jactus</a> L.H. Bailey <a href="#">Rubus jaysmithii</a> L.H. Bailey <a href="#">Rubus lassus</a> L.H. Bailey <a href="#">Rubus longipes</a> Fernald <a href="#">Rubus lundelliorum</a> L.H. Bailey <a href="#">Rubus macdanielsii</a> L.H. Bailey <a href="#">Rubus mainensis</a> L.H. Bailey <a href="#">Rubus maltei</a> L.H. Bailey <a href="#">Rubus masseyi</a> L.H. Bailey <a href="#">Rubus minnesotanus</a> L.H. Bailey <a href="#">Rubus neonefrens</a> L.H. Bailey <a href="#">Rubus occidualis</a> (L.H. Bailey) L.H. Bailey <a href="#">Rubus occultus</a> L.H. Bailey <a href="#">Rubus pauper</a> L.H. Bailey <a href="#">Rubus peracer</a> L.H. Bailey <a href="#">Rubus pityophilus</a> S.J. Sm. <a href="#">Rubus pohlii</a> L.H. Bailey <a href="#">Rubus polulus</a> L.H. Bailey <a href="#">Rubus polybotrys</a> L.H. Bailey <a href="#">Rubus prior</a> L.H. Bailey <a href="#">Rubus problematicus</a> L.H. Bailey <a href="#">Rubus redundans</a> L.H. Bailey <a href="#">Rubus rhodinsulanus</a> L.H. Bailey <a href="#">Rubus ricei</a> L.H. Bailey <a href="#">Rubus rosagnetis</a> L.H. Bailey <a href="#">Rubus sanfordii</a> L.H. Bailey <a href="#">Rubus satis</a> L.H. Bailey <a href="#">Rubus semierectus</a> Blanch.
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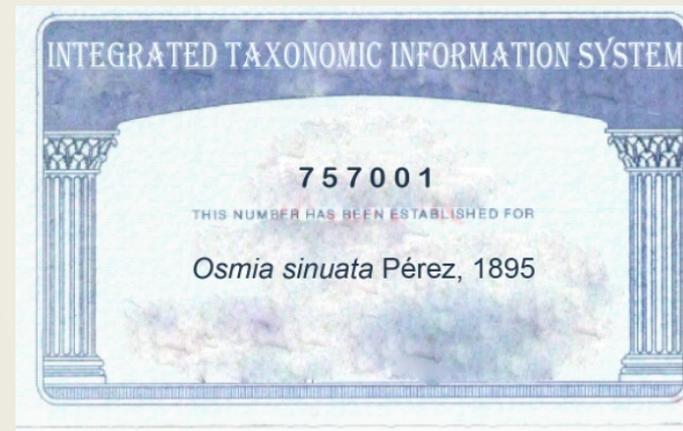
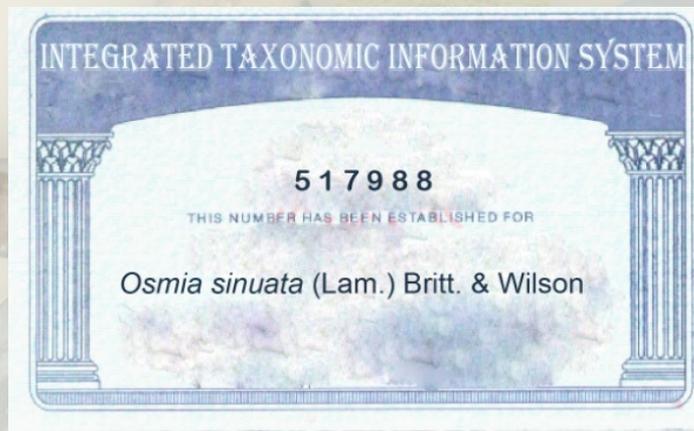
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--

98% of records in BISON are covered by ITIS





ITIS Taxonomic Serial Numbers are Social Security Numbers for Species Names

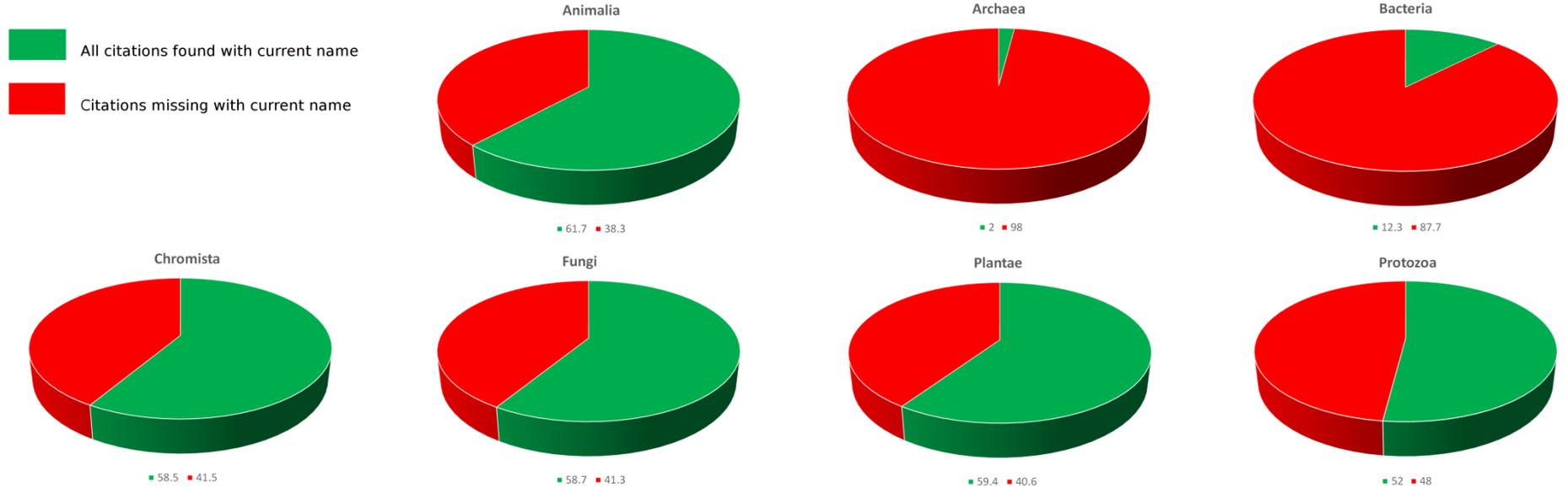




RESEARCH ARTICLE

## The Importance of Species Name Synonyms in Literature Searches

Gerald F. Guala\*



*TIME*  
*for*  
*QUESTIONS*

( Thank you )

