



Citizen Science in a Changing World

Grant Foster

About Me

Grant Foster

PhD Student, University of South Carolina
Department of Biological Sciences

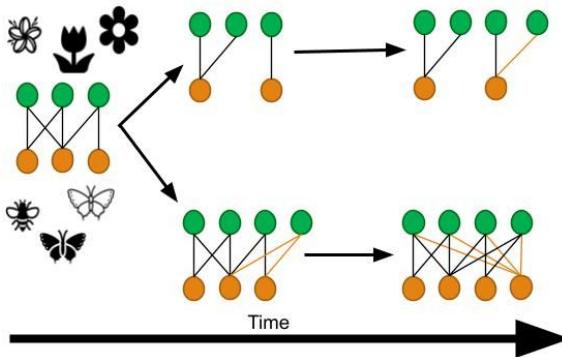
Mentor: Dr. Tad Dallas

Research Interests: Quantitative Ecology; Assembly and Breakdown Dynamics of Species Interaction Networks

Locally involved with **Columbia Audubon** and **Gills Creek Watershed Association**

Self described **Citizen Science Nut!**

@grant226 
@Riverman12 eBird



Citizen Science is Growing

Participation in citizen science is higher now than ever!

1 in 10 Americans have participated in a citizen science project in the last year
(Thigpen, and Funk, 2020)

Citizen Science provides an **unique opportunity** to gather data in a **rapidly changing natural environment**, and engage local communities with the natural world



Citizen Science Happening Locally

Richland County

eBird: 34,000+ checklists, 3449 observers



iNaturalist: 73,000+ observations, 3,802 observers

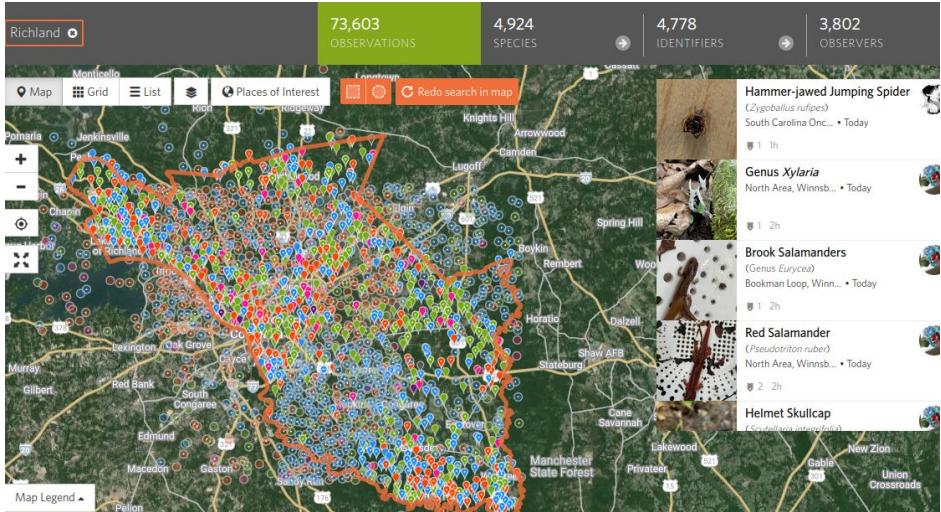


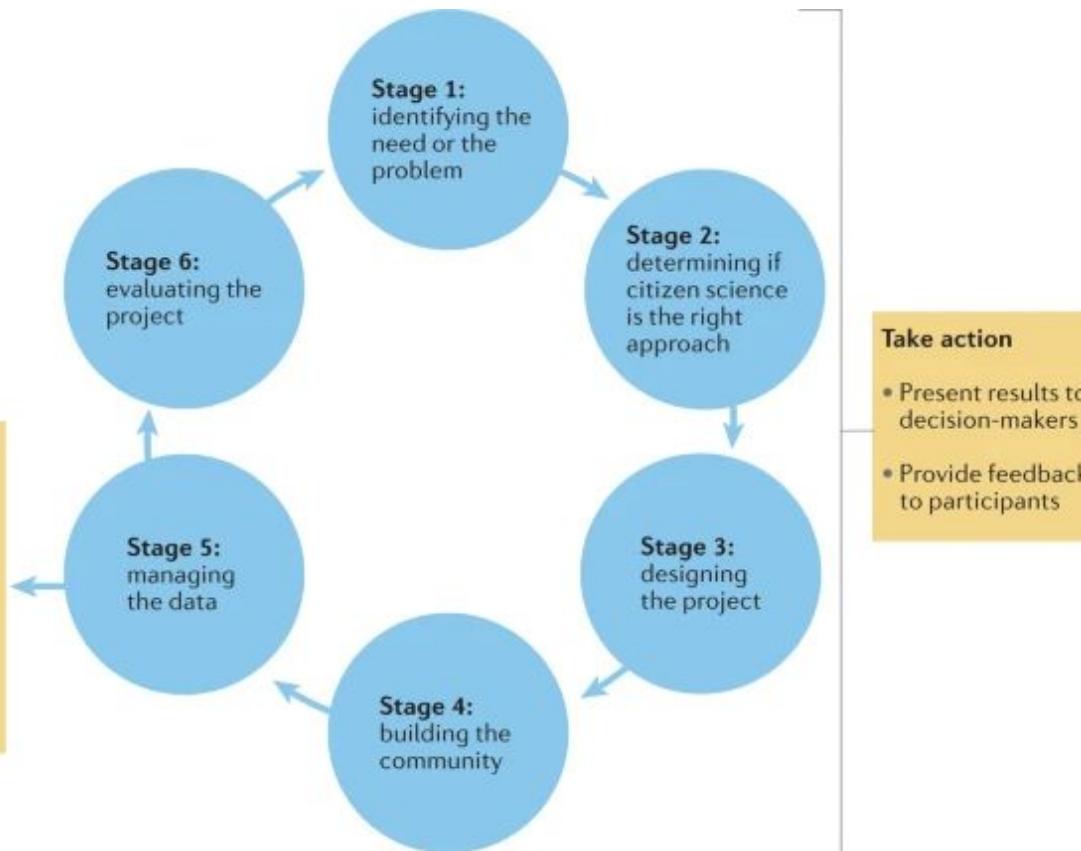
SC Adopt-a-Stream: Dozens of sites across Richland

South Carolina

Litter Journal: 12,800+ observations; 3.25 million pieces of litter collected

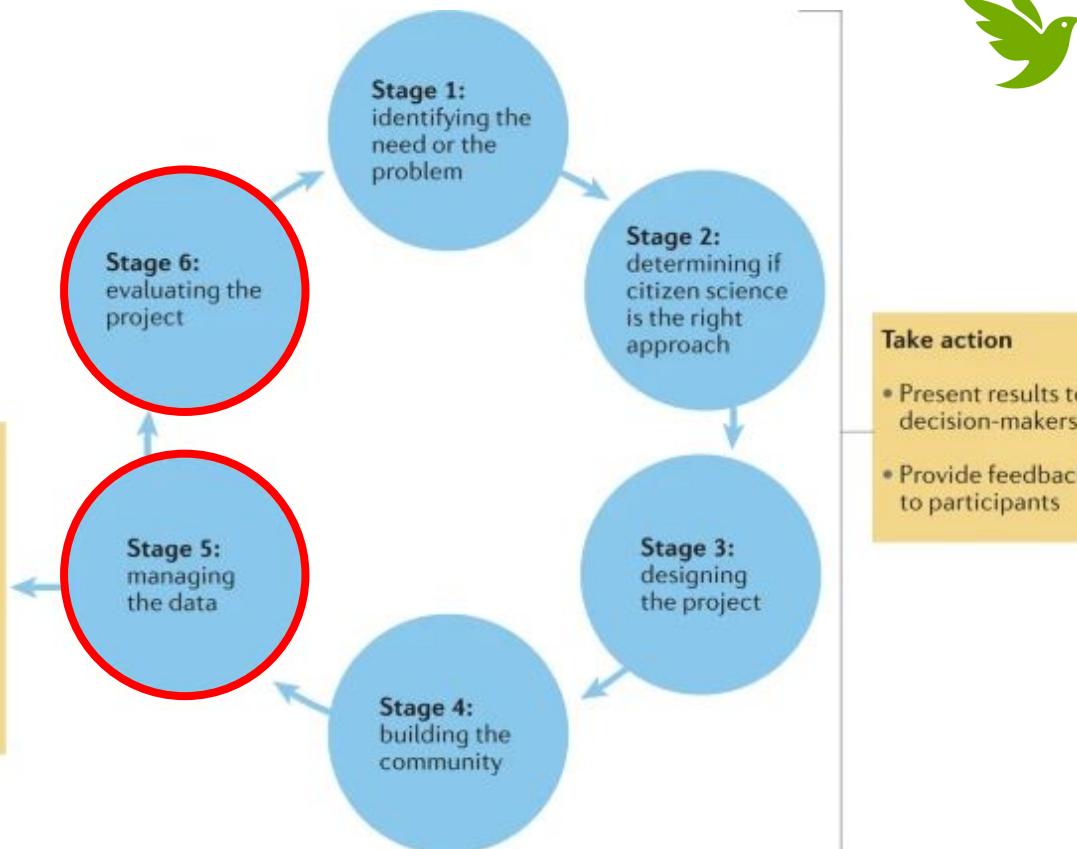
Nature's Notebook: 1,105 observations





From Fraisl et al., 2022

“Citizen science in environmental and ecological sciences”



Steps of the data management stage

- Planning
- Collecting
- Assuring
- Analysing
- Describing and preserving
- Integrating

Take action

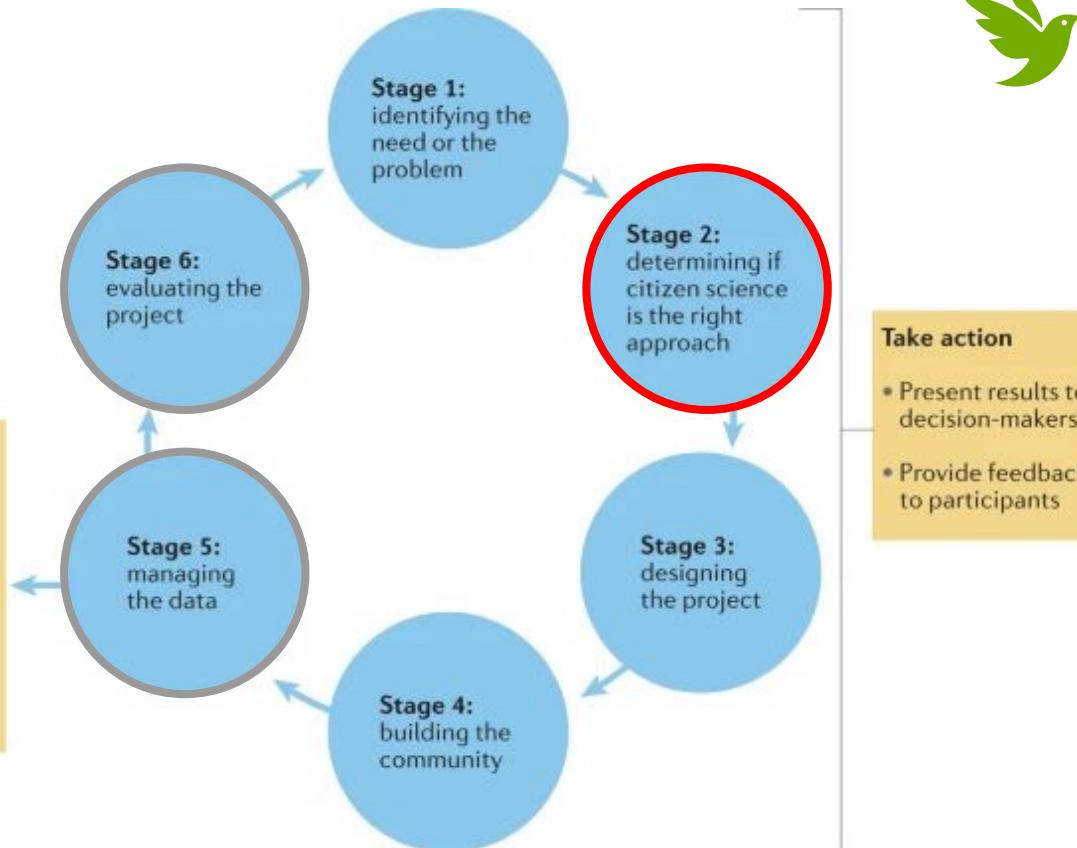
- Present results to decision-makers
- Provide feedback to participants

The Cornell Lab of Ornithology

eBird

From Fraisl et al., 2022

“Citizen science in environmental and ecological sciences”



The Cornell Lab of Ornithology

eBird

From Fraisl et al., 2022

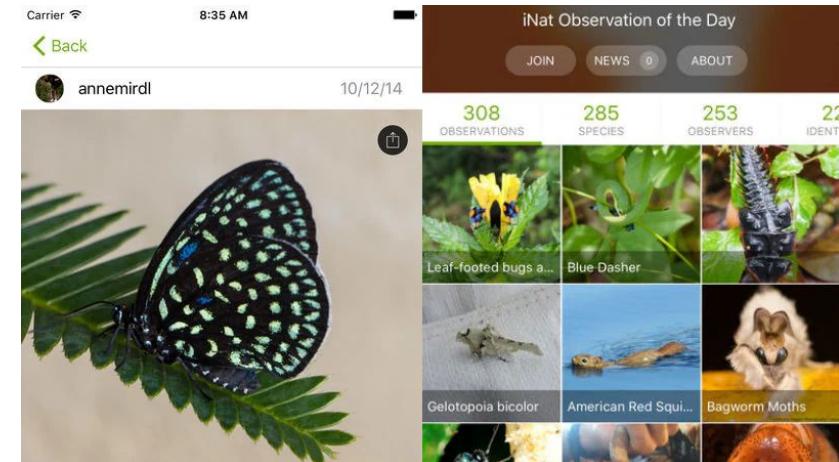
“Citizen science in environmental and ecological sciences”



iNaturalist

What is iNaturalist?

- Online repository for wildlife observations
- Crowdsourced Species identification tool
- Social network of people sharing biodiversity information
- Started as a Master's project of Ken-ichi Ueda, Nate Agrin, and Jessica Kline at UC Berkeley's School of Information in 2008
- Became an independent non-profit in 2023
- **5.9 million users, 124 million+ observations**



Submitting an observation: iNaturalist

Opportunistic/Incidental observations

An “observation” includes...

Who you are
You'll need to make an iNaturalist account and please only post your own personal observations



What you saw

Choose a group of organisms like butterflies or better yet a specific organism like the **Monarch butterfly**. If you provide evidence you can leave this blank and the **community can help**

When you saw it
Record the date of your encounter, not the date you post it to iNaturalist



Evidence of what you saw

By including evidence like a **photo or sound**, the community can help add, improve, or confirm the identification of the organism you encountered. Help the community by taking clear well framed photos, by including multiple photos from different angles



Submitting an observation: iNaturalist

iNaturalist

+ Add

Remove

Combine

Duplicate

Select All

Drag & drop some photos or sounds

or

Choose files 

More Import Options ▾

Submitting an observation: iNaturalist

iNaturalist

+ Add Remove Combine Duplicate Select All

Editing 1 observation:

Details

Species name

2024/04/28 4:08 PM

Location

Notes

Location is public

Captive / Cultivated

Tags

Projects

Fields

Offset Time

Species name

2024/04/28 4:08 PM

Location

Notes

Submitting an observation: iNaturalist

Richland County, SC, USA

Map Satellite Richland, SC, USA

Latitude: 33.96319020922222
Longitude: -80.93279269377653
Acc (m): 25.896255915993134
Geoprivacy: Open
Locality notes: Richland County, SC, USA
Pin

Cancel Update Observations

Submitting an observation: iNaturalist

iNaturalist

+ Add Remove Combine Duplicate Select All

Editing 1 observation:

Details

Species name

2024/04/28 4:08 PM

Richland County, SC, USA

Notes

Location is public

Captive / Cultivated

Tags

Projects

Fields

Offset Time



We're pretty sure this is in the genus:

 Cowbirds
Genus *Molothrus* View

Here are our top suggestions:

 Brown-headed Cowbird
Molothrus ater View
Visually Similar / Expected Nearby

 Common Grackle
Quiscalus quiscula View
Visually Similar / Expected Nearby

Include suggestions not expected nearby

iNat has implemented computer-vision based ID suggestions since 2017!



Submitting an observation: iNaturalist

iNaturalist

+ Add × Remove ⚡ Combine Duplicate Select All

Editing 1 observation:

Details

 Brown-headed Cowbird 

 2024/04/28 4:08 PM

 Richland County, SC, USA

Notes

Location is public

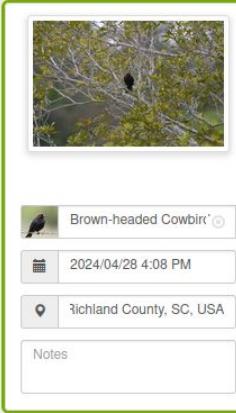
Captive / Cultivated

Tags

Projects

Fields

Offset Time



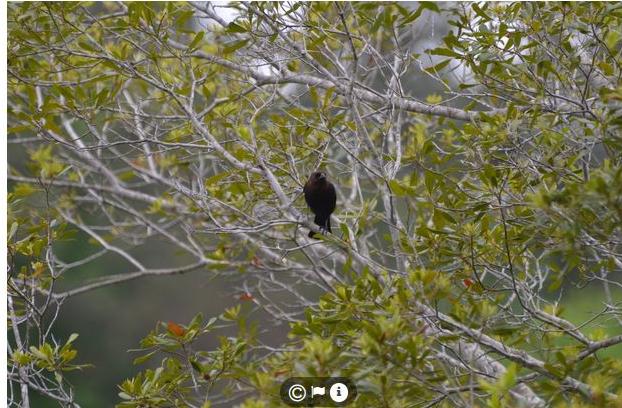
A detailed view of an observation card. It features a green border and contains the following information:
- A thumbnail image of a Brown-headed Cowbird perched on a branch.
- The species name "Brown-headed Cowbird" followed by a small edit icon.
- The date and time "2024/04/28 4:08 PM".
- The location "Richland County, SC, USA".
- A "Notes" field.

Submitting an observation: iNaturalist

Brown-headed Cowbird (*Molothrus ater*)

Needs ID

Edit



grant226
201 observations

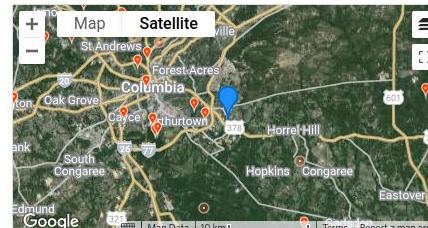


Observed:

Apr 28, 2024 · 4:08 PM EDT

Submitted:

May 13, 2024 · 3:45 PM EDT



Richland County, SC, USA

Details

Be the first to fave this observation!

Activity



grant226 suggested an ID

Leading

is

▼



Brown-headed Cowbird
Molothrus ater

Compare

Community Taxon

Compare • What's this?

The Community ID requires at least two identifications.

Annotations

iNaturalist Community Identification

Community Driven!

Individuals are encouraged
to ID other users
observations to the lowest
taxonomic level supported

Brown-headed Cowbird (*Molothrus ater*) [Research Grade](#) [Edit](#)



grant226 200 observations [View Profile](#) [Edit](#)

Observed: Apr 28, 2024 - 4:45 PM EDT Submitted: Apr 29, 2024 - 1:38 PM EDT



Richland County, SC, USA [Details](#)

Be the first to fave this observation!

Activity

grant226 suggested an ID [Improving](#) 14d ago

 Brown-headed Cowbird *Molothrus ater* [Compare](#)

concavator07 suggested an ID 14d ago

 Brown-headed Cowbird *Molothrus ater* [Compare](#)

Community Taxon

Brown-headed Cowbird (*Molothrus ater*) Cumulative IDs: 2 of 2



0 **2/3ds** 2

[Agree](#) [Compare](#) [About](#)

Annotations (2)

iNaturalist Community Identification

Brown-headed Cowbird (*Molothrus ater*)

Research Grade



grant226 200 observations

Observed: Apr 28, 2024 · 4:45 PM EDT Submitted: Apr 29, 2024 · 1:38 PM EDT

Map Satellite

Richland County, SC, USA

Be the first to fave this observation!

A screenshot of an iNaturalist observation page for a Brown-headed Cowbird. It shows a photo of the bird, the user's profile (grant226), location (Richland County, SC, USA), and a map showing the area around Columbia, SC. The observation was made on April 28, 2024, at 4:45 PM EDT, and submitted on April 29, 2024, at 1:38 PM EDT. There are 200 other observations for this species in the same location.

Activity

grant226 suggested an ID 14d

Brown-headed Cowbird (*Molothrus ater*)

concavener07 suggested an ID 14d

Brown-headed Cowbird (*Molothrus ater*)

A screenshot of the activity feed on the iNaturalist platform. It shows two users suggesting IDs for the same observation: grant226 and concavener07. Both suggestions are for Brown-headed Cowbird (*Molothrus ater*). The activity is from 14 days ago.

Community Taxon

Brown-headed Cowbird (*Molothrus ater*)

Cumulative IDs: 2 of 2

0 2/3rds 2

Agree Compare About

Annotations (2)

A screenshot of the community taxon page for Brown-headed Cowbird (*Molothrus ater*). It shows a progress bar indicating 2 cumulative IDs out of 2. Below the bar are buttons for Agree, Compare, and About. At the bottom, there is a link for Annotations (2).

“Verifiable”

- Has a date
- Is Georeferenced
- Has Photo or Sound
- Is of a non-captive/cultivated organism

“Research-Grade”

- Verifiable
- Community taxon is at species level or lower, and has at least 2 IDs

iNaturalist Community Identification

Downy Woodpecker (*Dryobates pubescens*)

Research Grade

A screenshot of an iNaturalist observation page. At the top left is a photograph of a Downy Woodpecker perched on a branch. To its right is a "Research Grade" button with a red border. Below the photo is a user profile for "jonathan_sellman" with 2,701 observations. A map shows numerous orange location pins across a geographic area, with a blue marker indicating the specific observation point. Below the map is a "Details" section with the date observed as May 12, 2024, at 10:18 AM CDT, and the date submitted as May 13, 2024, at 1:07 AM EDT. A "Be the first to fave this observation!" button is at the bottom.

Activity

	jonathan_sellman suggested an ID		15h	
	Downy Woodpecker <i>Dryobates pubescens</i>			
	grant226 suggested an ID		1s	

Community Taxon

What's this?

Downy Woodpecker (*Dryobates pubescens*)

Cumulative IDs: 2 of 2

0 2/3rds 2

Agree Compare About

Annotations



Bill shorter than head



Red on back of head (males)

White Back

White outer tail feathers

Black spots (not always visible)

Downy Woodpecker

Dryobates pubescens

Bill same length as head



Hairy Woodpecker

Dryobates villosus

iNaturalist Community Identification

Dryobates Woodpeckers (Genus *Dryobates*)

Needs ID

The screenshot shows a woodpecker perched on a blue bird feeder containing suet. Below the image are five small icons representing different categories. To the right is a detailed observation card:

- User:** apalmieri (942 observations)
- Observed:** May 10, 2024 - 3:47 PM EDT
- Submitted:** May 10, 2024 - 3:59 PM EDT
- Location:** Map showing a location in Bluffton, SC, US.
- Community Taxon:** Dryobates Woodpeckers (Genus *Dryobates*)
- Cumulative IDs:** 2 of 2

Notes

It's been awhile since I've seen a hairy woodpecker, but this female's beak seemed quite large for downy. There were also no spots on the white tail feathers and there was a black diving line down the back of the head where the red spot would be on males.

Activity

spalmieri suggested an ID

Hairy Woodpecker *Dryobates villosus*

pieceofmind suggested an ID*

Downy Woodpecker *Dryobates pubescens*

On feeders, usually the easiest way to distinguish downy/hairy is body size. What's the diameter of each ball/disk?

Overall, this one looks Downy to me. The tail barring is on the outer (bottom) feathers, which are often not visible from side or top views when the tail is folded in. The red spot split by a black line is only reliable for males; in my experience, female downies are less likely to have a thick black line down the back, but there's lots of variation in both species (from none to thick). As for the beak, note that the fluffy tuft at the base is largely missing, which will make the beak look larger. There's also a fair amount of individual variation in beak size. Last, there's no black shoulder spur, which are common in hairy's.



Bill shorter than head



Downy Woodpecker

Dryobates pubescens

Bill same length as head



Hairy Woodpecker

Dryobates villosus

iNaturalist Community Identification

Downy Woodpecker (*Dryobates pubescens*) Needs ID



thewoodturner
161 observations

Observed:

Apr 12, 2024 - 4:30 PM EDT

Submitted:

Apr 12, 2024 - 4:42 PM EDT



Be the first to fave this observation!

Activity



thewoodturner suggested an ID

Leading

1mo

Community Taxon

What's this?

Dryobates Woodpeckers (Genus *Dryobates*)

Cumulative IDs: 2 of 2

2/3rds

2

Agree

Compare

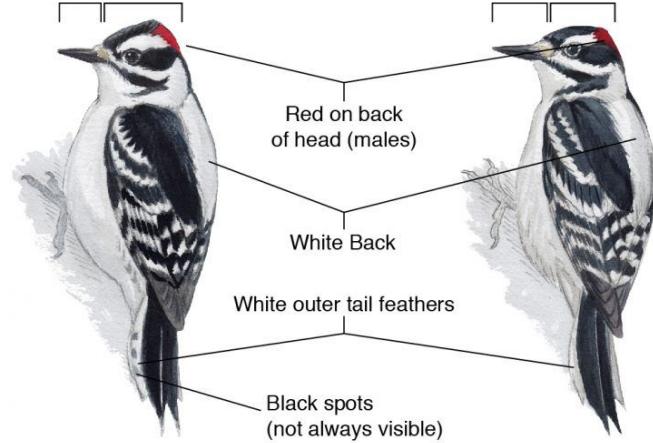
About

Annotations



Bird Academy

Bill shorter than head



Downy Woodpecker

Dryobates pubescens

Hairy Woodpecker

Dryobates villosus

iNaturalist Community Identification

Downy Woodpecker (*Dryobates pubescens*) Needs ID



thewoodturner
161 observations

Observed:

Apr 12, 2024 - 4:30 PM EDT

Submitted:

Apr 12, 2024 - 4:42 PM EDT



Be the first to fave this observation!

Activity



thewoodturner suggested an ID

Leading

1mo

Community Taxon

What's this?

Dryobates Woodpeckers (Genus *Dryobates*)

Cumulative IDs: 2 of 2

2/3rds

2

Annotations



Bill shorter than head



Bill same length as head



Downy Woodpecker



Hairy Woodpecker

Dryobates pubescens

Dryobates villosus

iNaturalist Community Identification

Activity



choess suggested an ID

Improving

6y

Community Taxon

What's this?



Class Bryopsida
True Mosses

Compare

Agree

Class Bryopsida (True Mosses)

Cumulative IDs: 3 of 4

0

2/3rds

4

Agree

Compare

About



allenratzlaff suggested an ID

6y



Class Bryopsida
True Mosses



eraskin suggested an ID

4y



Class Bryopsida
True Mosses



annkatrinrose suggested an ID

Maverick

7mo



Genus *Polytrichum*
Haircap Mosses

Compare

Probably - I've seen a lot of it up at Craggy Gardens.

Annotations

Attribute

Value

Agree

Disagree

Sex

Select ▾

Projects

Add to a Project

Observation Fields

Choose a field

Top Identifiers of Bryopsida

How well does this validation model work?

Data Quality Assurance is **Community-driven**

iNat conducts regular Quality Control Studies

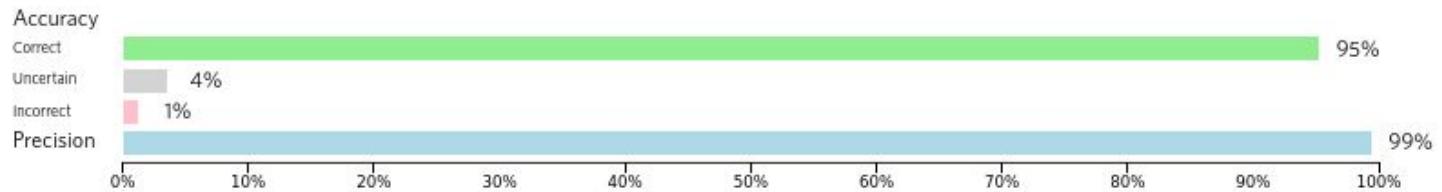
Observation Accuracy Experiment (0.4)

May 13, 2024

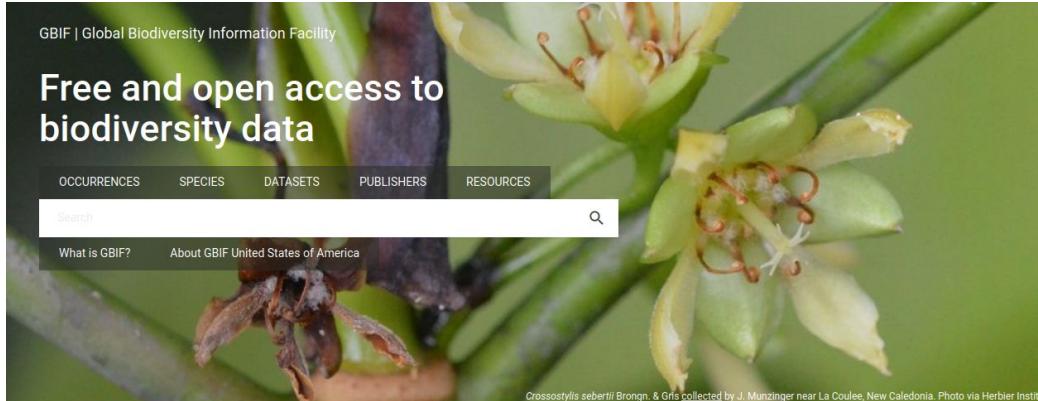
Abstract: We generated a sample of observations on May 7, 2024 and coordinated a team of validators to assess their accuracy by May 13, 2024. All results shown below show characteristics of the sample observations at the time the sample was generated (for example Research Grade or not). The accuracy of the sample observations was assessed on May 13, 2024. See the methods tab for more details.



As observations from this sample are validated, the uncertain percentage will decrease and the percentage correct and incorrect will increase.



How is iNat data used?



2,935,996,819

Occurrence records



104,853

Datasets



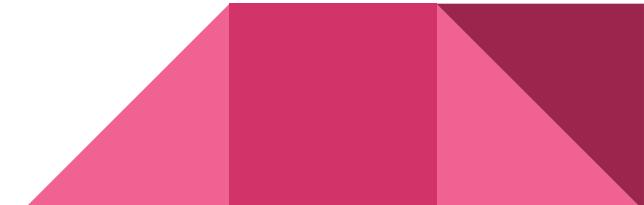
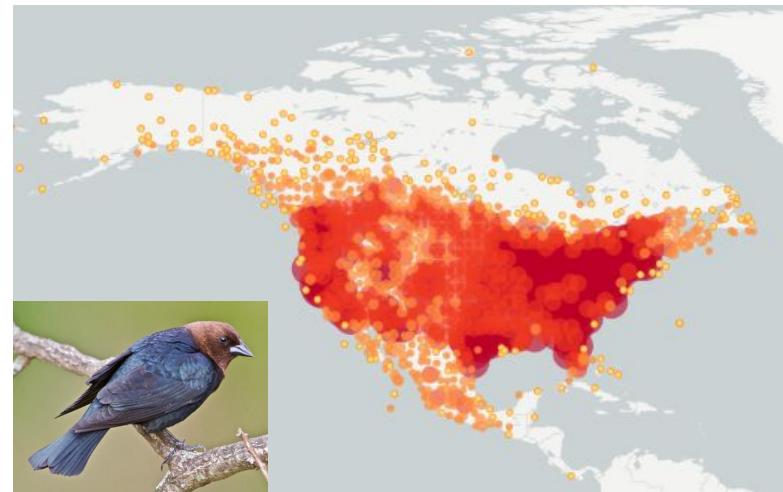
2,220

Publishing institutions



10,522

Peer-reviewed papers
using data



Observation Fields & Projects



Stats

79755

Observations »

5644

Species »

5143

People »

Most Observations

	la4bonte	5310 observations
	xris	4870 observations
	berzou	3339 observations
	laurasea	1664 observations
	misspt	1533 observations

Most Species

	paul127	989 species
	berzou	436 species
	aliandbrice	248 species
	Monarch	1450 observations
	xris	228 species

Most Observed Species

	Western Honey Bee	2741 observations
	Common Eastern Bumble Bee	2387 observations
	Monarch	1450 observations
	Eastern Carpenter Bee	999 observations
	Gulf Fritillary	997 observations

Annotations (4)

Attribute	Value	Agree	Disagree
Alive or Dead	Alive		
Evidence of Presence	Organism		
Evidence of Presence	Select		
Life Stage	Adult		
Sex	Male		

About Members 5

This project is to keep track of the USC Graduate Association for Biology Student's BioBlitz of the Gills Creek Watershed! We're looking to record observations from as many taxa as possible, so if it's alive feel free to add a record! Mushrooms? Daisies? Salamanders? Moths? All are great additions-just get outside in the watershed and Read More

2024 USC Gills Creek BioBlitz APR 13, 2024

Overview 89 OBSERVATIONS 60 SPECIES 25 IDENTIFIERS 5 OBSERVERS

Recent Observations

Lyreleaf Sage
Salvia lyrata

American Water Frogs
Genus *Lithobates*

Cambarid Crayfishes
Family Cambaridae

Bladder Snails
Family Physidae

iNat for Engagement

BIOBLITZ!

A BioBlitz is an event where members of the community **identify** and **record** as many species as they can in a specific location during a specific time frame. This information can be valuable for researchers monitoring **biodiversity**. The best part is that **anyone** can participate and contribute!

Some useful tools for a BioBlitz include **cameras**, **binoculars**, **microscopes**, **nets** for collecting insects, and **clear containers** for holding specimens during viewing. You'll also want a way to **record** what you find. If you have a smartphone, the iNaturalist app can make it simple to document your observations.



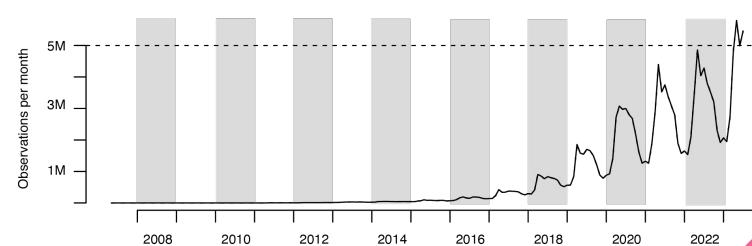
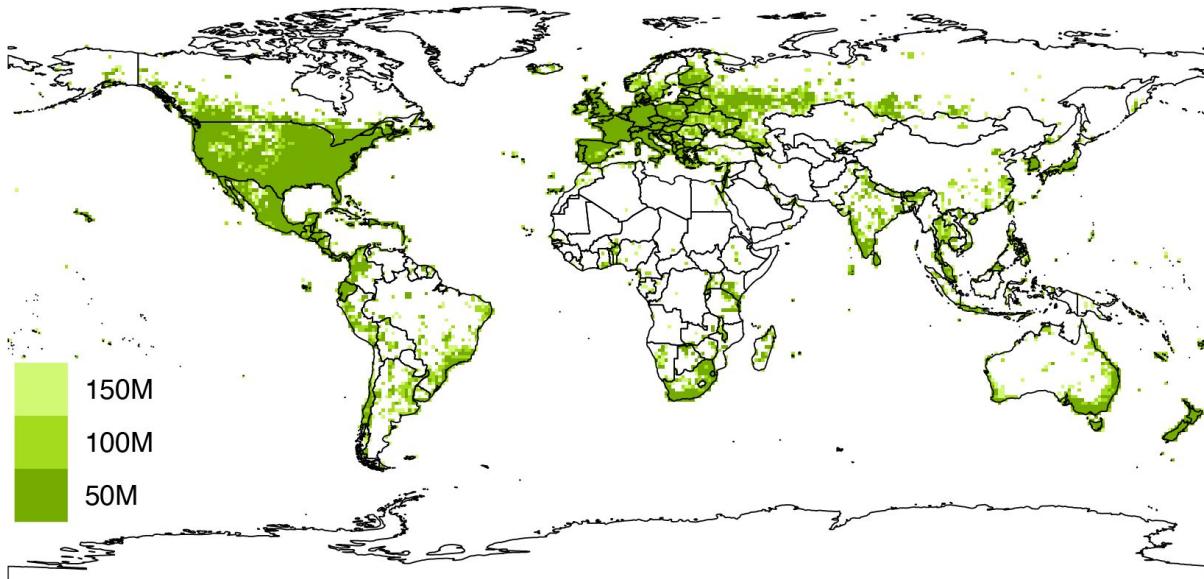
You don't have to be an expert in identifying species to be part of a BioBlitz. Some BioBlitz organizers provide **guides** to help you recognize local flora and fauna. If you're using the iNaturalist app, you can take a photo of an unidentified species and the app will offer a suggestion of what it might be. Human observers can then confirm or correct that identification.

A BioBlitz can be a great, hands-on way to interact with nature. But it can also provide valuable data about **species distribution** for researchers. If captured through iNaturalist, the observations can achieve "research grade" status. This means they become part of the data available through the **Global Biodiversity Information Facility** and the **Encyclopedia of Life**.



Biases in iNat Data

Cells with at least 1,000 Observations



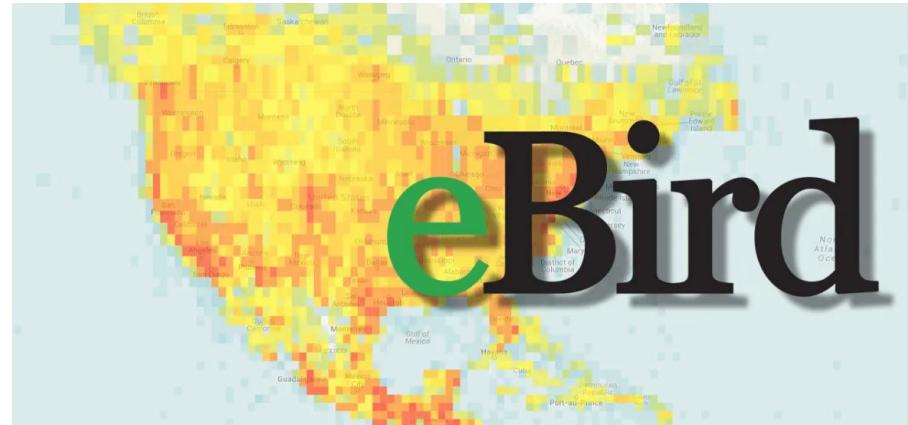
iNat observations
are presence-only!

No straightforward
way to measure
sampling effort

Subject to large
spatial, temporal,
and taxonomic
biases

Another Citizen Science Model: eBird

- Worldwide project of bird checklists
- Developed and managed by Cornell Lab of Ornithology
- **13.3 million** checklists submitted in 2023 alone!
- Data submission styled after effort-controlled surveys
- Tracks data about sampling effort
 - Time spent
 - Number of observers
 - Distance Traveled

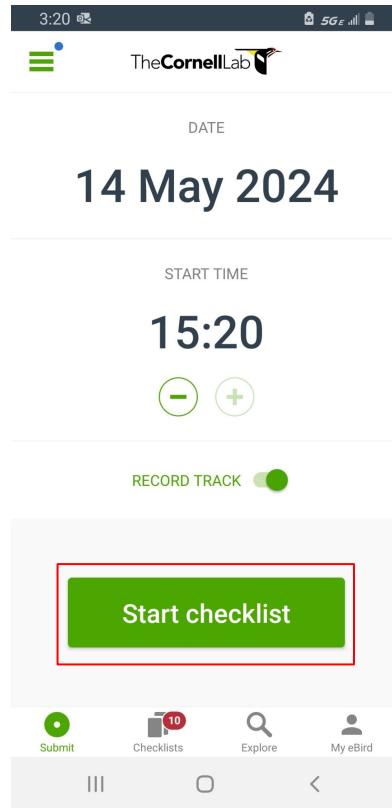


Submitting an observation: eBird

Data submitted in the form of checklists!

Most users interact through the phone app

Automatic time, date, location, and distance



Get eBird Mobile

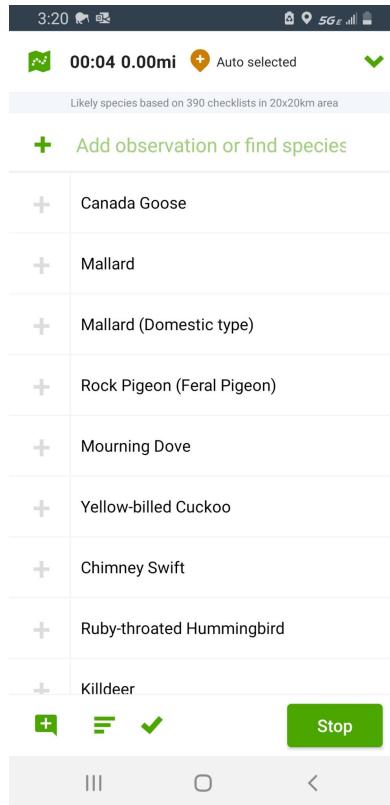


eBird Mobile makes it easy to record the birds you find and seamlessly link observations with eBird—a global online database of bird records used by hundreds of thousands of birders around the world. This free resource helps you keep track of your birding activity, while making your data openly available for scientific research, education, and conservation.

eBird Mobile is the only app that passes information directly from your mobile device to your eBird account on the web.



Submitting an observation: eBird



3:20 5G Auto selected

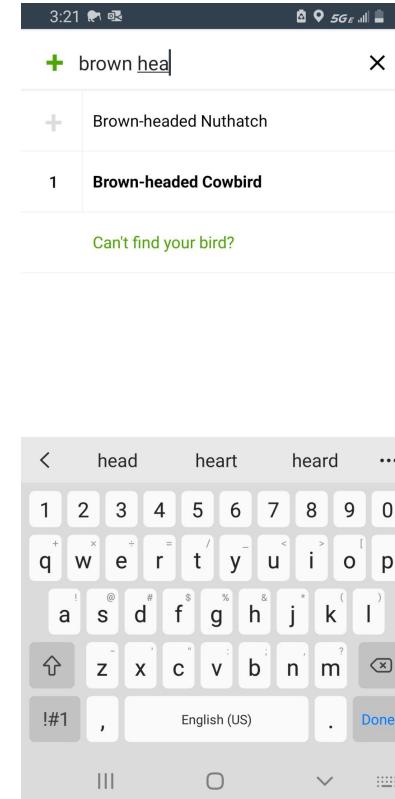
00:04 0.00mi Auto selected

Likely species based on 390 checklists in 20x20km area

+ Add observation or find species

- + Canada Goose
- + Mallard
- + Mallard (Domestic type)
- + Rock Pigeon (Feral Pigeon)
- + Mourning Dove
- + Yellow-billed Cuckoo
- + Chimney Swift
- + Ruby-throated Hummingbird
- + Killdeer

Stop



3:21 5G

+ brown hea X

+ Brown-headed Nuthatch

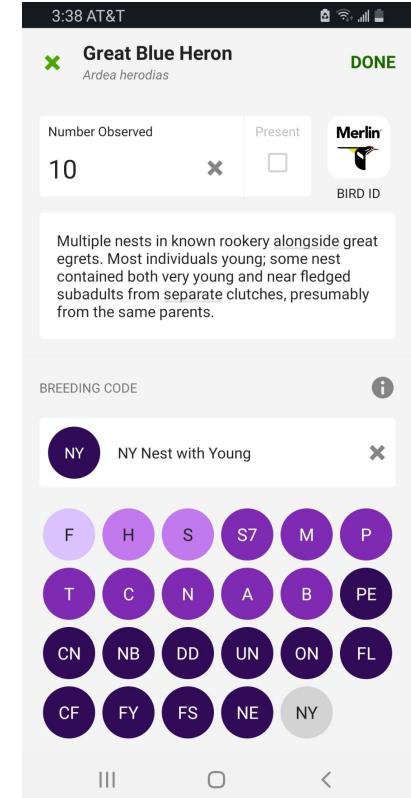
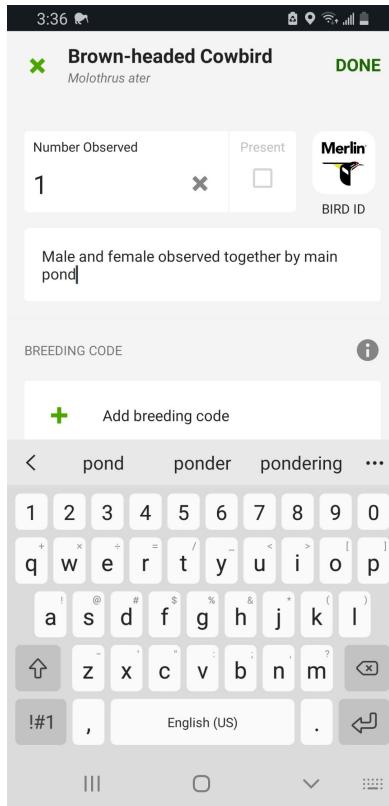
1 Brown-headed Cowbird

Can't find your bird?

< head heart heard ...

1	2	3	4	5	6	7	8	9	0
q	w	e	r	t	y	u	i	o	p
a	s	d	f	g	h	j	k	l	
z	x	c	v	b	n	m			⌫
!#1	,	English (US)				.	Done		

Submitting an observation: eBird



Observations can include **comments + Breeding/Behavior Codes**

Example

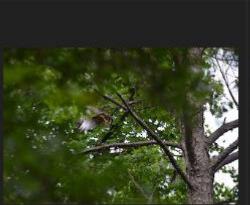
S: Singing males **C:** Courtship Display
T: Territory Defense **FY:** Feeding Young

Submitting an observation: eBird

 **Manage Media** 28 Apr 2024 4:11 PM Southeast Park, Richland, South Carolina, US [Send feedback](#) [Done](#)

   14  0 View or select media to make changes.

4	Canada Goose <i>Branta canadensis</i>	Details Change Species Add media
1	Chimney Swift <i>Chaetura peligra</i>	Details Change Species Add media
1	Turkey Vulture <i>Cathartes aura</i>	Details Change Species Add media
1	Red-shouldered Hawk <i>Buteo lineatus</i>	Details Media Select:  2  0 Change Species Add media



    ★★★★★     RS_HawkDSC_0315.JPG     RS_HawkDSC_0314.JPG

Upload up to 20 photos and 10 audio file per species.

Drag and drop media from your file system onto the correct species.

Photos

- JPG (preferred) or PNG
- Maximum file size: 20 MB
- High resolution without watermark preferred

Audio

- WAV (preferred), MP3, or M4A
- Maximum file size: 500 MB
- At least 44.1 kHz, at least 16 bits

Submitting an observation: eBird

Birds x My media

120,178 3,481 134 Location Date Contributor More filters Clear filters Brown-headed Cowbird - Molothrus ater Export Recently uploaded

The image displays a grid of 18 bird photographs from the eBird platform. The birds shown are Brown-headed Cowbirds (Molothrus ater). The images are arranged in three rows: the top row has six images, the middle row has seven images, and the bottom row has five images. The birds are shown in various settings: some are perched on tree branches, others are on the ground in grassy fields, and one is at a blue bird feeder. The images illustrate the diversity of habitats where these birds can be found.

Submitting an observation: eBird

CHECKLIST S170831998

Sun 28 Apr 2024 4:11 PM

Edit date and effort

Southeast Park Richland County, South Carolina, United States

Edit location



Checklist tools

Grant Foster



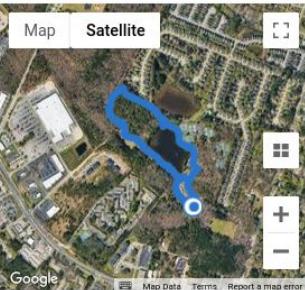
27
Species Observed
78 individuals



7
Species with Photos

Manage media

Edit species



eBird Mobile Tracks

Submitted from eBird for Android, version 2.17

[Edit comments](#)

SUBMIT ANOTHER FOR...

Same location and date

Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same location

Southeast Park, Richland County, South Carolina, US

Same area and date

Another location near Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same area

Another location near Southeast Park, Richland County, South Carolina, US

Same date

Sun Apr 28, 2024

4 Canada Goose

Remove

1 Chimney Swift

Remove

1 Turkey Vulture

Remove

1 Red-shouldered Hawk



3 Red-bellied Woodpecker

Remove



2 Great Crested Flycatcher

Remove

1 Eastern Kingbird

Remove



Submitting an observation: eBird

CHECKLIST S170831998

Sun 28 Apr 2024 4:11 PM

Edit date and effort

Southeast Park  Richland County, South Carolina, United States

Edit location



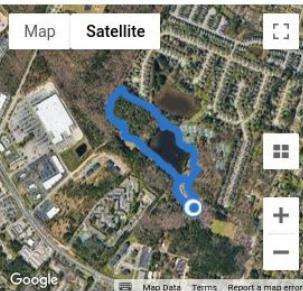
 Checklist tools

Grant Foster



Traveling Complete 

1 0 1 hr, 6 min 1.11 mi



eBird Mobile Tracks

Submitted from eBird for Android, version 2.17

[Edit comments](#)

SUBMIT ANOTHER FOR...

Same location and date

Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same location

Southeast Park, Richland County, South Carolina, US

Same area and date

Another location near Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same area

Another location near Southeast Park, Richland County, South Carolina, US

Same date

Sun Apr 28, 2024

 27

Species Observed
78 individuals

 7

Species with Photos

[Manage media](#)

[Edit species](#)

4 Canada Goose

 Remove

1 Chimney Swift

 Remove

1 Turkey Vulture

 Remove

1 Red-shouldered Hawk



3 Red-bellied Woodpecker

 Remove



2 Great Crested Flycatcher

 Remove

1 Eastern Kingbird

 Remove



Time + Date

Submitting an observation: eBird

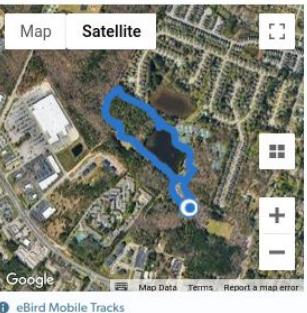
CHECKLIST S170831998

Sun 28 Apr 2024 4:11 PM [Edit date and effort](#)

Southeast Park [Edit location](#)

Grant Foster [Share](#)

Traveling Complete [1 hr, 6 min](#) [1.11 mi](#)

 27 Species Observed
78 individuals

 7 Species with Photos

[Manage media](#) [Edit species](#)

4 Canada Goose [Remove](#)

1 Chimney Swift [Remove](#)

1 Turkey Vulture [Remove](#)

1 Red-shouldered Hawk [Remove](#)


3 Red-bellied Woodpecker [Remove](#)


2 Great Crested Flycatcher [Remove](#)

1 Eastern Kingbird [Remove](#)


Submitted from eBird for Android, version 2.17 [Edit comments](#)

SUBMIT ANOTHER FOR...

Same location and date
Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same location
Southeast Park, Richland County, South Carolina, US

Same area and date
Another location near Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same area
Another location near Southeast Park, Richland County, South Carolina, US

Same date
Sun Apr 28, 2024

Time + Date

Spatial Extent

Submitting an observation: eBird

CHECKLIST S170831998

Sun 28 Apr 2024 4:11 PM [Edit date and effort](#)

Southeast Park Richland County, South Carolina, United States [Edit location](#)

Grant Foster [Share](#)

Traveling Complete 1 hr, 6 min 1.11 mi

Map Satellite [Map Data](#) [Terms](#) [Report a map error](#)

Submitted from eBird for Android, version 2.17 [Edit comments](#)

SUBMIT ANOTHER FOR...

Same location and date
Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same location
Southeast Park, Richland County, South Carolina, US

Same area and date
Another location near Southeast Park, Richland County, South Carolina, US on Sun Apr 28, 2024

Same area
Another location near Southeast Park, Richland County, South Carolina, US

Same date
Sun Apr 28, 2024

27 Species Observed
78 individuals

7 Species with Photos

[Manage media](#) [Edit species](#)

4 Canada Goose [Remove](#)
1 Chimney Swift [Remove](#)
1 Turkey Vulture [Remove](#)
1 Red-shouldered Hawk [Remove](#)

3 Red-bellied Woodpecker [Remove](#)

2 Great Crested Flycatcher [Remove](#)
1 Eastern Kingbird [Remove](#)

Time + Date

Spatial Extent

Species information + Associated Media

eBird Data Validation

3:52

Red-headed Woodpecker **DONE**

Melanerpes erythrocephalus
Infrequent

Number Observed
Present

BIRD ID

Details

BREEDING CODE

+ Add breeding code

1 2 3
4 5 6 **Next**
7 8 9
0

III

- 3:54
- + Add observation or find species**
- | | |
|-----|------------------------------|
| 500 | Red-headed Woodpecker |
| + | Hairy Woodpecker |
| + | Northern Flicker |
| + | American Kestrel |
| + | Blue-headed Vireo |
| + | Loggerhead Shrike |
| + | Bank Swallow |
| + | Tree Swallow |
| + | Purple Martin |
| + | White-breasted Nuthatch |
| + | House Wren |
- III

eBird Data Validation

3:50

+ woodpecker X

- + Red-bellied Woodpecker
- + Downy Woodpecker
- + Pileated Woodpecker
- + Red-headed Woodpecker
- + Hairy Woodpecker
- + woodpecker sp.
- + Red-cockaded Woodpecker

Can't find your bird?

Please fix the items below

Need Details

1

Red Crossbill *Loxia curvirostra* RARE

Change Species

Media:

Add photos and sounds to your checklist by clicking the green **Submit** button and then **Add media** at the top of the bird list on the next page. [Learn more](#)

Details:

*rare; flyover pair giving soft "dip dip, dip dip" calls. Seen well; reddish finches with heavy, crossed bills, eliminating potential confusion with Purple Finches making "dripping faucet" calls.

Add data...

Age & Sex

Breeding Code

Oiled Birds

Media

Details

Why?

Complete

This bird is rare for this date & location: please add comments, check 'Complete', and add any photos or sounds after submitting and saving the checklist.



eBird Data Validation

Who decides?
Network of volunteer data
reviewers!

2,700 reviewers active in 2023
Reviewers are assigned to cover
specific localities

Example: Richland County records are
reviewed by Dr. John Grego!



eBird Review Tools [Review](#) [Quick Review](#) [Search](#) [Filters](#) [Tools](#) [Hotspots](#) [John Garrett \(johngarrett\)](#) [Sign Out](#)

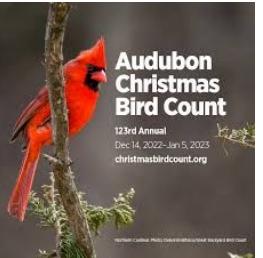
Review Observations

[Filter List...](#)

Select and change... Review decision: Reason: Notes: [Change](#)

Submission	Species - Tax/Cat	Note	Count	Date	User	Location	County	St/Prov	Review decision	Status	Rereview	Filter	History
<input type="checkbox"/> S86557517	Scaled Antpitta <i>Grallaria guatimalensis</i>		1	Apr 26, 2021	Sergio Pedrero Villanueva	Rancho Vista Hermosa, San Cristóbal de las Casas, Chiapas, MX (16.73, -92.672)	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86439458	Scaled Antpitta <i>Grallaria guatimalensis</i>		1	Apr 26, 2021	Daniel Garza Tobón	Rancho Vista Hermosa, San Cristóbal de las Casas, Chiapas, MX (16.73, -92.672)	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86557517	Gray-cheeked Thrush <i>Catharus minimus</i>		1	Apr 26, 2021	Sergio Pedrero Villanueva	Rancho Vista Hermosa, San Cristóbal de las Casas, Chiapas, MX (16.73, -92.672)	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86439458	Gray-cheeked Thrush <i>Catharus minimus</i>		1	Apr 26, 2021	Daniel Garza Tobón	Rancho Vista Hermosa, San Cristóbal de las Casas, Chiapas, MX (16.73, -92.672)	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86436951	Blue-winged Teal <i>Spatula discors</i>		20	Apr 25, 2021	Daniel Garza Tobón	Humedales de Montaña La Kisst, Laguna de Chapultepec y Sedem	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86304473	Green-backed Sparrow <i>Arremonops chloronotus</i>		3	Apr 24, 2021	Daniel Garza Tobón	Parque Educativo Laguna Báltica	Ocozocoautla de Espinosa	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86201016	Happy Wren <i>Pheugopedius felix</i>		2	Apr 23, 2021	MIGUEL GARCIA CRUZ	Area de Protección de Flora y Fauna Nahá	Ocosingo	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S86510676	Mealy Parrot <i>Amazona farinosa</i>		1500	Apr 19, 2021	Iris Melgar Martinez	Centro Ecoturístico Tres Lagunas	Ocosingo	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85910876	Eye-ringed Flatbill <i>Rhynchoscyllis brevirostris</i>		15	Apr 19, 2021	Iris Melgar Martinez	Centro Ecoturístico Tres Lagunas	Ocosingo	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85651130	Bar-winged Oriole <i>Icterus maculialatus</i>		2	Apr 14, 2021	MIGUEL GARCIA CRUZ	Area de Protección de Flora y Fauna Nahá	Ocosingo	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85237147	Sora <i>Porzana carolina</i>		2	Apr 10, 2021	Luz Rodríguez Parga	Humedales de Montaña La Kisst, Laguna de Chapultepec y Sedem	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85438309	Rufous-tailed Hummingbird <i>Amazilia tzacatl</i>		1	Apr 10, 2021	José Santos zuniga sanchez	Cascadas El Chiflón	Tzimol	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85247550	Sora <i>Porzana carolina</i>		1	Apr 10, 2021	Karina Andrea Vázquez Morales	423 Boulevard Juan Sabines, San Cristóbal de las Casas, Chiapas, MX (16.732, -92.645)	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Unreviewed	Filter	History	
<input type="checkbox"/> S85278480	Sora <i>Porzana carolina</i>		2	Apr 10, 2021	Atzin Campos	Calle Hermanos Domínguez, San Cristóbal de las Casas MX-CHIS 16.73441, -92.63984	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85775204	Sora <i>Porzana carolina</i>		2	Apr 10, 2021	Luz Rodríguez Parga	Calle Hermanos Domínguez, San Cristóbal de las Casas MX-CHIS 16.73441, -92.63984	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	
<input type="checkbox"/> S85283429	Sora <i>Porzana carolina</i>		2	Apr 10, 2021	Jessica Thompson	Calle Hermanos Domínguez, San Cristóbal de las Casas MX-CHIS 16.73441, -92.63984	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Unreviewed	Filter	History	
<input type="checkbox"/> S85900966	Sora <i>Porzana carolina</i>		2	Apr 10, 2021	DIEGO MANZO MENDEZ	Calle Hermanos Domínguez, San Cristóbal de las Casas MX-CHIS 16.73441, -92.63984	San Cristóbal de las Casas	CHP (MX)	Unconfirmed	Rereview	Filter	History	

eBird Features for Users



LIST: World All years All species Download (csv)

My eBird

World Life List

321 Species Observed Detailed stats

First seen Last seen Updated 13 sec ago. Date: Newest First

DATE	LOCATION	
11 May 2024	Screaming Eagle Rd US-SC	View All
11 May 2024	Orangeburg Sod Farms (Please Stay on Roads) US-SC	View All
11 May 2024	Orangeburg Sod Farms (Please Stay on Roads) US-SC	View All

My Trip Reports

Global Big Day 2024

11 May 2024 Link-only

South Carolina, United States
Calhoun | Charleston | Colleton | Orangeburg | Richland
Grant Foster

Share Edit

Narrative
Owners and editors of a Trip Report may write a narrative.
[Add narrative](#)

Map Satellite

Keyboard shortcuts | Map data ©2024 Imagery ©2024 TerraMetrics | Terms | Report a map error

130 Species Observed +1 other taxa

14 Checklists

LIFERS 30

Species Observed

27 Black-bellied Whistling-Duck

4 Canada Goose

1 Wood Duck

5 Blue-winged Teal

Show all details

eBird Limitations

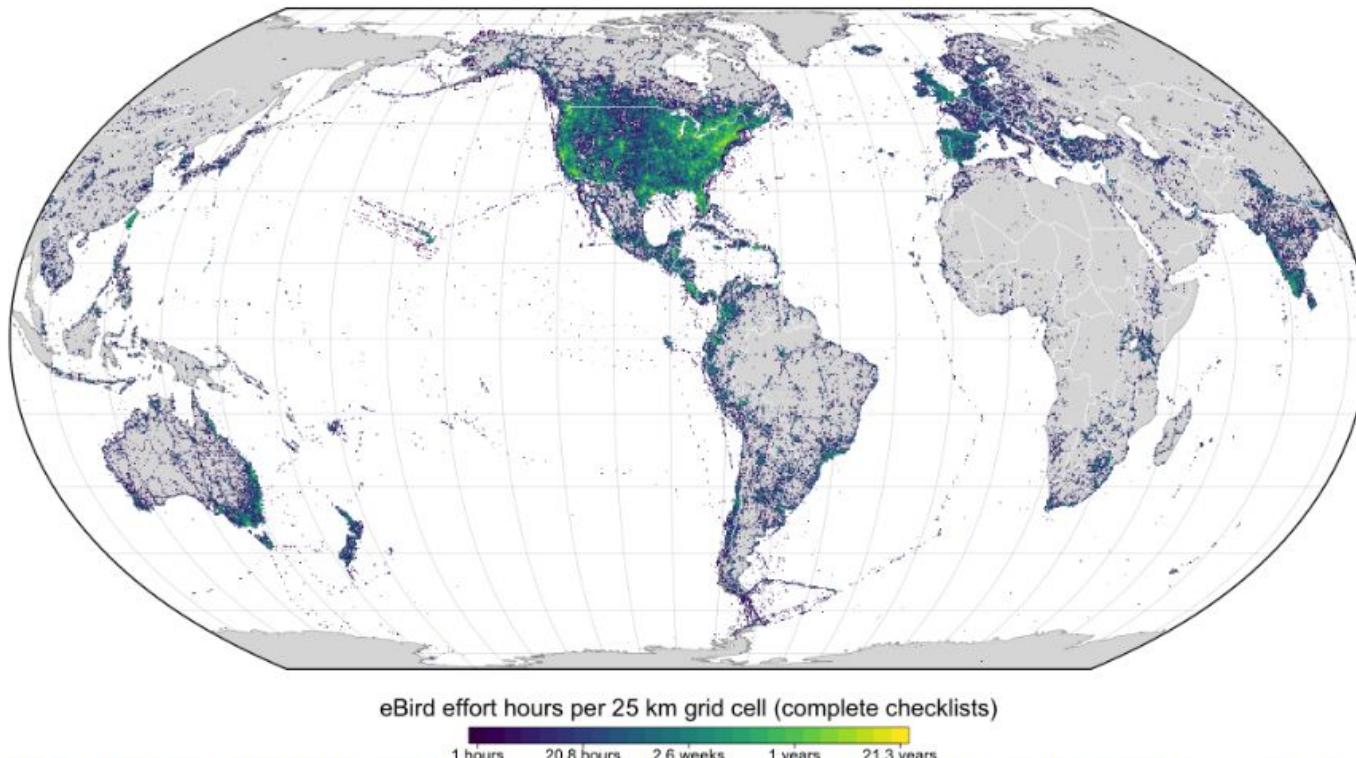


Figure 1. Cumulative duration of eBird complete checklists aggregated within 25 x 25 km grid cells. These aggregations are from eBird data submitted up to the end of Dec 2018.

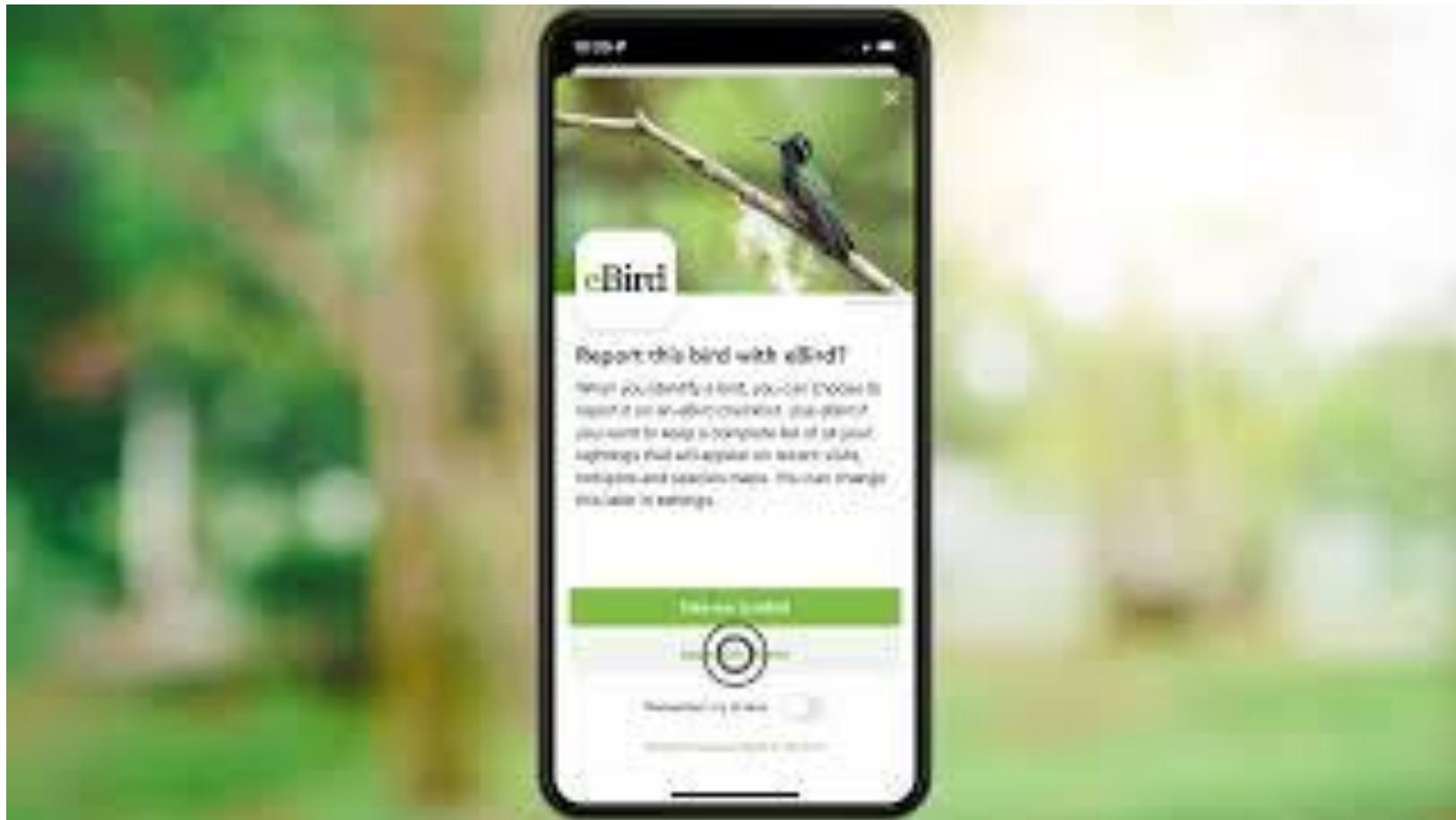
Sampling biases

Reliant on
volunteer
network of local
experts

Requires ID skills

AI tools may
increase data
quantity, but may
reduce quality
(without careful
implementation)

Merlin: AI-Powered Avian Audio ID



How are these data being used?

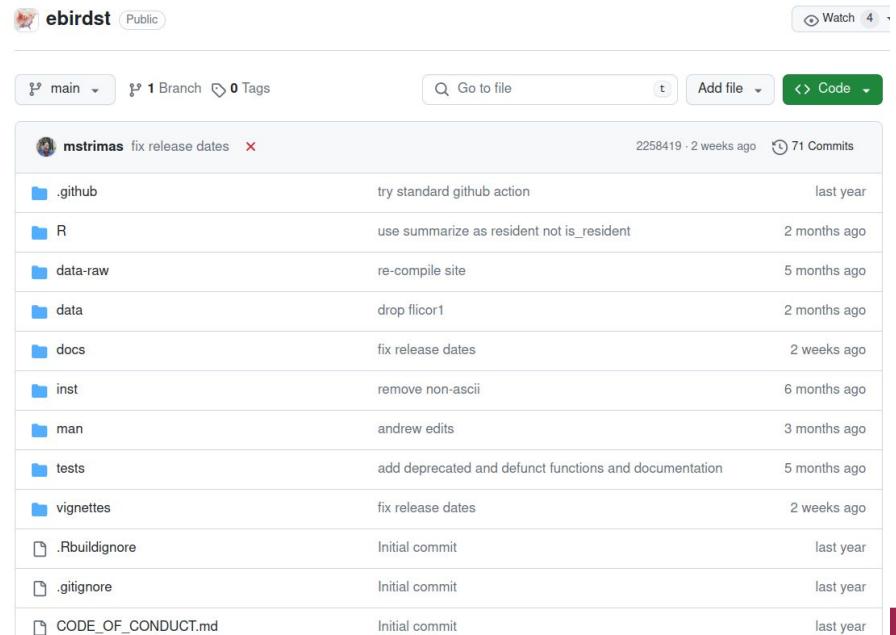
eBird Data has been cited in over 930 peer-reviewed publications

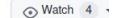
10,000+ peer reviewed papers have been published using GBIF

iNaturalist and eBird are both major data contributors

Both can be downloaded directly

Cornell Lab publishes Status and Trends data products. Accessible through download or API call, including through the r package `ebirdst` available on CRAN



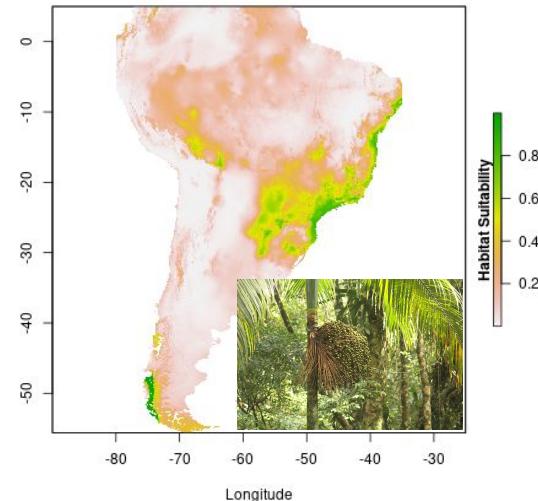
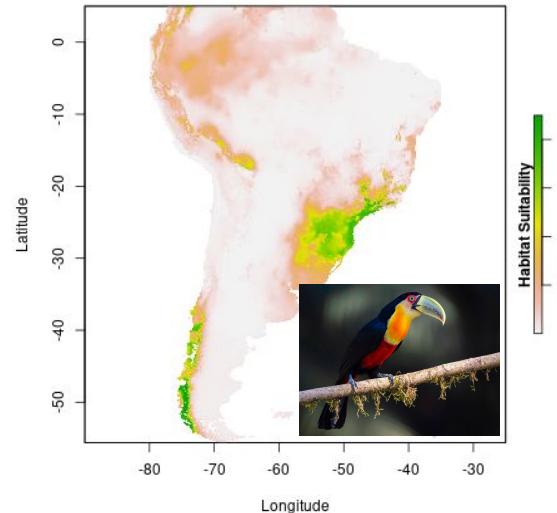
ebirdst Public		
main	1 Branch	0 Tags
 mstrimas fix release dates 	2258419 · 2 weeks ago	 71 Commits
↳ .github	try standard github action	last year
↳ R	use summarize as resident not is_resident	2 months ago
↳ data-raw	re-compile site	5 months ago
↳ data	drop flicor1	2 months ago
↳ docs	fix release dates	2 weeks ago
↳ inst	remove non-ascii	6 months ago
↳ man	andrew edits	3 months ago
↳ tests	add deprecated and defunct functions and documentation	5 months ago
↳ vignettes	fix release dates	2 weeks ago
📄 .Rbuildignore	Initial commit	last year
📄 .gitignore	Initial commit	last year
📄 CODE_OF_CONDUCT.md	Initial commit	last year

What types of questions are these data useful for?

Both to an extent “use agnostic”
models (Wiersma, 2023)

Volume of data is enormous!

Ex. Incredibly useful for
training Species Distribution
Models



What types of questions are these data useful for?

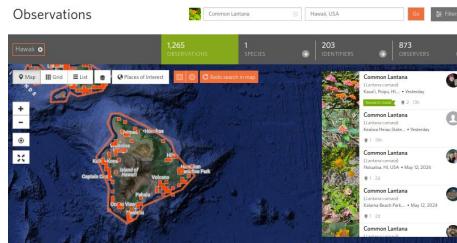
Both to an extent “use agnostic” models (Wiersma, 2023)

Volume of data is enormous!

Ex. Incredibly useful for training Species Distribution Models

Rapid data collection

Ex. Tracking range shifts/spread of invasive species



Citizen science can complement professional invasive plant surveys and improve estimates of suitable habitat

Monica Dimson, Lucas Berio Fortini, Morgan W. Tingley, Thomas W. Gillespie

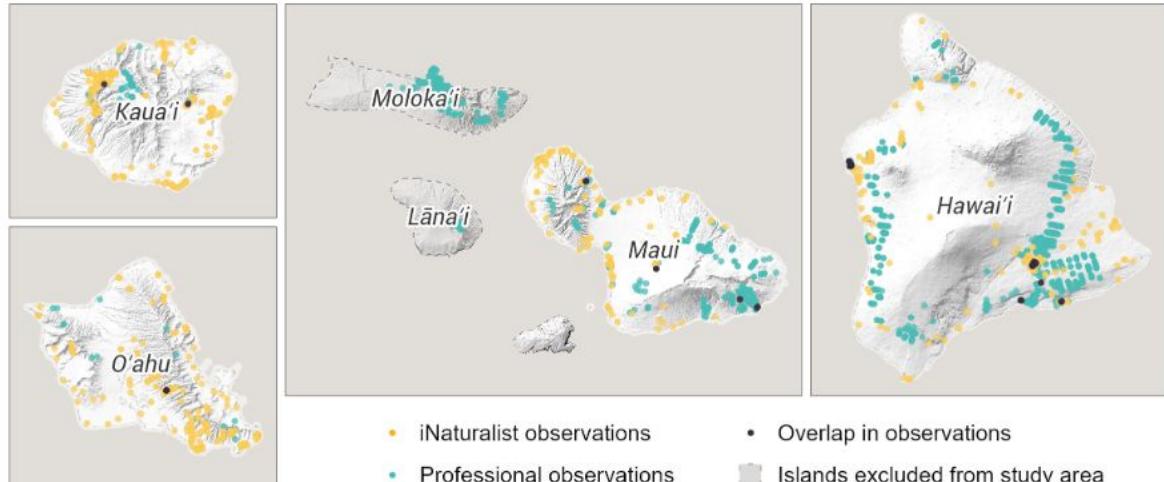


FIGURE 1 Distribution of iNaturalist and professional agency observations for *Hedychium gardnerianum*, *Lantana camara*, *Leucaena leucocephala* and *Psidium cattleianum* (map projection: Universal Transverse Mercator Zone 4N; Kauai, Oahu, and Maui scale 1:1900000; Hawaii scale 1:2900000).

What types of questions are these data useful for?

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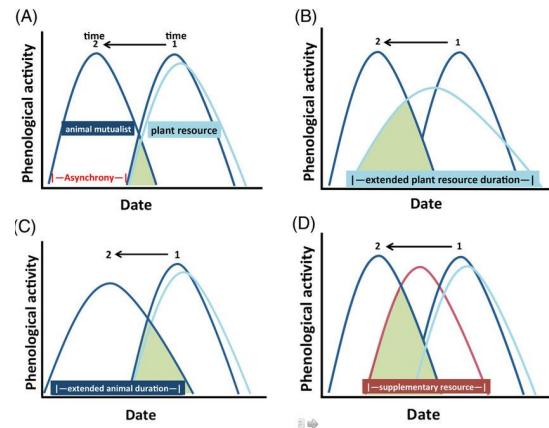
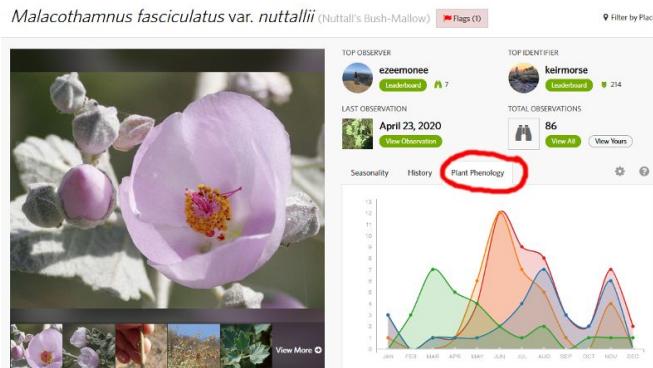
Volume of data is enormous!

Ex. Incredibly useful for training Species Distribution Models

Rapid data collection

Ex. Tracking range shifts/spread of invasive species

Capture phenological & geographical shifts



Olliff Yang et al., 2020

What types of questions are these data useful for?

Both to an extent “use agnostic”
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Volume of data is enormous!

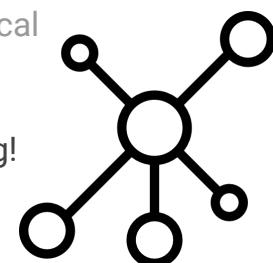
Ex. Incredibly useful for training
Species Distribution Models

Rapid data collection

Ex. Tracking range shifts/spread
of invasive species

Capture phenological & geographical
shifts

Other potential uses/data scraping!



Red-breasted Toucan (*Ramphastos dicolorus*) Research Grade

Follow ▾

 agujaceratops 22,518 observations

Observed: Apr 25, 2024 - 3:43 PM -03:00 Submitted: Apr 25, 2024 - 5:07 PM EDT

Map Satellite



Aguas Mornas - State of Santa Ca... Show Details ▾

Be the first to fave this observation!

Activity

Community Taxon

What's this?

agujaceratops suggested an ID	Improving	19d
 Red-breasted Toucan <i>Ramphastos dicolorus</i>	Compare	Agree

enricostoto96 suggested an ID	19d
 Red-breasted Toucan	

Red-breasted Toucan (*Ramphastos dicolorus*) Cumulative IDs: 4 of 4 0 2/3rds 4

Agree Compare About

Citizen Science is a Tool for Outreach & Empowerment

- Increase Public Engagement
- Empower local communities
- Support Conservation



Limitations

Data make abundance estimation difficult

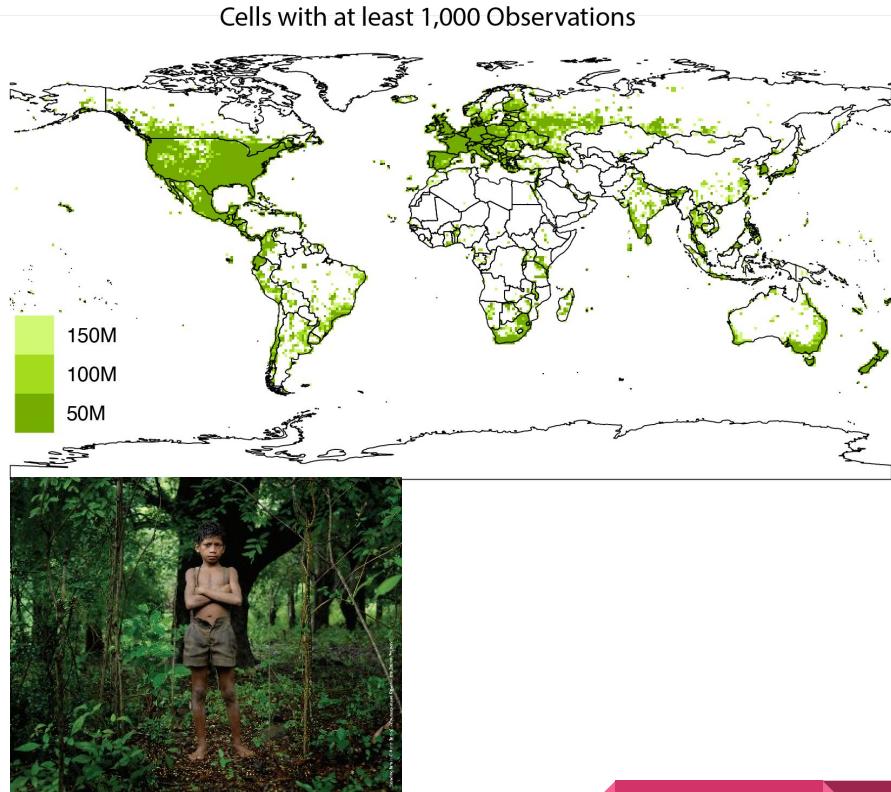
Things like ebird's quantification of effort help, but still need to account for biases & detection probability

Spatial/taxonomic biases mean we have to interpolate a lot in some places/times

Diversity is often low in citizen science spaces

Allf et al. (2022) found that members of US citizen science projects were 8x more likely to be white and 5x more likely to hold advanced degrees than the general populace

Need to create inclusive spaces and encourage community-level participation





eBird



A project of the Chicago Botanic Garden

ADOPT
a
STREAM

Citations

Thigpen, CL and Funk, C. 2020. *Younger, more educated U.S. adults are more likely to take part in citizen science research*. Washington, DC: Pew Research Center

Fraisl, D., Hager, G., Bedessem, B., Gold, M., Hsing, P. Y., Danielsen, F., ... & Haklay, M. (2022). Citizen science in environmental and ecological sciences. *Nature Reviews Methods Primers*, 2(1), 64.

<https://inaturalist.ca/posts/94061-observation-accuracy-experiment-v0-4-is-underway>

GBIF.org (2024), *GBIF Home Page*. Available from: <https://www.gbif.org> [9 May 2024].

iNaturalist (2024). Available from <https://www.inaturalist.org>. [9 May 2024]

Sullivan, B.L., C.L. Wood, M.J. Iliff, R.E. Bonney, D. Fink, and S. Kelling. 2009. eBird: a citizen-based bird observation network in the biological sciences. *Biological Conservation* 142: 2282-2292.

Johnston, A., Hochachka, W. M., Strimas-Mackey, M. E., Ruiz Gutierrez, V., Robinson, O. J., Miller, E. T., ... & Fink, D. (2021). Analytical guidelines to increase the value of community science data: An example using eBird data to estimate species distributions. *Diversity and Distributions*, 27(7), 1265-1277.

Dimson, M., Berio Fortini, L., Tingley, M. W., & Gillespie, T. W. (2023). Citizen science can complement professional invasive plant surveys and improve estimates of suitable habitat. *Diversity and Distributions*, 29(9), 1141-1156.

Olliff-Yang, R. L., Gardali, T., & Ackerly, D. D. (2020). Mismatch managed? Phenological phase extension as a strategy to manage phenological asynchrony in plant-animal mutualisms. *Restoration Ecology*, 28(3), 498-505.

Allf, B. C., Cooper, C. B., Larson, L. R., Dunn, R. R., Futch, S. E., Sharova, M., & Cavalier, D. (2022). Citizen science as an ecosystem of engagement: Implications for learning and broadening participation. *BioScience*, 72(7), 651-663