

# CITIZEN SCIENCE MONTH



April is citizen science month! There are plenty of ways you and your family can participate in citizen science projects this spring while being safe and also having fun.

Check out these activities from our science staff to learn how you can become a #ManometCitizenScientist! Use this hashtag on Facebook, Twitter, and Instagram to share your family's adventures in field science with us.

## MIGRATION MAGIC

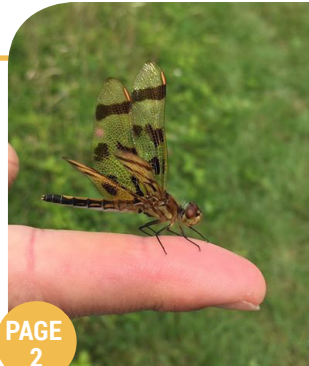
Did you know that billions of birds fly north every spring from South and Central America to breed and nest during the summer? Head out to your yard or local green space with a parent or guardian and see what you can find, then report your sightings to eBird!



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## BACKYARD BIOBLITZ

Your yard or local greenspace is teeming with life, from birds to mammals to insects and plants, there could be hundreds—sometimes thousands—of different organisms using even a single square mile of land! Using the iNaturalist (or iNat for short) app or website, you can list observations of all kinds just by uploading a photo—iNat's identification software will take care of the rest!



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## TEST YOUR COUNTING SKILLS

The return of spring means that river herring (a collective term for alewives and blueback herring, two species that live in the ocean but travel upstream each spring to spawn), which range from Florida to Canada, will soon be surging up coastal rivers and streams. Take a field trip to watch the fish migrate upstream and use a timer and see how many fish you can count in one minute.



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## TRACKING INVADERS

The European green crab is an invasive species that was transported to the United States in ship ballast water in 1817. You can find green crabs on most shorelines in New England that have moveable rocks and seaweed. Head out to your local coastline and see how many you can find.

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## HELPING HANDS FOR HORSESHOE CRABS

Horseshoe crabs are an important part of our coastal ecosystem. Their eggs feed migratory shorebirds and other wildlife all along the Atlantic Coast—females can lay up to 100,000 at a time! Count how many horseshoe crabs you find on your local beach this spring and let us know what you find!

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Keep reading! We have provided some fun science activities on the next few pages.

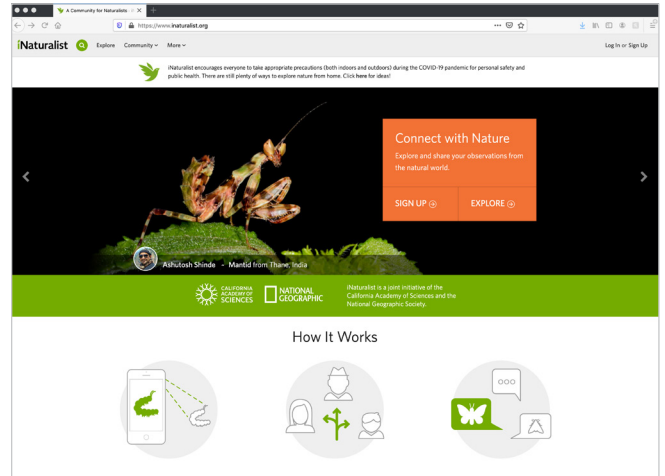


# Backyard BioBlitz

Your yard or local greenspace is teeming with life, from birds to mammals to insects and plants, there could be hundreds—sometimes thousands—of different organisms living in a single acre! All you need to observe and document these living things is a notebook or smartphone and a senses of adventure!

One of the easiest ways to document nature sightings is the app **iNaturalist** (iNat for short). You may need an adult's help in setting up an iNaturalist account. Using the iNat app or website, you can list observations of all kinds just by uploading a photo—iNat's identification software and volunteer identification experts will take care of the rest! Like eBird, iNat has thousands of users—including some specialists who are extra knowledgeable in certain areas—submitting their nature observations every day all over the world. Experts can offer suggestions for what you saw based on the pictures you upload, so you don't need to be a pro to participate. Head to [iNaturalist.org](https://www.inaturalist.org) to learn more and start documenting what lives in your area now!

**Make some observations using the guidelines below:**



DATE

TIME

LOCATION

What did you see?

- |  |                                    |                                  |
|--|------------------------------------|----------------------------------|
| <input type="checkbox"/> plant                     | <input type="checkbox"/> insect    | <input type="checkbox"/> fish    |
| <input type="checkbox"/> fungus                    | <input type="checkbox"/> mammal    | <input type="checkbox"/> mollusk |
| <input type="checkbox"/> bird                      | <input type="checkbox"/> reptile   |                                  |
| <input type="checkbox"/> arachnid (spiders, ticks) | <input type="checkbox"/> amphibian |                                  |

Can you identify the species on your own?  Yes, it's \_\_\_\_\_  No

Can you provide a picture?  Yes  No

Notes (behavior (if applicable), are there more than one, etc.)

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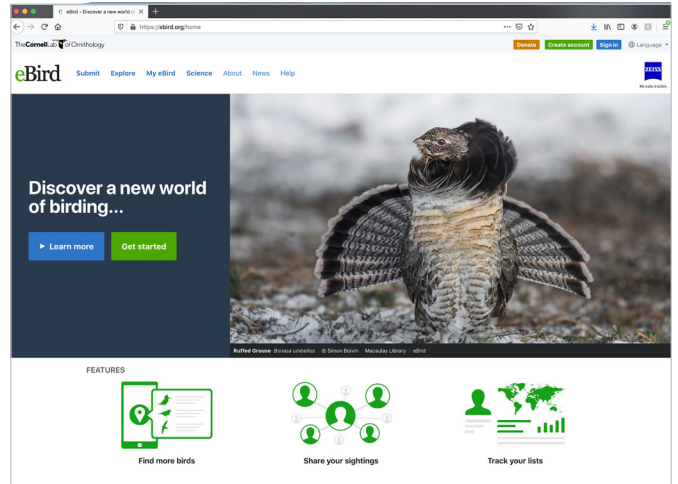
*Please be careful! Only perform surveys with a parent/guardian present. Watch out for ticks and stinging insects, and always observe wildlife from a safe and respectful distance.*

# Migration Magic

Did you know that billions of birds fly north every spring from South and Central America to breed and nest during the summer? Right now, warblers, vireos, orioles, and more are heading to a forest, park, or yard near you to rest and feed before continuing their northward migration.

Finding migrating birds is as easy as going to an area with lots of trees and natural features early in the day between now and June with a pair of binoculars! With the help of a parent or other trusted adult, you can even list your bird sightings online in a giant citizen science database called **eBird**, a place where, every day, thousands of people upload their bird sightings every day from around the world. Each sighting is an important contribution to data that can help protect bird populations, so even one entry will make a big difference! Go to [ebird.org](http://ebird.org) to learn more. You may need an adult's help with setting up an eBird account.

Create your own checklist! **Practice entering data here, just like observers on eBird do!**



DATE

TIME

LOCATION

- Are you:  Travelling/walking/driving while birding  Staying in one place while birding  
 Saw/heard a bird without purposely looking? (Incidental)  Other:

TIME STARTED

TIME ENDED

Species observed (make as many notes as you can about each sighting, including behavior, whether it was singing, any recordings/pictures, etc.):

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You can find a full list of likely species in your area using [eBird.org](http://eBird.org).

Happy birding!

# Test Your Counting Skills

The return of spring means that river herring (a collective term for alewives and blueback herring, two species that live in the ocean but travel upstream each spring to spawn), which range from Florida to Canada, will soon be surging up coastal rivers and streams. It is a natural phenomenon that draws predators, such as osprey and bald eagles, fishermen who harvest the fish for bait, and nature lovers enjoying the spectacle of nature’s annual spring renewal. A fun activity for families is to take a field trip to watch the fish migrate upstream. The run generally lasts a few weeks; the start of the run depends on warming ocean waters but generally occurs in regions between March (southern New England) and as late as June (eastern Maine).

Volunteers in many communities help out by counting river herring as they pass upstream. You can practice your counting skills by finding a place along a stream where the fish must pass through a narrow opening as they work their way upstream. Use a timer and see how many fish you can count in one minute. Repeat a few times and compare your findings, keeping in mind that sometimes the fish move upstream in pulses. If your counts are similar you are probably getting an accurate reading; if not, try again.



LOCATION	DATE	START TIME	# HERRING (TALLY MARKS ARE FINE)

# Tracking Invaders

The European green crab is an invasive species that was transported to the United States in ship ballast water in 1817. In recent years, they have rapidly increased in abundance in the Gulf of Maine as ocean temperatures have warmed. Unfortunately, they like to eat native species such as soft-shell clams and mussels, leading to declines in their populations and negative impacts to the fishermen whose livelihoods depend on those species. Manomet has been working to create a fishery for green crabs, which would help fishermen to benefit from them and would promote removing them from the environment.

You can find green crabs on most shorelines in New England that have moveable rocks and seaweed. Simply flip over rocks or gently move aside seaweed to find them! When you find one, see if you can determine if it's male or female, gently squeeze it to see if it's hard or soft (indicating if it has recently shed its shell in order to grow), count how many claws and how many legs it has to determine if it's injured (the maximum a crab can have is 2 claws and 8 legs), and note the color (green crabs can range from gray-green to orange-red in color). Head out to your local coastline and report your findings!



Male



Female

**Use this table to record data on every crab you find; use one row per crab sighted.**

DATE	TIME	LOCATION (TOWN)	HARD OR SOFT?	# CLAWS	# LEGS	MALE/FEMALE	COLOR	NOTES

# Helping Hands for Horseshoe Crabs

Horseshoe crabs are an important part of our coastal ecosystem. Their eggs feed migratory shorebirds and other wildlife all along the Atlantic Coast—females can lay up to 100,000 at a time! Unfortunately, overharvesting of horseshoe crabs and habitat degradation has left us with fewer horseshoe crabs and not enough eggs for shorebirds, fish, and terrapins (a species of turtle).

Lend a helping hand to horseshoe crabs in need by heading to a calm, sandy beach during late spring and early summer and flipping over any crabs you find upside down (legs up). If you find them with wet feet and shells up, they are probably spawning and should be left alone—count how many you find on your beach and let us know what you find! You can also see if you can spot the difference between males and females: males are smaller and use their ‘boxing glove’ front legs to attach to females. Females are larger and all the legs look the same.

What can you find on your beach?



**Fill out the table below to conduct a survey of horseshoe crabs using your area by writing down information in each row for every crab you see (tally how many male and females you see, if you aren't sure, tally under unknown):**

DATE	TIME	LOCATION (TOWN)	MALE	FEMALE	UNKNOWN	NOTES