

# These Maps Are For The Birds

*Students will study New York State Breeding Bird Atlas maps to learn where different bird species nest and how their distributions have changed over time.*

**Objectives:** Students will understand:

- how maps serve as representations of a geographic region;
- how the distribution of animals varies geographically based on habitat requirements;
- how the distribution of animals changes over time as environmental conditions change, often in response to human activities.

**Grade level:** Elementary (Grades 4-5)

**Subject Area:** Science, Social Studies

**Standards:** Social Studies Standard 3  
Mathematics, Science, & Technology Standard 4

**Skills:**

- Interpret data presented geographically on a map.
- Observe, identify, and communicate patterns in data.
- Analyze document-based information presented in scientific figures.

**Vocabulary:** atlas, breeding, data, habitat, estuary, landscape, pesticide, population, relief map, species

**Duration:** Preparation time: 10 minutes

Activity time: 40 minutes

**Materials:** Each student should have:

- Worksheet: These Maps Are For The Birds
- Relief Map of New York State with county boundaries
- Pencil or pen



## Background:

Maps usually show terrain, political regions, roads, towns, and similar features of the natural and built landscape, but can also show other information linked to geography. This lesson looks at how maps present data from the New York State Breeding Bird Atlas. Over 1,200 volunteers collected data on nesting birds in 5,332 blocks—sections of U.S. Geological Survey maps—that together formed a mosaic covering all of New York. On a map created for each species, blocks in which it occurred were colored in to show the bird's breeding distribution.

Students will view actual Breeding Bird Atlas maps and answer document-based questions about information in these scientific figures. The maps are unaltered except for being reduced in size and—most likely—converted to black and white in photocopying. Students will examine how bird distribution is linked to landscape and habitat. Using data collected over time, they will also study how this distribution can vary over the years.

Environmental change can alter the distribution of breeding birds. Examples include the disappearance of grasslands due to urbanization, an increase in forest cover as farm fields are abandoned, and milder winters due to global warming. Humans can have more direct impacts on birds—through shooting and application of toxic pesticides, for instance. People have also brought birds from other places to New York; these exotics sometimes displace native birds.

## Activity:

1. Review vocabulary words and point out that the lesson will look at where birds nest in New York. The maps do not show where birds migrate or cover species that don't breed here.
2. Compare an Atlas map to the state relief map. Point out the location of major topographic features: the Adirondacks, Catskills, Atlantic Ocean, Great Lakes, and Hudson River. On the Atlas map, find the county in which your school is located.
3. Go through the "These Maps Are For The Birds" worksheet in class.

## Assessment:

- Have students share answers to worksheet questions, or collect and grade sheets.
- Select other Breeding Bird Atlas maps for students to analyze. Suggestions: eastern bluebird, upland sandpiper, red-bellied woodpecker, and double-crested cormorant.

## Answers:

- |                       |   |
|-----------------------|---|
| 1. evening grosbeak   | 10. wild turkey increasing due to more forest cover and release by humans; ring-necked pheasant decreasing (in spite of release by people) as fields become forests or are developed; peregrine falcon increasing due to ban on pesticides like DDT. See <b>Resources</b> for links to documents with more information. |
| 2. common tern        |   |
| 3. Bicknell's thrush  |   |
| 4. black vulture      |   |
| 5. bald eagle         |   |
| 6. Carolina wren      | 11. a. bald eagle—common: no pesticides then; b. eastern meadowlark—uncommon: landscape was mostly forest; c. wild turkey—common: landscape mostly forest; d. Carolina wren—absent: winters more severe then; e. mute swan—absent: hadn't been imported to US yet.  |
| 7. eastern meadowlark |   |
| 8. mute swan          |   |
| 9. whip-poor-will     |   |



## Resources:

Classrooms with internet access can view all the actual Atlas maps at the Department of Environmental Conservation website <http://www.dec.ny.gov/cfm/xtapps/bba/> . Scroll down to the table "Breeding Bird Atlas - Maps By Species." In the row labeled "Alphabetic Order" select 1980-1985 or 2000-2005 to reach a list of species for which maps are available (to see maps from both time periods on one page, select "Alphabetic Order" in the row labeled "Compare Maps"). Clicking on a name in the list—duck, for example—opens a table listing one or more species in that category; click on a species name to access its distribution map.

The DEC website also has documents with information about changes in distribution of the species covered in question 10, as well as many other birds. While the site's search function can locate such documents, it will be hard for elementary students to sort through the "hits" that the search produces. Here are the URLs for documents covering these three species:

wild turkey [http://www.dec.ny.gov/docs/wildlife\\_pdf/wildturk.pdf](http://www.dec.ny.gov/docs/wildlife_pdf/wildturk.pdf)

ring-necked pheasant <http://www.dec.ny.gov/animals/7071.html>

peregrine falcon <http://www.dec.ny.gov/animals/7059.html>

For links to an array of DEC fact sheets and information pages about birds, visit <http://www.dec.ny.gov/animals/271.html>

A broad array of information about birds is available on the Cornell Laboratory of Ornithology's website at <http://www.birds.cornell.edu/> , including photographs of many species and activities for school classrooms.



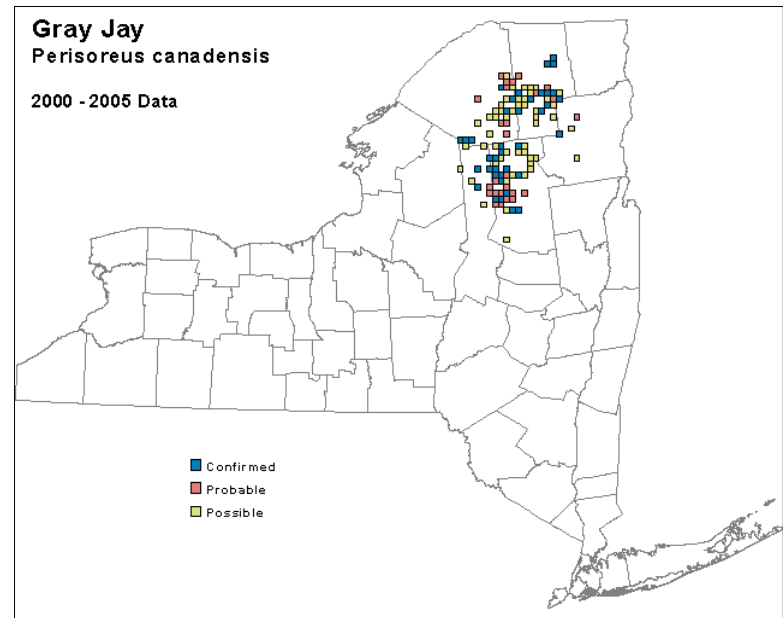
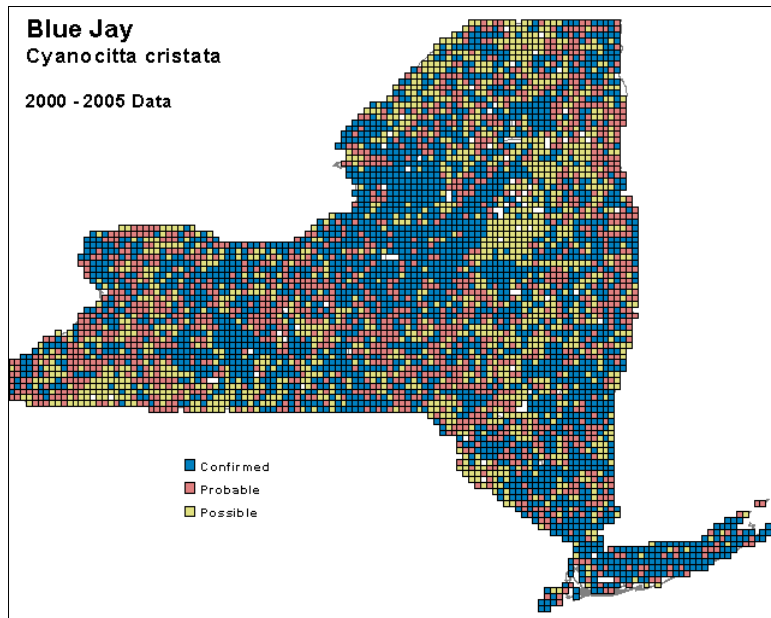
## Worksheet: These Maps Are For The Birds

The Hudson River Valley and New York State are home to hundreds of kinds of birds. There are many different types of habitats here, and each has its own set of bird species. Cities have pigeons, starlings, and sometimes peregrine falcons; rivers have ducks, geese, and gulls. A city with a river flowing through it might have all these kinds of birds.

With the help of many volunteers, scientists collected data about where birds nest in New York. Nesting locations were marked on maps of small sections of the state. A book that collects many maps together is called an atlas. So the collection of all the maps showing where birds nest in New York is called the Breeding Bird Atlas.

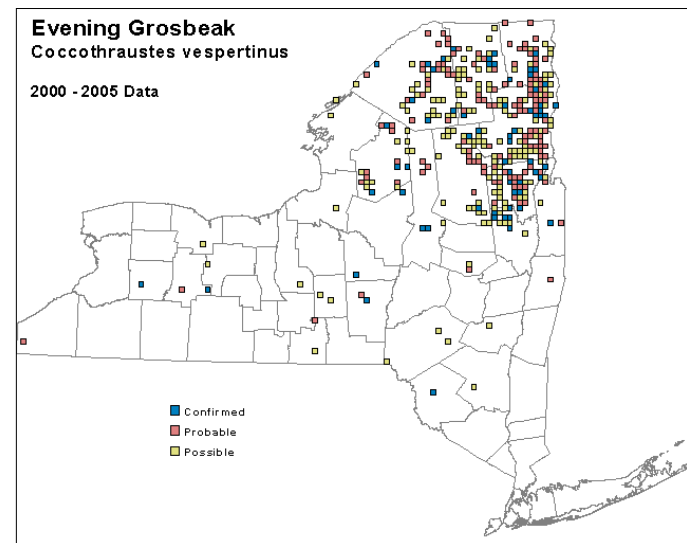
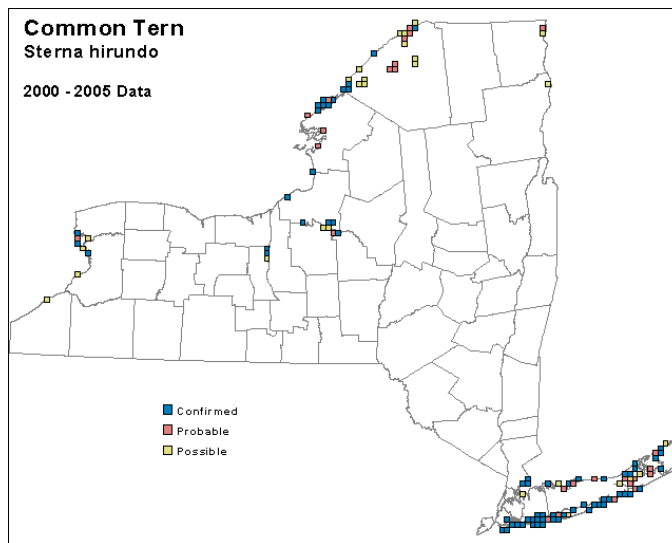
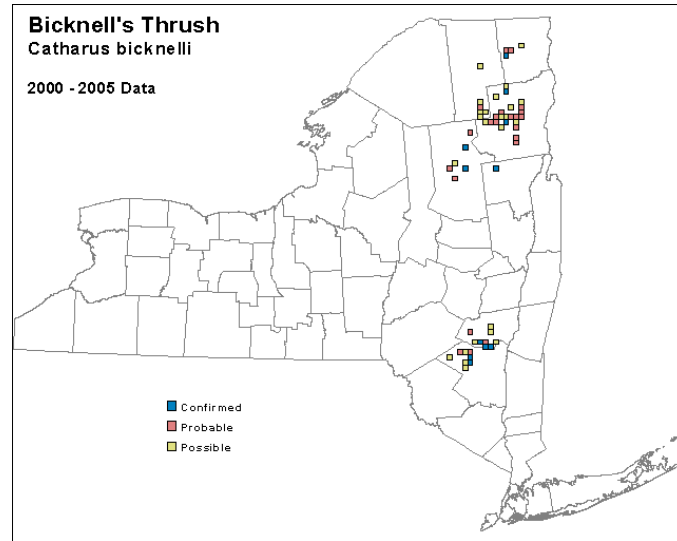
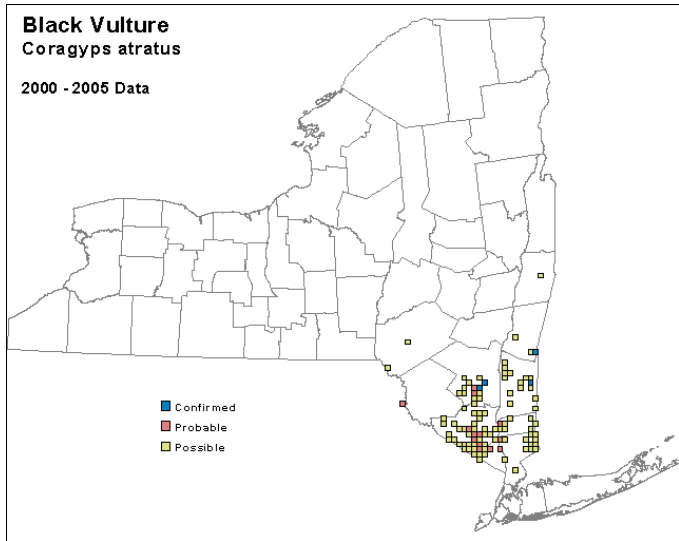
Here are two maps from the Breeding Bird Atlas. One is for a very common bird—the blue jay. It nests all over the state. The other is for the gray jay. Its scientific name—*Perisoreus canadensis*—gives a clue about where this jay is most common. In New York, it nests only in the Adirondack Mountains, where the forests are much like those in Canada.

On the maps, each tiny square indicates that the bird was found in that small map section during nesting season. The different colors show how likely it was that the species did nest. The darkest color means confirmed breeding: perhaps a nest was located or babies seen. The lightest color means only that the bird was seen in the right nesting habitat.



Breeding Bird Atlas maps do not show rivers, lakes, mountains, or other landscape features. To see how such features influence where birds nest, compare the Atlas maps to a relief map of New York State. Then answer these questions.

1. Which of these birds mainly nests in northern New York?
2. Which bird nests near large bodies of water?
3. Which of these birds nests on mountain tops?
4. Which bird is more common in states south of New York?



Breeding Bird Atlas data was first collected between 1980 and 1985. Data was collected again between 2000 and 2005. By comparing maps from the two sets of years, you can see changes in the populations of New York's breeding birds. Using the five maps on this page and the next, choose a bird that best fits each description below. Write its name below the description.

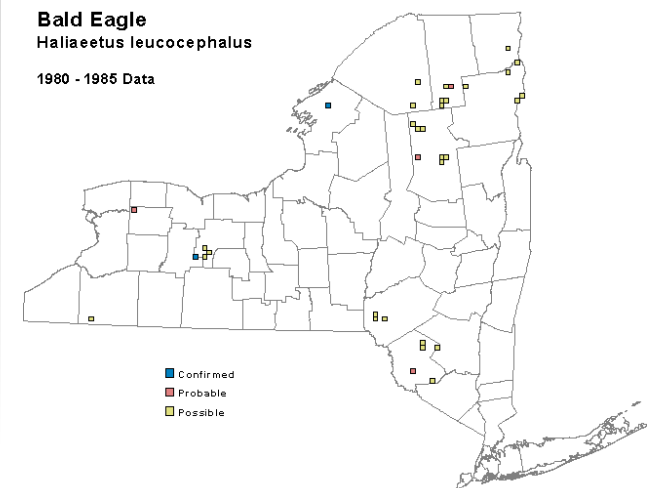
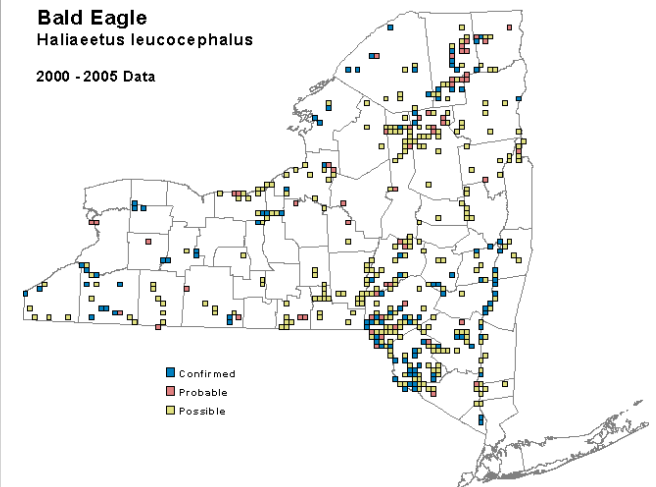
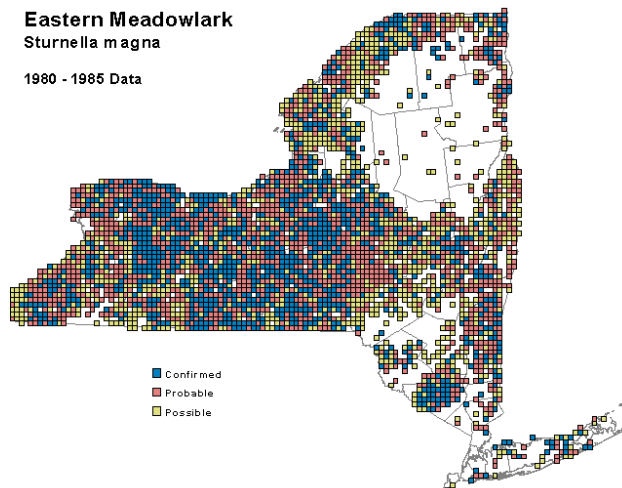
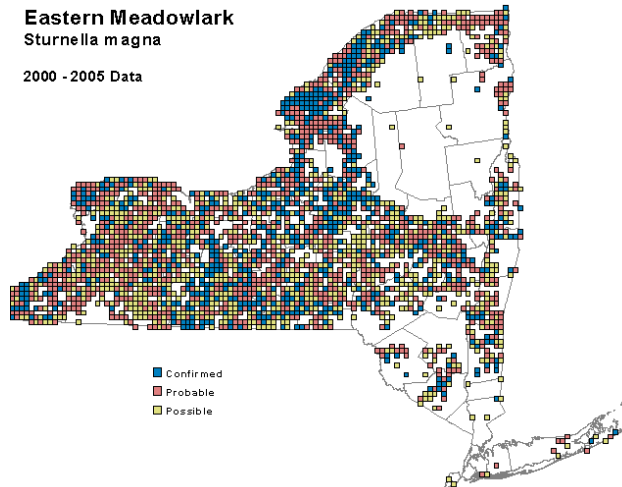
5. Poisoned by pesticides, this bird nearly vanished from New York but is now coming back.

6. As winters become milder, this bird is spreading into New York State from the south.

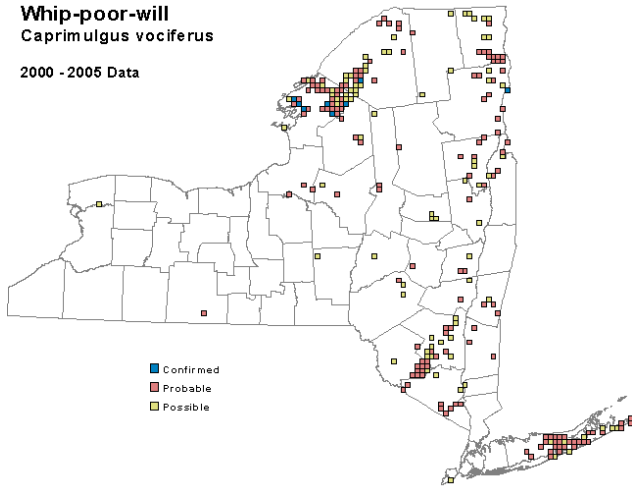
7. This bird's nests in large open fields that are less common than they used to be. Trees grow in unused farm fields, and houses, stores, and other buildings are built in these habitats.

8. This bird is not native to the United States. People admired its beauty and brought it from Europe to Long Island. However, it is spreading and competing with native birds for food and territory.

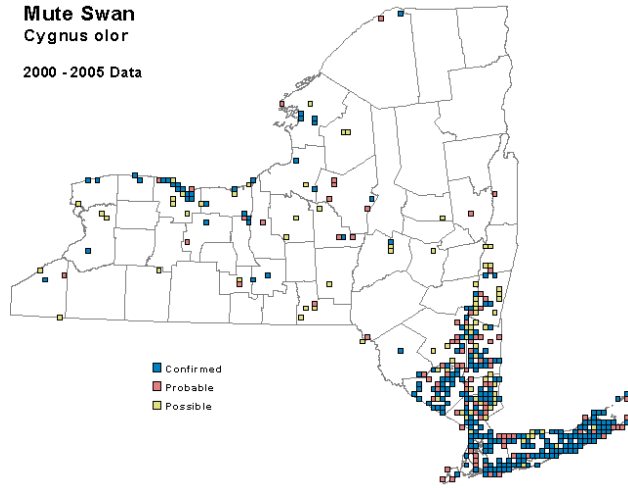
9. This bird nests all over New York, but is a species of special concern. Its decline may be caused by loss of openings in forests as trees grow and as houses, other buildings, and roads spread into these habitats.



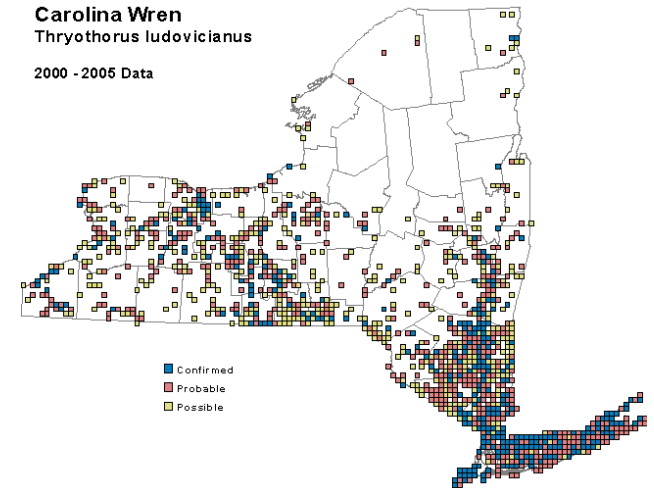
**Whip-poor-will**  
*Caprimulgus vociferus*  
2000 - 2005 Data



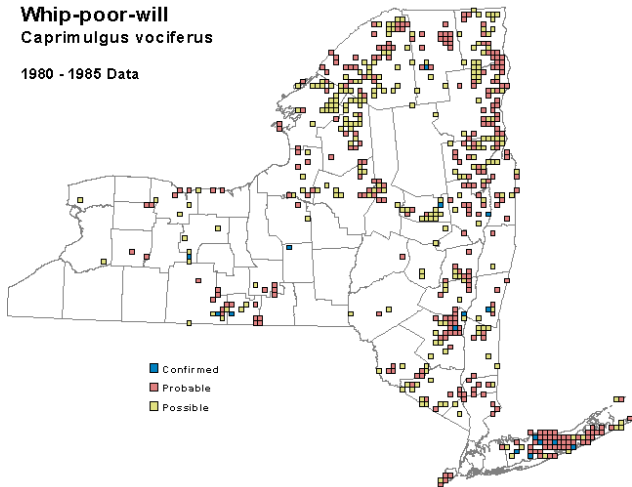
**Mute Swan**  
*Cygnus olor*  
2000 - 2005 Data



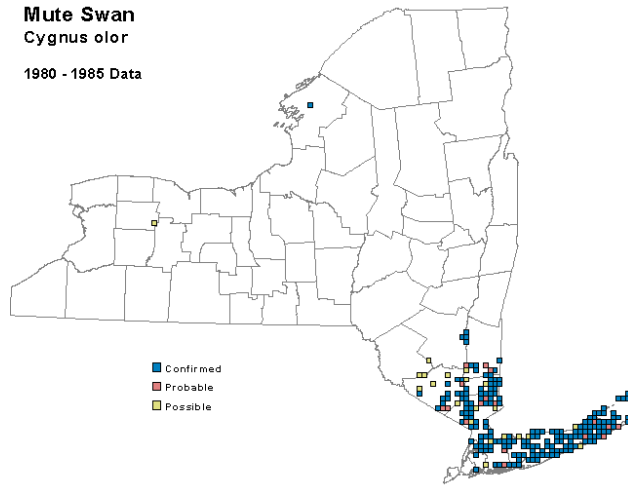
**Carolina Wren**  
*Thryothorus ludovicianus*  
2000 - 2005 Data



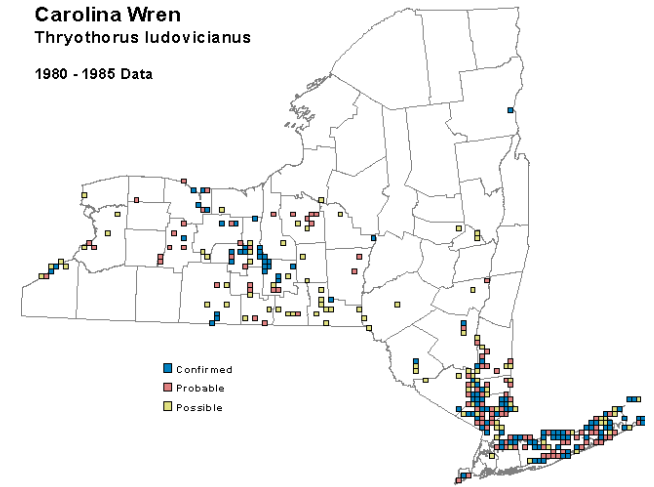
**Whip-poor-will**  
*Caprimulgus vociferus*  
1980 - 1985 Data



**Mute Swan**  
*Cygnus olor*  
1980 - 1985 Data

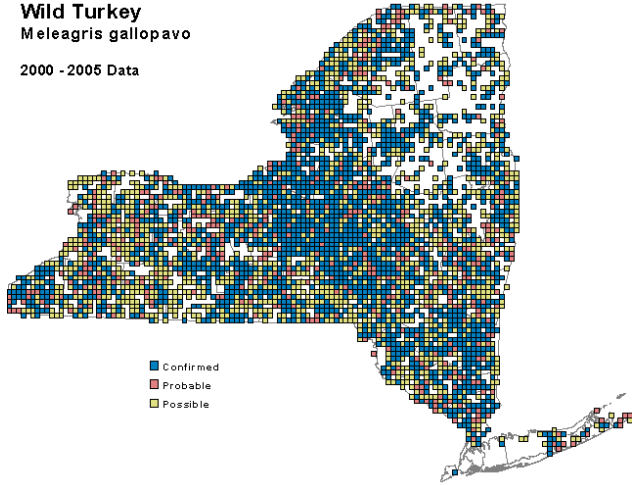


**Carolina Wren**  
*Thryothorus ludovicianus*  
1980 - 1985 Data

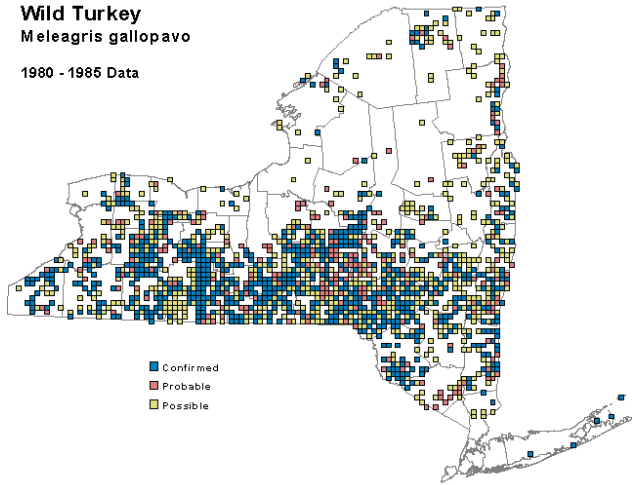


10. Describe the changes in nesting populations of these three birds. Are they increasing or decreasing?  
Can you explain what might have caused the changes you see in the breeding populations of each species?

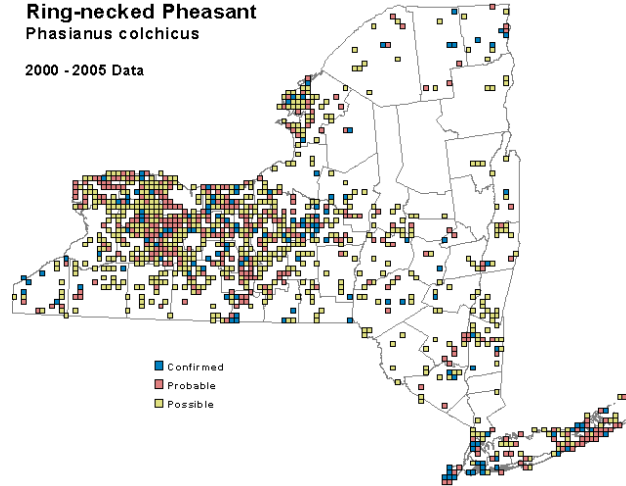
**Wild Turkey**  
*Meleagris gallopavo*  
2000 - 2005 Data



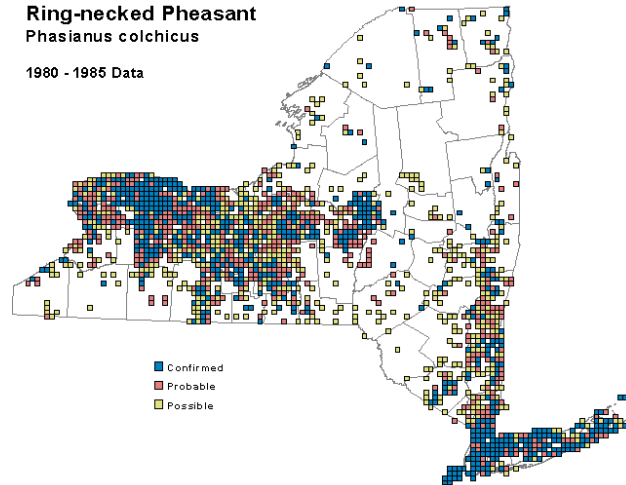
**Wild Turkey**  
*Meleagris gallopavo*  
1980 - 1985 Data



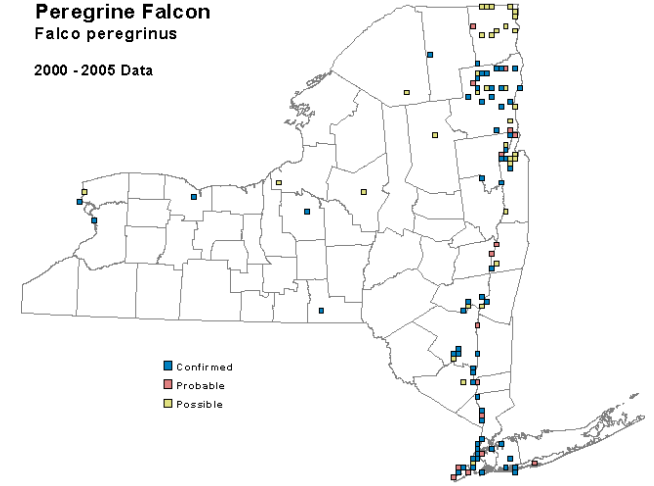
**Ring-necked Pheasant**  
*Phasianus colchicus*  
2000 - 2005 Data



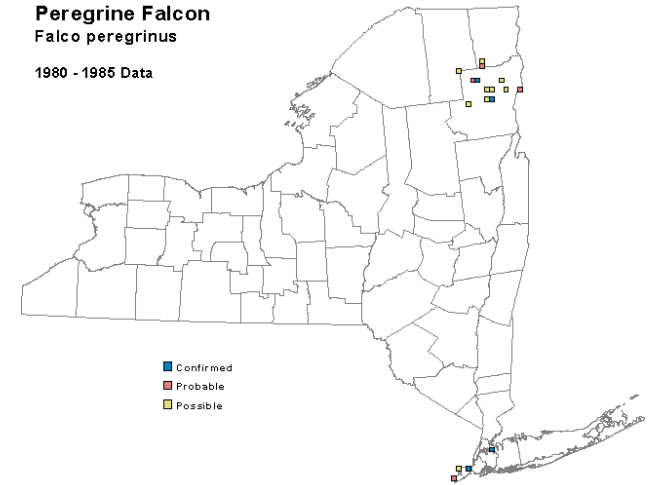
**Ring-necked Pheasant**  
*Phasianus colchicus*  
1980 - 1985 Data



**Peregrine Falcon**  
*Falco peregrinus*  
2000 - 2005 Data



**Peregrine Falcon**  
*Falco peregrinus*  
1980 - 1985 Data



11. Imagine how the Hudson Valley would have looked when the Half Moon sailed up the river in 1609. What sort of habitats would Henry Hudson and his sailors have seen along the river? Would they have been the same ones that we see today?

Now, using information about what causes breeding bird populations to change, write down whether each bird in this list would have been common, uncommon, or absent here in the Hudson Valley when Hudson explored it in 1609. Explain your reasons for choosing common, uncommon, or absent.

- a. bald eagle
- b. eastern meadowlark
- c. wild turkey
- d. Carolina wren
- e. mute swan