

madison
AUDUBON



Climate Initiative

Lesson 8: Phenological Mismatch

Lesson 2: Climate & Habitat

- Generalist
- Specialist



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Lesson 2: Climate & Habitat

- Generalist
 - thrive under a wide variety of conditions
- Specialist
 - Require a specific type of habitat or food



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Migration Review

What is migration?

Why do some birds migrate?

Do all birds migrate?

Why not?

How is climate change going to affect migration?



© Carolyn Byers

How far do birds migrate?

Long distance migrants:

eat:



© Carolyn Byers



© Carolyn Byers

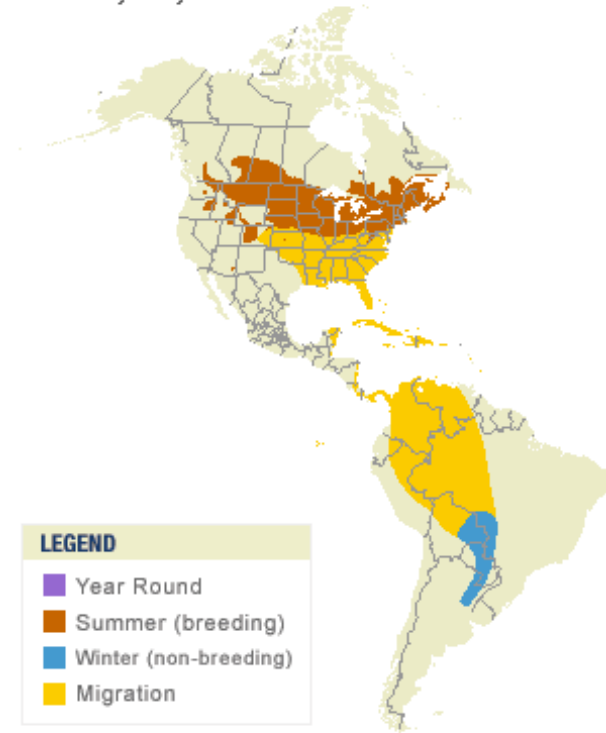
How far do birds migrate?

Long distance migrants:
eat insects or fruit



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Bobolink
Dolichonyx oryzivorus



LEGEND

- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

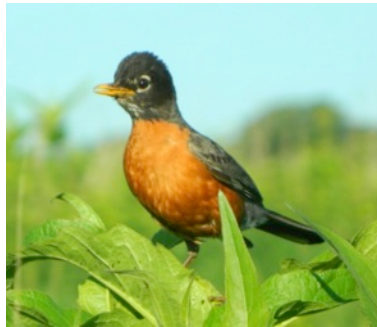
Map by Cornell Lab of Ornithology
Range data by NatureServe

How far do birds migrate?

Short distance migrants:



Photo: BJ Byers



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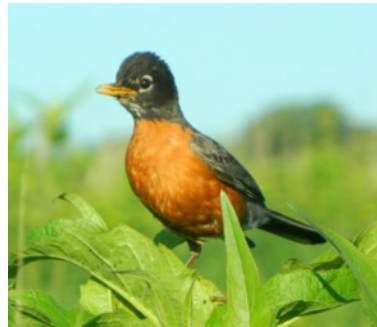
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How far do birds migrate?

Short distance migrants: only travel as far as they need to find food



Photo: BJ Byers



© Carolyn Byers



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How far do birds migrate?

Irruptive migrants:



© Tambako the Jaguar



© Carolyn Byers

How far do birds migrate?

Irruptive migrants: only move when they can't find food



© Tambako the Jaguar



© Carolyn Byers

How far do birds migrate?

Irruptive migrants: only move when they can't find food



© Tambako the Jaguar




© Carolyn Byers



Phenology Data

What did you collect this year?

What other types of data could we have collected?



Let's look at the data: early 1900s - present

January

February

March

April

Let's look at the data: early 1900s - present



January

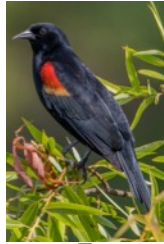
February

March

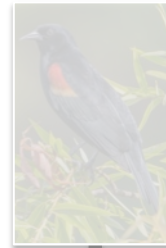
April

Let's look at the data: early 1900s - present

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January

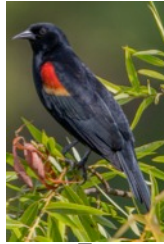
February

March

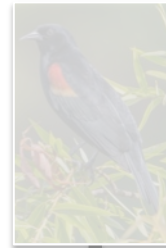
April

Let's look at the data: early 1900s - present

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January

February

March

April

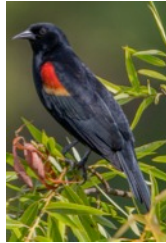
Let's look at the data: early 1900s - present

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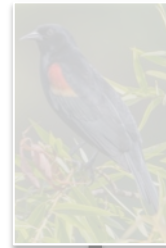
January

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February

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March

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April

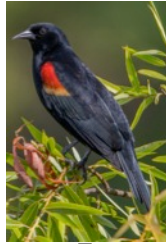
Let's look at the data: early 1900s - present

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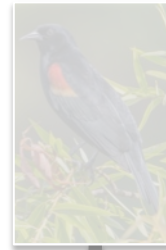
January

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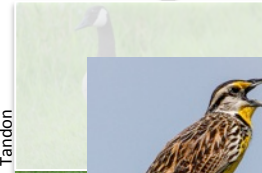
February

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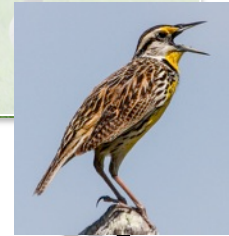


March

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April

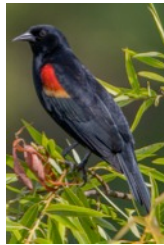
Let's look at the data: early 1900s - present

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January

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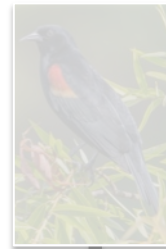


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February

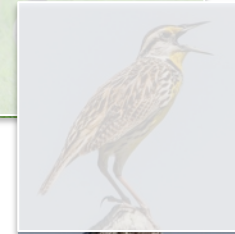
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March

April

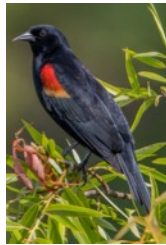
Let's look at the data: early 1900s - present

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January

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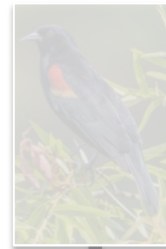


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February

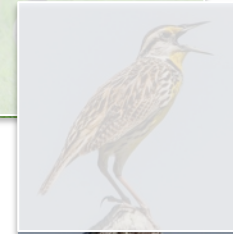
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March

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April

Let's look at the data: early 1900s - present



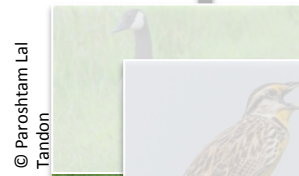
January



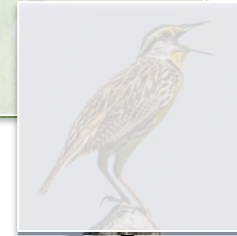
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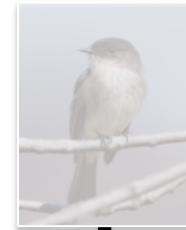
February



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March



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April

Let's look at the data: early 1900s - present



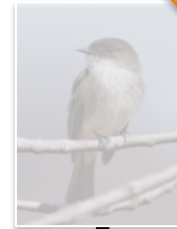
January



February



March



April



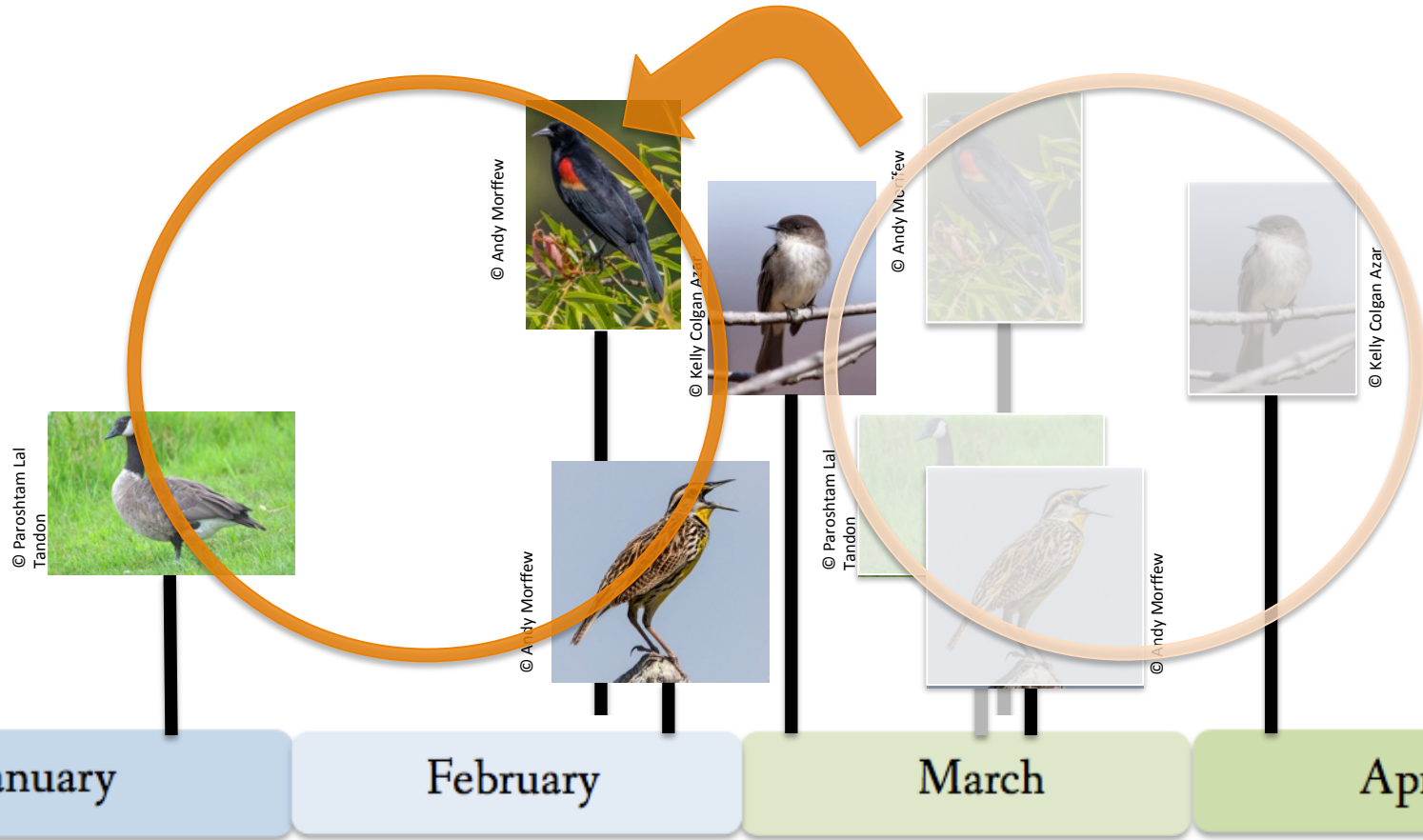
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Let's look at the data: early 1900s - present



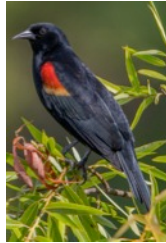
Let's look at the data: early 1900s - present

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January

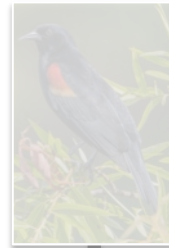
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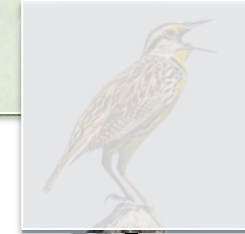
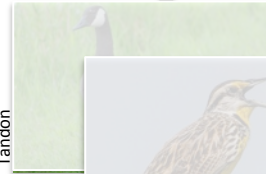
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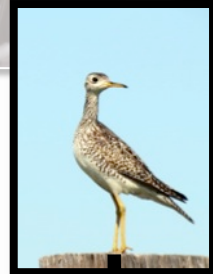


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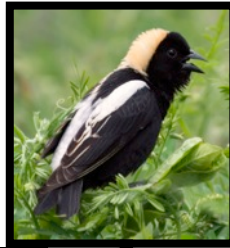
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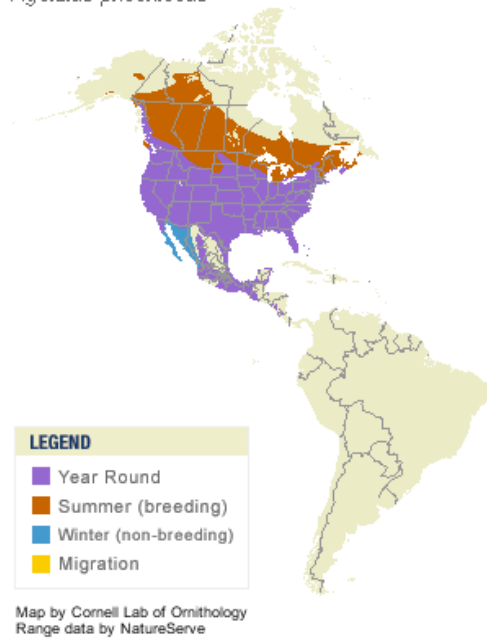
February

March

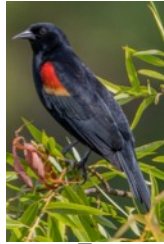
April

Let's look at the data: early 1900s - present

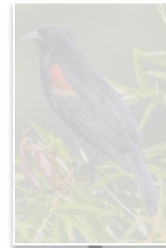
Red-winged Blackbird
Agelaius phoeniceus



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January

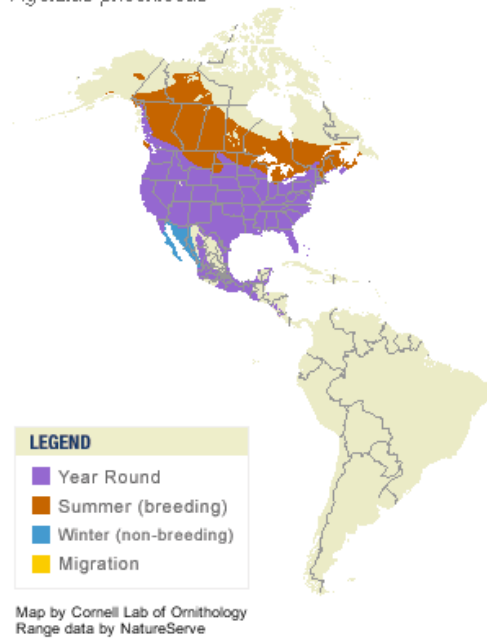
February

March

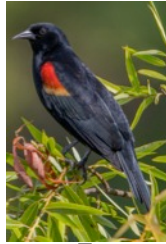
April

Let's look at the data: early 1900s - present

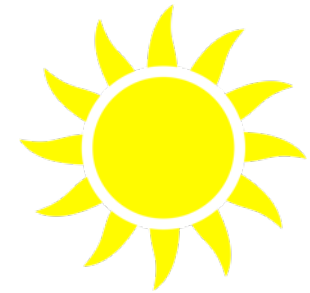
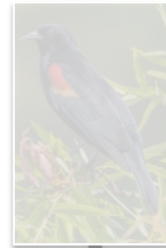
Red-winged Blackbird
Agelaius phoeniceus



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January

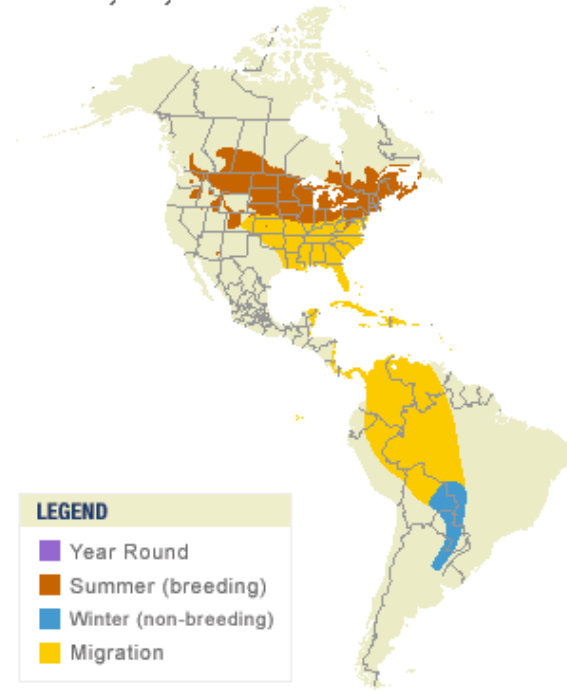
February

March

April

Let's look at the data: early 1900s - present

Bobolink
Dolichonyx oryzivorus



LEGEND

- Year Round
- Summer (breeding)
- Winter (non-breeding)
- Migration

Map by Cornell Lab of Ornithology
Range data by NatureServe



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January

February

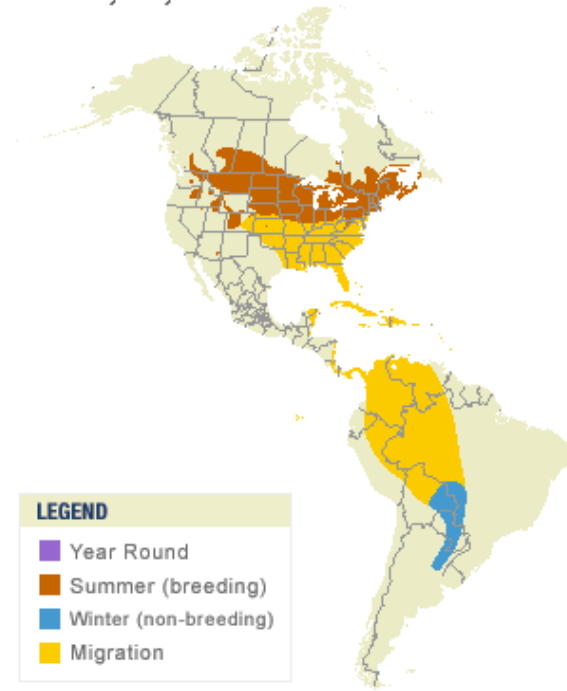
March

April

Let's look at the data: early 1900s - present

Bobolink
Dolichonyx oryzivorus

Photoperiod



Map by Cornell Lab of Ornithology
Range data by NatureServe



January

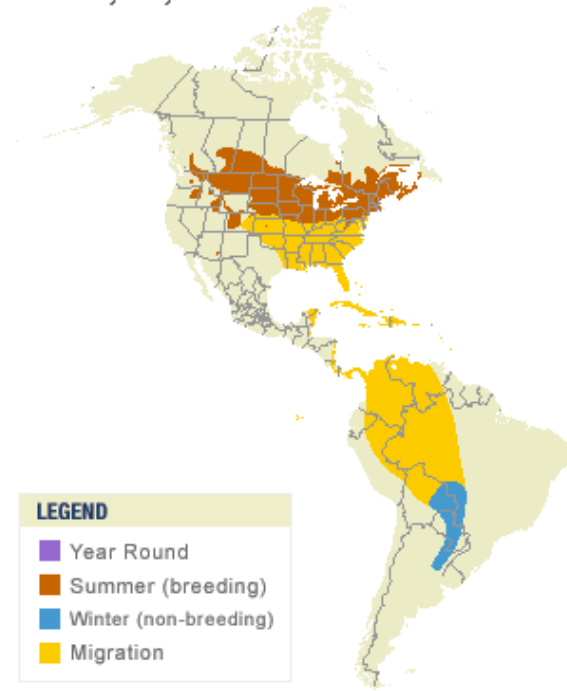
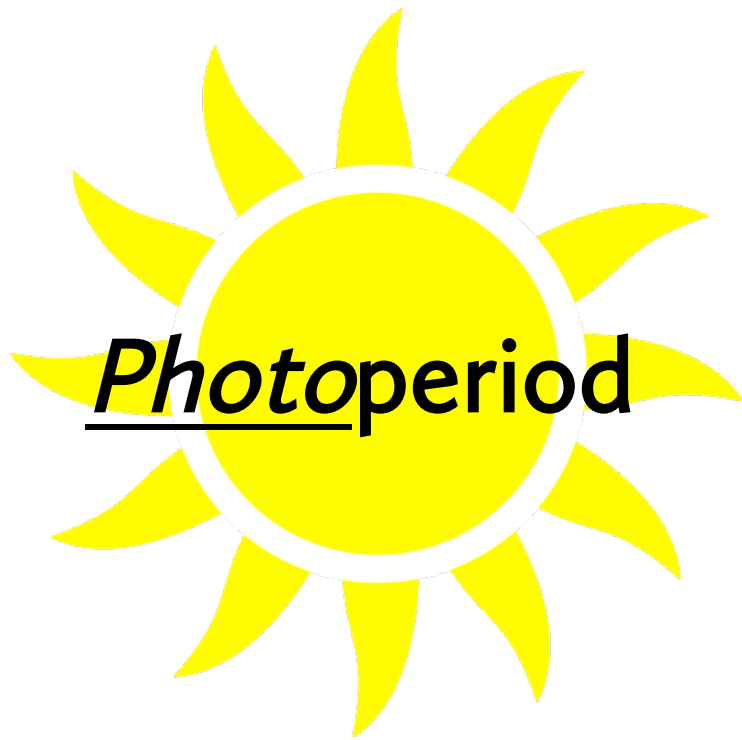
February

March

April

Let's look at the data: early 1900s - present

Bobolink
Dolichonyx oryzivorus



Map by Cornell Lab of Ornithology
Range data by NatureServe



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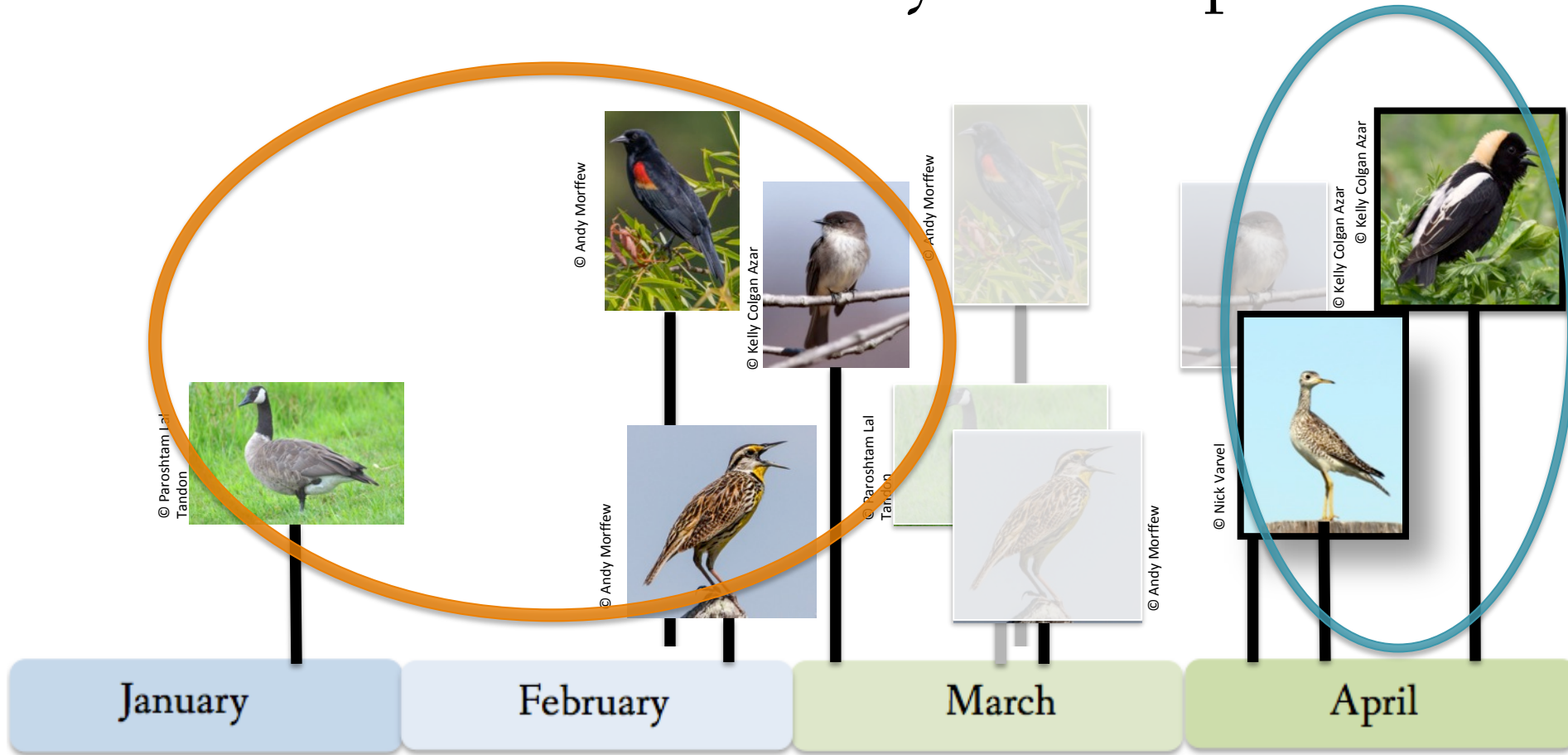
January

February

March

April

Let's look at the data: early 1900s - present





Phenological Mismatch

How is our climate changing?

Temperature:

Rainfall:

Spring will come:



Phenological Mismatch

How is our climate changing?

Temperature: **warmer**

Rainfall:

Spring will come:



Phenological Mismatch

How is our climate changing?

Temperature: **warmer**

Rainfall: **more variable**

Spring will come:



Phenological Mismatch

How is our climate changing?

Temperature: **warmer**

Rainfall: **more variable**

Spring will come: **Earlier**



Phenological Mismatch

How is our climate changing?

Temperature: warmer

Rainfall: more variable

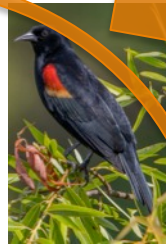
Spring will come: Earlier

Bird migration: ??

Short Distance Migrants



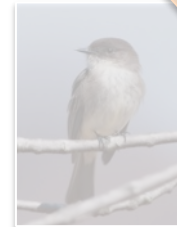
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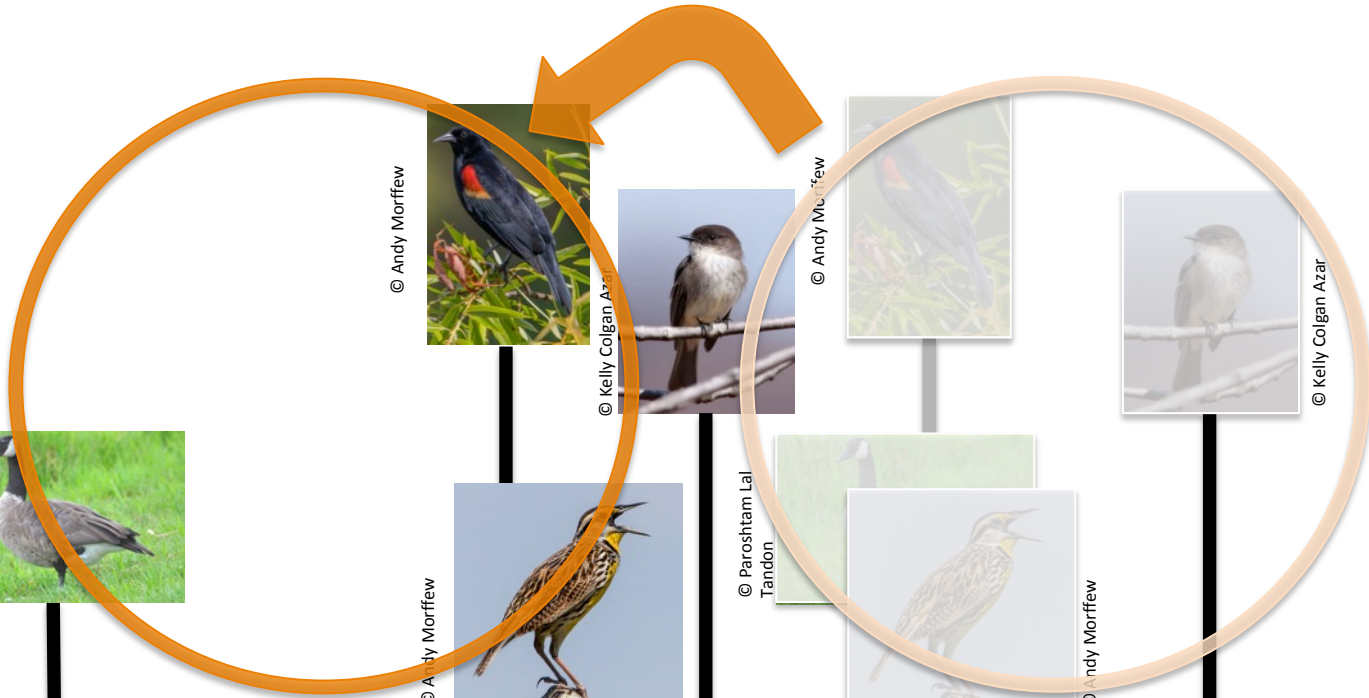
February



March



April





Short Distance Migrants- the past

March

April

May

June



Short Distance Migrants - the past



March

April

May

June

Short Distance Migrants- the past



March

April

May

June

Short Distance Migrants- the past



March

April

May

June

Short Distance Migrants- the past

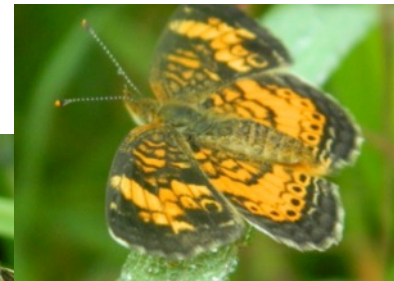


March

April

May

June





Short Distance Migrants- the present

February

March

April

May

June

Short Distance Migrants- the present



February

March

April

May

June



Short Distance Migrants- the present



February

March

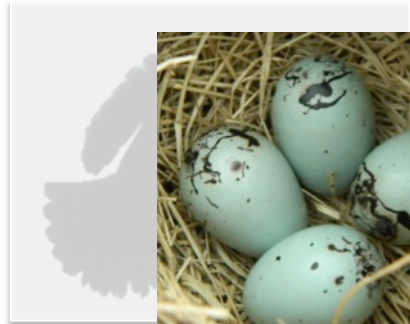
April

May

June



Short Distance Migrants- the present



February

March

April

May

June



Short Distance Migrants- the present



February

March

April

May

June



Short Distance Migrants - the present



February

March

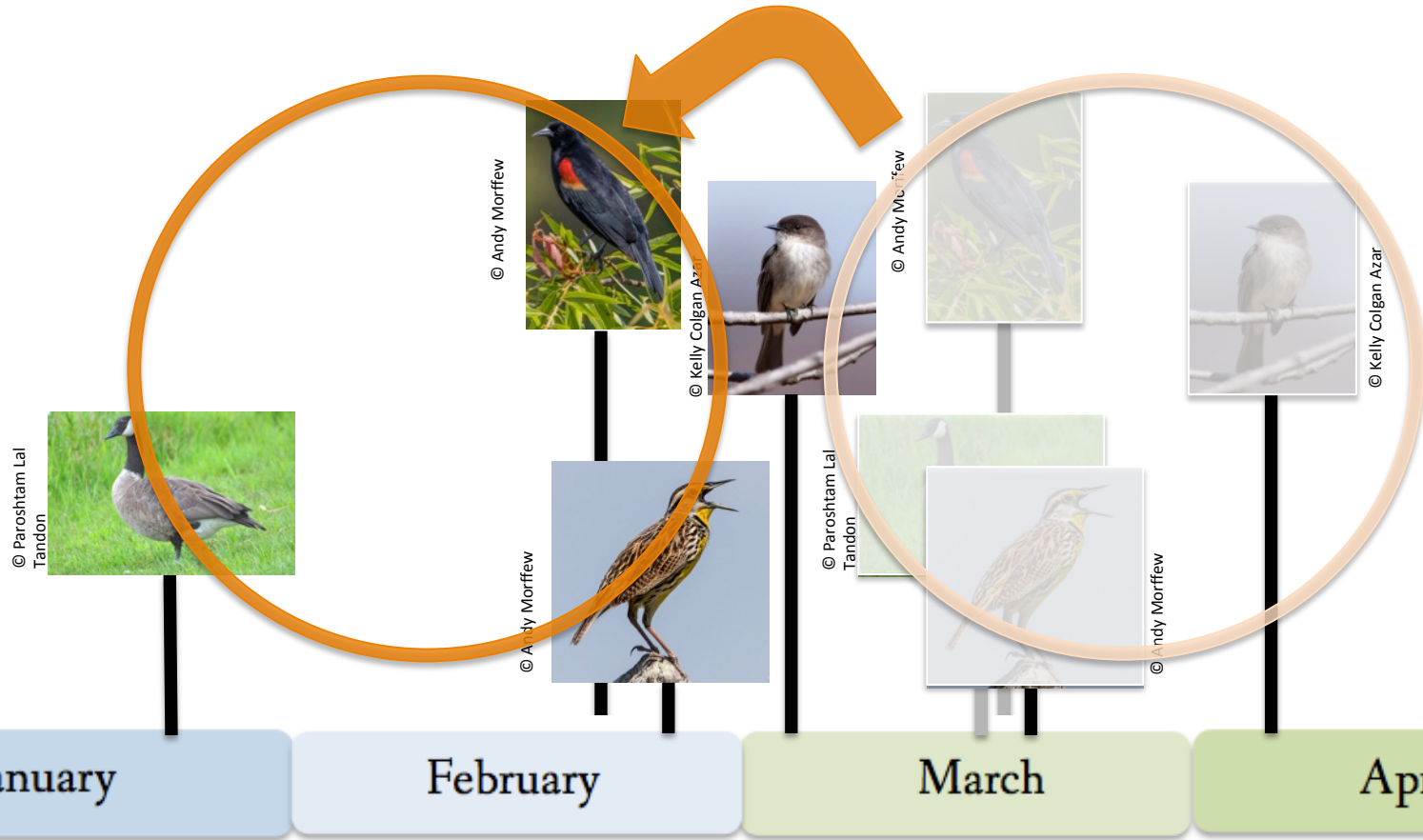
April

May

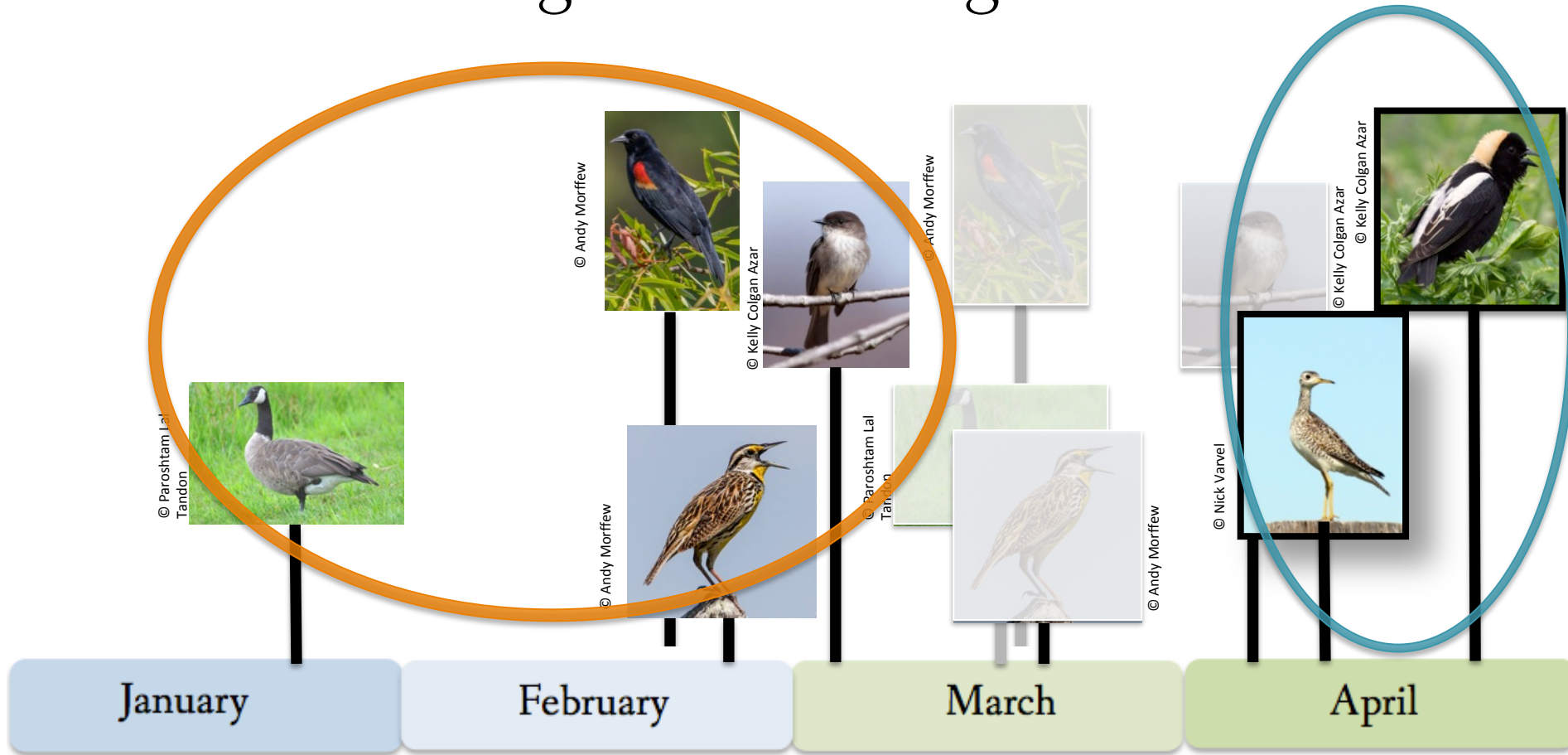
June



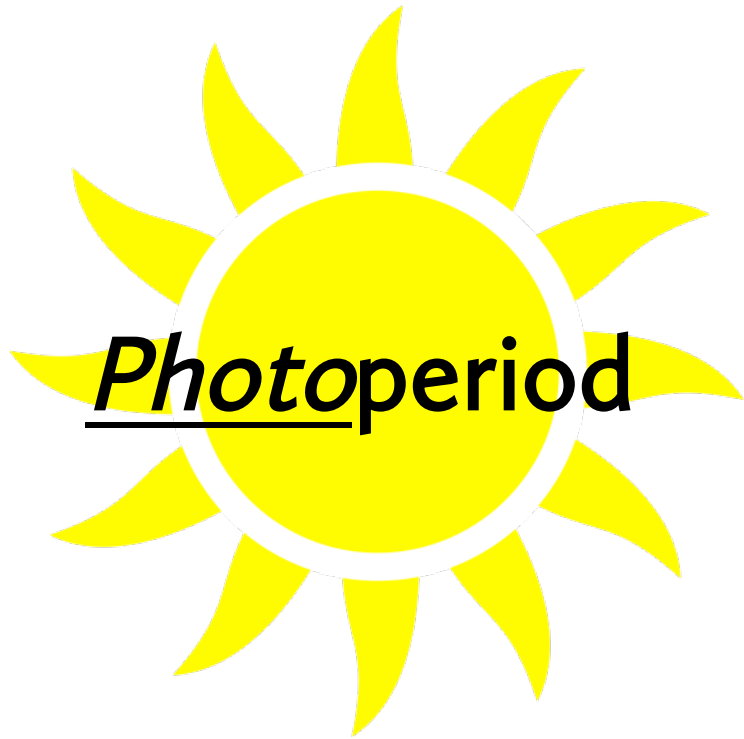
Short Distance Migrants



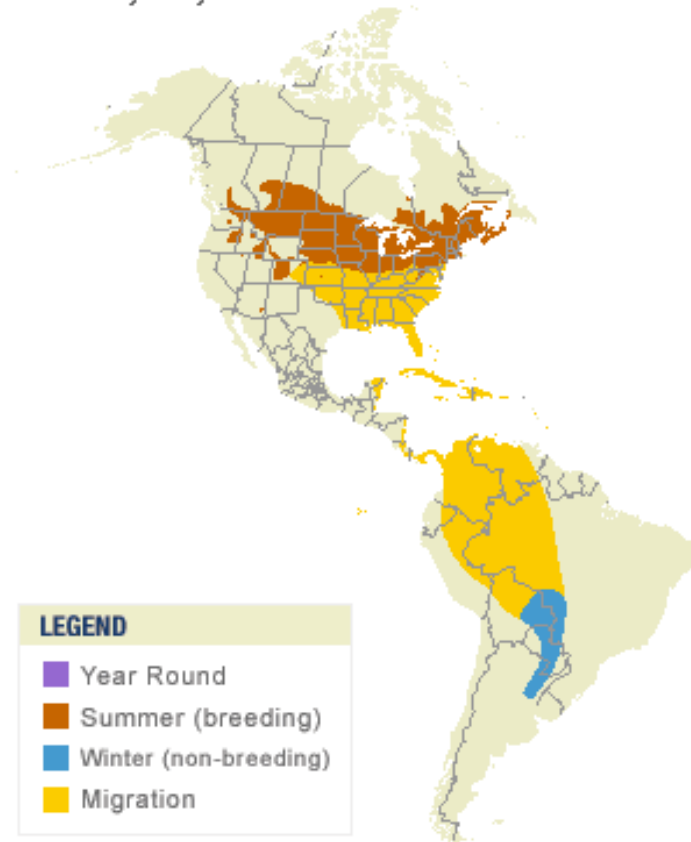
Long Distance Migrants



Long Distance Migrants



Bobolink
Dolichonyx oryzivorus



Map by Cornell Lab of Ornithology
Range data by NatureServe

Long Distance Migrants- the past



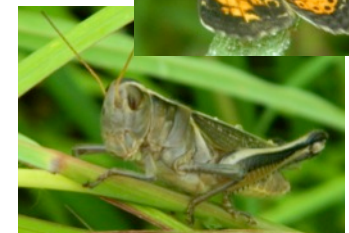
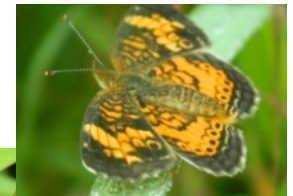
February

March

April

May

June



Long Distance Migrants- the present



February

March

April

May

June



Long Distance Migrants- the present



February

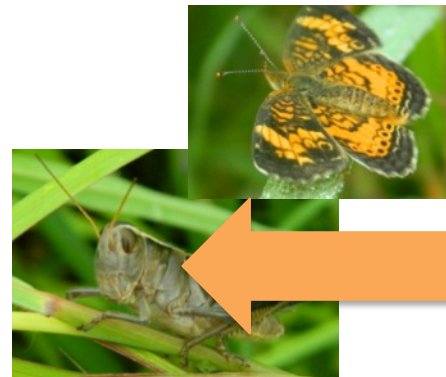
March

April

May

June

Phenological Mismatch



Bobolink

Habitat Specialist

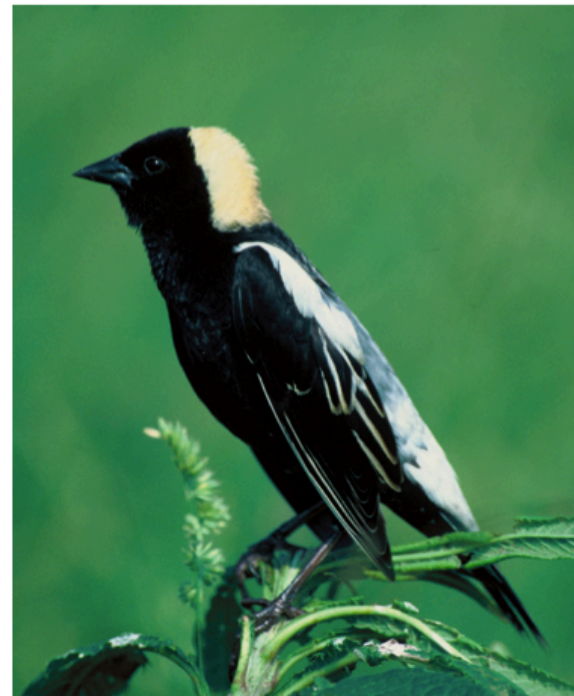
Grassland 
Agriculture 

- Long-distance Migrant
- Short-distance Migrant
- Resident

Diet Specialist

Summer	Winter
Insectivore insects	Omnivore seeds, grains insects

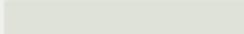





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Bobolink

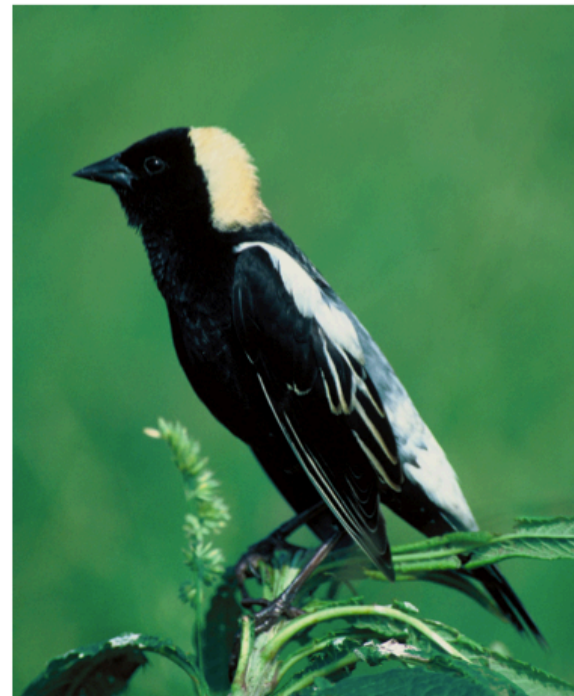
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Grassland 
Agriculture 

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Bobolink

Habitat Specialist

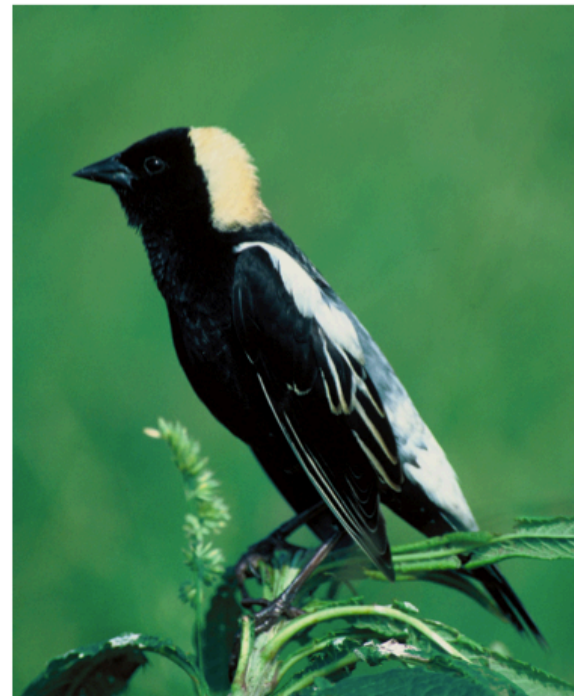
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