Keys Please! A Guide to Classification

Specific Learning Outcomes

6-1-01: Use appropriate vocabulary related to their investigations of the diversity of living things.
6-1-02: Describe various kinds of classification systems used in everyday life, and identify related advantages and disadvantages.
6-1-04: Identify living things using an existing classification key, and explain the rationale used.
6-1-05: Identify advantages and disadvantages of having a common classification system for living things, and recognize that the system changes as new evidence comes to light.

General Learning Outcomes

6-0-1a: Formulate specific questions that lead to investigations.
6-0-1b: Identify various methods for finding the answer to a specific question and select one to implement.
6-0-2a: Access information using a variety of sources.
6-0-2b: Review information to determine its usefulness, using predetermined criteria.
6-0-2c: Make notes on a topic, combing information from more than one source and referencing sources appropriately.
6-0-5a: Make observations that are relevant to a specific question.
6-0-6f: Evaluate the methods used to answer a question or solve a problem.

Vocabulary

classification system, classification key, shorebird, wetland

Summary

Students are introduced to wetlands and the diversity of living things by developing the ability to use a classification key in order to identify shorebirds found at Oak Hammock Marsh. Students will also evaluate the usefulness of using a key, as well as the advantages and disadvantages of having a common classification system for living things.

Materials

- *Projector and computer to present slideshow*
- *Student access to a library and the internet*
- *Print one key per student*
- *Either print images in colour and cut-out (recommend laminating for future use) or provide a digital copy of the shorebird pictures and identification tips page for student assignment*

Procedure

Warm Up

Begin with the provided slideshow presentation, which discusses the need for classification when studying living things and introduces students to different types of classification systems. The slideshow will be both the warm up and the majority of the activity.

A wetland is an area of land that holds shallow water, with a maximum depth of two metres. The water makes the soil very moist, so that water-loving plants will grow in and around the wetland; this is why a wetland can not be deeper then two metres, because otherwise these kinds of plants drown and do not receive enough sunlight. The water moves slowly because there are so many plants that slow the flow, absorbing some of the water like a sponge and filtering it as it moves through.

A classification system is an approach to classification, where a large group is divided into smaller subgroups then arranged in a particular way, used to better differentiate between those in a group.

A classification key is a tool that helps determine the identity of something in the natural world through the process of elimination. The key gives you choices based on structural or behavioural features, and as you select one it narrows down the possibilities until you get to a species. If you have correctly used the key and have chosen the right kind of key(s), you arrive at the correct name of the species you are trying to identify.

Activity

The slideshow will provide an opportunity for students to learn how to use a classification key, going through an example step by step.

Each student should be given a copy of the Shorebird classification key which is used in the slideshow as the example, and will also be used for the second half of this activity.

Once you have finished presenting the slideshow, either assign or have students choose one of the shorebird pictures (provided). Each student will then have to go through the key on their own and see if they are able to identify the shorebird they have picked. This can either be a classroom activity (as long as your students have access to the internet) or a take-home assignment.

Recommended: Encourage students to reference the provided Shorebird Identification Tips page, as well as a bird book or the following websites to compare and contrast between the likely possibilities.

Recommended Websites:

- www.allaboutbirds.org
- www.audubon.org

Wrap Up

After students have had the opportunity to identify their shorebird, have students come together to discuss first what bird species they believe they have picked, and than what was their experience with the key.

Conclude by explaining that as a class you will be visiting Oak Hammock Marsh, which is one of the many wetland habitats these shorebirds visit as they move from place to place. Students will have an opportunity to explore and hopefully see a few shorebirds themselves!

Optional: Bring the shorebird classification key or use the Merlin app (which is a free, downloadable bird identification tool) while on your field trip to gain experience using these classification tools in the field! You will see the most shorebirds at Oak Hammock Marsh during the early spring and early fall seasons, although some stay here for the summer to breed.

Identification Tips:

When students are looking at their Shorebird picture, encourage them to notice…

- Body size
- Leg colour
- Bill colour, shape, and length in comparison to their head
- Colour of the plumage (feathers) on their back
- Colour and plumage pattern on the chest - Are there any streaks (vertical lines) or bars (horizontal lines)? How far along the body do the streaks or bars go?
- Colour and patterns around their eyes — Is there an eye ring? Is there an eye line?
- Are the wing feathers longer then the tail?

See accompanying Identification Tips page for visual examples.

Wetland—Bog

Image from Wikipedia.

Key Characteristics of Bogs:

- Peat-covered (peat is a brown, soil-like substance made of decaying *Sphagnum* mosses)
- Isolated from ground water
- Rain-fed
- Low nutrients in the water and acidic
- Dominated by *Sphagnum* mosses with tree, shrub or treeless vegetation cover

Wetland—Fen

Image from Ducks Unlimited Canada.

Key Characteristics of Fens:

- Peat-covered (peat is a brown, soil-like substance made of decaying *Sphagnum* mosses)
- Exposed to ground water; water at surface is moving
- Fed by rain, streams and groundwater
- More nutrients in the water then bogs and is less acidic
- Greater variety of plants than bogs: grass meadows, shrubs, and trees

Wetland—Swamp

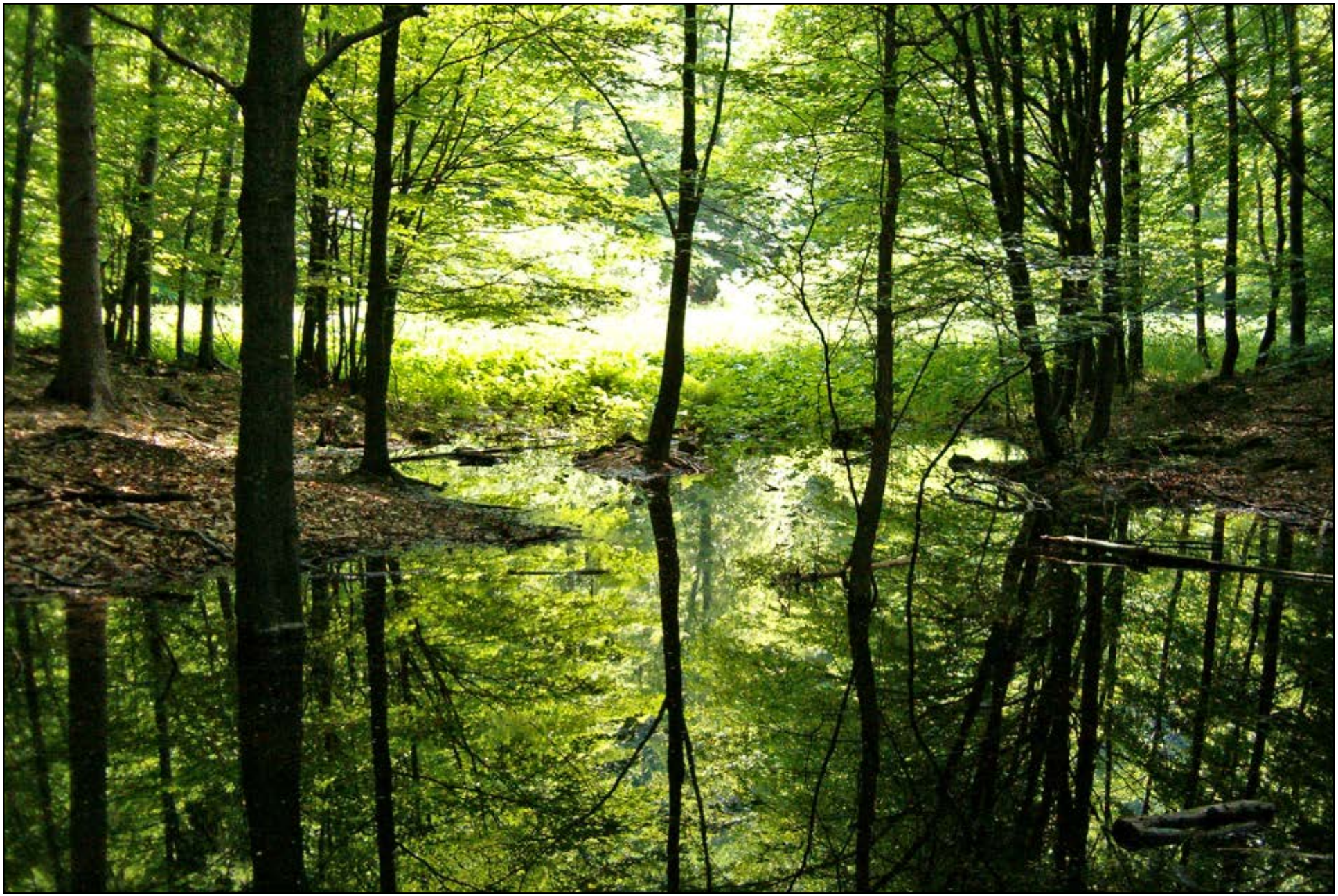


Image from Ducks Unlimited Canada.

Key Characteristics of Swamps:

- Non-peat forming wetland
- Has flowing water; flooded for the majority of the growing season
- Waterlogged soil, often standing water
- Vegetation is dense, and can include coniferous or deciduous trees, or tall shrub thickets

Wetland—Freshwater Marsh

Image from Ducks Unlimited Canada.

Key Characteristics of Freshwater Marshes:

- Non-peat forming wetland
- Frequently or continually flooded with shallow, slow moving water
- Waterlogged soil that is oxygenated, which allows for plants to form roots
- Nutrient rich water offers greater plant diversity, such as cattails, reeds, rushes, or sedges
- No trees

Shallow Open Water

Image from Wikipedia.

Key Characteristics of Shallow Open Water Wetlands:

- Locally known as ponds, sloughs and marshes
- Non-peat forming wetland
- Standing water, often a transition between lake and marsh
- Fewer emergent plants but submersed plants may be present

HARRY J. ENNS WETLAND DISCOVERY CENTRE

Shorebird Key

(Adapted from: A key for breeding or partial breeding plumage shorebirds in Prairie Canada – prepared by The Western Hemisphere Shorebird Reserve Network)

This key is designed to help you identify shorebirds found here at Oak Hammock Marsh. It gives you choices and as you select one it narrows down the possibilities until you get to one. This should be the correct species. It is always a good idea to check a book once you have identified your bird. You may still not be satisfied that the identification is right. You can run through the key again and see if you come up with the same answer. It is always possible that the bird you are looking at is not in the key. If this is the case it is probably a rare shorebird.

I) Body size larger than a Mourning Dove and body colours mostly black and white — Avocets

A) Bill upturned, legs bluish-grey, peachy coloured head and neck — AMERICAN AVOCET

II) Large head, large eye, short neck, short and stout bill; typically forages in a run/stop & look/run & grab manner — Plovers

A) Body **larger** than a robin

1) Plumage is black on upper & lower breast, **under-tail is white** — BLACK-BELLIED PLOVER

2) Plumage is black on upper & lower breast, **under-tail is black** — AMERICAN GOLDEN-PLOVER

3) **2** distinct black bands across white breast — KILLDEER

B) Body **smaller** than a robin

1) Back plumage **light grey** or grey-brown, legs light, bill orange with black tip, **1** distinct black breast band — PIPING PLOVER

2) Back plumage **solid brown**, **2** distinct black breast bands — KILLDEER

3) Back plumage **solid brown**, **1** distinct black breast band —SEMIPALMATED PLOVER

III) Small head, small eye, thin bill and neck, forages by probing – Sandpipers

A) Body **equal to or larger** than a Mourning Dove

1) **Upland habitat**, bill same length as head, plumage brown, sits on fence posts — UPLAND SANDPIPER

2) **Wetland habitat**, bill longer than head, long legs

(a) Legs greyish, bill straight and thick, **black & white wing pattern** — WILLET

(b) Legs yellow

(i) Bill **less than 1.25X** the head length — LESSER YELLOWLEGS

(ii) Bill **greater than 1.25X** the head length — GREATER YELLOWLEGS

(c) Legs dark, bill curves up

(i) Brown plumage, mottled back, **brown barred front** — MARBLED GODWIT

(ii) Black & white tail pattern, **reddish front** — HUDSONIAN GODWIT

B) Body **smaller** than a Mourning Dove **and larger** than a Red-winged Blackbird

1) Bill **2X** length of head

(a) Typically damp, second-growth woodland, chunky appearance, **usually solitary** — AMERICAN WOODCOCK

(b) Lateral head stripe, typically **wet, grassy habitats**, usually solitary or in loose flocks — WILSON'S SNIPE

(c) Open, muddy habitats, steady probing (**sewing-machine-like**), usually in closely spaced flocks

(i) **Tail looks white with black bars**, white on belly, white rump patch far up back — SHORT-BILLED DOWITCHER

(ii) **Tail looks black with white bars**, rusty lower belly, barred sides — LONG-BILLED DOWITCHER

2) Bill **less than 1.5X** length of head

(a) **Thin, needle-like bill**, small head, **frequently swimming (often in circles**)

(i) Legs yellowish, **bill longer than head** — WILSON'S PHALAROPE

(ii) Legs dark, **bill about length of head**— RED-NECKED PHALAROPE

(b) Long legs, **upright posture**, **conspicuous eye ring**

(i) **Chronic teetering motion**, smoky brown back, bill length about same as head length, when flying shows white wing stripe — SPOTTED SANDPIPER

(ii) Occasional teetering motion, fresh water habitat, **dark brown back**, bill longer than head, when flying shows **no** white wing stripe — SOLITARY SANDPIPER

(iii) **Legs yellow**, bill less than 1.25X length of head — LESSER YELLOWLEGS

(c) Long legs, **upright posture**, **no eye ring**

(i) Legs straw-coloured, **buffy coloration above and below**, typically in short-grass or stubble fields,
long wings — BUFF-BREASTED SANDPIPER

(d) **Hunched posture**, eye ring not distinct

(i) Straw-coloured legs, brown plumage with **vertical streaks** on upper breast stopping mid-breast in **abrupt line** — PECTORAL SANDPIPER

(ii) Dark legs, no vertical streaks, **salmon-coloured breast/belly in breeding plumage** — RED KNOT

(iii) Greenish legs, bill slightly down-turned at tip, **prominent eye line**, typically wading (often belly-deep) and probing for bottom-dwelling invertebrates, often submerging entire head —STILT SANDPIPER

3) Bill chisel-shaped, **legs orange**, conspicuous black chest markings (not bands) — RUDDY TURNSTONE

C) Body **smaller** than a Red-winged Blackbird

1) Wing tips extend **2+ mm beyond tail**

(a) **Prominent eye line**, speckles on sides, grey-brown back, typically wading — WHITE-RUMPED SANDPIPER

(b) Thin, tapered bill, buffy breast with streaks, **brown back**, dark legs, often forages above water line — BAIRD'S SANPIPER

2) Wing tips **do not** extend much beyond tail

(a) Body slightly **larger** than a sparrow

(i) **Clear white belly feathers**, light grey back, typically running between foraging attempts — SANDERLING

(ii) **Dirty white belly feathers** (black belly with reddish back feathering in breeding plumage), typically walks between foraging attempts**, bill slightly down-curved entire length** — DUNLIN

(b) Body **similar in size** to a sparrow

(i) **Smudged** and streaked upper breast, **brown back**, **yellowish legs** — LEAST SANDPIPER

(ii) Finely streaked but not smudgy upper breast, **grey-brown back, dark legs**

(01) Bill **less than** head length — SEMIPALMATED SANDPIPER

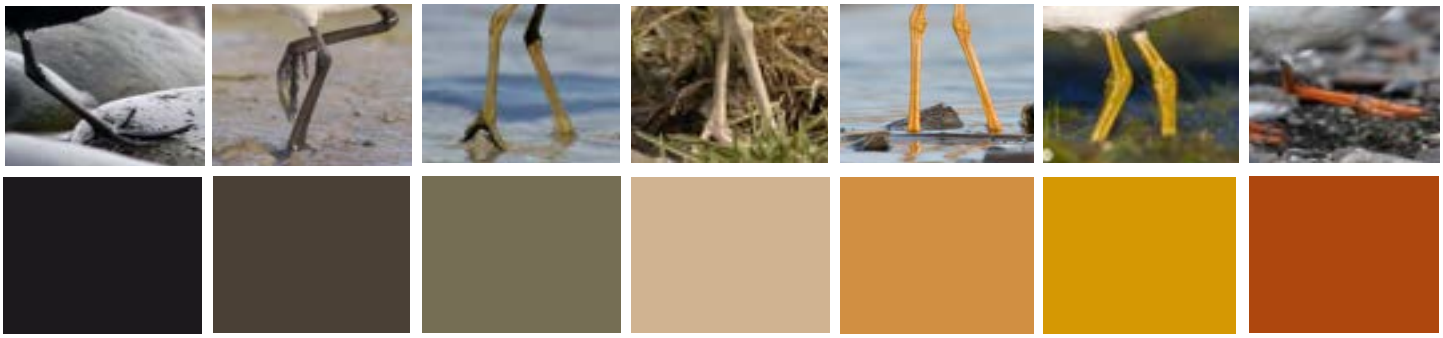
(02) Bill **greater than 1.25X** head length, drooped at tip, often reddish on back (**NOTE**: there is some overlap with Semipalmated, Western is accidental) — WESTERN SANDPIPER

Shorebird Identification Tips

Notice the bird's…

Size – compare size to another bird in order to create a scale to learn where your bird fits among its bird group. *Is it the size of a Mourning Dove, Robin, Red -winged Blackbird or Sparrow?*

Leg Colour



Bill Length, Shape & Colour

Smaller than head | Same length as head | Longer than head

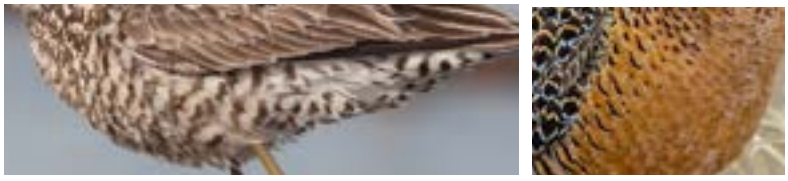
Curved Up | Straight | Curved Down

Eye Ring & Line

Distinct Eye Ring | Indistinct Eye Ring | No Eye Ring

Distinct Eye Line | Indistinct Eye Line | No Eye Line

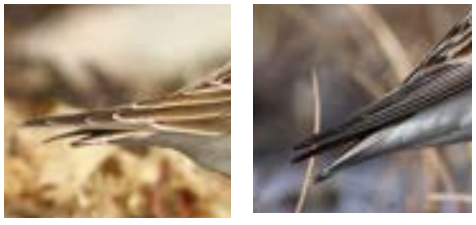
Plumage Colour & Pattern



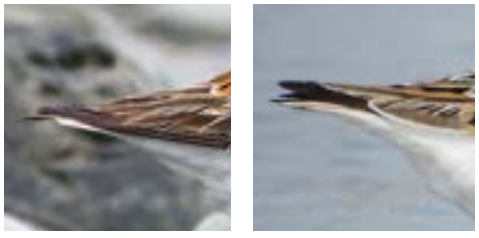
Bars (horizontal lines) along body | Bars along side

Streaks on top of chest | Streaks on top & sides | Streaks along body

Tail & Wing Length



Wings longer than tail



Wings as long or shorter than tail

Piping Plover image from Wikipedia. Red-necked phalarope image from Flickr. Wilson's Phalarope image from Dominic Sherony. Buff-breasted sandpiper image from Asociacion Armonia. Stilt sandpiper image from Dan Pancamo. Western sandpiper image from Andy Morffew. Sanderling image from Peter Wallack. Willet, Marbled Godwit, Dunlin, Solitary Sandpiper images from Ducks Unlimited Canada.

Teacher's Shorebird Answer Key

1. Black-bellied Plover
2. Piping Plover
3. Wilson's Phalarope (female)
4. Upland Sandpiper
5. Willet
6. Hudsonian Godwit
7. American Golden Plover
8. Killdeer (Plover)
9. Buff-breasted Sandpiper
10. Semipalmated Plover
11. American Woodcock
12. Short-billed Dowitcher
13. Marbled Godwit
14. Greater Yellowlegs
15. Spotted Sandpiper
16. Red-necked Phalarope
17. Long-billed Dowitcher
18. Wilson's Snipe
19. Pectoral Sandpiper
20. Solitary Sandpiper
21. Ruddy Turnstone
22. Stilt Sandpiper
23. Dunlin
24. White-rumped Sandpiper
25. Red Knot
26. Least Sandpiper
27. Baird's Sandpiper
28. Western Sandpiper
29. Semipalmated Sandpiper
30. Sanderling

Note:

When assigning a shorebird to your students, below are some tips regarding the difficulty level for each bird.

For students that may have the most difficulty in either focusing or detail distinction, it is recommend they are given a Plover (five in total; 1, 2, 7, 8, 10) to identity. Plovers have very distinct features and once students identify them as part of the Plover group, it significantly reduces the possible answers the students can choose.

Other shorebirds in this list that have very distinct features include the Dunlin (23), Ruddy Turnstone (21), Spotted Sandpiper (15), the Wilson's Phalarope (3), and the Red-necked Phalarope (16).

For students who are usually quick at tasks, detail-oriented and love a challenge, the most difficult shorebirds to identify (from this list) will be the Short-billed Dowitcher (12) and the Long-billed Dowitcher (17). However, these two species are difficult to distinguish so you may wish not to assign them if you think it would be too difficult for your students.

Larger than a Robin

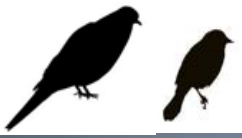
Photo by Mark Peck, Flickr

1

Smaller than a Robin

Photo from Wikipedia

2



Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Dominic Sherony, Flickr

3

Equal to or larger than a Mourning

Photo by USFWS—Midwest Region, Flickr

4

Equal to or larger than a Mourning Dove

Photo from Ducks Unlimited Canada

5

Equal to or larger than a Mourning Dove

Photo by Francesco Veronesi, Flickr

6

Larger than a Robin

Photo from Ducks Unlimited Canada

7

Can be larger or smaller than a Robin

Photo by Curt Hart, Flickr

8

Smaller than a Mourning Dove, larger than a

Photo by Associación Armonia, Flickr

9

Smaller than a Robin

Photo from Ducks Unlimited Canada.

10

11

Photo by Fyn Kynd, Flickr

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Dick Daniels, Flickr

12

Equal to or larger than a Mourning Dove

Photo from Ducks Unlimited Canada

13

Equal to or larger than a Mourning Dove

Photo from Ducks Unlimited Canada

14

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo from Ducks Unlimited Canada

15

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Gregory Smith, Flickr

16

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Francesco Veronesi, Flickr

17

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

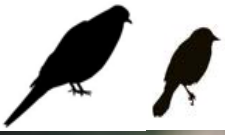
Photo from Ducks Unlimited Canada

18

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Andrew Cannizzaro, Flickr

19



Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo from Ducks Unlimited Canada

20

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo by Omar Runolfsson, Flickr

21

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

Photo from Bettina Arrigoni, Wikipedia.

22

Smaller than a Red-winged Blackbird

Photo from Ducks Unlimited Canada

23

Smaller than a Red-winged Blackbird

Photo from Wikipedia

24

Smaller than a Mourning Dove, larger than a Red-winged Blackbird

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25

Similar size to a Sparrow

Photo by Mike's Birds, Flickr

26

Smaller than a Red-winged Blackbird

Photo by Jamie Chavez, Flickr

27

Similar size to a Sparrow

Photo by Andy Mordffew, Flickr

28

Similar size to a Sparrow

Photo by Bill Thompson/USFWS, Flickr

29

Smaller than a Red-winged Blackbird

Photo from wildlife-land.blogspot.com.

30