

Total: 168 points possible

Station 1 - Inca Dove (*Columbina inca*), 6 points total

1. What gland does this bird lack, and what is its replacement? (2 points total, 1 for naming the gland, and 1 for naming its replacement)

The Inca dove lacks the Uropygial gland (preen gland, oil gland), so instead, they rely on powder down.

2. Why is xerophilic behavior essential to this bird's survival? (1 point)

The Inca Dove lives in arid habitats with low water availability and must get its water from the food it eats, as there is a lack of a body of water.

3. True / False: The crop milk this bird excretes has a strong resemblance to mammalian milk. (1 point)

4. What do these birds do when they pyramid roost? (1 point)

A group of birds arrange themselves in rows on top of one another as they roost in order to conserve heat.

5. This bird's common name is a misnomer. Why? (1 point)

The Inca Dove's range does not coincide with the range of the Inca Empire.

Station 2 - Green-winged Teal (*Anas crecca*), 9 points total

1. Identify the scientific name of the bird this wing belongs to. (1 point)

Anas crecca

2. What is sexual dimorphism? (1 point)

Sexual dimorphism is the difference in form between males and females of the same species.

- a. How does this species exhibit it? (2 points, 1 point for each gender's physical description)

Breeding males have grey on their flanks and back, a yellow rear end, a white-edged green speculum, a chestnut head, and a green eye patch.

Females are light brown with a yellowish streak along the tail.

3. Where does this bird get its common name? (1 point)

The green-winged teal gets its name from the green speculum on its wing.

4. At what time of year do this species' pair bonds form? (1 point)

Pair bonds form in the fall and winter (from September to February).

5. (1 point) The chicks of the bird to which the pictured wing belongs to are:

- a. Precocial
- b. Semiprecocial
- c. Altricial

6. How do these birds feed? (1 point for mentioning dabbling; 2 points total for mentioning dabbling and probing around in the mud, but a detailed description isn't needed)

Green-winged teals feed by dabbling in the water or probing mud.

(Extra info) There are two methods to dabbling:

Surface feeding: The duck skims along the water's surface with its neck stretched out and the bill parallel to the water. The bill is making small biting motions, and the duck may sway its head from side to side.

Tipping up: The duck submerges itself in the water, with the exception of its tail and back feet, which sticks up out of the water. The tail and feet may move around to maintain balance while the duck feeds.

Station 3 - Whip-poor-will (*Caprimulgus carolinensis* or *Antrostomus carolinensis*), 13 points total

1. What is the organ that allows these birds to sing? (1 point)
The syrinx
2. Where do these birds lay their eggs? (1 point)
Eggs are laid directly on the forest floor, as these birds do not build nests.
3. (1 point) This bird's conservation status is:
 - a. Least concern
 - b. Near threatened
 - c. Vulnerable
 - d. Endangered
4. This bird has been placed into two different genera over time. Which two are they? (2 points total, 1 for each genus mentioned)
Caprimulgus and Antrostomus (this bird was moved to genus Antrostomus in 2010)
5. Nesting for the bird pictured above is based off the solar / lunar cycle (circle one). (1 point)
6. (7 points, 1 for each measurement) List the standard measurements for this species:
 - a. Length: 22–27 cm (8.7–10.6 in)
 - b. Weight: 42–69 g (1.5–2.4 oz)
 - c. Wingspan: 45–50 cm (18–20 in)
 - d. Wing chord: 14.7 to 16.9 cm (5.8 to 6.7 in)
 - e. Tail: 10.5 to 12.8 cm (4.1 to 5.0 in)
 - f. Bill: 1 to 1.4 cm (0.39 to 0.55 in)
 - g. Tarsus: 1.5 to 1.8 cm (0.59 to 0.71 in)

Station 4 - Cliff Swallow (*Petrochelidon pyrrhonota*), 7 points total

1. Identify the bird's scientific name. (1 point)
Petrochelidon pyrrhonota

2. (1 point) This bird builds what kind of nest?
 - a. Cup
 - b. Platform
 - c. Earth-hole
 - d. Ground/mound
 - e. Scrape
 - f. Adherent**

3. What kinds of habitats do these birds avoid? (2 points total, 1 for each type of habitat)
Areas with dense/heavy forests and deserts

4. Name one invasive bird species that have been threatening this bird's survival (give a common name). (1 point)
House Sparrow or European Starling (accept either one)

5. This bird embarks on its migratory journey during the **day** / night (circle one). (1 point)

6. What are the young most likely to do after leaving the nest (but aren't independent yet)? (1 point)
 - a. Establish a territory
 - b. Form a pair bond
 - c. Form a creche**
 - d. All of the above

Station 5 - Owl (chick) - 10 points total

1. What order does this specimen belong in? (1 point)

Strigiformes (Owls)

2. Many members of this order have asymmetrical ears. How is this an advantage to them? (2 points total, 1 point for mentioning that it provides a hunting advantage, and 1 point for explaining how the two ears work together)

This adaptation allows owls to hunt more efficiently at night. One ear is situated higher on the head, so the owl will hear a sound at two slightly different times, making it easier for them to pinpoint their prey.

- a. Which ear is located higher on the head? (1 point)

The left ear

3. Do these birds use echolocation? (1 point)

No, owls cannot echolocate.

4. What is the difference between monocular and binocular vision? (1 point for each term, 2 points total)

Monocular vision is the ability to see with only one eye at a time. Binocular vision is seeing with both eyes.

- a. Which one does this bird possess? (1 point)

Owls possess both monocular and binocular vision.

5. Birds of this order share a similar eye structure to what other group(s) of animals? Select all that apply. (2 points total, 1 for each correct group)

- a. **Strepsirrhine primates**
- b. Felines
- c. Sciurid rodents
- d. Crocodylians
- e. **Bathypelagic fishes**
- f. Chiropteran bats

Station 6 - Greater Prairie-Chicken (*Tympanuchus cupido*), 9 points total

1. The above specimen is a female. What is one trait that's unique for males? (1 point)

You only need one of the following:

- Orange comb-like feathers over the eyes
- Dark, elongated head feathers along the neck.
- A circular, orange, un-feathered neck patch which can be inflated while displaying

2. How do these birds create their signature booming sound? (1 point)

Males expand their orange air sacs on their neck to produce this booming sound.

3. When males perform their mating display in a group, what is it called? (1 point)

Lekking

4. Give 3 reasons why are these birds vulnerable to bottlenecking events(3 points total, 1 for each reason)

Reasons include: hunting, habitat destruction, random consequences/natural disasters, and low reproductive success amongst certain populations.

5. Nest parasitism is common between this species and another bird. Give this other species' scientific name. (1 point)

Phasianus colchicus

- a. Which of these two bird species is the parasite? Which is the victim? Give the common name of both species (2 points total, 1 point each for correctly identifying the parasite and victim)

Parasite: Ring-necked Pheasants

Victim: Greater Prairie-Chicken

Station 7 - Ruby-throated Hummingbird (*Archilochus colubris*), 7 points total

1. True / **False**: This bird's coloration is the result of pigments such as carotenoids. (1 point)
2. True / **False**: This bird is the largest of its genus. (1 point)
3. List 2 ways this bird's wings have been modified for multidirectional flight and hovering. (2 points total, one for each modification)
Any 2 of the following:
 - The wings connect to the body only from the shoulder
 - The wing can rotate 180 degrees (for multidirectional flight and hovering)
 - A smaller humerus than most birds
 - Large deltoid and pectoral muscles
 - The pectoral muscles are made up of Type I muscle fibers
4. Do males stay with the female and help brood the young? (1 point)
No, they leave the female directly after copulation.
5. How do these birds move on the ground? (1 point)
Hummingbirds can only shuffle around on the ground, as they can't walk or hop properly.
6. On average, this bird flaps its wings at a rate of **53** times a second. (1 point)

Station 8 - Common Raven (*Corvus corax*), American Crow (*Corvus brachyrhynchos*), 10 points total

1. Give the common and scientific name of both specimens. (4 points total, 1 for each name)

Specimen A: Common Raven (*Corvus corax*)

Specimen B: American Crow (*Corvus brachyrhynchos*)

2. Specimen (A / B / neither) is larger. (1 point)
3. (1 point) Specimen B's breeding season is:
December to April
4. Specimen A / B / both (circle one) are known for tool usage. (1 point)
5. Specimen A / B / both (circle one) practices kleptoparasitism. (1 point)
6. At what age range does specimen A typically begin breeding?(1 point)
2-4 years
7. Which specimen is a bioindicator for the West Nile Virus? (1 point)
Specimen B

Station 9 - Order Trogoniformes, 6 points total

1. Which order does the bird with the above foot morphology belong to? (1 point)
Trogoniformes (trogons)
2. What is the toe arrangement in the above diagram called? (1 point)
Heterodactyly
3. How many species and genera are in this order? (2 points total, 1 for each number)
39 species; 7 genera
4. These birds rely heavily on woodpeckers, as they nest in cavities that woodpeckers have abandoned. What term describes this bird's nesting behavior? (1 point)
Secondary Cavity Nester
5. (1 point) This bird is
 - a. Carnivorous
 - b. Omnivorous**
 - c. Herbivorous

Station 10 - Belted Kingfisher (Megasceryle alcyon), 8 points total

1. What family does this bird belong in? (1 point)

Alcedinidae

2. This bird has what kind of toe arrangement? (1 point)

a. Anisodactyl

b. Zygodactyl

c. Syndactyl

d. Didactyl

3. Do adults digest the bones of their prey? (1 point)

No (this bird loses its ability to digest bone after reaching the fledgling stage).

4. When this bird is threatened by a predator, how can it respond? Describe 3 different ways. (3 points total, 1 for each behavior)

Belted Kingfishers may utter a screaming call, spread its wings, and raise the patch of white feathers next to each eye.

5. The bird pictured above is a male / female (circle one).. (1 point)

6. How long are this bird's nesting burrows? (1 point)

1-8 feet

Station 11 - Greater Roadrunner (*Geococcyx californianus*), 7 points total

1. What speed can this bird reach? (1 point)
32 km/h (20 mph) (also accept 42 km/h or 26 mph)
2. Up to what percent of this species' winter diet is made up of plant material? (1 point)
 - a. 10%
 - b. 25%
 - c. 50%
 - a. 75%
3. The entrance to this bird's nest cavity is circular / oblong (circle one). (1 point)
4. What kind of toe arrangement does this bird have? (1 point)
 - a. Pamprodactyl
 - b. Zygodactyl
 - c. Syndactyl
 - d. Heterodactyl
5. What is the difference between torpor and estivation? (1 point for explaining each term, 2 points total)
Torpor is a state of inactivity/lethargy, dictated by certain environmental conditions. Aestivation is torpor specifically during a hot or dry period.
6. About how long does incubation take for this species? (1 point)
19-20 days

Station 12 - Cooper's Hawk (Accipiter cooperi), 6 points total

1. What is this bird's common name? (1 point)

Cooper's Hawk

2. Name one regional difference between Eastern and Western populations of this species. (1 point)

Western populations weight $\frac{1}{6}$ less on average than eastern populations; Western populations are smaller (accept either).

3. Members of this species sometimes employ a dangerous "attack flight" when hunting. Describe what the bird does during this "attack flight." (1 point)

During the attack flight, a Cooper's Hawk will fly as quickly as possible to catch its prey.

- a. What bone is most commonly broken while attempting one of these flights? (1 point)

The wishbone (furcula)

4. (1 point) Throughout the 1900s, populations of the above bird's order declined. The chemical responsible for this is:

- a. Neonicotinoids
- b. Paraquat
- c. 1,3-dichloropropene
- d. Dichlorodiphenyltrichloroethane

5. What is special about this bird's social hierarchy in terms of sex? (1 point)

Males are often submissive to females.

Station 13 - Pileated Woodpecker (*Dryocopus pileatus*), 5 points total

1. How does this bird species follow Bergmann's Rule? (1 point)
Individuals in colder regions will be larger in size, and those in warmer regions will be smaller (award this point if there is a mention of size increasing as latitude increases).
2. Which organism makes up most of this bird's diet (give its common name)? (1 point)
Carpenter Ants
3. When do nestlings become independent from their parents? (1 point)
Around 3-4 months after hatching
4. If this bird's eggs have fallen out of the nest, what will the bird most likely do? (1 point)
 - a. Bring the eggs back to the nest and continue incubation
 - b. Start a new clutch using the same nest
 - c. Abandon the nest and move to a new site
5. The male / female contributes most when building the nest. (1 point)

Station 14- Grebe nest (Order Podicipediformes), 11 points total

1. What order does the bird that built this nest belong in? (1 point)

Podicipediformes

2. What is the etymology behind the name of the order this bird belongs in? (1 point for the name breakdown, 2 total for explaining the meaning behind the breakdown)

Podicipediformes is derived from Latin (podiceps + iformes).

Podiceps comes from pōdex (meaning “rear, butt”) and pes (foot), referring to how grebes have their legs set further back than most birds.

3. Why are these birds very awkward on land? (1 point)

Grebes’ feet are set so far back on their body that it’s hard and awkward to walk on land.

4. The bird who built this nest is a synchronous molter. Why is this molting strategy more advantageous over others in this case? (2 points total, 1 point for mentioning wing loading, 1 point for mentioning the impact of the loss of a few feathers)

These birds have high wing loadings (a ratio of a bird’s weight and its wings’ surface area), so the loss of a few flight feathers significantly impacts the bird’s ability to fly.

5. Feathers serve many functions for birds. Birds of this order have an additional usage for these feathers. What is it? (1 point)

Grebes eat their feathers at a young age in order to add roughage to the waste it excretes and to prevent possible injury from small bones in their digestive tract.

6. What is the maximum number of clutches that a female can produce within one breeding season? (1 point)

2 clutches

7. (1 point) This bird’s feet are considered

- a. Totipalmate
- b. Semipalmate
- c. Palmate
- d. Lobate

8. Give two reasons why this foot structure from the previous question helps improve the bird’s lifestyle.. (2 points)

Any 2 of the following: The lobes on the feet act as paddles that makes diving more efficient; the increased surface area of the feet allow the bird to walk on floating vegetation; the “lobes” fold backwards while on land, so the bird can move effectively between water and land.

Station 15 - Laysan Albatross (*Phoebastria immutabilis*), 9 points total

1. What is the common name of this bird? (1 point)

Laysan Albatross

a. Where did it get its common name? (1 point)

The first specimen for this bird was from Laysan Island, which is the location for one of its breeding colonies.

2. List two reasons why this bird's populations are declining. (2 points total, 1 for each reason)

Some reasons include: overfishing, pollution, hunting, poaching, longline fishing methods, bycatch, habitat destruction, and the introduction of invasive and non-native predators

3. How many eggs does this bird produce in a single breeding season? (1 point)

One egg

a. How does this aspect of this bird's nesting strategy make it difficult for them to recover from population declines? (1 point, a mention of the difficulty for the slow reproduction rate to overcome the rate of decline needed)

Albatrosses only produce one egg per year, and take years to reach sexual maturity. This results in a population that is producing new members at a rate that can't easily overcome the rate of its decline.

4. How are nestlings fed? (1 point)

Nestlings are fed via regurgitation by their parents.

5. As of 2016, how old is the oldest bird recorded for this order? (1 point)

- a. 65 years
- b. 66 years
- c. 67 years
- d. 68 years

6. How do uneven sex ratios within a nesting colony impact this bird species' pair bonds?(1 point, must mention same-sex pair bonds)

Uneven sex ratios result in same sex pair bonds due to an uneven amount of individuals of different sexes.

Station 16 - Northern Jacana (*Jacana spinosa*), 7 points total

1. What is the function of this bird's long toes? (1 point)

The long toes of this bird help the Jacana walk on aquatic vegetation.

2. (1 point) This species is:

- a. Monogamous
- b. Polyandrous
- c. Polygynandrous
- d. Bigamous

3. On average, females / males (circle one) have larger territories. (1 point)

4. What is the etymology behind the common name of this bird? (1 point)

Jacana is derived from the name the Tupi tribe of Brazil gave this bird.

5. (1 point) This bird's range can be described as

- a. Afrotropical
- b. Neotropical
- c. Nearctic
- d. Palearctic

6. What is the negative effect of this bird's mating system on females? (2 points total, 1 point for mentioning the energy cost of eggs, and 1 point for mentioning how eggs hinder a females' ability to maintain a territory)

Because each female mates with 1-4 males, she sacrifices a majority of her energy to produce eggs, making it harder to defend her territory. Females are more likely to be replaced than males within a territory.

Station 17 - Common Loon (*Gavia immer*) - 12 points total

1. What is this species' scientific name? (1 point)

Gavia immer

2. How are these birds an indicator of bioaccumulation? (2 points total, 1 point for mentioning the bird's diet, 1 point for describing the toxin's path up the food chain)

Loons eat aquatic organisms such as fish, crustaceans, aquatic insects, and aquatic plants. If a toxin is present, it will eventually be transferred from the habitat to the bird's prey, and then to the bird, where it will build up.

3. Name two treaties that protect avians with the same order as the bird pictured. (2 points)

Any two of the following:

- Agreement on the Conservation of African-Eurasian Migratory Waterbirds
- Migratory Bird Treaty Act
- Convention on the Conservation of Migratory Species

4. In terms of egg incubation, what is the difference between synchronous and asynchronous hatching? (1 point for describing each method, 2 points total)

With synchronous hatching, females do not start incubation until all the eggs are laid. With asynchronous hatching, females initiate incubation as soon as the first egg is laid.

- a. Do the eggs of this bird hatch synchronously or asynchronously? (1 point)

The eggs of this bird hatch asynchronously.

5. How many species are in this bird's family? (1 point)

Five

6. What continents are the species of this bird's family found on? (3 points total, 1 for each continent)

North America, Europe, Asia

Station 18 - Anhinga (Anhinga anhinga), 7 points total

1. What is a popular nickname for this bird? (1 point)
Snake Bird or Water Turkey (either is acceptable)

2. Which two traits result in this bird's reduced buoyancy? (2 points, 1 for each trait)
 - Lack of a waterproofing mechanism results in wet feathers that are heavy
 - Dense bones

3. How are these birds different from cormorants? Give two differences. (2 points, 1 for each difference)
Any two of the following:
 - Anhingas spread their tail out when they fly, and cormorants do not.
 - Cormorants are heavier and have larger wingspans.
 - Anhingas have longer necks and a straight bill while cormorants have shorter necks and a curved bill.
 - Cormorants are typically darker-colored.

4. True or false: this bird is monotypic. (1 point)

5. Why do certain nests built by this bird look white? (1 point)
Some nests appear white due to a buildup of excrement that is not cleaned out or removed from the nest.

Station 19 - Whooping Crane (*Grus americana*), 13 points total

1. What is the conservation status of this bird? (1 point)

Endangered

- a. Describe two ways that humans have helped recover populations. (2 points total, 1 for each way)

Any two of the following:

Set up wildlife refuges (wetland preservation), captive breeding programs, laws and regulations against hunting, public education

- b. Describe one reason why were some reintroduction attempts unsuccessful. (1 point)

Any one of the following:

The birds failed to mate with each other due to issues with imprinting as hatchlings, natural disasters (tornadoes), illegal shooting

- c. When did the population decline to around 20 birds? (1 point)

The 1940s

2. Name the four states that this bird resides in. (4 points total, 1 for each state)

Texas, Louisiana, Florida, Wisconsin

3. What method have humans used to teach reintroduced individuals migration routes? (1 point)

Pilots use specialized planes to lead cranes to their wintering grounds.

4. How long is this bird's trachea? (1 point)

About 5 feet

5. What two practices were responsible for this bird's massive population decline? (2 points total, 1 for each practice)

Hunting/Overhunting, Habitat Destruction

Station 20 - Green Heron (*Butorides virescens*), 6 points total

1. This bird and other members of its order have a unique vertebral structure that allows them to do what? (1 point)
This bird and other herons can extend and retract their neck; this helps them hunt/grab prey out of the water.
2. One egg is laid approximately every ___2___ days during the breeding season. (1 point)
3. Explain how these birds create and use tools to their advantage. (1 point, award this point if there is a mention of using some sort of bait for hunting)
Green herons create fishing lures with bread crumbs and other types of bait. They then drop the bait on the water's surface to lure in fish.
4. At what water depth do these birds prefer to forage in? (1 point)
4 inches or less
5. Populations for this species declined everywhere except for in which US state? (1 point)
California
6. These birds have a mostly _____ feeding habit. (1 point)
 - a. Diurnal
 - b. Nocturnal
 - c. Crepuscular (green herons can be active during the day or night, but it mostly feeds during dawn and dusk)