

BirdSO 2021 Ornithology C Answer Key

Station 1

1. Great Blue Heron [+1]
2. Ardea herodias [+1]
3. A [+1]
4. B [+1]
5. Niche partitioning [+1]
6. A [+1]
7. Nictitating membrane [+1]
Function is to wipe, clean, protect, and moisten the eye [+1]
8. Some possible usable evidence includes but is not limited to: 1) White morph has smaller beak and plumes than blue morph = separate species 2) Alternatively, there is overlap in bill length vs wing length of the two morphs, which is not enough data to suggest two different species = same species 3) the two morphs occur in markedly different geographic locations = separate species 4) according to the species hypothesis, two organisms are separate species if they cannot interbreed and produce viable offspring, and the wurdemann's morph is a viable hybrid therefore = same species 5) Since white/white and blue/blue pairs are much more common, there might be a prezygotic barrier = separate species. **(+2 for each piece of evidence, +1 coherent explanation, +1 for connecting evidence to overall argument)**

Station 2

1. Black Billed Magpie [+1]
2. Pica hudsonia [+1]
3. A, B, C [+2]
4. West Nile Virus [+1]
5.
 - a. Induced power due to lift generation decreases as speed increases (more power is needed to take off from the ground initially); parasitic power increases as speed increases (because wind is striking/moving past the bird at a higher speed); and profile power increases as speed increases (same explanation as parasitic power). [Explanation not required for full points, -1 for each wrong answer] [+2]
 - b. The dip is a result of the combination of induced power, parasitic power, and profile power together. [+1]
 - c. It would be higher in flapping as the local wind speed surrounding the wing is higher. (explanation not required) [+1]
 - d. This is one of the optimal flight speeds for a bird as it focuses on minimizing power exertion relative to speed [+1]

6. Species B is most likely our bird (+1) Species A has a more intermittent flight style with different flight speeds, while the flight style of species B remains relatively constant (+1). [+2]
7. All four species seem to have the same U-shaped curve shown in Diagram A. [+1]

Station 3

1. Red Crossbill [+1]
2. *Loxia curvirostra* [+1]
3. B [+1]
4. D [+1]
5. Their non-migratory nature is largely dependent on their diet: they feast entirely on pine cones, and only occasionally irrupt in search of better cones. [+2]
6.
 - a. A [+0.5]
 - b. A [+0.5]
 - c. B [+0.5]
 - d. C [+0.5]
 - e. A [+0.5]
 - f. A [+0.5]
7. The amount of food present; this is to meet energy demands required by the bird to mate, form eggs, and incubate them until fledging time. (surprisingly, the amount of cone seeds present was shown in some studies to shift this species' breeding season altogether :O) [+2]

Station 4

1. Northern Fulmar [+1]
2. *Fulmarus glacialis* or *Procellaria glacialis* [+1]
3. Stomach Oil [+1]
4. D [+1]
5. Naricorn [+1]; this is a bony tube that covers the nostril and serves to keep the salty secretions from the salt glands from getting into their eyes [+1].
6.
 - a. It follows Allen's rule [+1], where northern populations likely have shorter bills than those located closer to the equator to minimize heat loss [+1]
7. Dark morphs are uniformly gray, while light morphs have a white head and body with gray wings and tail. [+1]
8. False [+2]

Station 5

1. Downy Woodpecker [+1]
2. *Picoides pubescens* [+1]
3. Nape [+1]
4. False [+1]

5. Sawdust [+1]
6. Zygodactyl [+1]
7. Does more tapping and excavating in winter (1), more gleaning from the surface in summer (1). [+2]
8. Birds will eat to stay warm (1). Combines equal parts of fat and birdseed (1). [+2]
9. Other birds may be more likely to fly away or be easily intimidated by the downy woodpecker if they've come in contact with a hairy woodpecker before OR hairy woodpeckers would be less likely to attack birds of its own kind. [+2]

Station 6

1. Osprey [+1]
2. *Pandion haliaetus* [+1]
3. Hovering; they maintain their altitude and position in the air to look for their prey on the floor below [+2]
4. Bird A: it is heavier with a mottled and defined necklace and overall darker plumage (explanation not required, for competitors' benefit during review). [+1]
5. Females have evolved to be 20% heavier (+1) than their male counterparts in order to dominate them (+0.5) and prevent increased aggression from males during courtship and parental care of their young (+0.5). (+1 for stating adaptation, +1 for explaining usage) [+2]
6.
 - a. Mortality/Death, and emigration [+1]
 - b. I, III, IV, V [+2]
7.
 - a. C [+0.5]
 - b. C [+0.5 pt]
 - c. A [+0.5]
 - d. A [+0.5]
 - e. C [+0.5]

Station 7

1. Laughing Gull [+1]
2. *Leucophaeus atricilla* or *Larus atricilla* [+1]
3. A [+1]
4. They will follow pelicans and other birds trying to steal fish they caught >:0 [+1]
5. **+1 for statement, +1 for explanation**
 (other/slightly varied answers can potentially be acceptable)
 - They increase a feather's resistance to degradation by bacteria that reside in feathers (the bacterium *Bacillus licheniformis* secretes an enzyme that erodes the beta-keratin matrix of the feather) [+1]. Birds in wetter climates have higher densities of these bacteria in their plumage, so their environment will favor birds

with higher levels of feather melanin to increase resistance to these bacterial enzymes [+1]. **OR**

- Melanin may help damp feathers dry [+1] by absorbing and concentrating radiant heat in the feathers, since they absorb radiant energy which helps thermoregulation [+1].

6.

- a. Possible answers include increased parasitism from these fish and fatal inflammation, refusal to eat more fish and therefore starvation, increased competition for oil-free fish and reduced mobility resulting in starvation, etc. [+1 **for specific health risk and +1 for explanation**]
- b. We can check their answers...but the obvious answer should be synthesizing urea and uric acid from protein in the liver [+1]
- c. Usually, birds with liver disease or damage will be put on diets high in simple and complex carbohydrates [+2] (because carbohydrates are useful for hypoglycemic birds, and insoluble fibers will bind many endotoxins and noxious bile acids; only give one point if they just say “carbs”, must specifically include complex carbs because fruit does have carbs). It would be challenging because these birds do not eat plant matter high in complex carbs, just berries and such. [+1]

Station 8

- 1. Cedar Waxwing [+1]
- 2. *Bombycilla cedrorum* or *Ampelis cedrorum* [+1]
- 3. True [+1]
- 4. She eats it [+1]
- 5. A [+1]
- 6. Voracious means eating until full. [+1] Distensible organ [+1]
- 7. Cool and moist environments encourage cyanogenesis and these birds’ diets are mostly fruit in the winter [+0.5] – so they are more dependent on fruit that will have higher levels of cyanide during that same period of time. [+0.5]
These birds are voracious eaters [+0.5] – more likely to overeat and get intoxicated. [+0.5]
- 8. When cytochrome oxidase is inhibited, mitochondrial respiration fails so blood cells do not function properly/do not have the proper energy to do so [+1]. Therefore, oxygen-saturated hemoglobin fails to release oxygen to the tissues/their blood is still bright red because it is over-oxygenated [+1]. **(Half-credit for anything reasonable)**

Station 9

- 1. Rock pigeon [+1]
- 2. *Columba livia* [+1]
- 3. B [+1]

4. Homing pigeon [+2]
5. The fibers can wrap super tightly around their toes, which stops circulation and can therefore cause gangrene, lost toes, and then death. [+1] These birds live primarily in cities, and often nest in manmade structures as well which have thread and hair that can get stuck on their feet. [+1]
6. Uric acid [+1]; something about how toxic ammonia is converted to uric acid so increased toxins eventually lead to increased uric acid production [+1]
7. Liver [+1] because it is responsible for processing and transforming toxins [+1]

Station 10

1. American White Pelican [+1]
2. False [+1]
3. Nuptial tubercle [+1]
4. They tip their head forward to drain out the water from the pouch (1). They throw back their head and swallow the food whole (1). [+2]
5. Roseate spoonbill [+1]
6. True [+1]
7. Sham battle [+1]
8. True [+1]
9. B, C, E [+3]
10. Biomagnification (1) (small fish: little mercury>large fish: some mercury>bird: high mercury concentration) (1). Specimen A (1), mercury accumulation increases with each level of the food web and Specimen A eats larger fish than Specimen B (1), meaning there is a higher concentration of mercury in Specimen A's prey. [+4]

Station 11

1. Screech owl [+1]
2. *Strix asio* or *Macabra* [+1]
3. A [+1]
4. A [+1]
5. Any two of: birds are pollinators, ecological indicators, important components of the food webs, etc. [+3]
6. It traps the air beneath the bird's feathers, and in turn their body heat warms this air up (must have both). This keeps the bird warm. [+2]
7. Birds have countercurrent blood flow (+1 for term) in their legs; their arteries and veins are close to each other (+1), which results in a transfer of heat from the warm arterial blood to the cold venous blood (+1 for explanation). [+2]

Station 12

1. Greater Roadrunner [+1]
2. *Geococcyx californianus* [+1]
3. Gular fluttering [+1]
4. New Mexico [+1]

5. A, B, C, D, E [+2]
6. Run until he is a short distance [+1] away from the nest, then raise and lower the head crest [+1], flash the colored patches on the side of the head [+1] and call out [+1].
7. Parents regularly inspect chicks and if any are weak or lethargic, they are eaten or fed to the stronger chicks [+1]. Food is often scarce in a desert habitat [+1]. Chicks hatching in the first few days [+1] have an advantage.
8. Since many animals cannot digest and handle venomous prey, gaining such a specific advantage allows roadrunners to claim and take advantage of a very unique niche. [+1] Therefore, they have access to more prey items and gain ecological fitness with limited competition. [+2] (give credit as long as it is clear they understand that the purpose is for a unique ecological niche/increased fitness)

Station 13

1. Canada Goose [+1]
2. *Branta canadensis* or *Anas canadensis* [+1]
3. A [+1]
4. A, B, C, and D [+2]
5. C [+1]
6.
 - a. More [+1] Likely happens because the parental investment needed to replace a lost clutch and the probability that eggs will hatch increase with time [+1]
 - b. Honking: as a territorial advertisement/warning to intruder/long-distance mate call (accept any of these) [+1] Hissing: a threat or alarm signal performed in response to short-distance intrusion by other geese or humans [+1]
7. **Answers may vary, but two model answers (+1 for statement, +1 for explanation):**
Airplanes nowadays are becoming more advanced and quieter than old ones, making it difficult for birds to recognize that aircrafts are advancing closer. Modern airports are built near more natural habitats where many wildlife species are nesting, foraging, etc., so there are more wild birds who may cause bird strike accidents.

Station 14

1. Ovenbird [+1]
2. *Seiurus aurocapilla* or *Motacilla aurocapilla* or *Seiurus aurocapillus* [+1]
3. Golden haired [+1]
4. Spectrograph [+1]
5. A, B, C, D [+2]
6. F [+1]
7. Spruce budworm [+1] can severely defoliate trees [+1], the ovenbird increases the number of clutches per year [+1] due to increased food abundance [+1].
 - a.

Station 15

1. Ruby crowned kinglet, Golden crowned kinglet [+1]
2. Alarm, begging, contact [+1.5]
3. A, B, D, E, F [+2]
4. Fledging [+1]
5. True [+1]
6. A, D, E [+2]
7. Ruby - hovering, wider range of species, upper third of trees [+1] Golden - gleaning, restricted to a few species, more generalized in height [+1] Niche Theory [+1] - two similar species will modify foraging to partition habitat [+1]

Station 16

1. Yellow headed blackbird [+1]
2. *Xanthocephalus xanthocephalus* [+1]
3. C [+1]
4. Polygyny [+1]
5. Red-headed blackbird [+1]
6. Marsh wren [+1]
7. Leapfrogs over its flock mates [+1] to the front edge [+1].
8. Drought, loss of wetlands, pesticides [**Have at least one of these, +1**]
9. Nest on tall vegetation (cattails, bulrush, etc.) [+1] in marshes with extremely deep water or water 2-4 ft deep [+1]. Young can fall out of nests [+1] so are capable of swimming to vegetation [+1].

Station 17

1. Northern bobwhite [+1]
2. *Colinus virginianus* or *Tetrao virginianus* or *Ortyx virginiana* [+1]
3. A, B [+2]
4. Flush [+1]
5. Pectoralis muscles [+1]; these muscles lack much myoglobin, an oxygen-storing protein, because quails are a largely flightless bird and only use their wings for short bursts of activity [+2]
6.
 - a.
 - i. Crop [+0.5]
 - b.
 - i. Proventriculus [+0.5]
 - c.
 - i. Ventriculus/Gizzard [+0.5]
 - d.

- i. Cloaca/Vent [+0.5]
- 7.
 - a.
 - i. Green [+0.5]
 - b.
 - i. Red [+0.5]
 - c.
 - i. Green [+0.5]
 - d.
 - i. Yellow [+0.5]
- 8. They have nine flexible air sacs that allow a unidirectional flow of air through their lungs, making it so that fresh air and old air are not constantly mixed (like it is in humans) **OR** Their alveoli branch much more, providing more surface area for gas exchange [+2]
- 9. B [+1]

Station 18

- A. Snowy Owl
 - B. Bald Eagle
 - C. Eastern Bluebird
 - D. Wood Duck
 - E. Tufted Puffin
 - F. Scissor-Tailed Flycatcher
 - G. Lapland Longspur
 - H. Red-Necked Grebe
 - I. Scarlet Tanager
 - J. American Woodcock
 - K. Sora
 - L. Tufted Titmouse
-
- 1. Red Tailed Hawk
 - 2. Black billed cuckoo
 - 3. Common Yellowthroat
 - 4. Sora
 - 5. Carolina Wren
 - 6. Common Yellowthroat
 - 7. Great-Crested Flycatcher
 - 8. Northern Flicker