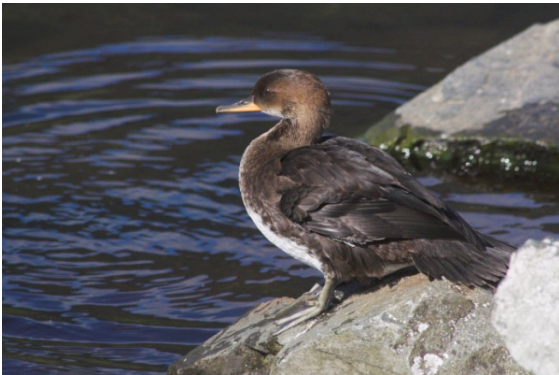


1. You will have 50 mins to finish this test.
2. Each "station" should time you around 3-4 mins.
3. You are expected to know everything listed in the official bird list.
4. Unless the question specifies, please identify the birds to the lowest classification on the official bird list.
5. If you have any questions during the test, send private message to the event supervisors via the Scilympiad platform.
6. Q2#7, Q3#6, and Q7#4 are tiebreakers. If the ties still can't be broken, the team's overall score on Q1 will determine the ranks



(A)



(B)

(Text block #1)

1. (2.00 pts) Referring the two birds A and B shown in Text block #1,
1. Identify bird A.
 2. Identify bird B.

Mallard

Hooded Merganser

2. (5.00 pts) Referring the two birds A and B shown in Text block #1,

3. In which period of a year (give month) will a male A look similar to a female A? During this period, how should people differentiate a male A from a female A?
4. Describe how an adult A's feet is different from a juvenile A's feet in terms of color.
5. Male A normally lose its flight ability for a certain period of time during a year. Approximate the length of this flightless period.

Expected Answer: 3 (2 pts). June to August; beak color 4 (2 pts). Adult mallard typically have orange feet while juvenile mallard mostly have yellowish feet. 5. A month (4 weeks)

3. (4.00 pts) Referring the two birds A and B shown in Text block #1,

6. What makes A capable of enduring high environmental temperature?
7. Compare the calls of a male A bird with a female A bird.
8. Describe how is bird B sexually dimorphic.

Expected Answer: 6. Mallard's plumage has a low thermal conductance. 7. Male mallard's call is quieter than that of female mallard. 8 (2 pts). Male has a fan-shaped black crest often with white line extends to the eyes; female's crest is smaller and bushy (not fan-shaped).

4. (3.00 pts) Referring the two birds A and B shown in Text block #1, (fill the first blank #9 and the other two blanks for #10)

9. How many functional primaries does B have?
10. Why did the eastern (in U.S.) population of bird B fell a hundred years ago?

10

Habitat loss

Human hunting

5. (3.00 pts) Referring the two birds A and B shown in Text block #1,

11. Bird B is indigenous to North America but sometimes they "roam" to Europe. Name three European countries that B might visit.

UK

Iceland

Ireland

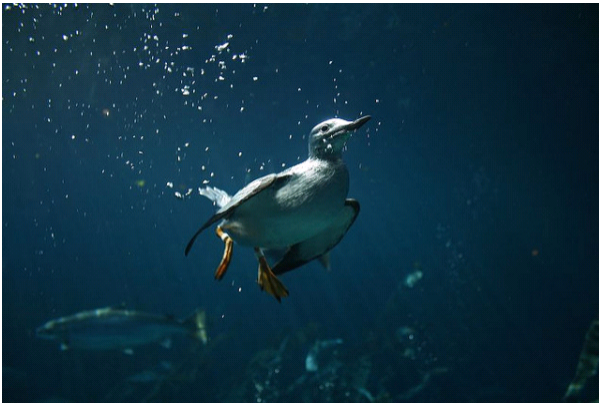
6. (3.00 pts) Referring to the two birds A and B shown in Text block #1,

12. Explain why does B have a good underwater vision.
13. How thick are B's eggs approximately (give number)?

Expected Answer: *** for #11, Germany and Scandinavian countries are acceptable as well. 12 (2 pts). It could alternates the refractive property of its eyes, and it has a high nictans transparency. 13. Any number between 0.54 mm to 0.64 mm is acceptable.



(A)



(B)

(Text Block #2)

7. (2.00 pts) Referring the two birds A and B shown in Text block #2,

1. Identify bird A.
2. Identify bird B.

Magnificent frigatebird

Common murre

8. (6.00 pts) Referring the two birds A and B shown in Text block #2,

3. Describe the courtship display by male A birds during the breeding season.
4. Where and when was this bird first discovered?
5. During bird A's migration, why males and females are normally found in separate locations?

Expected Answer: 3 (2 pts). Male frigatebirds inflate their gular sac, wave its head back and forth, "shake" their wings, and make calls to female frigatebirds. 4 (2 pts). Cape Verde Islands, 1492 5 (2 pts). Males and females have different wind-loading ratio, and males tend to abandon their nests when juveniles are about 3 month old.

9. (3.00 pts) Referring the two birds A and B shown in Text block #2,

6. List three possible nesting sites bird A might choose.

Beach shrubs

Deciduous trees / bushes

mangrove trees

10. (3.00 pts) Referring the two birds A and B shown in Text block #2,

7 (TB 1). What type of feet does bird A have? What is the characteristic of this type of bird feet?

8. Which population (give geographic location) of bird A is classified as "near threatened" by IUCN?

Expected Answer: 7 (2 pts). Totipalmate; all for toes are connect by webbing 8. West Indian

11. (3.00 pts) Referring the two birds A and B shown in Text block #2,

9. What is the typical average life span of bird B?

10. List two bird diseases that influence B's survivability.

20 years

Avipoxvirus

Adenovirus

12. (7.00 pts)

Referring the two birds A and B shown in Text block #2,

11. B's plumage color would most likely to fade in which period of a year?

12. Bird B has a very high wing-loading ratio and a low aspect ratio. What do these mean to B's flight?

13. Bird B adopts two types of appeasements in response to other bird's attack. Name these two types of appeasement and also name the specific three steps involved in one of the appeasement type.

Expected Answer: *** for # 10, bird malaria is acceptable as well 11. Late summer (months such as mid-late Aug or early Sep is acceptable) 12 (2 pts). In order to stay in air, it need to flap its wings frequently and maintains a high flight speed. 13 (4 pts). Active, passive; side-preening, stretch-away, turn-away

13. (3.00 pts) Referring the two birds A and B shown in Text block #2,

14. From the official bird list, identify three predators of B.

Bald Eagle

Snowy Owl

Peregrine Falcon



(A)



(B)

(Text Block #3)

14. (2.00 pts) Referring the two birds A and B shown in Text block #3,

1. Identify bird A.
2. Identify bird B.

Clapper Rail

Snowy Egret

15. (7.00 pts) Referring the two birds A and B shown in Text block #3,

3. Describe how people distinguish a male A from a female A.
4. Describe bird A's typical habitat.
5. What are the two important factors that influence bird A's nest site choice? Most of the time, why can't A find an optimal place to nest?

Expected Answer: 3 (2 pts). Male clapper rail is larger and heavier than female clapper rail, and male plumage is slightly brighter than that of female. 4 (2 pts). Coastal saline wetlands with cordgrass, pickleweed or mangroves. 5 (3 pts). The nest site need to avoid flooding by tides and predators with dense cover vegetation. Most of the time, these two conditions couldn't coexist (avoid flooding makes clapper rail to place nest at high-elevation location, but that place has less dense plant coverings, and vice versa).

16. (2.00 pts) Referring the two birds A and B shown in Text block #3,

- 6 (TB 2). What is the most effective technique for bird A's population conservation?
7. What is the typical shape of A's egg?

Wetland protection

Subelliptical

17. (2.00 pts) Referring the two birds A and B shown in Text block #3,

8. Feathers will start to emerge on a juvenile bird B after how many days of its birth?

9. What's the color of bird B's feet?

8

Yellow

18. (5.00 pts) Referring the two birds A and B shown in Text block #3,

10. Describe some changes in B's appearance (adult) during the breeding season.

11. What kind of sound will B produce during its snap display?

12. Before the enactment of the Migratory Bird Treaty Act in 1916, bird B became almost extinct in which U.S. State?

Expected Answer: 10 (3 pts). Plumage become wispy and extends from the back of the bird's head to form a "crest" shape to the scapular of the bird. Legs become darker and feet become more reddish. 11. Clicking sound 12. Florida



(A)



(B)

(Text Block #4)

19. (2.00 pts) Referring the two birds A and B shown in Text block #4,

1. Give the scientific name of bird A.
2. Give the scientific name of bird B.

Rynchops niger

Arenaria interpres

20. (7.00 pts) Referring the two birds A and B shown in Text block #4,

3. What's the typical difference in bill length and average mass between a male A and a female A?
4. What type of feet does A have? What type of feet does B have? What's the difference between these two types of feet?
5. Describe the uniqueness of bird A's eyes and explain how does the unique eyes feature benefit A.

Expected Answer: 3 (2 pts). 10 mm, 100 g 4 (3 pts). Black skimmer has palmate feet, ruddy turnstone has semipalmate feet. The web that joined toes in semipalmate feet is way smaller than that of palmate feet 5 (2 pts). The pupil of black skimmer constricts to a vertical slit. This feature effectively protect black skimmer's eyes from bright light.

21. (3.00 pts) Referring the two birds A and B shown in Text block #4,

6. Bird A normally arrives its northeastern (in U.S.) breeding colonies in which month?
7. List two U.S. state where you could find A.

April

California

New York

22. (5.00 pts) Referring the two birds A and B shown in Text block #4,

8. Why does A prefer to have other bird species in its habitat?
9. How do B's male and female species differ in body length (be general here)?
10. What type of mode of life does bird B adopt during the nonbreeding season?

Expected Answer: For #7, All of the east coast states beside Maine, New Hampshire, and Vermont are correct. Texas, Louisiana, Mississippi, and Alabama are correct as well. 8 (2 pts). Other bird species could provide warning and defense against habitat intruders. 9. Males are shorter than female. 10 (2 pts). Scavenger and opportunistic feeder

23. (3.00 pts) Referring the two birds A and B shown in Text block #4,

11. B is known to consume other birds' eggs. From the official bird list, list three birds whose eggs might be targeted by B.

Least tern

Laughing gull

Herring gull

24. (5.00 pts) Referring the two birds A and B shown in Text block #4,

12. During bird B's incubation period, which three factors affect its body energy cost?
13. Name the two types of aerial displays in B's courtship.

Expected Answer: *** for #11, other gulls or terns listed on the bird list are correct answers as well. 12 (3 pts). The bird's nest side selection, body orientation to the sun, and wing direction 13 (2 pts). Pursuit flight and courtship flight



(A)



(B)

(Text Block #5)

- 25. (2.00 pts)** Referring the two birds A and B shown in Text block #5,
1. Identify bird A.
 2. Identify bird B.

Golden eagle

Sora

- 26. (6.00 pts)** Referring the two birds A and B shown in Text block #5,
3. Bird A will be considered as an "adult" at what age? What's the difference in plumage color of an adult A and a juvenile A?
 4. Describe how does bird A follow Bergmann's rule.
 5. Bird A does not follow Allen's rule. Name one bird from the bird list that follow both Allen's rule and Bergmann's rule.

Expected Answer: 3 (3 pts). 4 years old. The inner primaries and base of secondaries of juvenile golden eagle are in white while adult golden eagle have dark brown in these regions. The tail of juvenile golden eagle is also partially white. 4 (2 pts). Golden eagle tend to have larger body size in high latitude regions. 5. Mallard

27. (3.00 pts) Referring the two birds A and B shown in Text block #5,
7. A sets its habitat in various geographic areas. Identify a common feature that is generally shared within all of its habitat.
8. Name one Alaska national park in which you could find A.
9. At least how many hunting techniques does bird A have?

Areas of high topographic (r

Denali National Park

7

28. (5.00 pts) Referring the two birds A and B shown in Text block #5,
10. Bird A was first described in which book by whom?
11. When would bird B do a swanning display?
12. Describe some characteristics of B's nest site.

Expected Answer: 10 (2 pts). Systema Naturae 10th Edition, by Carl Linnaeus. 11. When opposing male sora try to invade others' territory. 12 (2 pts). Nest is often placed in emergent vegetation with shallow water. The preferable vegetation is either cattail or sedge.

29. (2.00 pts) Referring the two birds A and B shown in Text block #5,
13. Bird B usually produce a descending whinny call. What's the minimum number of note in one descending whinny call?
14. How many notes are in the spring peeper call (this call only occurs during spring migration) of bird B?

10

2

30. (13.00 pts)



(A)

Picture A depicts archaeopteryx, an early bird. This famous fossil specimen was discovered in Solnhofen Limestone, Germany.

1. Scientists determined that archaeopteryx had furcula. What does having this bone mean to archaeopteryx? In addition, please describe the function of furcula.
2. Scientists find out that the sternum of archaeopteryx is really flat. What's the difference in sternum structure between archaeopteryx and modern bird? What's the significance of this difference in sternum structure?
3. Archaeopteryx has a set of gastralia, or belly ribs, but modern birds do not. Gastralia are important because they provide attachment points for abdominal muscles and other tissue. Why do you think modern birds lose it?
4. Scientists have recently found out that archaeopteryx's flight behavior is really similar to that of modern pheasants. Based upon your knowledge about the pheasants' flight, describe archaeopteryx's flight behavior.

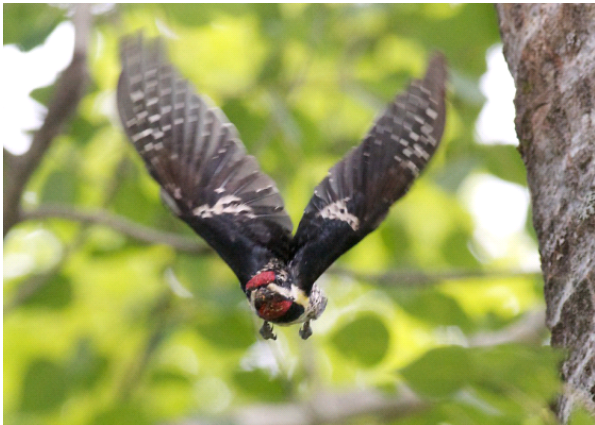


(B)

Picture B depicts brachiosaurus, a dinosaur who lived in late Jurassic.

5. Scientists have found out that air sacs play an important role in brachiosaurus' respiratory system, just like those modern birds. Based upon your knowledge on air sacs function, describe how does having air sacs aid brachiosaurus's respiration.
6. Just like what they do in modern birds' body, the air sacs forms the diverticula in brachiosaurus. Describe the function of diverticula in brachiosaurus.

Expected Answer: 1 (2 pts). It grants archaeopteryx the ability to fly continuously (** it's wrong to say furcula enables flight). Furcula helps the birds thoracic skeleton to withstand continuous flight. 2 (2 pts). Modern birds have a keel attached to sternum, strengthen modern bird's flight ability. Archaeopteryx's flight ability is thus weaker than modern birds. 3 (2 pts). Modern birds need to take off quickly in order to fly thus they want their body be as light as possible. Gastralia add unnecessary weights which might make bird flight harder. 4 (2 pts). Archaeopteryx's flight distance was short, and during its flight it flapped its wings at a very high frequency. 5 (3 pts). Air sacs enables a unidirectional airflow that the air always move toward the lung. This means that brachiosaurus don't need to exhale air thus they takes more oxygen in and release more CO₂ out. 6 (2 pts). Invade to other bones in the body and hollow these bone out thus lighten the skeleton weight.



(A)



(B)

(Text Block #6)

31. (2.00 pts) Referring the two birds A and B shown in Text block #6,
1. Identify the genus of bird A.
 2. Identify the genus of bird B.

Sphyrapicus

Pyrocephalus

32. (2.00 pts) Referring the two birds A and B shown in Text block #6,
3. Explain the etymology of the genus of bird A.
 4. Explain the etymology of the genus of bird B.

Expected Answer: 3. Sphyrapicus in Greek combines the meaning of "hammer" and "woodpecker". 4. Pyrocephalus in Greek means "flame headed"

33. (7.00 pts) Referring the two birds A and B shown in Text block #6,
5. Name one bird from the bird list that appears to be an close ally with bird A.
 6. Describe the difference in appearance of a male A and a female A.
 7. List three aspects that are not well studied by the scientists about bird A.

Expected Answer: 5. Ruby-throated hummingbird 6 (3 pts). Male normally has red chin and throat while female has white chin and throat. The red color of the forehead is more obvious on male than female. 7 (3 pts). Yellow-bellied sapsucker's body physiology, its criteria of picking tree to create sap wells, and the role it plays in forest communities. (Interaction between tree and the bird is correct as well).

- 34. (2.00 pts)** Referring the two birds A and B shown in Text block #6,
8. In how many U.S. states you could possibly find bird B?
9. How many functional rectrices does B have?

5

12

- 35. (8.00 pts)** Referring the two birds A and B shown in Text block #6,
10. What's an obvious difference between B and other birds under bird B's family?
11. Describe how does bird B use Nest-Site-Showing Display to determine the location to place its nest.
12. Name one bird from the official bird list that might lay its own eggs in B's nest. How does male B and female B respond to parasitic nests?

Expected Answer: 10 (2 pts). Male vermilion flycatcher has nearly half of its body red while other flycatchers generally have their body white or gray. 11 (3 pts). First male vermilion flycatcher flies to potential nest site and then crouches in horizontal fork and makes slight nest forming movements. Male performed the display once in several potential sites in nest tree and repeatedly at a single site. That single site is then determined to be the nest site. 12 (3 pts). Brown-headed cowbird. Male reduces its feeding rate while female increases its feeding rate.



(A)



(B)

(Text Block #7)

36. (2.00 pts) Referring the two birds A and B shown in Text block #7,

1. Identify bird A.
2. Identify one bird who only lives in Southern U.S. from the official bird list that prey on B.

Cactus wren

Crested caracara

37. (6.00 pts) Referring the two birds A and B shown in Text block #7,

3. At least how many vocalization variation does a male bird A has? What's the difference between a male bird A's call and a female bird A's call?
- 4 (TB 3). Bird A's supercilium is in which color? What's the common name of supercilium?
5. Briefly describe the annual migration route of bird A.

Expected Answer: 3 (3 pts). 32; the frequency of a female cactus wren's call is weaker than that of male, but the notes in female bird's call is higher than that of male. 4 (2 pts). White, eyebrow 5. In fact, cactus wren do not migrate.

38. (5.00 pts) Referring the two birds A and B shown in Text block #7,

6. Bird is could be considered as a xerophile. What does this mean?
7. Describe one factor which not caused by the human that contributes to the population decrease of bird A.
8. Describe bird A's daily activity frequency when the temperature of environment is moderate.

Expected Answer: 6. Cactus wren could survive without consuming any free water 7. Habitat fragmentation, which leads to severe discontinuity in cactus wren's distribution 8 (3 pts) Activity frequency increases from early morning to noon, then decreases slightly during after noon, and finally peaks at dawn (about 6 to 6:30 pm).

39. (3.00 pts) Referring the two birds A and B shown in Text block #7,

- (*** Let's call the bird you identify from question #2 bird B)
9. What's the common local name of bird B in some areas?
 10. What's the typical wingspan of bird B?
 11. You could find bird B in which Arizona desert?

Mexican buzzard

1.2 meters

Sonoran Desert

40. (6.00 pts) Referring the two birds A and B shown in Text block #7,

12. Bird B feed on various types of birds. From the official bird list, list four birds who could potentially get targeted by bird B.
13. Describe how could you tell whether bird B is at ease or get threatened.

Expected Answer: 12 (4 pts). Turkey vulture, Osprey, Indigo bunting, Greater roadrunner. 13 (2 pts). Crested caracara's bare facial skin is bright orange-red when at ease and pale yellow when it get threatened.



(A)



(B)

(Text Block #8)

41. (2.00 pts) Referring the two birds A and B shown in Text block #8,

1. Identify bird A.
2. Identify bird B.

Northern mockingbird

Horned lark

42. (7.00 pts)

Referring the two birds A and B shown in Text block #8,

3. What scientific name was given to bird A when it was first described?
4. Describe some specific places that bird A inhabit under the urban/suburban setting.
5. Beside the birds within bird A's family, please select one bird from the bird list who is closely related to bird A. What types (give two) of data are used by the scientists to determine this close relationship?

Expected Answer: 3. *Turdus polyglottos* 4 (3 pts). gardens, cemeteries, mowed lawns with access to shrubs or hedges. Sometimes could be found in fruiting trees or agricultural fields. 5 (3 pts). European starling. Data on DNA sequence, physiology, or DNA hybridization

43. (3.00 pts) Referring the two birds A and B shown in Text block #8,
6. Bird A is known to feed on one specific genus of lizard. Name this lizard genus.
7. What type of bird is A considering its active period during a day?
8. Bird A is known to have 4 types of calls. Among these 4 call types, which type of call is female-specific?

Anolis

Diurnal

Nest relief call

44. (7.00 pts) Referring the two birds A and B shown in Text block #8,
9. What's bird B's name in Europe or Asia?
10. Describe the difference in appearance between a male bird B and a female bird B.
11. Describe the color variation in bird B population among different geographic regions in the U.S.

Expected Answer: 9. Shore lark 10 (2 pts). The "horns", or occipital feather tufts, is darker and larger on male than female. 11 (4 pts). Northeastern species are the darkest, southern and western species have light-color feathers. Throat, eyebrow stripe, and ear coverts tend to be yellow in southern and western regions and tend to be white in northeastern species

45. (2.00 pts) Referring the two birds A and B shown in Text block #8,
12. How long could bird B's flight last continuously?
13. What type of dyadic marriage relationship does bird B adopt?

Any number in 60-70 s are t

Monogamous



(A)



(B)

(Text Block #9)

46. (2.00 pts) Referring the two birds A and B shown in Text block #9,
1. Identify bird A.
 2. Identify bird B.

Cliff swallow

Cooper's hawk

47. (6.00 pts) Referring the two birds A and B shown in Text block #9,
3. List two places in which bird A avoids to inhabit.
 4. Typically, bird A migrates twice a year. Please indicate the starting month of each of the two migrations.
 5. When constructing their nest, why do bird A tend to work synchronously in a large group?

Expected Answer: 3 (2 pts). Desert, heavy forest. 4 (2 pts). Spring migration starts in February, fall migrations typically starts in August. 5 (2 pts). This makes the nest construction more efficient and also brings vigilance advantage.

48. (3.00 pts) Referring the two birds A and B shown in Text block #9,
6. What's the typical dimension (length and width) and the height of one bird A's nest? Fill length in the first blank, width in the second and height in the third.

20 cm

16 cm (14-17 are acceptabl

10 cm (9-11.5 are acceptab

49. (7.00 pts)
Referring the two birds A and B shown in Text block #9,
7. From the official bird list, name one bird who often occupies bird A's old nests after A leave their nests. Then describe some factors that influence A's decision on whether using old nest or not.
 8. Describe bird B's iris color change as it grows up.
 9. What habitat location preference does bird B have during its migration?

Expected Answer: 7 (3 pts). House sparrow; cliff swallow avoid using old nest infested with ectoparasites (thus they like to return to old nests in small colonies instead of big colonies) or mouse nesting material. 8 (3 pts). At first cooper's hawk's iris is blueish-gray. The iris color turns to yellow when the hawk is about one year old. As the hawk grows up, the iris color shift from yellow to orange and finally red. 9. Prefer deciduous forest cover instead of open areas.

- 50. (3.00 pts)** Referring the two birds A and B shown in Text block #9,
10. Which venomous snake could potentially prey on bird B?
 11. Name the parasite that is most commonly found in juvenile bird B's body.
 12. Name one class of organic chemical compound that negatively affect bird B's health beside common pesticide (DDT, DDE i.e.).

Copperhead (rattlesnake) is

Trichomoniasis

organophosphate

- 51. (14.00 pts)** Birds are known to have several types of feathers. Describe the characteristics of the five feather types listed below in terms of their rachis and barb feature.
1. Down
 2. Contour
 3. Semiplume
 4. Filoplume
 5. Bristle
 6. Describe the function of filoplume feather and bristle feather.
 7. From the official bird list, name one bird who has afterfeathers.

Expected Answer: 1 (2 pts). Typically doesn't have a rachis, barb appears as a tuft near the base of the feather. 2 (2 pts). Rachis longer than the longest barb. Barbs have hooks to form a pennaceous vane structure. 3 (2 pts). Rachis longer than the longest barb. Barbs still contribute to the formation of a vane structure, but not pennaceous because barbs don't have hooks. 4 (2 pts). Rachis is slender and bare (not surrounded by the barbs), barbs is tiny and only locates on the feather tip. 5 (2 pts). Structurally similar to contour feather, but barely has barbs. 6 (3 pts). Filoplume: birds use it to monitor and detect changes in feather position that might be caused by wind/body movement; Bristle: birds use it for eye protection and potentially a sensory organ to detect movements of prey held in beak. 7. Ruffed Grouse