Part 6 – Sexing birds using gonads
(includes 2 quizzes with answer sheet)
The Migratory Bird Conventions Act regulates the take and possession of birds in Canada. The Migratory Bird Treaty Act regulates the take and possession of birds in the United States. In addition, the provinces (in Canada) and the states (in the United States) also require permits. For some species SARA, ESA, or CITES permits may be required.

Always check the laws of your country and obtain the proper permits; failure to do so may result in civil and/or criminal penalties.

When handling dead birds, it is probably impossible to tell if a bird is infected with a pathogen that may cause human illness even if you know the cause of death to be a wound or an injury. Take reasonable precautions to protect yourself. The Ornithological Council offers a peer-reviewed fact sheet on avian zoonotic disease and safety precautions for those who handle birds in the field and in the lab.

http://www.nmnh.si.edu/BIRDNET/documents/WNV&H5N1-FactSheet.pdf
Start your cut here.

Continue cutting at an angle. Stop before you reach the spine.

Repeat on the other side.

Neck
Humerus
Femur
Last rib
Views of the same cut for different species.

- American Avocet
- Great Horned Owl
- Band-tailed Pigeon
Organ shape and colour varies in different types of bird.

Find the stomach and move it out of the way.
Decomposition alters the look of the organs. This is especially true of the liver.
Look for the kidneys.

Birds have 3 pairs of kidneys. They lie along both sides of the spinal column.
In this picture the digestive track has been removed. All six kidneys are visible.

Kidneys 2 & 3 have a green tint due to leakage from the intestines.
The gonads are on top of the spinal column.

Just behind the testes are two adrenal glands.
? Cancer like growth.

This digestive track was persevered in a vial filled with 70% ethanol.

Unlike the oviduct, sperm ducts are attached relatively securely to the kidneys.

Testes

Nestling Barred Owl
Most labs require that the length and width of both testes be measured.

Usually the left testis is larger.

If the right testis is larger, make a notation indicating that this is not a scribing error.
Testes shape, size, and asymmetry, are highly variable depending on age and breeding condition.
Note how round the right testis is and how egg-like both testes look.
Same Spotted Towhee:
This bird had a fully developed cloacal protuberance. Inside are two seminal vesicles. Measure and record both on the prep sheet.
Finding flesh coloured seminal vesicles is often a challenge.

If the testes are large, persist until you find the seminal vesicles. The ducts connecting the seminal vesicles to the cloaca are fragile and normally break.

Black-headed Grosbeak in 1st winter (formative) plumage. Don’t assume sub-adult males are not in breeding condition!
These two cream coloured adrenal glands have a tangled thread-like pattern inside a smooth case.

The colour of testes varies from cream, pink-brown, to gray-black.
Typically birds have one elongate ovary which exhibits a grainy surface texture.

Compare this globular pattern with the previous slide. Adrenal glands have a smooth outer covering which reflects light differently.

This is the oviduct. It is straight and smooth in juveniles and females that have not laid an egg.
Typically birds have one elongate ovary which exhibits a grainy surface texture.

Compare this globular pattern with the previous slide. Adrenal glands have a smooth outer covering which reflects light differently.

This is the oviduct. It is straight and smooth in females that have not laid an egg.

Oviducts are loosely attached and float above the kidneys. Sperm ducts are firmly attached to the kidneys.
Accipitriformes and falconiformes occasionally have two ovaries.

Find the twin oviducts.
Once an oviduct has passed an egg, it’s shape is changed forever.

Note the irregular diameter and convoluted way in which it lies.
The egg and two soft shell fragments were preserved in a labelled vial.

When an egg is found, record if it has a soft or hard shell and whether it is plain or pigmented.
Once in a blue moon, you find a shelled egg.

The first clue was the weight of this McCall’s Screech-Owl.

Note the two unshelled developing ova.
This bird's brood patch resembles a large water blister.

Measure the length and width of the ovary and the largest ovum.

Oviducts diameter is measured in the middle or where it joins the cloaca. Note which method you are using.
Ask someone for a second option.
Things are not always crystal clear. This female has a convoluted oviduct.
Finding gonads in a fat bird can be a challenge.

Photos taken at the Slater Museum

The same
Red-tailed Hawk
Anyone that states they can use gonads to sex birds 100% of the time is delusional:

• Decomposition can create an organ soup
• Extremely emaciated birds reabsorb their organs
• Many birds have minute gonads until their first breeding cycles
• Some migratory birds reduce the size of many organs to minimize weight

There is no shame in writing the following:
• Gonads not found
• Gonads rotten, possibly a female with a smooth oviduct
• Only one testis found

• DO NOT WRITE:
• Nothing; this implies that you forgot to look for the gonads
• If you are not 100% sure, don’t imply that you are!
Gynandromorphs have bilateral asymmetry:
- The Orchard Oriole in the center has male plumage on the right and female plumage on the left.
- Gynandromorphs can have one testis and a sperm duct on the male side and an ovary and oviduct on the female side.

Photo taken at the Philadelphia Academy of Natural Sciences.
Look for both sexes in the gynadromorph and record your findings. Write “not found” if one of the sexes is missing. Photograph and consider preserving the sex organs in alcohol.
QUIZZ NO. 1
(Novice)

Test your ability to sex the next 10 birds.

Write your answers on a piece of paper. Answer sheet provided.

Bird No. 1
Bird No. 2
Bird No. 3
Bird No. 4
Bird No. 6
Bird No. 7
Bird No. 8
Birds No. 9 & 10
QUIZZ NO. 1 ANSWERS:

1. Male: Mourning Dove (May)
2. Male: Adult American Robin
3. Female: Northern Saw-Whet Owl, oviduct convoluted
4. Male: American Coot (January)
5. Female: Sun Parakeet, aviary bird
6. Female: Mallard (late June), oviduct convoluted
7. Male: Budgerigar, aviary bird
8. Female: Cassin’s Finch (May) oviduct convoluted
9. Left = Male: Barred Owl
10. Right= Female: Barred Owl, oviduct smooth

An instructors quiz is available. Email: ildiko@zoology.ubc.ca if request a copy.
QUIZZ NO. 2
(As clear as mud)

Bird No. 1
Bird No. 2
Bird No. 3
Bird No. 4
Bird No. 6
Bird No. 8
Bird No. 9
Bird No. 10
QUIZZ NO. 2 ANSWERS:

1. Male: Belted Kingfisher
2. Female: Juv. Sharp-shinned Hawk, twin ovaries & oviducts smooth
3. Female: Juv. Brant’s Cormorant (winter) oviduct smooth
4. Male: Juvenile Brown Pelican (winter)
5. Female: Immature Glaucous-winged Gull, oviduct not found
6. Male: Great Horned Owl
7. Male: Budgerigar, aviary bird
8. Female: Laughing Gull, oviduct convoluted
9. Female: Western Screech Owl, oviduct convoluted
10. Male: Immature Osprey. Note that the RIGHT testis is larger

An instructors quiz is available.
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Bonus Question:

Write down everything that you see.

Hint: This is a domestic chicken.
- Female with many developing ova.

- 2\textsuperscript{nd} fully developed right oviduct present. This is extremely unusual in galliformes.

- Egg in the oviduct
OTHER

PRESENTATIONS IN THIS SERIES

Introduction: The look of the bird & A few things to look for
  Part 1 - Spread wings, a good way to start
  Part 2 - Skinning your first bird
  Part 3 - Other skinning methods
  Part 4 - Stuffing your first bird
  Part 5 - Other stuffing and pinning methods & Bird parts
  Part 6 - Sexing birds using gonads (includes 2 quizzes with answer sheets)
  Part 7 - Determining skull pneumatization & Skeleton preparation
  Part 8 - DNA tissue sampling & Gut analysis
  Part 9 - Washing skins for ectoparasites & Drying washed skins
  Part 10 - Recording fat levels & Cleaning fatty or stinky skins
  Part 11 - Flat skins, shmoos, and other types of study skins
  Part 12 - Preserving eggs and shell fragments (in prep)
  Part 13 - Determining cause of death (in prep)
  Part 14 - Labelling: the most important step

To download another PowerPoint presentation in this series go to:
http://www.beatymuseum.ubc.ca/research/birds
IN MEMORIAM

DR. REX KENNER
Former Curator of the Cowan Tetrapod Collection who encouraged me to begin this project.

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Unless otherwise indicted, all pictures were taken by the author at the Cowan Tetrapod Collection, University of British Columbia Beaty Biodiversity Museum.