Species, Age and Sex Identification of Ducks Using Wing Plumage

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By
Samuel M. Carney

Washington, D.C. 1992

U.S. Department of the Interior
U.S. Fish and Wildlife Service

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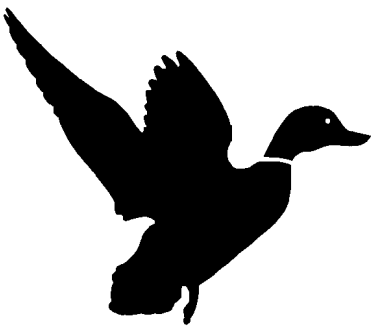

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Procedures have been developed over the past 30 years for managing the take of waterfowl by hunters. Wings of ducks contributed voluntarily to the U.S. Fish and Wildlife Service by hunters are examined each year by experts. This procedure involves the determination of species, sex, and age of ducks through an examination of these detached wings. Many persons skilled at examining wings of ducks have retired in recent years. We became concerned that these skills might be lost to future generations if not properly documented. Documenting such skills is difficult. Subtle differences in feather color and feather texture are used to distinguish young ducks from adult ducks and males from females. Printed words and pictures have their limitations, but we hope this publication captures the technique and preserves it.

Director
U.S. Fish and Wildlife Service

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INTRODUCTION

This publication contains procedures used by the U.S. Fish and Wildlife Service to determine the species, sex and age composition of the harvest of North American ducks using detached wings contributed by hunters. Original studies of the use of duck wings for this purpose began in 1958 and were led by the author and A.D. Geis. Others contributing to these studies include R.L. Croft, E.M. Martin, A.N. Novara, L.D. Schroeder, M.G. Smart, and M.F. Sorensen. Major suppliers of known-age specimens include: W. Anderson, R.S. Billard, A.J.Erskine, D. Hall, A.S. Hawkins, C. Hoffpauir, L.R. Jahn, R. L. Jessen, F.B. Lee, J.J. Lynch, R.K. Martinson, D.P. Olson, R.P. Osbolt, C. Ritcey, R.N. Smith, H.E. Spencer, V.D. Stotts, and J. Takekawa. R.I. Smith edited the text, A.J. Godin prepared Figure 2, Larry Ketchum Photography took the pictures, and R.E. Cummins typed the manuscript.

The Waterfowl Parts Survey became the means by which large samples of duck wings were obtained. This survey became national in scope in 1961. Collection of goose tails was added to the survey in 1962. Packages of envelopes are mailed to selected hunters who return wings from shot ducks and tail feathers from shot geese by mail to collection points throughout the United States where they are examined to determine species, sex, and age.

For readers who are interested in more detailed information on the development and testing of procedures described in the following pages, copies of a more technical report, which was prepared by the author, are available by writing to Waterfowl Harvest Surveys, U.S. Fish and Wildlife Service, 10800 Laurel-Bowie Road, Laurel, Maryland 20708-3600. That report, titled *Observations on Sexing and Aging Ducks Using Wings*, makes several points that must be understood by anyone who plans serious use of these techniques. The procedures presented here vary among species in the degree to which they accurately identify the age and sex of duck wings. Accuracy varies according to skills of the observer. Some individuals become highly skilled after examining large numbers of duck wings, while other individuals never develop the ability to detect subtle differences in feather texture and feather quality with high levels of proficiency. Levels of skill will decline if techniques are not practiced with regularity.

Terminology related to age must be clarified. An immature wing possesses one or more characteristics known to be associated with ducks hatched in the most recent nesting season. Since the term *immature* often refers to maturing processes not related to plumage, *juvenal* might have been more appropriate. Nevertheless, after 30 years of use in this context, introducing another age designation would serve no purpose. All wings not possessing characteristics associated with the most recent hatch are classified as adult except those of yearling male eiders which are identified as being from *sub-adults.*

To determine the species, age, and sex of ducks from detached wings, a worker must be familiar with the various feather groups (Figure 1). The first step is to determine the species represented. A key to species is included as an appendix to this publication. Usually, slight differences in feather shape, color, pattern, wear, or replacement are sufficient during the fall and winter to separate immatures from adults. Age determination is a step-by-step search for one or more traces of immature plumage. Wings on which no traces of immaturity can be found, or in some cases those that have positive adult characters, are considered to be from adults.

During their first fall and winter immatures of many of the more common species of ducks molt certain wing-feather groups located near the body and replace them with adult-type feathers. Those feathers that are replaced include the tertials, greater tertial coverts, post humerals, and scapulars. Scapulars are of limited use in classifying wings because most hunters do not include scapulars on the wings they remove. Tertials, as defined here, are actually the more proximal secondaries, which are generally different in size, shape, and color from their more distal counterparts. These feathers are often sexually dimorphic and usually molt with adjacent body feathers. Post humerals are feathers attached to the humerus. They lie between the tertials and scapulars. They usually molt with adjacent body feathers. Greater coverts are the first row

continued on page 4

Feather Groups of the Duck Wing

REMIGES: (Flight feathers)

Alula: The feathered "thumb" of the bird wing

Primaries: Flight feathers attached to the hand (manus)

Secondaries: Flight feathers attached to the forearm (ulna)

Tertials: Incorrect (morphologically) but used here to designate the more proximal secondaries which are generally different in size, shape, and color from their more distal counterparts, are often sexually dimorphic, and usually molt with adjacent body feathers.

Post humerals: Feathers attached to the humerus. They lie between the tertials and scapulars, usually molting with adjacent body feathers.

Scapulars: Feathers of the humeral (upper arm) feather tract. These lie on either side of the back and may partially cover a folded wing. They usually molt with adjacent body feathers. (Not shown)

Axillars: Elongate feathers growing in the "armpit" region and closing the space between the spread wing and the body

WING COVERTS: (Cover flight feathers)

Greater coverts: The first row of feathers overlying the flight feathers, identified by the particular feathers they cover as primary, secondary, or tertial coverts.

Tertial coverts: Those greater coverts that overlie the tertials. Designated separately here because they are sexually dimorphic in adults of several species and usually molt with the adjacent body feathers.

Middle coverts: The next row of coverts.

Lesser coverts: The next several rows of coverts.

Marginal coverts: An indefinite number of rows anterior to the lesser coverts

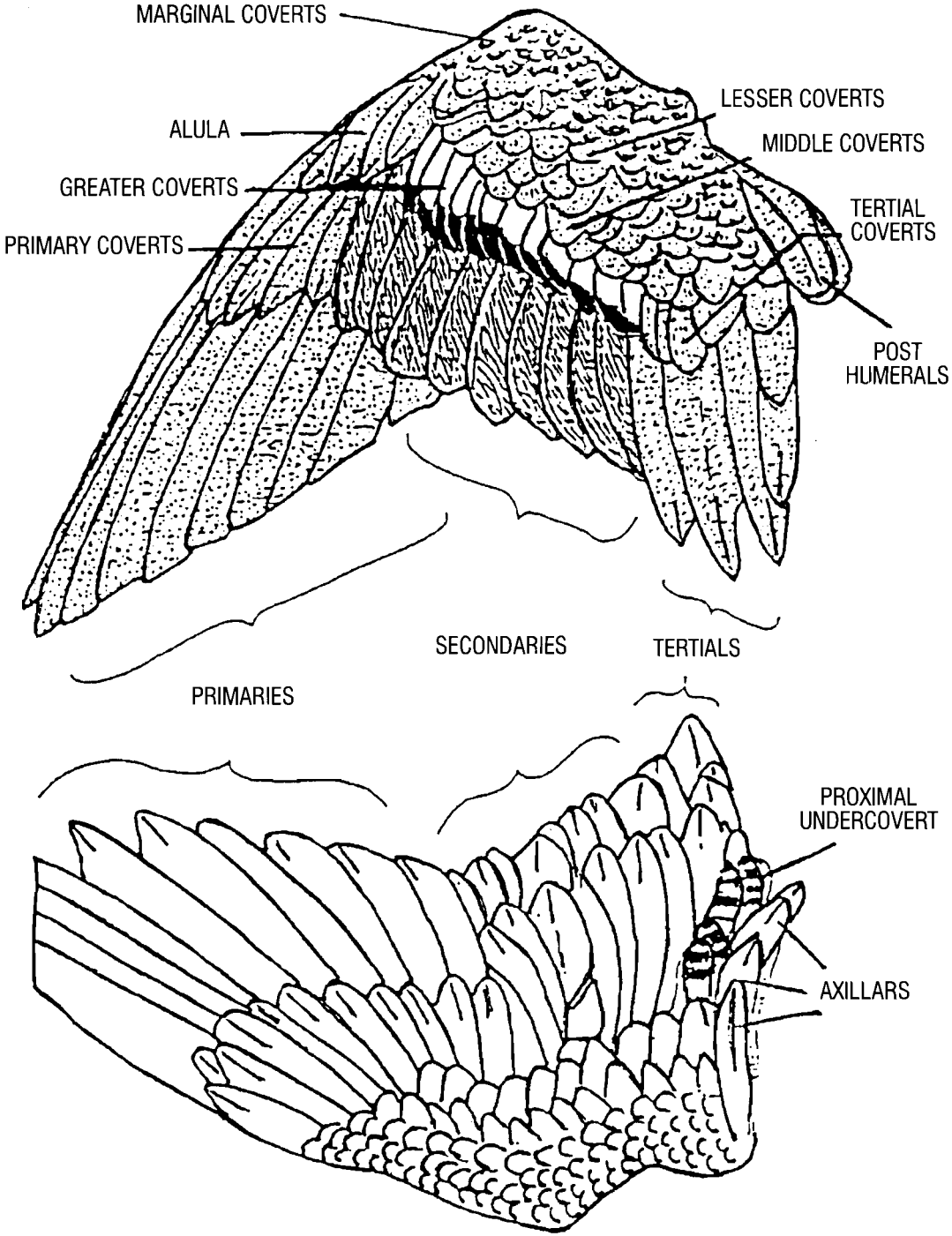
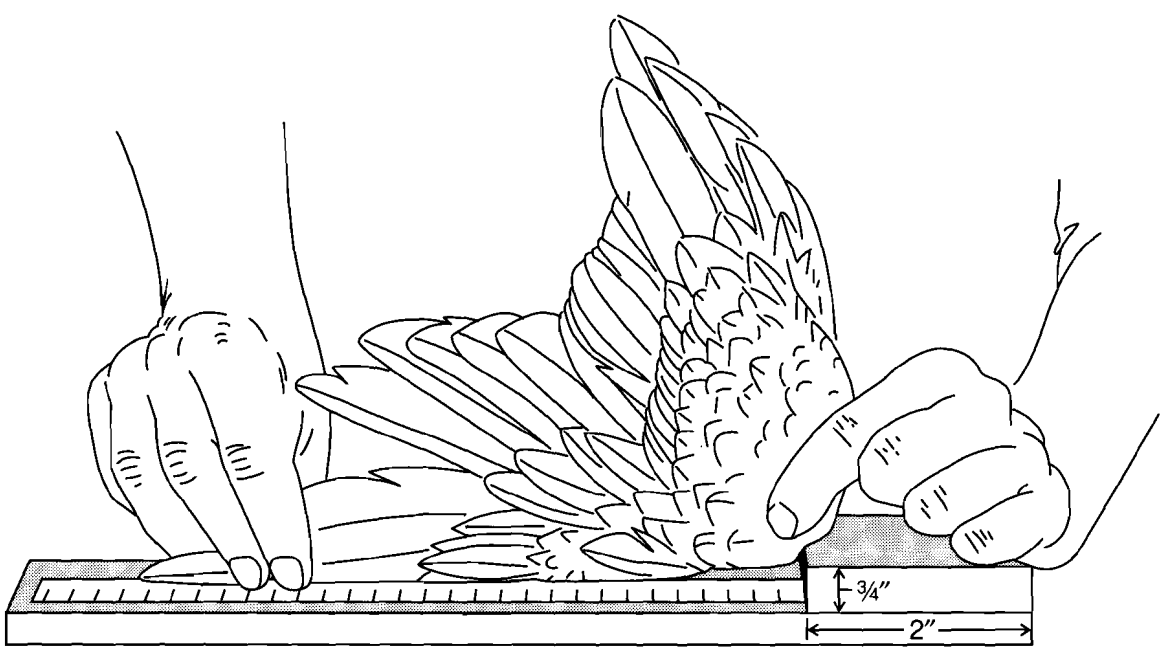


Figure 1. Feather groups of a typical dabbling duck wing

of feathers overlying the flight feathers, identified by the particular feathers they cover as primary, secondary, or tertial coverts. Greater tertial coverts are those greater coverts that overlie the tertials. They are designated separately because they are sexually dimorphic in adults of several species and often molt with the adjacent body feathers. The degree to which these feathers are replaced is quite variable, even among closely related species. Southern nesting duck species may initiate upperwing molts in the fall rather than in the spring. Fall wing molting occurs among wood ducks, mottled ducks, and whistling ducks. Such molting reduces the accuracy of immature wing identification in the fall and winter.

Male wings on most North American ducks are slightly larger than those of females. For a few species, this difference is large enough to permit separation of the sexes using wing measurements. The procedure for measuring duck wings applies to both fresh wings and wings with varying degrees of stiffness, as they are commonly received through the Waterfowl Parts Survey. To ensure uniformity, all measurements are made using a standardized procedure and measuring board (Figure 2). Measurements are referred to as wing notch-length.

Tables have an advantage over keys in that the color, shape, or texture of a particular group of feathers can be compared on one page across the four age and sex categories. Unlike keys, tables do not lead one directly to the answer. Despite this limitation, most people prefer tables to keys. Therefore, tables are used in this publication to present information on individual species. Wing characteristics are not always listed in the same sequence for each species. They are listed in the sequence in which they can be most efficiently used. A brief narrative, which identifies the most frequently used wing characters in a table, accompanies most tables.



Place the heel of one hand over the end of measuring board and grasp wing in the area of the radius and ulna. Pull until wooden block seats tightly into the notch at the bend of the wing. Flatten the leading edge of the wing and note the length of the wing at the longest primary.

Note: If primary quills are not completely grown, the measurement is not valid.

Figure 2. Procedure for measuring wings

MALLARD

Sex Determination

The white bar anterior to the speculum extends onto the greater tertial coverts on all female wings but terminates at the proximal edge of the speculum on nearly all male wings. Approximately 2½–3 percent of males show some white edging on their tertial coverts. Adult males can be identified because the white is not continuous with that over the secondaries. Immature males with white over the tertial coverts are difficult to tell from immature females. The white bar is the easiest sex character to use, because of its high degree of reliability and the fact that it is rarely lost when a wing is detached.

Vermiculated scapulars are found only on males. Early in the hunting season (September and October) many males possess barred scapulars which are remnants of their summer plumage.

Proximal underwing coverts are vermiculated or flecked on adult and most immature males. These feathers are barred on females and on a few immature males.

Age Determination of Males

Immature tertials are often frayed and faded, usually narrow, and lack the pearly color of adult tertials. By late November immature tertials are replaced by first winter tertials, identical in appearance to adult feathers. At the same time, immature tertial coverts may be replaced by coverts which are broader, unfrayed, and similar to adult coverts and thus differ from adjacent immature coverts, which have not been molted. Many immature males have light edging on the inner webs of the most distal primary coverts. Adult males do not show this character. Middle coverts of immatures are narrower and more trapezoidal than those of adults. Occasionally, these feathers on immature males are worn and/or have light edges. This type of edging does not occur on the middle coverts of adult males.

Age Determination of Females

Tertials that are frayed and/or faded are remnants of immature plumage and are found only on immature ducks. Tertial coverts of immatures are often frayed, faded, and narrow, and the two most proximal often lack the white of the speculum bar. As with males, greater tertial coverts of immatures may be replaced. Conspicuous light edging on the inner webs of the four most distal primary coverts is found only on immatures. Adults may have minute or no edging on these coverts. Middle coverts of immatures tend to be narrow and trapezoidal, while those of adults are broadly rounded.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Vermiculated or barred or both		Barred	
Proximal underwing coverts	Flecked to vermiculated		Barred	
	[redacted]	Sometimes barred		
Greater tertial coverts	Dull gray to reddish brown, no white edging		Brown, one or more with white edging	
	Tips form smoothly rounded arcs, rarely frayed or faded; edging usually broad extending well toward body	Tips generally slightly triangular to trapezoidal; often much frayed or faded		Tips form smoothly rounded arcs, rarely frayed or faded; edging usually broad extending well toward body
			White edging often narrows proximally	
		After molt: Similar to adult male	After molt: Similar to adult female	
Tertials	Broad, pearly gray, no edging, rarely frayed or faded. May be growing in October	Small, narrow, brownish, often frayed or faded near tips. Adult type feathers may be growing in December or later		Varies from pearly gray to brownish, often light edging; rarely frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser coverts	Broadly rounded; solid gray to brown; no edging	Slightly triangular to trapezoidal; often frayed or faded; usually brown		Broadly rounded; brown; usually with light brown edging; sometimes no edging
		May have fine edging or no edging	Edging varies from conspicuous to absent	
Primary coverts	No edging	Inner web of four most distal have light edging or no edging	Inner web of four most distal without edging to conspicuous edging	Inner web of four most distal with light edging or no edging

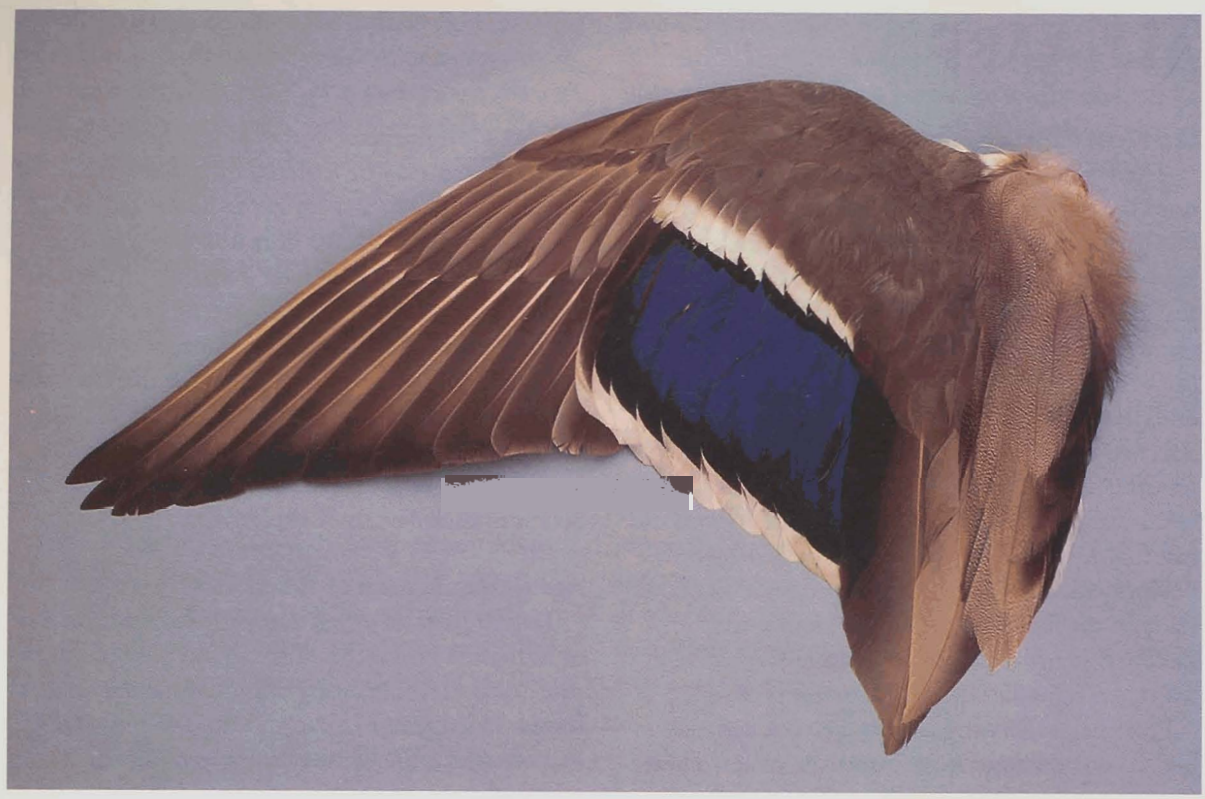


Figure 3. Adult male mallard

Figure 4. Adult female mallard with edged coverts

Figure 5. Adult female mallard with unedged coverts

Figure 6. Immature male mallard with immature tertials

Figure 7. Immature male mallard with edged coverts

Figure 8. Immature female mallard with edged coverts

Figure 9. Immature female mallard with unedged coverts

American Black Duck

Age Determination

Because wings of the sexes are similar, it is easier to determine the age of black ducks before attempting to identify their sex. Tertials small, narrow, and frayed and/or faded near their tips are remnants of immature plumage. Adult tertials are longer and wider and are not frayed or faded. Tertial coverts of the immature plumage tend to be narrow, somewhat trapezoidal, and frequently frayed and/or faded. Those of adults are wide, broadly rounded, and rarely frayed or faded. During their first fall and winter, a substantial fraction of the immatures may replace both their immature tertials and tertial coverts with adult-type feathers. Thus, it is important to look closely at the middle coverts immediately anterior to the tertial coverts for indications of the trapezoidal shape, duller color, and wear that indicate immaturity. Primary coverts of many immatures have light edging on their inner webs. This type of edging does not occur on adults.

Sex Determination of Adults

Adult male tertials are more than 90 mm. long from the edge of the longest tertial covert to the tertial tip, and acutely pointed with some pearly color on the outer webs. Tertial coverts have broad edging which is pale brown. Middle and lesser coverts are broadly rounded and unfrayed. The notch-length of 94 percent of the adult male known-age specimens was greater than 281 mm.

Adult female tertials are less than 90 mm. from the edge of the longest tertial covert to the tertial tip, and they are rather bluntly pointed. Pearly color generally does not occur on the outer webs. Tertial coverts have broad edging which is pale brown. Middle and lesser coverts are broadly rounded and unfrayed. The notch length of 94% of adult females was less than 281 mm.

Immature tertials less than 88 mm. from the longest covert to the tertial tip are from females and longer tertials are from males.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Broad; tips often acutely pointed; usually pearly gray-brown colored; no edging to narrow light edging; not frayed or faded	Small; narrow; often frayed or faded		Broad; tips often bluntly pointed; rarely pearly colored; usually wide to narrow light edging; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	Broad; often light edging; tips are smoothly arced; not frayed or faded	Often somewhat narrow and trapezoidal; may be frayed or faded		Broadly rounded; usually more light edging than males; tips are a smoothly rounded arc; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser secondary coverts	Tips form smoothly rounded arcs; may have light edging or no edging	Slightly triangular to trapezoidal; often somewhat frayed or faded; may have edging or no edging; tendency toward edging only on tips		Tips form smoothly rounded arcs; may have light edging or no edging
Greater primary coverts	Four most distal do not have light edging on inner webs	Four most distal often (but not always) have light edging on inner webs		Four most distal do not have light edging on inner webs
Notch-length	94% > 281 mm.	93% > 273 mm.	94% < 273 mm.	94% < 281 mm.

Figure 10. Adult male black duck

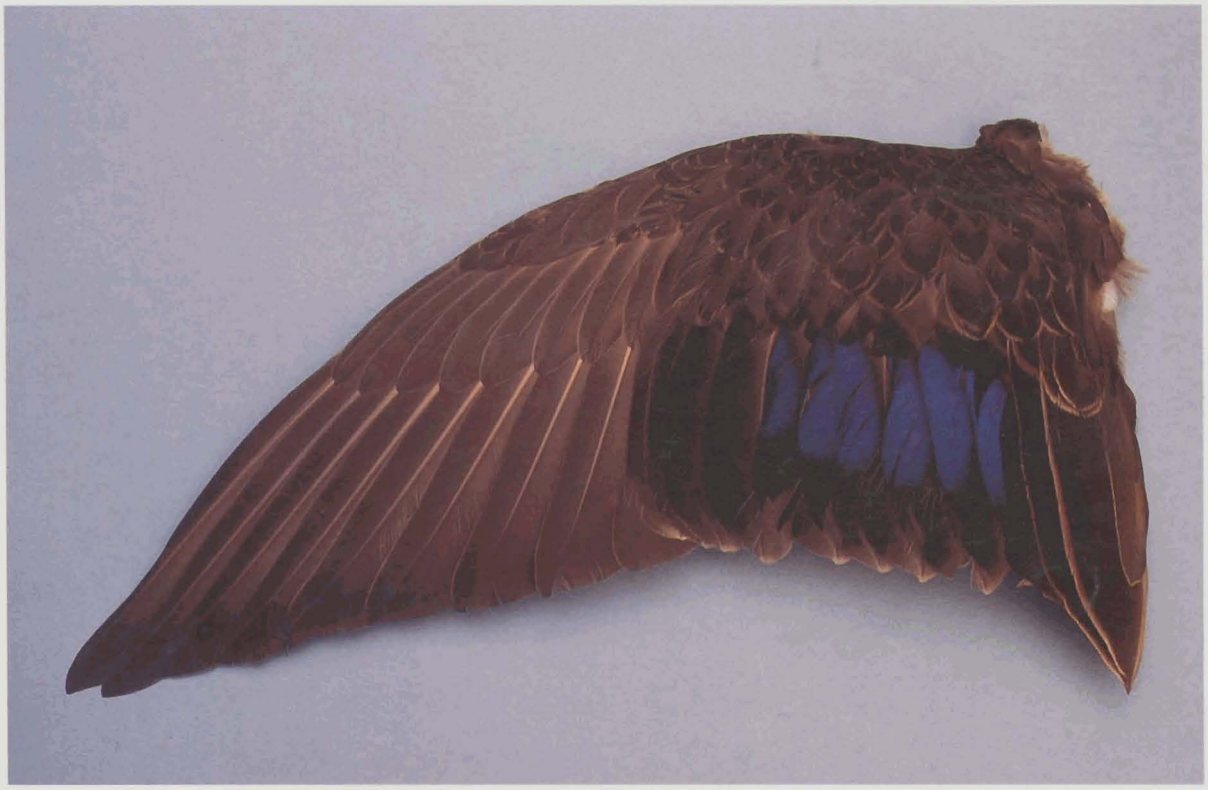


Figure 11. Adult female black duck

Figure 12. Immature male black duck

Figure 13. Immature female black duck

Mottled Duck

Because mottled ducks are southern nesters, most immatures have replaced both tertials and greater tertial coverts at the time hunting occurs. Careful scrutiny, however, will usually reveal one or more faded coverts in this area. These are remnants of the immature plumage. Sexual identification is difficult. Wings of males are generally longer than those of females, but there is considerable overlap. Birds with three or more non-iridescent secondaries are virtually all females, but birds with only one or two non-iridescent secondaries may be of either sex. The greater tertial coverts of females tend to more heavy edging than those of males, but the two types grade together.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Usually acutely pointed; covert to tertial tip often > 90 mm.; lack internal markings	Similar to adult males; lack internal markings	Similar to adult females; internal markings often present	Often bluntly pointed; internal markings often present
Greater tertial coverts	Broadly rounded; edging varies from broad to narrow	Usually similar to those of adult males; often one or more narrow and frayed or faded	Usually similar to those of adult females; sometimes one or more narrow and frayed or faded	Broadly rounded with heavy tan edging
Secondaries	Normally, only one or two are not at least partly iridescent	Normally, only one or two are not at least partly iridescent	Approximately 80% of the wings have at least 3 non-iridescent feathers	Approximately 75% of the wings have at least 3 non-iridescent feathers
Notch-length	81% > 255 mm.	84% > 251 mm.	81% < 250 mm.	86% < 254 mm.

Figure 14. Adult male mottled duck

Figure 15. Adult female mottled duck

Figure 16. Immature male mottled duck

Figure 17. Immature female mottled duck

GADWALL

Sex Determination of Adults

Greater, middle, and some lesser coverts of adult males are mostly either black or cinnamon. On adult females, black and cinnamon feathers are much restricted to the posterior three or four rows of coverts. Tertials of adult males are long, acutely pointed, silver-gray without edging or tipping. Those of adult females are much shorter, more bluntly pointed, and silver-brown with cream colored tips. Greater tertial coverts of adult males are part black and part gray, rarely with traces of white tipping. Those of adult females are similar but usually well tipped with white. Marginal coverts of adult males are without edging but have arcs of narrow vermiculation. On adult females, these feathers are similar to the lesser coverts and often have edging but may be either plain or with wide internal bars or arcs. Post humerals of adult females usually have cream edging at their tips. Those of other ages and sexes do not have this edging.

Sex Determination of Immatures

Tertials of both sexes are short, bluntly pointed, and often frayed at their tips. They are quite similar to those of adult females. In late fall, they may be replaced by sexually dimorphic adult-type tertials. Greater tertial coverts of both sexes usually appear part black and part gray and are tipped with cream. They are narrower and more pointed than those of adults. Greater, middle, and some lesser coverts of immature males have some black and/or cinnamon in three or more rows. Immature females usually have little or no cinnamon color and black is often restricted to two rows of coverts. Some males show arcs of narrow vermiculation. Both sexes may show pale barring, which is usually wider on females. Notch-length measurements are useful to identify immatures by sex, as long as the shafts of the primary feathers have hardened. In 90 percent of the specimens measured, immature male notch-lengths were equal to or greater than 255 mm., while those of immature females were less than 255 mm.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Vermiculated or barred or both		Barred	
Tertials	Long, acutely pointed; silver-gray; without edging; tips not frayed or faded	Small; brownish; bluntly pointed; usually frayed and faded near tips; often pale-tipped		Shorter; bluntly pointed; gray-brown with cream-colored tips which are not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater, middle, and lesser secondary coverts	Cinnamon color present on half the wing; black on three or more rows (if covert bases are considered)	Cinnamon color in one or more rows; some black in three rows; brown coverts narrowly edged with dirty white and with fine central (often arc-shaped) markings	Cinnamon color absent or on covert edges only; black usually on two rows only; brown coverts well edged with dirty white and with coarse central markings	Cinnamon color usually present; black in two or more rows; brown coverts usually well edged and with coarse internal variable markings
Greater tertial coverts	Bluntly pointed; outer webs black; inner webs gray, rarely with traces of white tipping; not frayed or faded	Somewhat pointed; outer webs black; inner webs brown; often frayed and faded at tips		Broadly rounded; usually with white tipping; outer webs black or brown; inner webs brown; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Marginal coverts	Usually with arc-shaped vermiculation	Often arc-shaped vermiculations; otherwise without brown pattern	Brown without pattern	Brown without pattern
Post humerals	Broad, rounded, tips without edging	Narrow; pointed; tips without edging		Broad rounded tips, usually light edging
Notch-length	95% > 262 mm.	90% > 255 mm.	90% < 255 mm.	92% < 262 mm.

Figure 18. Adult male gadwall

Figure 19. Adult female gadwall

Figure 20. Immature male gadwall

Figure 21. Immature female gadwall

American Wigeon

Adult males have a large white upperwing patch, long acutely pointed tertials with black outerwebs, and gray greater tertial coverts that are somewhat pointed and narrowly white-edged.

Adult females have a sharply defined white edging on both greater and middle tertial coverts. Usually the sharp white edging on the middle and lesser coverts is sufficient to identify adult females, however, a few are so lightly colored as to resemble immature males. A careful check of tertials and greater tertial coverts will serve to identify them.

Immature males usually have small, brownish tertials and tertial coverts, but by November these are often replaced with adult male-type feathers. The middle and lesser coverts are gray-brown and indistinctly edged with a lighter gray.

Immature females have small, brownish tertials and tertial coverts similar to those of immature males. By the middle of the fall hunting season these may be replaced with adult female-type feathers. The middle and lesser coverts are brownish with well-defined pale tan edges. Often the greater secondary coverts lack most of the black tipping common to wings of other ages and sexes and their outer webs are brownish gray to gray-white.

Separation of American wigeon wings from Eurasian wigeon wings can be accomplished using the following procedures:

American wigeon

Axillars (if present) entirely white or flecked only at their tips.

Underwing middle coverts all or nearly all white.

Scapulars of males (if present) are heavily vermiculated with reddish brown.

Eurasian wigeon

Axillars (if present) heavily flecked with gray over their entire length.

Underwing middle coverts heavily flecked with gray.

Scapulars of males (if present) are heavily vermiculated with black and white.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Vermiculated or barred or both		Barred	
Underwing	Coverts gray, heavily flecked with white		Coverts brownish; heavily edged with white to gray	
		Occasionally as in females		
Middle and lesser coverts	Entirely white except few over tertials that are gray	Many white to gray-white; others brownish with light centers and poorly defined gray-white edging	Brownish with well defined light brown edges; a few have light centers	Brown; often with light center; each covert nearly circumscribed by a sharply defined white edging
Greater tertial coverts	Gray (including tips); somewhat pointed with narrow white edging	Brown with light gray-brown edging; often frayed and faded		Dark brown; edged with white to form a broadly rounded arc
		After molt: Similar to adult male	After molt: Similar to adult female	
Tertials	Long; acutely pointed outer web shiny black with narrow white edge; inner web dull gray; rachis trimmed with white	Pointed; inner and outer webs brownish; edged with white; often frayed, faded, or both at tips		Somewhat bluntly pointed; outer web brownish gray; rachis not trimmed with white
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater secondary coverts	1/2 inch terminal black band; remainder of outer webs white; inner web gray		Terminal band reduced, poorly defined and/or restricted to proximal coverts; remainder of outer webs brownish gray to dull white; inner webs brownish gray	1/2 inch terminal black band; remainder of outer webs white

Figure 22. Underwings of Eurasian (left) and American (right) wigeons

Figure 23. Adult male American wigeon

Figure 24. Adult female American wigeon (pale type)

Figure 25. Adult female American wigeon (common type)

Figure 26. Underwings of adult male (right) and female (left) American wigeons

Figure 27. Immature male American wigeon

Figure 28. Immature female American wigeon

Green-Winged Teal

If the scapulars are attached, the presence of one or more vermiculated feathers indicates that the wing is from a male. If none of the scapulars are vermiculated, the wing could be that of either a male or female.

The stripe on the most distal tertial is the most useful indicator of sex. On the wings of males, this stripe is black and sharply delineated from the basic feather color. On the wings of females, this stripe is black to brown, but grades into the basic feather color. The sex of approximately half of the immature birds can be identified by measurements. Wings 183 mm. or longer are from males and wings shorter than 175 mm. are from females, but sex cannot be determined from measurements between 176 mm. and 182 mm. A sample of wings from Adak Island, Alaska, green-winged teal (considered a different subspecies) averaged approximately 5 percent longer than wings collected in the lower 48 states. The number of iridescent secondaries differs between sexes. Wings having fewer than four secondaries with completely iridescent green outer webs are usually from females and wings with five or more such secondaries are usually from males. Sex cannot be determined in this manner from wings with four or four and a half iridescent secondaries.

Immature tertials are small, narrow, and rather delicate. The tips of these feathers are often badly frayed. Adult female-type tertials have cream colored edging. Adult male-type tertials are long, without edging, or with narrow edging. The presence of adult-type tertials is not by itself an indication of age. Many green-winged teal molt tertials during the hunting season. For some of these, it is possible to split incoming pin feathers to see whether the new feather is male or female in character. For wings with molted tertials, determination of sex is not possible.

Tertial coverts that are long and narrow, showing fine, light edging, and a frayed fringe are remnants of immature plumage and positively identify the wing as being immature. The tertial stripe may be used to separate the sexes. Adult female-type tertial coverts are broadly rounded with wide edging that is cream or brown. Adult male-type tertial coverts are a uniform gray, sometimes with a narrow buffy edging, and tapering to a blunt point. Adult-type tertial coverts are not a reliable indicator of age.

Middle coverts of adult males are smooth and without edging. Middle coverts of immatures are rough and may show gray-appearing wear at their edges. Immatures may also possess light edging which is more pronounced on females, but may also be present on males. Broad, rounded middle coverts with wide edging are found only on adult females. Traces of immature plumage usually remain most obvious immediately anterior to the tertial coverts.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Vermiculated or barred or both		Barred	
Tertials	Uniform gray; tapering to a narrow rounded tip; unfrayed; rarely have narrow light edging; black longitudinal stripe sharply defined along inner edge; may be molting	Small; narrow; rather delicate tips are often badly frayed; usually buff edging		Buff edging including rounded tips; unfrayed; longitudinal stripe often poorly defined along inner edge; may be brown or black; stripe sometimes well defined; may be molting
		Longitudinal stripe usually black and well defined	Longitudinal stripe usually brown and poorly defined along inner edge	
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	No edging; gray; may be either rounded or pointed; not frayed or faded	Narrow with fine light edging; often faded or frayed to wispy tips		Broadly rounded; usually with wide light edging; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser coverts	Broadly rounded; no edging; gray that matches tertial coverts	Gray with wear around edges; appear ragged; somewhat narrow and trapezoidal; late in year contrast to a variable degree with new (replaced) greater coverts		Broadly rounded; usually with wide light edging but sometimes no edging
Primary coverts	No edging to a trace of light edging on inner web of outer four	Usually with considerable light edging on inner webs of outer four		No edging; or faint, light edging on inner webs of outer four

Figure 29. Adult male green-winged teal

Figure 30. Adult female green-winged teal with unedged coverts

Figure 31. Adult female green-winged teal with edged coverts

Figure 32. Immature male green-winged teal

Figure 33. Immature female green-winged teal

Blue-Winged and Cinnamon Teals

Sex Determination

The speculum of males is a bright iridescent green and that of females is a dull non-iridescent green. Rarely, a female may show a trace of iridescence. The greater secondary coverts of males appear entirely white on their outer webs while those of females are heavily dark spotted and frequently appear more dark than light. A few males may show some spots in the greater coverts.

Age Determination of Males

Tertials of adults are greenish black, rarely frayed, and very long and pointed. They are trimmed with a very narrow tan edging. Tertials of the immature plumage have wide edging which is tan and they are much shorter and more bluntly pointed than those of adults. They are brownish and often somewhat frayed and faded at the tips. Adult-type tertials occur on immatures and are similar to those of adult males but are usually still growing in December. Adult and replaced tertial coverts of immatures are similar, i.e. a dark brownish black without edging but usually showing a blue wash. Immature-type tertial coverts are brown, usually with pronounced edging and tan and usually not washed with blue.

Age Determination of Females

Tertials of adults are much more bluntly pointed than are the immature tertials. In addition, immature tertials frequently become somewhat frayed at their tips. Tertial coverts of adults are usually straight sided to a rounded tip, whereas those of immature birds usually narrow slightly to a rounded tip that often shows traces of fading. Well proportioned white inverted "V's" generally indicate adults.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Secondaries	Iridescent green speculum on many feathers		All feathers a dull non-iridescent green	
Greater coverts	Mostly white to all white		Mostly with dark spots; sometimes predominately dark with little or no trace of white	
	Unspotted or sometimes one spot at tips	Sometimes 2 or more dark spots at tips	Pattern usually other than inverted "V's"	Tendency toward white inverted "V's"
Tertials	Long acute tips; greenish black; without edging to narrowly edged with light brown; not frayed or faded	Pointed dark brown; with light brown edging; often frayed or faded		Pointed blunt tips; well edged with light brown; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	
Tertial coverts	Broadly rounded; dark brown washed with blue; usually without edging; not frayed or faded	Narrow; somewhat pointed; often with light brown edging; may be frayed or faded		Broadly rounded; dark brown usually with pronounced light brown edging; not frayed or faded
		After molt: Similar to adult male	After molt: Similar to adult female	

Figure 34. Adult male blue-winged teal

Figure 35. Adult female blue-winged teal

Figure 36. Immature male blue-winged teal

Figure 37. Immature female blue-winged teal

Northern Shoveler

The presence of white primary shafts separates shovelers from all other North American ducks. All birds having specula that are more than half gray or dull non-iridescent green are females. All males and a few adult females have iridescent green on more than half of their secondaries.

Most females show cream edging on the lesser and middle coverts. This often covers all these feathers, particularly on adult females. Immature males may show a few cream colored edges on feathers near the alula.

The tertials of immature males are brownish and much frayed, while those of adults and first winter immatures are greenish black and much longer. The tertial coverts of the immature male are brownish black and often show a frayed fringe. Adult tertial coverts are blackish, often washed with blue. Both immature tertials and immature tertial coverts are usually present during October.

Immature males generally have small dusky spots on their greater coverts, while adults do not.

The immature tertials of females are similar to those of immature males. The tertials of adult females are wider, not frayed, and more heavily washed with white at the tips.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Acutely pointed; dark, shiny; greenish black; many with white on inner webs	Medium to bluntly pointed, dark brown tips; often frayed or faded; often narrowly edged with white After molt: Similar to adult male	After molt: Similar to adult female	Bluntly pointed; wide; white edging on outer webs; not frayed or faded
Greater tertial coverts	Smoothly rounded; dark brown to shiny black; unfrayed	Brown; often much frayed; with trace of light edging After molt: Similar to adult male	After molt: Similar to adult female	Brown; white edging forms smoothly rounded arc
Secondaries	Iridescent green present on all but most distal 1 or 2	Generally more than half have some iridescent green	Generally less than half have some iridescent green; sometimes all are entirely dull brownish	The number with iridescent green varies from one or two of more proximal to nearly all
Greater secondary coverts	White; dark bases normally covered by middle coverts	White; often with small dark spots at tip; about 1/4 - 1/2 inch of dark base normally shows	White; about 1/4 - 1/2 inch of dark base normally shows	
Middle and lesser coverts	Bright pale blue; without edging but quite pointed	Pale blue but brownish bases usually show; coverts near alula may have pale edging; generally quite pointed	Brownish blue to gray-brown; usually most have pale edges but sometimes entirely plain; generally quite pointed	Bluish to brownish blue; usually most have pale edges and often pale centers; rounded to bluntly pointed

Figure 38. Adult male northern shoveler

Figure 39. Adult female northern shoveler

Figure 40. Immature male northern shoveler

Figure 41. Immature female northern shoveler

NORTHERN PINTAIL

Sex Determination

The speculum is at least partly iridescent green (rarely purple) on males and a dull non-iridescent bronze or rarely non-iridescent green on females. The underwings of most males are flecked to vermiculated; those of a few males and all females are barred. Male adult and first winter tertials are long and gray and the innermost has a wide marginal black stripe. The tertials of females are shorter and more brownish and lack the black stripe. Immature tertials of both sexes are similar and somewhat like those of adult females. Vermiculated scapulars are found only on males, but unvermiculated scapulars may be present on both males and females.

Tertials and scapulars are useful for identifying some males, but not for separating the sexes in all cases.

Age Determination of Males

The most useful character for separating the ages is the condition of the middle coverts. These have light edging on immatures and often appear narrow, and frayed. Some of these feathers persist throughout the hunting season. On adult males, these feathers are not frayed and generally plain. About one wing in 20 shows faint light edging, but the general aspect of these is such that they can readily be identified as adults.

The tertial coverts of the immature plumage have conspicuous edging which is a light yellowish brown. Birds with such wings are immature males. Tertial coverts of the adult-type lack edging and are found on both adult and immature wings. Tertials that lack the black edging are immature. It seems likely that wings with new tertials growing after November are immatures.

Age Determination of Females

The middle coverts of the immature plumage are rather narrow and somewhat trapezoidal. Any barring of these feathers is largely made up of triangular patches at the feather edge. The middle coverts of adults are broad and rounded and any barring is made up of variable shaped patches recessed from the feather's edge.

The tertial coverts of the immature plumage are very frayed, often poorly edged and individual feathers are often long and narrow. The tertial coverts of adult-type plumage are not very frayed, are well rounded, and have conspicuous edging.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Vermiculated or barred or both		Barred	
Underwing	Gray; heavily flecked with white		Alternate brown and white bars	
Speculum	Iridescent green		Non-iridescent; bronze or (rarely) green	
Tertials	Acutely pointed; brownish gray; without edging; black longitudinal stripe surrounding rachis	Brown; most distal with broad black stripe; others with pale stripe near rachis; often frayed	Brown with pale longitudinal stripe near rachis; well edged with pale color; often frayed	Bluntly pointed; dark brown; heavily edged with light brown; outer webs with brownish longitudinal stripe; sometimes slightly frayed
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	Entirely gray; may be somewhat frayed; broadly rounded	Gray with pale edging; somewhat trapezoidal in shape; often frayed	Brown with pale edging; pointed; often frayed	Brown; well marked with pale edging forming a smoothly rounded arc
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser coverts	Gray; without edging; sometimes heavily marked with light flecks; rounded	Gray; light brown edging at tips; sometimes lightly flecked; somewhat trapezoidal	Brown with light edging; often with paired triangular marking merging with edging; somewhat trapezoidal	Brown with light edging; often with paired internal oblong markings separated from edging; rounded

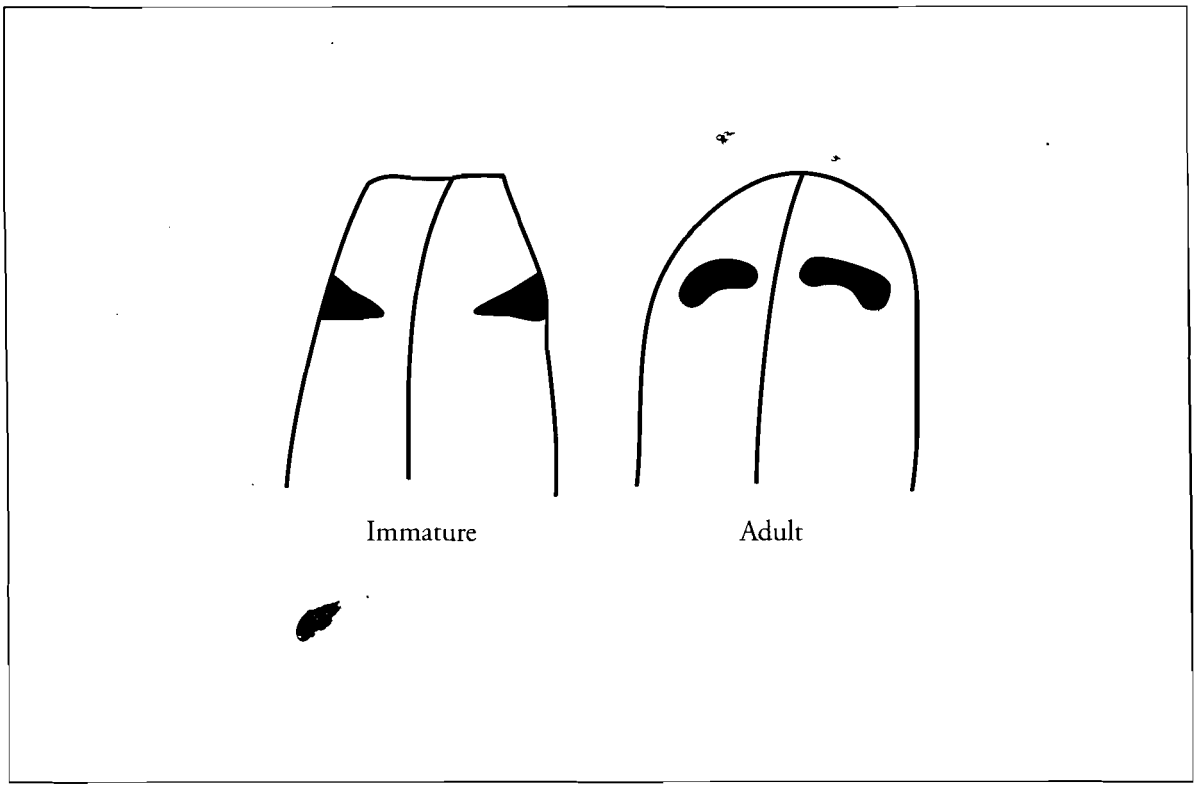


Figure 42. Common middle covert markings of female northern pintail

Figure 43. Adult male northern pintail

Figure 44. Adult female northern pintail

Figure 45. Underwing patterns of male (top) and female (bottom) northern pintails

Figure 46. Immature male northern pintail

Figure 47. Immature female northern pintail

Wood Duck

Sex Determination

The white trailing edge of the secondaries on females is much wider on the outer webs than on the inner webs. On males, this white edge is approximately the same width on both webs. On females, the first secondary proximal to these white-edged feathers is washed with black on the outer web. Males have no black on this feather.

Age Determination of Males

Immature tertials are pale bronze with pointed, usually frayed, tips. Immature tertial coverts are narrow and yellow-green. Most immatures replace both tertials and tertial coverts with dark blue adult-type feathers by late October. As the immature middle and lesser coverts are replaced by the adult-type plumage, the presence of a few dark blue feathers among the duller coverts indicates immaturity. Usually, the dark blue does not extend onto the third row of coverts and is much restricted to the area anterior to the proximal half of the secondaries. Generally, coverts of adults are somewhat wider and tend to lie more smoothly on the wing and the dark blue usually extends on to the third row of coverts and extends farther distally than on wings of immatures.

Age Determination of Females

Immature tertials are pale bronze with pointed, usually frayed, tips. Immature tertial coverts are narrow and yellow-green. Most immatures replace both tertials and tertial coverts with purplish red adult-type feathers by late October. Usually, the blue iridescence is confined to two rows of coverts and is restricted to the proximal half of the immature wing. Adult coverts are somewhat wider and tend to lie more smoothly on the wing. Dark blue usually extends onto the third row of coverts and extends farther distally than on the immature coverts.

Note:

By mid-fall, some immature wood ducks hatched in the southern United States appear to have replaced all of their immature upper-wing coverts. Their wings cannot be distinguished from those of adults.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Secondaries	Dull iridescent blue; tip edged with approximately the same amount of white on both inner and outer webs		Dull iridescent blue; tip edged with white much more widely on outer webs than on inner webs, usually forming a "tear drop"	
Tertials	Same length as secondaries; most distal purple on outer web to feather edge		Same length as secondaries; most distal purple or yellowish on outer web but margined with dull blackish	
	Others: Dark iridescent blue-black; second most distal white-edged at its tip	Others: Bronze-colored pointed with frayed tips		Others: Bronze-colored with rounded tips
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	Broadly rounded; dark blue	Small narrow yellowish to green; often very frayed		Longer than other greater coverts; purple and yellowish with dark square ends
		After molt: Similar to adult male but usually darker than surrounding coverts	After molt: Similar to adult female	
Other upperwing coverts	Greater and middle coverts same color as tertial coverts; bluish color extends anteriorly over three or more rows of coverts	Greater coverts and middle coverts paler than blue tertial coverts; bluish color often confined to two rows of coverts nearest secondaries	Greater coverts often iridescent only on outer webs; blue usually confined to two rows of coverts anterior to secondaries	Greater coverts usually iridescent on both webs; blue extends anteriorly over three or more rows of coverts

Figure 48. Adult male wood duck

Figure 49. Adult female wood duck

Figure 50. Immature male wood duck

Figure 51. Immature female wood duck

HARLEQUIN DUCK

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Distal three are mostly white on their outerwebs and their tips are not frayed	Distal three are dark brown; paler near their shafts; usually frayed at their tips; sometimes an adult-type replacement permits sex identification		Dark gray; blunt and their tips are not frayed
Secondaries	Very dark iridescent blue	Dark brown; often appear ragged		Black, shading to gray; tips smoothly rounded and not frayed
Greater coverts	Two or three have large white spots; all are dark blue	Dark brown; often slightly faded; may appear ragged		Black, shading to dark gray; tips smoothly rounded and not frayed
Middle and lesser coverts	Most are dark blue; usually three have white spots	Dark brown; tips are usually ragged		Black-tipped; shading to dark gray on bases of coverts

Figure 52. Adult male harlequin duck

Figure 53. Adult female harlequin duck

Figure 54. Immature harlequin duck

STELLER'S EIDER

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Sharply curved, outer webs bright blue, inner webs all or part white	Very slightly curved, tips often frayed and faded, inner web varies from dark brown to barely discernable blue		Sharply curved, outerweb bright blue, inner web gray, shading to white at tips
Greater tertial coverts	Entirely white on adults, but with some black tipping on sub-adults	Very dark brown with bluntly pointed tips that are usually frayed and slightly faded		Very dark brown with bluntly rounded not frayed tips
Greater secondary coverts	Entirely white on adults, but some black tipping on sub-adults	Brown with a white tip that is 1/4 inch wide or less and may be reduced to a trace		Brown with a 1/2 inch wide white tip
Secondaries	Outer webs bright blue; trailing edge a 1/2 inch wide white band	Outer webs dark brown usually with a faint bluish cast; trailing edge a 1/4 inch wide white band		Outer webs bright blue; trailing edge a 1/2 inch wide white band

Figure 55. Adult male Steller's eider

Figure 56. Adult female Steller's eider

Figure 57. Immature Steller's eider

Separation of Redhead and Canvasback

Adult male canvasbacks have much more white on the upper surface of their wings than any other age-sex category of redhead or canvasback. All other canvasbacks have much darker secondaries than those of all redheads. Thus, the contrast between secondary coverts and secondaries is greater on wings of redheads of all age and sex groups than it is on the wings of adult female or immature canvasbacks of either sex.

REDHEAD

Immature greater coverts are narrower, squared, often frayed to a point over the tertials with an indistinct pale tip over the secondaries. During the hunting season, immature birds occasionally replace both their immature tertials and greater tertial coverts with adult-type feathers. For a given sex, these new feathers are indistinguishable from those of adults but differ markedly from other immature greater and middle coverts which are retained. With practice, redheads can be aged primarily by the appearance of their tertial coverts. Several combinations are possible: 1) immature-type tertial coverts always indicate an immature bird but sex is best determined from other coverts; 2) adult male or adult female-type coverts similar to the surrounding coverts indicate an adult of that sex; 3) adult male or adult female-type tertial coverts that differ from the surrounding immature-type coverts indicate the sex of some immature birds.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Usually taper to a rounded point; some well vermiculated	Usually frayed to a sharp, ragged point; without flecking or vermiculation		Usually taper to a rounded point, without flecking or vermiculation
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	Broad, smoothly rounded and flecked or vermiculated	Appear narrow, and usually have ragged pointed tips		Broad, smoothly rounded without flecking or vermiculation
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser coverts	Broadly rounded; may vary from entirely vermiculated to lightly flecked	Often narrow somewhat toward tips; tips often appear notched		Broadly rounded and entirely plain to faintly flecked near their tips
		Flecking may vary from conspicuous to barely discernable	Entirely plain	

Figure 58. Adult male redhead

Figure 59. Adult female redhead

Figure 60. Immature male redhead

Figure 61. Immature female redhead

CANVASBACK

Age and sex determination is probably easier for canvasbacks than for any other species. All upper wing coverts and tertials on adult males are so heavily flecked and/or vermiculated as to cause the entire wing to appear white. Wings of other canvasbacks vary from gray-brown to heavily frosted gray. During the hunting season, a high fraction of immatures replace both immature tertials and tertial coverts with adult-type feathers which differ markedly from the remaining immature coverts. These form several combinations with other coverts: 1) immature male or immature female tertial coverts always indicate immatures, 2) adult male or adult female tertial coverts but all remaining coverts immature male or female also indicate immatures, 3) entire upper wing covered by adult male or adult female-type feathers indicate adults.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Tips usually rounded; overall appearance white due to heavy vermiculation over entire length of feathers	Tips usually frayed to a point; overall appearance gray		Tips usually rounded; overall appearance gray, flecked with white near tips
		Lightly vermiculated to heavily flecked with white	Plain to faintly flecked with white near tips	
		After molt: Similar to adult male and much whiter than other wing feathers	After molt: Similar to adult female	
Greater tertial coverts	Broadly rounded, not frayed and so heavily vermiculated as to appear white	Narrower, and often frayed to a point		Broadly rounded, not frayed and heavily flecked with white near tips of individual coverts
		Vary from heavy to light evenly distributed flecking	Vary from barely discernable flecking to unflecked	
		After molt: Similar to adult male and much whiter than other wing feathers	After molt: Similar to adult female	
Middle and lesser secondary coverts	Overall appearance white; heavily vermiculated; broadly rounded shape	Tend to narrow toward tip giving them a slightly trapezoidal shape		Overall appearance heavily frosted gray, well flecked with flecking generally concentrated near ends of individual coverts; broadly rounded shape
		Heavily flecked to lightly vermiculated; overall appearance heavily frosted gray	Plain to lightly flecked; overall appearance gray to brownish gray	

Figure 62. Adult male canvasback

Figure 63. Adult female canvasback

Figure 64. Immature male canvasback

Figure 65. Immature female canvasback

Separation of Greater and Lesser Scaups

A white wing stripe normally extends onto the primaries on greater scaup but is confined to the secondaries on lesser scaup. There are exceptions. The stripes may not conform on a few male lesser scaup with unusually white wings or female greater scaup with unusually dark wings.

Approximately 94 percent of scaup wings can be correctly assigned to species using wing length, provided the age-sex class of each wing is known. The following points will identify greater scaup in each age class: adult males > 213 mm., adult females > 206 mm., immature males > 209 mm and immature females > 203 mm. Wings in each age class that are shorter than these measurements are, in most cases, lesser scaup.

Because the two species are similar, the following discussion pertains to both. Scaup differ from most other species of the same genus in that they rarely molt tertial coverts during the hunting season (October-January). Other characteristics useful for age-sex identification do not vary greatly, and once a person has learned to recognize them, wings of scaup are relatively easy to classify. Although characteristics that separate ages and sexes are similar for both species, they are not identical, and each is presented in a separate table.

Greater Scaup

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Heavily vermiculated; appear more white than dark	Lightly vermiculated and/or flecked with white; appear more dark than white		
		After molt: Similar to adult male	After molt: No obvious change	
Tertials	Black, some flecked with white near tips, tips pointed and often drooping	Black, usually without flecking; tips pointed, usually frayed and faded	Dark brown, without flecking; tips pointed, usually frayed and faded	Black to very dark brown; without white flecking
Greater tertial coverts	Black, without flecking to very lightly flecked with white near tips; broadly rounded	Black to dark brown, without flecking; narrow toward tips	Dark brown, without flecking; narrow toward tips	Black to very dark brown without white flecking; broadly rounded
Middle and lesser coverts	Black; all are well vermiculated with white	Black to dark brown with large white flecks to small vermiculations recessed 1/8" from coverts' edge; often ragged and notched at tip	Black to dark brown, without white flecks; often ragged and notched at tip	Black to dark brown, plain or with very small white flecks concentrated near coverts' edge; broadly rounded at tip

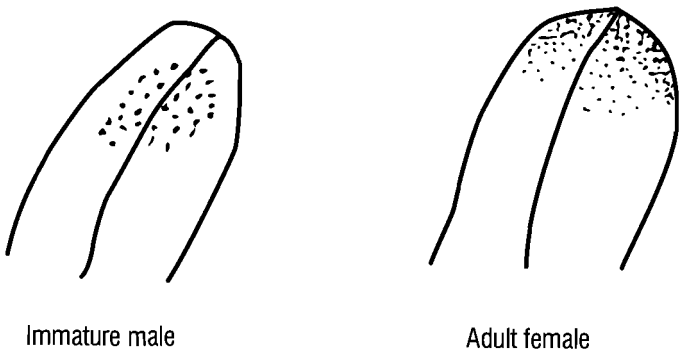


Figure 66. Usual patterns of flecking on scaup middle coverts

Figure 67. Adult male greater scaup

Figure 68. Adult female greater scaup

Figure 69. Immature male greater scaup

Figure 70. Immature female greater scaup

LESSER SCAUP

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Scapulars	Heavily vermiculated; appear more white than black	Lightly vermiculated or flecked with white; appear more dark than white		
		After molt: Similar to adult male	After molt: No obvious change	
Tertials	Black, flecked to vermiculated with white; tips pointed and often drooping	Black, barely flecked to well vermiculated with white; tips usually frayed to sharp point	Black to very dark brown, without flecks of white; tips usually frayed to sharp point	Black to very dark brown; without flecks of white; tips usually bluntly pointed
Greater tertial coverts	Black, flecked to well vermiculated with white; broadly rounded	Black, usually without white flecking, rarely flecked to vermiculated; narrow toward frayed tips	Black, without white flecking; narrow toward frayed tips	Black without white flecks; broadly rounded
Middle and lesser coverts	Black; all are well vermiculated with white	Black with large white flecks to small vermiculations recessed 1/8" from coverts' edge; often ragged and notched at tip	Black without white flecks; often ragged and notched at tip	Tips broadly rounded and smooth; coverts black with small white flecks concentrated at tips or plain

Figure 71. Adult male lesser scaup

Figure 72. Adult female lesser scaup

Figure 73. Immature male lesser scaup

Figure 74. Immature female lesser scaup

Ring-Necked Duck

Age Determination

Ring-necked duck wings should be examined under ideal lighting, preferably daylight rather than artificial light. A high fraction of immatures replace tertial coverts during the hunting season with shiny black feathers that differ slightly from the very dark brown of the other wing coverts. It may be necessary to tilt a wing back and forth to see this difference. If no difference is apparent and all tertial coverts are broadly rounded, the wing is from an adult. If, however, the tertial coverts tend to narrow toward their tips and/or appear frayed and/or notched, the wing is from an immature. Many of the middle and lesser coverts of immatures may also show notches.

Sex Determination

The sexes of approximately half of each age group can be identified from wing measurements provided all primary quills have hardened. Adults with a notch-length of 196 mm. or more are males and those with a notch-length of 188 mm. or less are females. Immatures with wings 194 mm. or longer are males while those with wings 184 mm. or shorter are females. There are a few exceptions to these measurements. There is too much overlap to permit accurate sex determination of adults with wings 189-195 mm. long or immatures with wings 185-193 mm. long using measurements alone.

Adult male tertials are shiny, greenish black and bluntly pointed. The tertials of adult females are similar but slightly less shiny, greenish brown and broadly rounded. Males are usually flecked (often faintly) on the underwing over the radius and ulna. Females are rarely flecked in this area. All of these differences are slight and accurate sex determination is quite difficult. Because some immature males resemble immature females, sex determination of immatures is not completely reliable.

Wing Character	Male		Female	
	Adult	Immature	Immature	Adult
Tertials	Dark blackish, often with faint greenish cast; droop to rounded tip	Blackish to dark brown, usually frayed to a ragged point; straight		Blackish brown, often with faint cinnamon cast; droop slightly to rounded tip
		After molt: Similar to adult male	After molt: Similar to adult female	
Greater tertial coverts	Broadly rounded, dark blackish	Dark brown to blackish; usually narrow slightly to ragged tips		Broadly rounded, dark brown
		After molt: Similar to adult male	After molt: Similar to adult female	
Middle and lesser coverts	Broadly rounded, dark gray-black	Narrow slightly toward tips which are often ragged and may be slightly notched; slightly browner than adults		Broadly rounded, dark brownish
Underwing	White flecking present on small coverts near leading edge of wing most pronounced near body		Small coverts near leading edge brownish, with white edging, rarely with trace of white flecking	
Notch-length	88% > 193 mm.	88% > 189 mm.	86% < 189 mm.	88% < 192 mm.

Figure 75. Adult male ring-necked duck