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## Handbook of Waterfowl Behavior: Tribe Dendrocygnini (Whistling Ducks)

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# The Subfamily Anserinae

This subfamily, by Delacour's classification, contains two tribes, the Dendrocygnini (whistling ducks) and the Anserini (swans and true geese). Both tribes are characterized by the fact that in them the sexes have almost identical plumages and tracheae, and exhibit almost identical behavior. Both tribes are also characterized by a relatively permanent pair bond. Like the magpie goose, they have a characteristic reticulated scale pattern on the surface of the tarsus. Of the two tribes, the whistling ducks appear to be the more specialized, but since they are also more distinctly isolated from the rest of the Anatidae (as indicated by their failure to hybridize with members of any other tribe), and since they exhibit certain anatomical similarities to the magpie goose (Woolfenden, 1961), they will be considered first.

## TRIBE DENDROCYGNINI (WHISTLING DUCKS)

The whistling, or "tree," ducks comprise a group of eight species of world-wide, though primarily tropical, distribution. A single genus, *Dendrocygna*, is generally accepted, and indeed the species form such a homogeneous group that it is extremely difficult to establish intra-generic differences upon which to judge probable species relationships. In most respects, whistling ducks are very gooselike, differing from geese mainly in their more specialized tracheal structure, their whistling voices, and their distinctive downy plumage patterns. They possess relatively long legs and large feet (Fig. 2A), and they can dive remarkably well. Despite being commonly called "tree ducks,"

they do not perch a great deal and only rarely nest in tree holes. All are vegetarians, usually tipping-up or diving for food, though some grazing is also done. Family bonds are strong, and in at least a few species the male assists with incubation. It is not certain how long it takes them to mature, but since they attain their adult plumage at about six months of age, they probably mature in their first year. In all species, the birds of both sexes have whistling voices; furthermore, the birds of many of the species produce distinctive whistling or whirring noises in flight, by vibrating variously indented inner vanes on the outermost primaries. Most species have light-colored upper-tail coverts, like those found in geese, which are conspicuous in flight and probably serve as flight signals in the same manner as those of geese. Adult plumages are rather variable, and the downy plumages appear to be the best indicators of intrageneric relationships. The following sequence is based on these features as well as on behavioral evidence.

#### Spotted Whistling Duck (*Dendrocygna guttata*)

In several respects the spotted whistling duck appears to represent one extreme in the genus *Dendrocygna*. The plumage pattern of the downy young—striped back, large cheek patch, ashy-white base color—closely resembles that of the plumed whistling duck. The adult trachea differs in the two sexes, that of the male being symmetrically enlarged while that of the female is not enlarged and has a dorsal membranaceous area near the junction of the bronchi. This arrangement of the female trachea appears to be typical in all species of whistling duck except the Cuban and the red-billed, in which females lack the membranaceous area. Adults have a unique plumage pattern, most of the body feathers having several rounded light spots arranged linearly and connected by narrow bars. Thus the pattern is quite different from the outwardly similar spotted pattern of the Cuban whistling duck. The same type of patterning occurs, however, on some of the upper flank and axillary feathers of the plumed whistling duck. The outermost primary, being deeply indented, produces a whirring noise in flight. The species is restricted to the East Indies and is sympatric with the wandering whistling duck. No hybrids involving the spotted whistling duck are known.

*General behavior.* This species is a particularly quiet one, both in manner and in voice. The most common vocalizations are a nasal

one-syllable call, *gack*, and a simple whistle, *whee'-ow*, but occasionally I have heard the more complex call *whe-a-whew'-whew*. The only aggressive posture I have seen is the "Head-back" posture. Mutual preening or nibbling is a common form of social behavior.

*Sexual behavior.* This is the only species of whistling duck on which I have no information about copulatory behavior.

### Plumed Whistling Duck (*Dendrocygna eytoni*)

The plumed, or Eyton's, whistling duck appears to bridge the evolutionary gap between the spotted whistling duck and more typical whistling ducks such as the fulvous. The plumage pattern of the plumed downy young is much like that of the spotted downy young, but the former have a smaller cheek patch and are less distinctly striped on the back. The tracheal structure of the plumed whistling duck is very similar to that of the spotted whistling duck. Except that they are uniquely elongated, the flank feathers of the adult plumage are basically the same as those of the fulvous and the wandering whistling duck. The bill of the adult is spotted like that of the spotted whistling duck, but its yellowish iris is unique. The outermost primary is little if at all modified for sound production, but the upper-tail coverts form a conspicuous light buff crescent. The species is restricted to Australia and is sympatric with the wandering whistling duck. Hybrids have been produced in captivity with the fulvous whistling duck.

*General behavior.* The plumed whistling duck strongly resembles the fulvous in its behavior and vocalizations. Its usual call note is a whistled *wa-chew'*, although like the other species it also produces softer, "conversational" notes and a rapid, high-pitched, repetitious whistle in aggressive situations. In threat situations I have seen both the Head-back posture and the Head-low-and-forward (see Fig. 3D). McKinney (1953) has recorded mutual nibbling in this species.

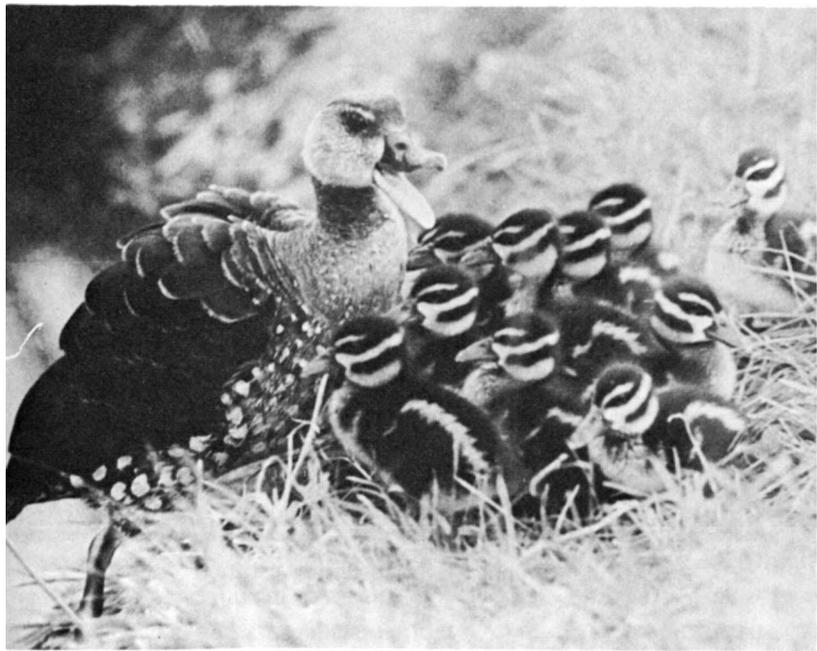
*Sexual behavior.* Wolfgang von de Wall informs me (pers. comm.) that in this species copulation is performed exactly as it is by fulvous whistling ducks.

### Fulvous Whistling Duck (*Dendrocygna bicolor*)

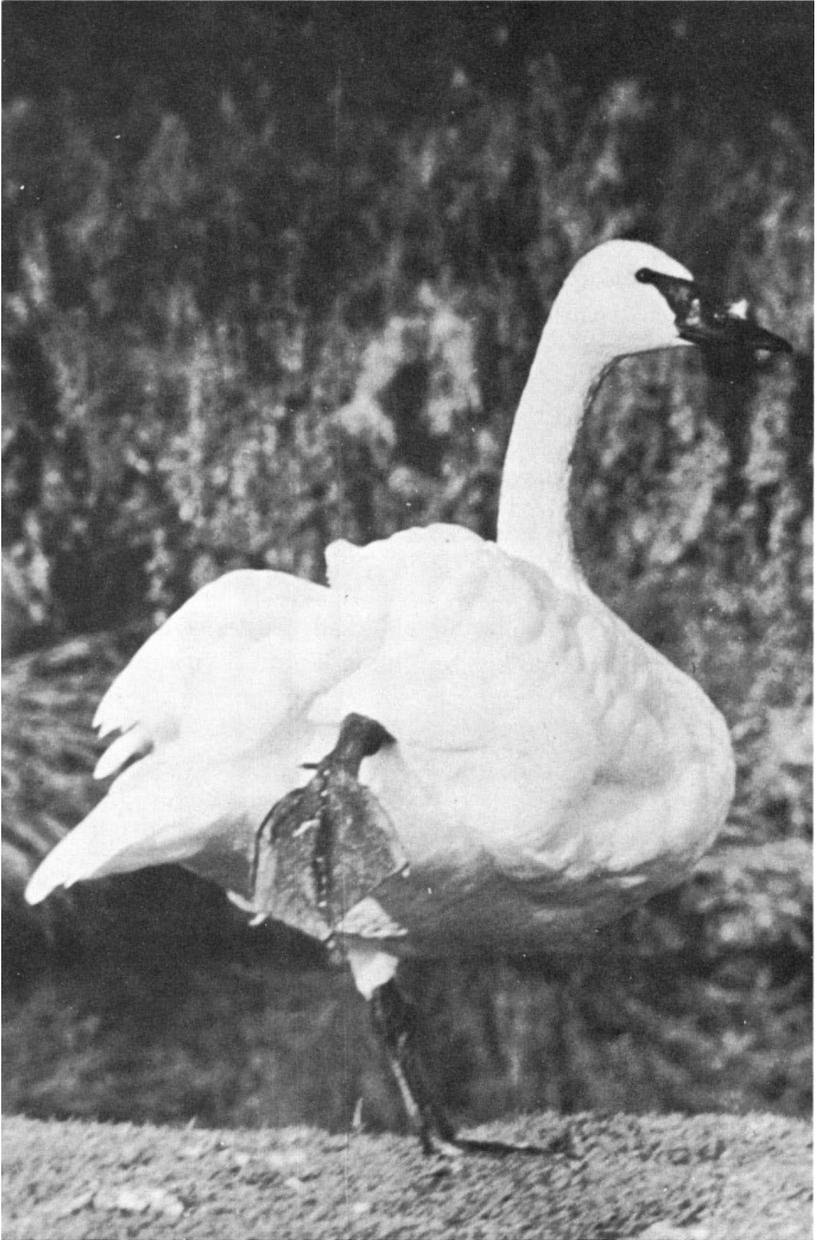
The fulvous appears to be a typical whistling duck which, with the wandering and the lesser, might be thought of as forming the core of the genus *Dendrocygna*. It is undoubtedly a close relative of



Magpie Geese, adults perching in a tree.



Spotted Whistling Duck, female defending brood.



Adult Trumpeter Swan, resting posture.

these two species, especially of the former, which it resembles in its downy plumage. This plumage consists of a dark, unmarked back, an unmarked light cheek, and an ashy-white base color. The tracheal structure is essentially like that of the plumed whistling duck. The adult plumage closely resembles that of the wandering whistling duck, especially in the flank feathers, chestnut upper-wing coverts, and the striated neck feathers. The fulvous does not, however, produce a loud wing noise in flight, and the upper-tail coverts form a conspicuous light buff crescent. The species occurs over an extraordinarily broad range in North and South America, Africa, Madagascar, and India without obvious subspeciation. It is sympatric with the red-billed, white-faced, and lesser whistling ducks, and in captivity has hybridized with the lesser, wandering, plumed, and white-faced whistling ducks.

*General behavior.* The fulvous whistling duck is a fairly noisy and aggressive bird. The usual call note of both sexes is a strong, whistled *wa-kew'*, which is often uttered in flight. Like the wandering and lesser whistling ducks, the fulvous uses lateral Head-shaking as a preflight signal. The usual threat posture is the Head-back; the Head-low-and-forward seems to be used relatively seldom (Fig. 3A). Neither McKinney (1953) nor I have recorded mutual nibbling in this species, which is not highly social.

*Sexual behavior.* Although the fulvous whistling duck is perhaps the best-known species of the entire genus, published information on its sexual behavior is extremely scanty. No observer has yet described what might be considered courtship in this or any other species of whistling duck, thus pair-forming behavior in this group is evidently extremely inconspicuous. It seems unlikely that copulation plays an important role in pair formation for, as with swans and geese, it is largely restricted to the period shortly before nesting. At times I have noticed a presumed male swimming ahead of another bird in a posture similar to the "haughty" courting posture of true geese, but I am not certain that this was true courtship behavior.

Copulatory behavior has been described for this species by Finn (1919) and by Meanley and Meanley (1958). I have observed copulation on several occasions, and in every case precopulatory behavior appeared to consist of mutual Head-dipping (Fig. 2B), which apparently derives from bathing movements. This lasts for a few seconds, after which the male suddenly mounts. Treading goes on

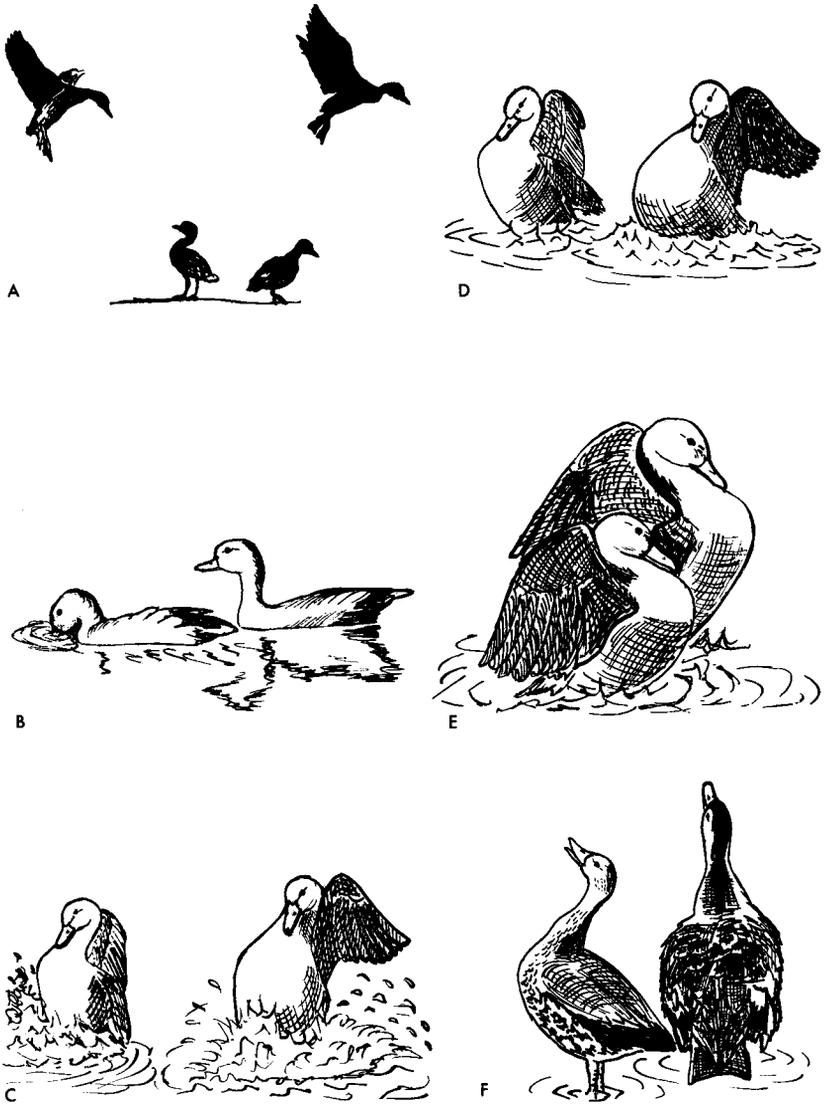


Figure 2. Fulvous and Cuban Whistling Ducks

- A. Adult whistling ducks in flight. Note long legs and large feet.  
 B. Precopulatory behavior, fulvous whistling duck. Male (left) Head-dipping, female with neck erect between Head-dipping movements.  
 C, D. Postcopulatory display, two phases. Note splashing of water caused by vigorous treading of feet.  
 E. Same as C (female in foreground).  
 F. Cuban whistling duck postcopulatory display (male on left).

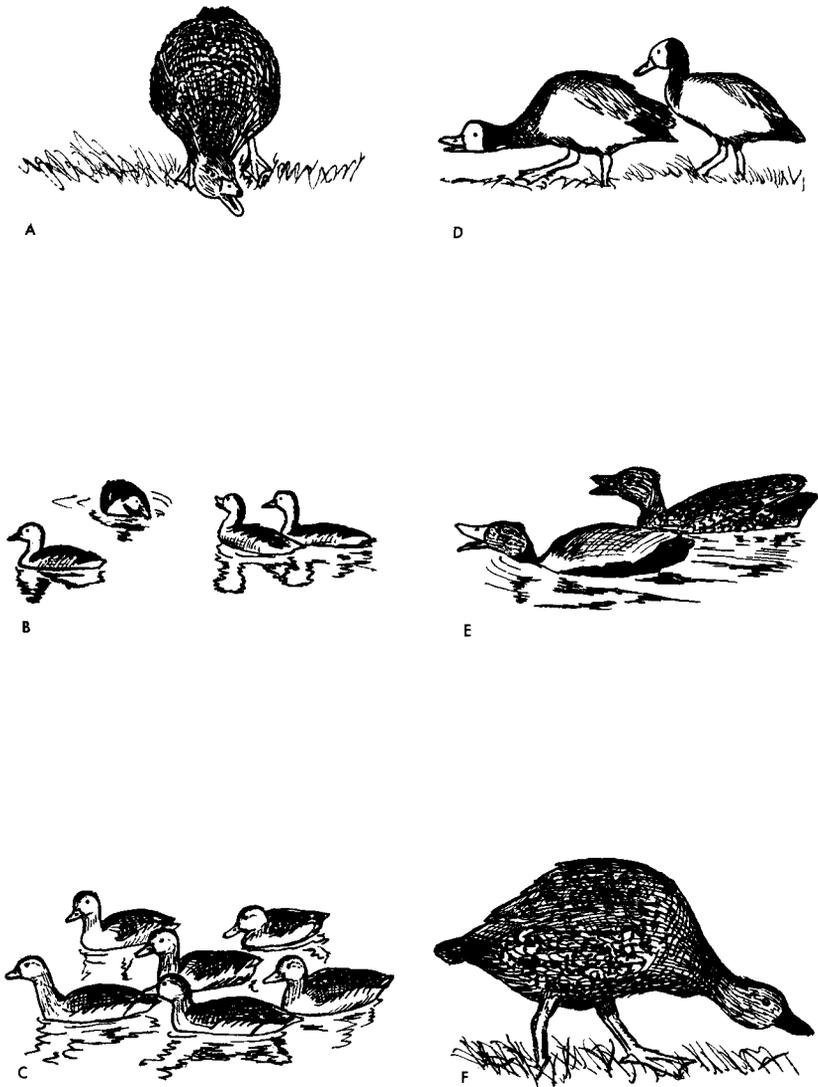


Figure 3. Whistling Ducks

- A. Fulvous whistling duck in Head-low-and-forward posture.
- B. Wandering whistling ducks in Head-back posture, threatening red-billed whistling duck (left center).
- C. Lesser whistling ducks in Head-back threat posture.
- D. White-faced whistling ducks in Head-low-and-forward (left) and Head-back (right) postures.
- E. Red-billed (left) and Cuban (right) whistling ducks, in Head-low-and-forward and Head-back postures respectively.
- F. Cuban whistling duck in Head-low-and-forward posture.

for only a short time, and immediately after ejaculation, apparently, both birds begin to call loudly and the male slips off to one side; then the birds rise up in the water side by side and facing the same direction (rarely opposite directions), tread water in a "Step-dance," and lift the wing on the side opposite the partner (Fig. 2C-E). Slowly the birds assume their normal posture; then they usually swim to shore where they bathe and preen extensively.

### Wandering Whistling Duck (*Dendrocygna arcuata*)

In size, shape, and plumage, the wandering whistling duck falls between the fulvous and the lesser whistling duck. It is practically identical to the fulvous in its downy plumage and its tracheal structure. The adult plumage is a richer brown than that of the fulvous, and the head pattern resembles that of the lesser. The neck striations are not so conspicuous as those of the fulvous. The wings make a marked whirring noise in flight and the first primary is distinctly notched. In addition, the upper-tail coverts form a conspicuous crescent in flight. The species ranges widely over the East Indies and Australia, and has been divided into three subspecies. It is sympatric with the spotted, plumed, and lesser whistling ducks, and in captivity it has hybridized with the fulvous.

*General behavior.* The wandering whistling duck is a less aggressive species than the fulvous, and appears to be somewhat more social. It is not particularly noisy, and its most usual call is a rapid, descending whistle—*wi-wi-wi-wi-wi-wi-whew*—of five to seven notes. I have recorded the Head-back (Fig. 3B) and the Head-low-and-forward postures in threat situations. Both McKinney (1953) and I have observed mutual nibbling.

*Sexual behavior.* In the few copulations I observed, I saw no deviation from behavior typical of the fulvous whistling duck.

### Lesser Whistling Duck (*Dendrocygna javanica*)

The lesser whistling duck is the smallest species of the genus. Its downy plumage falls between the two preceding species and the following ones—its back is spotted, it has a small cheek patch, and its base color is an ashy white. Its tracheal anatomy is much like that of the last species. Its adult plumage is similar to those of the fulvous and wandering whistling ducks, but its back is a bluish gray, and it

has a distinctive yellow eye-ring. Furthermore, its upper-tail coverts are a rich chestnut rather than a pale buff. The inner vane of its outermost primary is strongly modified for sound production (see illustration in Heinroth, 1911). The species occurs in India and through much of southern Asia and the East Indies, and is sympatric with the fulvous and wandering whistling ducks. In captivity it has hybridized with the former.

*General behavior.* This species does not associate with the larger whistling ducks to any great extent, but the birds are gregarious with members of their own species. The call is a high-pitched and soft whistle, and the most frequent call note is a *whi-wheee'*, with the second syllable louder and higher in pitch. Mutual nibbling is frequent among these birds. In aggressive situations they assume the Head-back (Fig. 3C) posture, as well as the Head-low-and-forward, and emit a series of rapid whistling notes.

*Sexual behavior.* If the two copulations I have seen are typical, the sexual behavior of the lesser whistling duck is in some respects different from that of the preceding species. The precopulatory display consisted of the male facing the female and performing "Bill-dipping" movements in the water. The female did not reciprocate, but remained in an erect posture. The male mounted suddenly, and after treading he performed the usual Step-dance of treading water and vertical Wing-lifting while the female responded with only a slight Wing-lifting during the Step-dance. In both cases copulation occurred in water of swimming depth.

### White-faced Whistling Duck (*Dendrocygna viduata*)

The white-faced whistling duck possesses a relatively distinctive plumage pattern and appears to be rather isolated from the other forms. Its downy young have a spotted back, a small cheek patch, and a yellow base color—features which indicate affinities with the two species to be discussed next. Like the females of the typical whistling ducks already mentioned, however, the female of this species has a membranaceous area at the dorsal surface of the trachea near the junction of the bronchi. The plumage of the white-faced adult, with its elongated rather than rounded back feathers, its barred flanks, and its strongly patterned black and white head, is distinctive. The head pattern is of special interest, for it is such that when the bird is seen exactly head on, the entire head appears to be white; whereas

when the bird is facing directly away, the head appears to be entirely black. I suspect that the white face accounts for the great tendency of this species to engage in mutual nibbling (which is generally restricted to the front of the head) and may function as a preening stimulus. On the other hand, all whistling ducks have somewhat darker feathers on the back of the head; hence the white-faced whistling duck seems to have evolved a "compromise" plumage pattern. This species does not have a crescent-shaped upper-tail covert pattern; nor are its outer primaries specialized for sound production. Perhaps, however, the over-all contrast of its body plumage functions as an effective flight signal. The species occurs in South America and Africa, and is sympatric with the fulvous and the red-billed whistling duck. In captivity it has hybridized with both of these species.

*General behavior.* This species is highly social and, as mentioned, engages in mutual nibbling to an extent not found in any other of the whistling ducks. Its most common call notes are distinctive, and might be written *wee-a-whew'*. In aggressive situations it frequently assumes the Head-back and the Head-low-and-forward positions (Fig. 3D).

*Sexual behavior.* I have not observed copulation in this species, but D. F. McKinney (pers. comm.) has observed one instance of it. The birds were swimming about six inches apart and dipping their beaks in the water. One bird (probably the male) rolled its cheeks on its back several times. Copulation lasted only a few seconds. Afterward both birds stood in the water and paddled with their wings open. They then preened. This suggests that mutual Bill-dipping is the precopulatory display and that this species performs the usual postcopulatory Step-dance and Wing-raising.

### Cuban Whistling Duck (*Dendrocygna arborea*)

The Cuban, or black-billed, is the largest of the whistling ducks. Its downy plumage consists of a spotted back, a large cheek patch, and a light yellow base color. The female syrinx lacks a membranaceous area on the dorsal surface; thus it conforms in structure to that of the red-billed whistling duck. The adult plumage, although outwardly similar to that of the spotted whistling duck, differs from it in that the flank spots are not rounded and linearly arranged, but are rather more irregular in shape and occurrence. The upper-tail coverts do not form a light-colored crescent, and the wings are not modified

for producing noise, but when the wings are extended their upper surface presents a pattern of ashy gray against a darker background that is conspicuous in flight and corresponds exactly to the white wing-pattern found in the red-billed whistling duck. The Cuban species is, in fact, so much like the red-billed whistling duck in so many respects that it might be considered an island-dwelling, highly modified form which, although deriving from the red-billed whistling duck's ancestors, has obviously achieved the status of a full species. The Cuban whistling duck occurs throughout the West Indies and is not known to be sympatric with any other species, although it possibly has occasional contact with the red-billed whistling duck. These two species have been hybridized at the Wildfowl Trust, but no other hybrid combinations are known.

*General behavior.* This is certainly one of the quietest of the whistling ducks. Its call is uttered only rarely, and is a multi-syllable *wheet-a-whew'-whe-whew'*. Both McKinney and I have recorded mutual nibbling. Threat behavior in this species consists of the Head-back (Fig. 3E) or, much more frequently, the Head-low-and-forward (Fig. 3F) posture. When the latter posture is assumed, the scapular feathers are ruffled and the bill is pointed slightly upward.

*Sexual behavior.* In this species, as in the following one, copulation occurs when the birds are standing on the ground at the edge of the water. Both sexes repeatedly Drink, until the male finally and rather deliberately mounts. As treading is completed, the male drops to the ground, and immediately both birds rear back to a very erect posture, raise their bills high, and call loudly (Fig. 2F). The male then rather stiffly "parades" in front of the female as they slowly depress their ruffled feathers and assume normal postures. That the copulatory behavior of the Cuban and the red-billed whistling duck is so similar no doubt explains why birds of the two species tend to form mixed pairs and hybridize in captivity.

### Red-billed Whistling Duck (*Dendrocygna autumnalis*)

The red-billed, or black-bellied, whistling duck occupies an extreme position in the genus *Dendrocygna*. The downy plumage is distinctive, and includes a spotted back, a large dark cheek patch, and a bright yellow base color. The tracheal structure is like that described for the Cuban whistling duck. The adult plumage pattern—black abdomen, extensive white on the wings—differs from that of any

other whistling duck. Although there is no crescent of color on the upper-tail coverts and the wings do not produce special sounds in flight, the upper surface of the wing does flash a brilliant white when the bird is flying. The species occurs from the southern tip of the United States through most of South America, and two subspecies are recognized. It is broadly sympatric with the fulvous and the white-faced whistling duck, and possibly also with the Cuban. Hybrids with all these species have been obtained in captivity.

*General behavior.* The red-billed whistling duck is a highly vocal and noisy bird, and its usual call is more musical than that of any other whistling duck. The call consists of from five to seven notes, and can be written as *weech*, *wha-chew'-whe-whe-whew* or *weech*, *wha-chew-whew-whew'*. (The introductory note is sometimes omitted.) It is uttered very frequently when the birds are in flight. Neither McKinney (1953) nor I have observed any mutual nibbling, although the birds are highly social. The usual threat behavior is the Head-low-and-forward posture (Fig. 3E) accompanied by the usual whistling notes, which rise and descend in pitch.

*Sexual behavior.* Meanley and Meanley (1958) have described copulation in this species; my observations are very similar. Treading appears normally to occur on land or while the birds are standing in shallow water. As a precopulatory display the male performs repeated Drinking movements, which the female may also perform. After treading, the male slips off to one side, and the birds stand side by side, calling mutually. The male usually lifts slightly the wing opposite the female, but this is not very noticeable, and unless one looks particularly for it one is not likely to see it.

## TRIBE ANSERINI (SWANS AND TRUE GESE)

The swans and true geese of the present tribe include about 21 species which are primarily temperate and arctic in distribution, with most forms occurring in the Northern Hemisphere. They are generally large grazing or dabbling birds, and all are highly social and have strong family bonds. Plumage patterns are the same in both sexes and tend to be relatively simple, with visual signal characteristics generally restricted to the bill, head, and rump. For the most part the species are very vocal, and in the true geese vocalizations probably reach the highest degree of development in the entire family. In all species the trachea is relatively simple in both sexes and lacks a bulla,