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# Table of Contents



*Inside back cover:* T.O.S. activities collage
*Back cover:* Great Kiskadee painted by Natasja Van Gestel, Second place T.O.S. Art contest

Young Burrowing Owls from a painting by Ramiel Papish.

# Behavior of a Group of Juvenile Masked Ducks

***By Mark B Bartosik***

Information on the general behavior and biology of the Masked Duck *Nomonyx dominica* is meager. Its nesting in Texas has a long, but poorly documented, history. Several authors list possible or probable nesting records, but only one at Anahuac National Wildlife Refuge, Chambers County, in October 1967, was accepted as confirmed. Secluded habitats, often a part of privately own land, and a secretive way of life are probably the major reasons that make the task of finding nesting sites of this small and elusive duck so difficult.

On October 23, 2007, a local birder, Ronald (Ron) Wood, discovered a brood of 8 ducklings associated with an adult female, foraging on small private ponds in Live Oak County, Texas. A male, in non-breeding plumage, was also seen at the same location by Mr. Wood and confirmed by additional birders. The site, in a lowland area has two small seasonal ponds located across from each other on both sides of the road. The pond where I observed the juvenile ducks had no emerging green vegetation at that time—only a few leafless shrubs and dried stems partially covered by water. On one side, this pond has a small wooded area with

Photo 1: Nov 19—Two Wing-and-leg-stretches performed by juvenile Masked Ducks that ended with putting the head with an outstretched neck on the water surface, the bill slightly dipped in the water and sometimes an outstretched leg. Photo by Mark B Bartosik

a muddy shoreline under the trees. The other sides of the pond have a grassy shoreline. A large drainage pipe runs under the road and connects the two ponds, but the water level during my visits was below the pipe openings. The ducklings probably were using this culvert to walk from one side of the road to the other as they were observed to utilize both ponds during their growth period. According to Ron Wood's description (personal communication), all the ducklings on the day he found them were still in natal plumage and were about one-third to one-half the size of the female. A clutch of a single Masked Duck generally has 4–6 eggs and larger clutch sizes probably are the result of egg laying by more than one female, a behavior known as egg-dumping. As many as 27 eggs were reported in a single nest in Argentina. The batch of at least 8 ducklings found in Live Oak County suggests the possibility that more then one female was involved in laying eggs.

My first visit to observe and photograph the behaviors of the juveniles was on November 19, 2007. At that time both adults were already gone and only 6 juveniles were present. There is no information available for the Masked Duck, but its close relative the female Ruddy Duck generally abandons her brood when the ducklings are 4–5 weeks old. On that day I spent a total of about 8 hours (from 8 AM to 5 PM with about a 50-minute break during the midday hour) observing and documenting their activities. I also took photographs documenting their molting stage. The late arrival was caused by extremely dense fog in the morning. On that day I left before sundown. The second visit lasted two full days. On December 1 and 2, I arrived a half-hour before sunrise and left a half-hour after sundown. To take photographs and to register the times of the recorded observations, including times of the dives and rest periods between dives, I used Canon digital cameras (40D and 20D) with a 500mm f4 L IS lens coupled with a 1.4X teleconverter. Shutter lag time on those cameras is estimated to be between 0.1–0.2 second, so my limitation was a time registered only to 1 second on the photograph time stamps. To register diving times, the shutter was pressed when the duck submerged and an "empty" photo was taken by pressing a shutter at the moment the duck surfaced from a dive. Data about the foraging time was collected by registering the time when the brood started feeding and again when it stopped for longer periods of preening, exercising the wings, flying or resting. All activity times, other then foraging in the interval between feedings, were summed together, as no individual time records for them were collected.

In this article I present the summary of the data collected on daily activities and behaviors of juvenile Masked Ducks. Those observations include comfort movements, interspecific and intraspecific interactions, and measurements collected when I took samples of juvenile Masked Duck diving times and poses between dive times. Only a few selected photographs from several thousands taken were chosen to illustrate the text. More photographs are available for review at this link: www.pbase.com/mbb /madu_live_oak_county_2007.

**COMFORT MOVEMENTS—General Discussion.**

One of the major purposes of my 3-day observation time was to study and make a photo documentation of the comfort movements of the juvenile Masked Ducks. Terminology used in present literature to describe known avian activities of shaking, stretching, preening and bathing still needs to be standardized. Many authors working in different parts of the world and on different avian taxa have evolved their own terms. In this article I used terminology proposed by McKinney (1965) with a few exceptions. This author uses the term Both-wing-stretch, but I decided to choose the term *Full-body-stretch* as used by Fjeldså (2004). The name *Both-wing-stretch* can be confusing. Stretching both wings at the same time is a first stage of the *Full-Body-stretch* and usually is followed in a continuous motion with a *Neck-and-bill stretch* to complete a *Full-Body-*

*stretch*. I also separated *Wing-shuffle* and *Wing-fan* from other movements being used at the same time since I often observed those two to be separate movements which were not always performed at the same time. I added the *Foot-stretch* movement used by Fjeldså to the list of comfort movements as on several occasions the juvenile Masked Ducks performed that movement without stretching their wing at the same time. All other comfort movements listed by McKinney and known to be used by members of the tribe Oxyurini, except *Somersaulting*, were observed and photographed. In addition, *Wing-shake*, listed by McKinney as not a documented movement for Oxyurini, was also observed. *Food-pecking, Bill-cleaning* and *Dashing-and-diving* are known to be used by many species of the family Anatidae, and McKinney suggests that those movements are probably used by members of the tribe Oxyurini. Siegfried (1973) states that he observed the Ruddy Duck performing all comfort movements listed for Anatini by McKinney with the exception of *Somersaulting*, but he does not provide a complete name list. During my observations, none of the juvenile Masked Ducks performed those movements. *Shoulder-rubbing* has been observed only in use by members of the tribe Anatini, and McKinney (1965) suspected that it can occur in all Anatidae; however, I did not observe this movement to be used by juvenile Masked Ducks.

## STRETCHING MOVEMENTS

Stretching movements were observed often during both visits and were associated mostly with the end of the resting periods when the juvenile Masked Ducks were preparing to start another period of feeding. *Full-body-stretch* and *Wing-and-leg-stretch* occurred at the end of almost all resting periods and usually were indicators that the ducks were getting ready to start moving and foraging. On several occasions the *Wing-and-leg-stretch* ended with the duck turning on one side with a partially open wing, putting the head with outstretched neck on the water surface, and holding this position for a longer moment with the end of the bill slightly dipped in the water (Photo 1). When it held this position, sometimes the leg was kept outstretched. *Foot-shake* in the form of rapid back kicking of one of the legs, several times in a row, was usually observed after longer periods of resting with the legs tucked under the wings. *Foot-stretch* was observed in similar situations. *Jaw-stretch* was often performed when awaking, but it also occurred during resting times and during short breaks during foraging.

## SHAKING MOVEMENTS

Juvenile Masked Ducks often used shaking movements. During the first visit when the ducks spent the entire day in the water and all their wing feathers were not fully developed, only a few shaking movements were observed. *Swim-shake* was observed often and usually ended with *Head-flick*. *Head-shake* also occurred often, usually during stops between dives or skimming. Several times during resting/preening, the juveniles were *Wing-flapping* for short moments. During the second visit, the juveniles had already fledged and spent some time on shore and on emerged logs. They used more shaking movements in addition to those listed above. *Wing-flapping* occurred quite often, mostly for a longer time to exercise the wings and as preparation for flights. *Body-shake* was performed several times when the juveniles were standing on the ground or in shallow water. A few times I observed the juveniles using a *Wing-shake*. This shaking movement is known to be used by most members of the Anatidae family, and all species of this family are expected to use it; however, it has not been recorded yet in the Oxyurini tribe. At the end of bathing and during preening when standing in shallow water, juveniles often performed *Tail-wag*, shaking their tails with a fast movement for a short moment. *Tail-fan* was also observed a few times and occurred as a separate movement, not used together with *Wing-shuffle*. *Wing-shuffle* was only observed a few times during the second visit and occurred when the ducks were resting on the water surface after bathing/oiling/preening activities. The ducks raised their wings slightly and kept vibrating them intensively for at least several seconds. This movement looked identical to the *Wing-shuffling* of the Pied-billed Grebe (I

Photo 2: Dec 2—Direct method used to scratch the head and neck. Here the juvenile Masked Duck was scratching during a short break between feeding dives; note that a part of the stem brought from underwater is still hanging from the bill. Photo by Mark B Bartosik

observed Least Grebes performing this movement much less often). Siegfried (1973) seems to describe *Wing-shuffling* as 'shivering' and suggests that this movement might be related to low temperatures when the duck is having a reaction to being cold at that moment. However, the juvenile Masked Ducks performed this movement on a warm day.

## SCRATCHING

Scratching, using a direct method, occurred very often during the day. Using the middle toe, juveniles scratched the sides and tops of their heads, throats and necks. Scratching was performed during resting periods, as well as during short breaks during foraging (Photo 2).

## BATHING

Masked Ducks are known to bathe using *Head-dipping* and *Wings-thrashing* movements. No juvenile was observed bathing during the first visit when prejuvenal molt was still far from being completed. During the second visit, all juveniles bathed often, usually starting this activity around the middle of the day and repeating it from time to time during the remaining hours. They usually started with several *Head-dipping* movements and then continued bathing with vigorous *Wing-thrashing* (Photo 3). Baths were taken most often when ducks were swimming on the deeper water, but they also occurred a few times near the shore.

## INTRASPECIFIC INTERACTIONS

During the first visit, the six Masked Duck juveniles stayed together all the time, synchronizing practically all their activities. During the rest breaks, they gathered together, with little distance between them. When resting on deep water, they all tried to anchor their bodies to submerged branches under them. No aggression toward each other was observed. During the second visit when all 4 remaining juveniles were fledged, synchronized activities were more loose; they often broke in 2l2 groups when preening and exercising their wings and sometimes when foraging. Most of

Photo 3: Dec 2—Wing-thrashing when the juvenile Masked Duck is bathing sometimes can be very vigorous. Juvenile Masked Duck vigorously vigorously wing-thrash while bathing.
Photo by Mark B Bartosik

the time they rested together, but with more distance between individuals. And as they often had both legs tucked under the wings during sleep, the water current from a strong wind took some of them several meters away from the group. Sometimes when they floated on the surface, the wind kept turning them around in a circular motion. Occasionally a floating juvenile would put one leg into the water to control its movement for a short time. When alerted during floating, the duck put both legs back into the water and swam back closer to the group; however, getting very close to another sleeping or foraging duck was not always tolerated. Several times when another juvenile got too close, the approached individual took an aggressive pose, stretching out the neck and gaping toward the intruder. A more serious fight occurred only one time when the ducks were feeding. During this incident, both individuals raised the front part of the body above the water and pushed each other's chest, then tried to quickly lower the head and thrust the tip of the bill into the opponent's throat. When it attacked from above after wrestling the opponent's body into the water, it often thrust its bill at the opponent's head from the side. Sometimes after being jabbed in the throat, the duck tried to use its body mass to push the attacker under the water. When wrestling side by side, both opponents pointed their bills toward each other's neck, and the one who was winning at that moment grabbed its opponent's neck. The feet were used either to push the attacker's head away or to push the opponent's head toward the water (Photo 4). The duck that decided to flee was grabbed by the neck from behind and pushed under the water. After getting free, the loser rapidly paddled away. The winning duck did not continue with the chase.

## INTERSPECIFIC INTERACTIONS

Many different species of birds, including other duck species, visited both ponds during my visits, but my presence kept many of them away from the pond where the juvenile Masked Ducks were foraging. There was no interaction with other species during my first visit. The second visit lasted two days; my

Photo 4: Dec 2—Selected frames from the fight that occurred between two juvenile Masked Ducks. Ducks were jabbing each other, wrestling, grabbing the opponent's neck and using their feet to attack and for defense. Photo by Mark B Bartosik

presence was fully accepted by several bird species, and a few other ones kept visiting this pond from time to time.

Wilson's Snipes and Killdeer often foraged along the edges of the pond. Wilson's Snipes sometimes stepped into the shallow water to bathe as well. Even though individuals of both those species were sometimes very close to the Masked Ducks, there was no interaction between any of those birds.

During the two days, one Great Egret spent a lot of time hunting tadpoles in the water and Rio Grande Leopard Frogs in the grassy area around the pond. This individual fully accepted my presence and often walked or even hunted at a distance not much over one meter from me. Small birds like Wilson's Snipes and Killdeer moved away promptly when the egret walked in their direction. The Masked Ducks did not show any reaction when the egret was walking around the pond, but they never swam toward the egret either. Rio Grande Leopard Frogs that were sunbathing on logs sought cover under the water even when the egret was quite far away. The frogs did not show any reaction to the Masked Ducks, even when the ducks were swimming next to them or resting a couple of feet away.

Only one time (shortly before sunset on December 1) other ducks, a couple of Blue-winged Teals, came to feed in this pond. After the teals landed on the water near the shoreline, all four juvenile Masked Ducks immediately swam toward them and continued to follow them very closely all the time during their few minutes' visit.

**Alert posture**

Many diurnal raptors flew over the pond, especially during my second visit, and included Red-tailed Hawk, Harris Hawk, Northern Harrier, Cooper's Hawk and Turkey Vulture. Only the Cooper's Hawk decided to make a few closer passes over the pond and through the surrounding woods. When a raptor was flying in close range, some juvenile Masked Ducks took an alert posture and got ready to flee. Alerted individuals sleeked their plumage and with erected neck and tail (Photo 5) prepared to escape. As the raptor never came too close, I did not observe the actual way they would have run away. Sleeked plumage suggested diving as the means they were going to use to escape.

Photo 5: Dec 1—Alert posture taken by the juvenile Masked Duck when a raptor was making close passes over the pond.
Photo by Mark B Bartosik

Photo 6: Nov 19—Juvenile Masked Duck raising its forehead feathers. Also note the green coloration of the base of duck's bill, showing the same shape and pattern of color as all other juvenile bills in the brood. Photo by Mark B Bartosik

**Raising forehead feathers**

Sometimes the juvenile Masked Ducks raised the forehead feathers (Photo 6) when watching their surroundings. In no observed case did an additional reaction follow which could be seen as a reason for taking this posture. This behavior probably occurs mostly at the times when the duck is agitated by some stimuli which are not strong enough to provoke a more aggressive posture or reaction.

**Least Grebe interactions with juvenile Masked Ducks and waterfowl species in general**

Perhaps the most interesting case of interaction with other species was the case of a single Least Grebe that stayed with the juvenile Masked Ducks most of the time during the second visit. The ducks tolerated the grebe's company almost all the time, and only on a couple of occasions did one of juvenile ducks show an aggressive behavior toward the grebe. In both cases the grebe swam very close to the duck which just outstretched its neck and gaped. The Least Grebe acted immediately by rapidly moving a little farther away, solving the conflict.

## DIVING AND PAUSE TIMES

Only a few authors published data of the diving time length and the pause between dives during foraging periods of the Masked Duck. The most complete data was published by Jenni (1969) and Jenni and Gambs (1974). Measurements were taken in the same place during 3 different years (1963, 1970, and 1972) and show different times of dives and pauses, comparing the years as the pond changed from a wild marsh type to a managed park-like lily pond.

The authors did not specify if the ducks were exposed to any distractions during measured pauses, but they mentioned that a bird on the surface was more apt to be distracted briefly by other stimuli and to interrupt the feeding with preening, drinking, or other behavior. Their published data includes diving and pause times of three diving

Photo 7: Dec 2—Least Grebe synchronizing most activities with juvenile Masked Ducks during the day, including resting breaks. Note the grebe's resting posture with head facing forward, bill tucked under side of neck and both feet tucked under wing and flank feathers. Toes are outstretched and they are visible. The Masked Duck sleeps with the bill tucked into the scapulars and keeps its toes folded when the feet are tucked under the wings (see Photo 8).
Photo by Mark B Bartosik

species coexisting together in one pond: Masked Duck, Least Grebe and Pied-billed Grebe. There is no mention of the age of any of those birds or their number, but there is a note calling them summer residents. As there is no indication of any juveniles present on this pond during their observations, all data published was probably collected while they were observing adult birds. In those papers the authors did not include detailed information about intraspecific or interspecific interactions between observed species.

My collected data of diving and pause times of the juvenile Masked Ducks include only two series of measurements on one diving individual. Those series were separated by a 1 minute 9 second break in collecting data while I observed the activities of another individual. The diving juvenile observed was in an unobstructed view, about 2 meters away from other ducks, on open water and without any noticeable distractions which could impact and extend pauses between dives. The number of measured dives (10), the pauses (9) and an accuracy of 1 second can give only a general idea of juvenile dive and pause times, but the possible correlation observed between the dives and the following pause times provides a starting point when more intensive research in the future could be performed.

The analysis of the measurements shows that usually shorter dives were followed by shorter pauses. The mean ratio between the longest dives and the pauses afterward was 2.9 (2.8–3.4, n=3), and the mean ratio between the shortest dives and the following pauses was 6.7 (6.3–7.0, n=3). The mean ratio of all observations was 4.6 (2.4–7.0, n=8). Measurements also show a possible trend of longer dives at the beginning to shorter ones at the end of an observed series of dives. This trend might be coincidental, and only when more data are collected and analyzed, using several more complete series for comparison, will it be possible to find out if this trend actually occurs more frequently.

The shortest juvenile surface pauses

between dives that I measured, despite only a 1 second accuracy, are much shorter than those registered by Jenni and Gambs (1974) when measuring presumable adult pause times. The mean of the 3 shortest juveniles pauses that I recorded was 3.0 seconds (3–3, n=3) and the shortest single pause reported by those authors was 8.3 seconds.

It is interesting to note that all juvenile Masked Ducks during the last moment of submerging used a powerful kick with both legs outstretched away from the body. On many occasions the feet were visible above the water after the kick and then submerged at the same time as the duck tail (Photo 9). Usually a large double splash was visible above the surface where the feet hit the surface after the duck was already completely submerged.

**FORAGING**

On November 19 all juvenile ducks spent the entire day on the water feeding, mostly by diving, but on several occasions they also strained the surface, mostly by slowly skimming.

On December 1 and 2, practically all feedings were done by diving, and the ducks only sporadically strained the water surface for short times, usually between dives.

It is interesting to note that on the first visit at least one duck, in a couple of feeding sessions, finished the small green part of a stem that emerged about a couple of inches above the water. The stem showed signs of being already `chewed' previously (possibly the day before). With its bill, the duck grabbed the emerged part of the stem and submerged it to work on it. After several tries, the duck left the partially eaten stem, and the same or another duck came back to it several minutes later to finish eating the emerged part in another session (Photo 10).

There were some insects trapped on the water surface. The Least Grebe often picked them up, but I did not notice any of the juvenile Masked Ducks trying to do that or even showing any interest in this kind of food.

Photo 8: Dec 2—Juvenile Masked Duck performing Full-body-stretch after awakening. Note that the foot tucked under the wing has toes folded; the foot is normally not visible with a closed wing.

Photo by Mark B Bartosik

Most diving birds have highly specialized legs adapted for swimming under the water. As a consequence, they have difficulty walking on land. Those legs adapted to swimming and diving are not very well suitable for walking on solid ground, plus their placement toward the back of the body forces the birds to stay or walk `upright' to keep their balance when they leave the water. All observed juvenile Masked Ducks did not show any problems in maintaining a horizontal position when walking or standing on land or logs. In fact, one observed juvenile had no problem with balance when it searched for food when standing on an emerged log. The duck tried to check on a small piece of plant matter and picked it up easily with its bill from below the level of its feet (Photo 11).

Photo 9: Dec 1—Juvenile Masked Duck diving. Note powerful kick with both legs outstretched away from the body.
Photo by Mark B Bartosik

Photo 10: Nov 19—Juvenile Masked Duck feeding on emerged part of the green stem.
Photo by Mark B Bartosik

Photo 11: Dec 1—Juvenile Masked Ducks drinking and probing plant matter near the shore. Note that they have no difficulty keeping a horizontal position when standing or walking.
Photo by Mark B Bartosik

**DAILY FEEDING TIME TABLE**

The daily foraging time during the first visit when the juvenile Masked Ducks were still not fully fledged was much shorter when compared to the fledged birds almost two weeks later. Feeding times on November 19 were taken between 8:00 to 12:53 and 13:44 to 17:00. This counts only for 489 minutes of observation from 635 minutes of total daytime on that day. On that day during those 489 minutes, the juveniles spent 154 minutes (31.5%) on feeding activities and 355 minutes (68.5%) on resting, sleeping and movements.

The data collected on December 1 and 2 included total daylight activities, plus the ducks were observed during the half-hour before sunrise and the half-hour after sundown. On both days the juveniles were active and foraged often before sunrise and after sundown. During the daytime on both days, the juveniles spent about half the day foraging and half the day on resting, sleeping and movements. Total feeding times were similar on both days – 49.9% of total daytime hours on the first day and 52.7% on the second day.

**DRINKING**

Juvenile Masked Ducks drank very often, usually taking 1–3 sips at a time. Most

drinking occurred when the juveniles were on the water, but I also observed them drinking when standing on the ground near the edge of the pond. Juveniles drank sometimes during pauses between feeding dives.

## SLEEPING

All juveniles slept with the bill tucked into the scapulars (Photo 7). They often anchored the body to underwater branches while on the deep water, or they stayed in very shallow places next to the shoreline. During the second visit they also often floated on the surface with their feet tucked under the wings. On a few occasions when the duck raised its wings while resting, it was possible to see that the toes were held in a folded position (Photo 8). When the wings were folded, the feet tucked under the wings were not visible.

## PREJUVENAL MOLT AND FLEDGING TIME

I did not examine juveniles in hand, and I only collected photographs showing some details of their prejuvenal molt stages during both visits. It also may be interesting to note that all juveniles had intensive green coloration of their bills on both jaws near the base. Especially the maxilla had a triangular-shaped green area starting from the feather line. All juveniles showed the same pattern and intensity of a green part of their bills, and those colored areas were very distinctive on all taken photographs (Photo 2 and 6).

All juveniles were fledged on December 1 and took active flights during that day (Photo 12). Flights were initiated during the middle part of the day, usually after intensive wing exercising, and continued during the afternoon and through sundown. At least 27 flights were observed during December 1 and at least 31 flights the next day. Since it sometimes took 2–3 tries for the duck to become airborne and remain flying, I counted that type of incident as a single flight. Many flights, usually taken one after another, were synchronized by 2–4 juveniles. On one occasion (December 2) all four juveniles swam to the shoreline and took flight one after another; then all swam back and re-


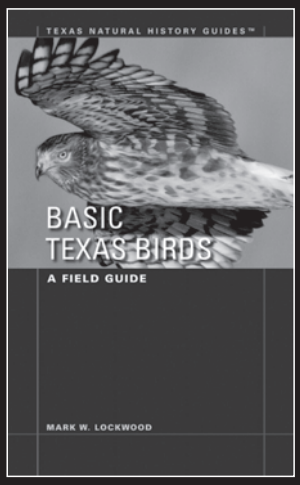


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Photo 12: Dec 1—Fledged Masked Duck taking flight across the pond. Photo by Mark B Bartosik

peated taking off in the same fashion one more time. Many flights, after intensive wing flapping while standing on the ground or on emerged log, were taken from a very shallow place near the shoreline. Often when the duck was rigorously flapping its wings, it looked like the bird was barely touching the surface with its "tip toes." Flights taken from deep water were either initiated by a short run on the surface with flapping wings or by leaping into the air almost vertically. I did not observe any cases were the duck dove first (as reported by Todd 1996) before leaping out of the water. Most flights were between 1.5–3 m at the highest point and about 10 m long. The small size of the pond has to be taken under consideration as a limited area to practice flights. The ducks always landed on the water.

Fledging time is thought to be about 45 days (Johnsgard and Carbonell 1996). December 1 could possibly be a fledging date for the Live Oak County brood as nobody observed the juveniles flying before that day. If 45 days is a correct number to be a fledging time, those Masked Ducks were hatched around the middle of October and the female (females) started to lay eggs around the middle of September. Johnsgard (1975) estimates the incubation period at about 28 days, but later (Johnsgard and Carbonell 1996) questioned the validity of this number as it is at least 4–5 days longer than that of any other stiff-tailed ducks. The laying rate is probably one egg per day (Johnsgard and Carbonell 1996). But because cited data is questionable and my collected information is very limited, all numbers above can be only a rough estimation at best.

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