

Porphyrio martinicus (Purple Gallinule or Blue Waterfowl)

Family: Rallidae (Rails, Crakes and Gallinules)

Order: Gruiformes (Cranes and Rails)

Class: Aves (Birds)



Fig. 1. Purple Gallinule, *Porphyrio martinica*.

[<https://www.flickr.com/photos/lastingimages/6468719821/sizes/l>, downloaded 10 November 2014]

TRAITS. The purple gallinule, known as the waterman or the blue waterfowl, is distinguishable by its bright purplish blue head and underbody and long bright yellow legs with large elongated toes used to walk steadily on floating swamp plants (Fig. 1) (Ffrench, 2004). It has a pale blue shield on its forehead and red cone shaped bill with a yellow tip (Dunn & Alderfer, 2006). Both sexes are of length: 28-32 cm (Schulenberg et al., 2010); weight: 203-305 g (Henderson, 2010) and wingspan: approximately 55 cm (Swartzentover, 2008). Adult colour: head, neck and entire underbody is a brilliant purplish blue plumage with bronze green wings and white feathery under tail coverts (Hilty & Brown, 1986). Both sexes are identical in appearance. Juvenile colour: chicks are black with tan legs and dark red bills. Juveniles (Fig. 2) are generally brown with dark green wings, dark yellow bills, dark brown legs and white underbody with fluffy white under tail coverts (Dunn & Alderfer, 2006).

ECOLOGY. Purple gallinules are inhabitants of tropical fresh water lowlands (Krekorian, 1978) such as marshes, lagoons, ponds, rice fields and overgrown swamps (Henderson, 2010) where there is an abundance of emergent aquatic flora. Range, other than Trinidad and Tobago, includes Central and South America, Chile, Argentina and Uruguay (Ffrench 2012). They are slightly nomadic and do not swim or float, rather forage for their food (Schulenberg et al., 2010) by wading through the water. Their diet is made of mainly vegetation and small invertebrates drifting in or on the water and floating plants. They also occasionally indulge in the eggs and young of the jacanas in their territory (Henderson, 2010).

SOCIAL ORGANIZATION. Found in flocks of approximately 50 or less birds (Wauer, 1996) or scattered loosely in small communities. They are considered highly sociable birds having adapted the behaviour of the juvenile birds, which are older than 2 months, becoming helpers in the community and remaining in the territory for up to a year portraying this role (Hunter, 1985). The young are cared for by both parents and sometimes helpers (Henderson, 2010). They are territorial birds during the nesting season which occurs during the latter three quarters of the year. Most abundant numbers observed in the beginning of the year and at the end of the year (Hilty & Brown, 1986) in tropical habitats due to migration of these birds from colder countries. Although males are slightly larger than females (Tarano et al., 1995) it is not enough to consider sexual dimorphism and there is no evident hierarchy within a flock with respect to sex (Ffrench, 2012) or age. They seldom fly together except during migration and when they do, they fly displaying their white under tail coverts (Ffrench, 2012).

ACTIVITY. They tend to move on to areas where food is easily accessible and thus to some extent nomadic (Schulenberg et al., 2010) but they rarely venture into open waters while in search of food (Hilty & Brown, 1986). They wade through the waters foraging for food while strutting in front of each other (Ffrench, 2012). The majority of their time, when they are not breeding, is taken up foraging; adults, juveniles and older chicks alike. Though the local population are not travellers, the species is considered to be highly migratory during winters of other residing countries such as Florida (Dunn & Alderfer, 2006). Before nesting, a suitable area is selected with a readily available food source in a low lying bush or in reeds (Ffrench, 2004).

FORAGING BEHAVIOUR. They are foragers, wading through the water and pecking at vegetation and invertebrates. The majority of their time during an average day is spent foraging (Fig. 3) for such food either singly or in pairs (Tarano et al., 1995). They feed on pondweed, fruits of the water lily, berries floating in the water and rice, making up approximately 60% of their diet (Tarano et al., 1995), and small fish and frogs, small insects like flies and grasshoppers, insect larvae and water spiders (Henderson, 2010). During incubation, they tend to have a preference for animal matter rather plant matter, with plant matter making up approximately 50% of their diet (Tarano et al., 1995) regardless of sex and are seen gently flipping over floating vegetation to feed on the eggs and larvae of invertebrates on the underside of the leaves (Henderson, 2010). They have been documented to sometimes raid the nests of the jacana, which live within the same territory, feeding on the unprotected eggs and the vulnerable young (Henderson, 2010).

COMMUNICATION. Olfactory Communication: No information was published with respect to the olfactory communication of the purple gallinule since some birds are believed to not have developed olfactory senses as a means of communication (Caro & Balthazart, 2010).

Visual Communication: Conspecifics rarely interact outside of breeding territory. They usually walk past each other, while feeding, in a strut like motion resembling that of a rooster (Ffrench, 2012). However, to defend a breeding territory or a feeding territory from a member of another community, a purple gallinule will fully spread its wings so that they are almost vertical and bent at the wrists while bending its body forward (Ffrench, 2012).

Vocal Communication: They are very vocal birds and are considered to be excitable and noisy (Ffrench, 2012) but they do not usually vocalize while in open areas unless alarmed, rather while they are under some sort of cover (Ffrench, 2004) when they need to communicate with others they cannot visualize. They are observed to sing during mornings with their calls varying from cackles to grunts with laughs and guttural note used, as well as a limpkin-like wail (Hilty & Brown, 1986). When they are alarmed, a series of “keh” or “ka” fast notes is sounded and when in flight, repeated “kek” notes are heard. No types of calls are documented between parent and chick.

SEXUAL BEHAVIOUR. The breeding season takes place from the middle of the dry season into the entire wet season; from the month of April to the month of December (Ffrench, 2012) when their food source is abundant. Aggression displays such as fighting, with kicks, pecks and chases, are increased during the breeding season towards conspecifics and other bird species who try to invade nesting territory (Tarano, 2003). The copulation process is brief with the male perched on a female’s back while she crouches. Preening of the female’s head and neck follows shortly after by the male (Fig 4). Both sexes are involved in selecting a nesting area but the male does most of the nest construction (Johnsgard, 2009). Rushes and brown plant matter are used to build a covered nest on banks near the water or approximately 1 m above water level if built in the water (French, 2012). Deposited in the nest by the female are 3-7 cream to light brown coloured eggs covered with brown spots and pale purple at the thick end of each egg (Fig. 5) (Ffrench, 2012). Incubation occurs over a period of approximately 18 days with the monogamous pair (Krekorian, 1978) sharing the incubation duty. As one parent arrives to relieve the incubating parent, a leaf is brought which is incorporated into the nest; a ritual observed for purple gallinules (Johnsgard, 2009). They will also share the role of hatchling care.

JUVENILE BEHAVIOUR. Chicks are precocial (Krekorian, 1978) and able to leave the nest and walk on the floating vegetation in the nesting territory almost immediately after hatching. They are brooded by the female almost continuously for approximately 1 week, which is then reduced to nights only (Johnsgard, 2009) and are allowed to forage with a parent. They usually stay with their parents for approximately 6-7 weeks (Johnsgard, 2009) after which they begin the moulting process and are considered juveniles (Dunn & Alderfer, 2006). From here on, they become helpers in the territory (Hunter, 1985) and aid in care of chicks and protection of feeding and breeding territory.

ANTIPREDATOR BEHAVIOUR. The purple gallinule avoids open water as its first defence of predators (Hilty & Brown, 1986). However in the event of a threat, a member will become very vocal upon recognizing such. With its neck outstretched and wings raised vertically, it sends a danger signal to other members. It will also display its unmistakable white under tail coverts (Ffrench, 2012). The gallinule will then retreat to slightly higher ground in low mangrove branches if it cannot fend the predator off. The juveniles who have become helpers are usually the members to display this behaviour (Krekorian, 1978). In the case of other species of birds preying on the young and eggs in a breeding territory, adults will display agonistic behaviour in the form of

chasing and fighting (Tarano, 2003). An adult will chase after a bird of another species by usually walking briskly on floating vegetation while vocalizing loudly and flapping its wings and may continue to chase in flight (Tarano, 2003). A fight may also ensue if the predator's level of aggression is to be match by also vocalizing and kicking and viciously pecking (Tarano, 2003) predator. Tarano (2003) also states that approximately 52% of the fights that take place occur with more than one adult displaying aggression.

REFERENCES.

- Caro, S. & Balthazart, J. (2010). Pheromones in birds: myth or reality? *Journal of Comparative Physiology*. 196(10): 751-766
- Dunn, J. & Alderfer, J. (2006). *National Geographic Field Guide to the Birds of North America*. United States of America: National Geographic Books.
- Ffrench, R. (2004). *Birds of Trinidad and Tobago*. Oxford, United Kingdom: Macmillan Publishers Limited.
- Ffrench, R. (2012). *A Guide to the birds of Trinidad and Tobago*. New York: Cornell University Press.
- Henderson, C. (2010). *Birds of Costa Rica: A Field Guide*. Texas: University of Texas Press.
- Hilty, S. & Brown, B. (1986). *A Guide to the Birds of Colombia*. New Jersey: Princeton University Press.
- Hunter, L., (1985). The effects of helpers in cooperatively breeding purple gallinules. *Behavioral Ecology and Sociobiology*. 18(2): 147-153.
- Johnsgard, P. (2009). *Birds of the Great Plains: Family Rallidae (Rails, Gallinules, and Coots)*. *Birds of the Great Plains* (Revised edition 2009). Paper 23.
- Krekorian, C., (1978). Alloparental Care in the Purple Gallinule. *The Condor*. 80(4): 382-390.
- Schulenberg, T., Stotz, D., Lane, D., O'Neill, J., Parker, T., (2010). *Birds of Peru: Revised and Updated Edition*. New Jersey: Princeton University Press.
- Swartzentrover, R., (2008). *Purple Gallinule*.
<http://www.swartzentrover.com/cotor/Photos/Hiking/Birds/BirdPages/PurpleGallinule.htm>, downloaded 12 November 2014.
- Tarano, Z. (2003). Agonistic Behavior Of Breeding Purple Gallinules *Porphyryula Martinica*: Potential Ecological Correlates. *Ecotropicos*. 161(1): 11-16
- Tarano, Z., Strahl, S. & Ojasti, J. (1995). Feeding Ecology of the Purple Gallinule (*Porphyryula martinica*) in the Central Llanos of Venezuela. *Ecotropicos*. 8(1-2): 53-61.
- Wauer, R., (1996). *A birder's West Indies: an island-by-island tour*. Texas: University of Texas Press.

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Fig. 2. Purple gallinule juvenile.

[http://avise-birds.bio.uci.edu/gruiformes/rallidae/porphyrio_martinicus/images/6puga.jpg, downloaded 11 November 2014]



Fig. 3. Adult purple gallinule foraging.

[http://www.markeaton.org/Galleries/Belize%20'11/Output/images/3408%20Purple%20Gallinule%20Porphyrio%20martinica%20IMG_9691.jpg, downloaded 10 November 2014]



Fig. 4. Male purple gallinule preening female after copulation.

[<http://www.pbase.com/davidmcd/image/156437889>, downloaded 13 November 2014]



Fig. 5. Purple gallinule nest and eggs.

[<http://floridamemory.com/items/show/269544>, downloaded 14 November 2014]

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