Grey heron (*Ardea cinerea*) individual behavior in Tanjung Rejo, Deli Serdang Sumatera Utara

E Jumilawaty and F S Dalimunthe

Departemen Biologi, Fakultas MIPA, Universitas Sumatera Utara
Jln. Bioteknologi No. 1, Kampus USU, Padang Bulan, Medan, Sumatera Utara 20155

*Email: erni_jumilawaty@yahoo.com

Abstract. Grey heron (*Ardea cinerea*) is one of the water birds which occupy the Mangrove area in Desa Tanjung Rejo. This bird has a large morphology compared to other waterbirds. Along with the increasing of human activities such as; aquaculture, fishing and catching fish, wood gathering and cutting down trees, as well as various marine transportation activities will lead to environmental changes that may affect the individual behavior of Grey heron. This research aims to determine the individual behavior of Grey heron. This research is done by using scan sampling method. Time of data collection is conducted at 07.00 AM until 05.00 PM. The research results showed that individual activity is dominated by body-care activities. Body care behavior includes: preening the feathers, scratching, shaking the body, sunbathing and stretching. Preening activity is the most common behavior in three observation times, i.e. morning (07.00-10.00 AM), noon (10.00 AM - 02.00 PM) and afternoon (02.00-05.00 PM). The most dominant activity during observation is preening the feathers and the rare activity is resting and shaking. From this research it can be concluded that the Grey heron has individual behavior activities that is not much different from other waterbird in general.

1. Introduction
Wetland habitat supports the existence of a wide range of wading birds including Heron and Stork. Wetlands are a very important habitat for herons and storks, these waterbirds make use of wetlands as breeding, survival, territorial and feeding places [1]. The pattern of daily behavior of birds is closely related to environmental conditions. Several factors that influence the pattern of daily bird activity are: availability of food, temperature, breeding and habitat type, territory, predation and abiotic factors [2, 3].

Desa Tanjung Rejo is a wetland area, which plays an important role in the breeding of waterbirds as a source of feeding places. Moreover, wetlands are also an important habitat for breeding, nesting and raising their children, feeding places, drinking water sources, shelter and social interaction for water birds.

An important factor in biodiversity indicators is survival ability. The ability of Grey heron to survive is strongly influenced by its individual behavior in facing changes environment conditions which have undergone changes in the form of land conservation and increased human activity for economic purposes. Human activities can be changing the behavior of species like this daily behavior or physiology of individuals of given species in contemporaneous [4, 5]. Grey heron (*Ardea cinerea*) currently has a conservation status of *Least concern*, coupled with its habitat conditions that have been disrupted due to habitat fragmentation being a common fishing ground, aquaculture area, area to look
for wood and the most dangerous threat to the existence of this bird is hunting. These factors are the background of this research to see how far the individual behavior of Grey heron in facing its habitat conditions.

2. Materials and Methods

2.1. Tools and Materials
The tools used in the observation include: digital camera, clock or stopwatch, binoculars, boots, mouth masks, camping hats, tally sheets and stationery.

2.2. Methods
Behavioral observation is done by using Scan Sampling method, the purpose of this method is to get the data of Grey heron’s individual behavior based on location and time. This method is done by observing directly the members of Grey heron population individual behavior taken randomly as much as 5 heads, while the focus of observation is conducted only on one individual only, but if the individual being observed leave the observation area then the observation is continued to the individual closest to it.

3. Result and Discussion
The results showed there are 2 types of individual behavior, namely; body care behavior and body maintenance behavior.

3.1. Body care behavior
Body care behavior is for the welfare of the bird itself, including the behavior of preening, head-scratching, sunning, body shaking and stretching. Body care behavior is related to the treatment of feather, skin and other body parts especially those used for flying or for insulators. Birds will perform the body care to ensure cleanliness and health of feathers that is used as a tool of motion and protect themselves from environmental circumstances. Body care includes:

3.1.1. Preening. Preening is the most important feather maintenance, because the feather is the most important motion part for birds to perform moving activities so that intensive care is needed to keep the function well. Preening is one of the behaviors by birds for a self-comfort behavior and is not part of the rituals in the breeding season [6]. Birds do the preening by using beaks and feet [7]. The process feathers preening begin with feathers found on the body part moved or bitten by using the beak to the tip of the body, this movement is typically performed by each species of bird. Bird legs are used to scratch the head, usually this movement is done to clean the head that cannot be touched by the beak. This process is repeated by the birds and takes a long time. Birds can pause for a while as they eat, and rest. Feather preening is more often done by birds when in a state of rest or being in the nest. Birds will spread one wing or two wings to do the preening alternately. When preening, the bird's neck is bent inward and the beak is inserted into the base of the feather on the wing surface, this is because the wing surface is covered by a fine feather that makes it difficult for the bird to reach the wider feather area [8]. During preening the chest and jugulum of the foot will be bent and the tail is lowered with the position of the body tilted back so that the back is almost vertical. The curve of the neck allows the bird's beak to touch the bird's chest. Preening is a fairly common activity during observations ranging from 32% of overall individual behavior (Figure 1).

3.1.2. Head-scratching. Scratching is done to clean the bird body parts. Scratching is done with the feet, this is to reach the body parts that cannot be preening by the beak. The bird will lift one of its legs up toward the head. The head will turn to the opposite side so it can be scratched until it reaches the neck and crown, or tilts upward to reach the throat and ear area. This scratching behavior is done as much as 20% (Figure 1).
3.1.3. Stretching. Wings and limbs stretching are performed alternately by birds. Wings and legs are parts of the body that serve to maintain body balance both when the birds fly and while perched. This stretch is done to flex the muscles of the wings and limbs of birds during their daily activities. The stretching movement is shown by flapping one wing, developing a tail feather and turning the head in the same direction followed by stretching the legs and toes on the same side. The length of time this stretching behavior is about 5-15 seconds per movement. This stretching behavior is done as much as 32% (Figure 1).

3.1.4. Sunning. A sunning bird show a response to sunlight by developing head, neck, back and back hairs of the head and spreading the wings and lifting the tail, sometimes followed by opening the mouth. In performing sunbathing activities, birds generally have some wing techniques or postures, most birds will use one or more of several wing postures: Spread Wing sunning (described by open wing position), Droop Wing sunning (drooping with wingtips hanging onto soil), and delta wing sunning (with wing joints spread). Sunbathing occurs only during the day when the temperature and humidity is relatively high. Sunbathing or sunning behavior occurs during hot weather with not very strong winds. The time spent on sunning is very short, only about two minutes. The purpose of sunbathing is to keep the humidity and body temperature, when sunning the bird will occasionally open the mouth and remove the tongue, which aims to stabilize the air temperature inside its body. This sunning behavior is done as much as 11% (Figure 1).

3.1.5. Body shaking. Body shaking is the movements shown to come from the comfort of the body. Body shaking is done by the bird by shaking the body and the feathers strongly. Shake the body is similar with bathing, where the movement aims to remove dirt and microorganisms contained in the bird's body. Body shaking or showering is often done to start a bird's rest time. It begins when the bird is bending and then continues to bend its legs resembling a sitting position. The bird will lengthen its neck and take the dust that is in front of it with its beak, then again forming its neck resembling the S letter and turning its head to the other side to dump it on the surface of the wing that has been folded over its back.

Moments after the shower the bird will start to sleep and occasionally wakes up again to lift the dust up his back, then will sleep again. In addition to bathing with dust the bird nurtures and cares for her body with anting activity. Anting is the activity when a bird pounding an ant then rubbing it on its body to get rid of toxins and unwanted substances before finally swallowing it. This body shaking behavior is done as much as 5% (Figure 1).
Daily behavior done by Grey heron covers some aspects of individual behavior related to body care that is: body shaking, sunning and stretching. Body care which observed in this research include; preening, rubbing, scratching and sunning. Preening is done by using the beak, especially on the wings and other body parts that can be reached by the beak. The beak performs movements like combing and nibbling the feathers. Rubbing is done by using the head, usually on the back and the sides of the body. Scratching is done with the feet, usually for the top and sides of the head. Sunning is done at certain times especially when the day is sunny. This activity can be observed in the morning to noon. All behaviors of body care were observed during the research with varying amounts.

3.2. Body maintenance Behavior

Body maintenance behavior is done by birds in order to maintain the equality of his body, by adjusting the feathers by moving or shaking, lifting, stretching, flapping the wings and then returning them in their original position; stretching; gaping, moving the mandible; rest, standing on one or two feet or sitting, relaxed feathers, heads lying on the neck and sometimes taking a sleeping position.

3.2.1. Sleeping. Sleep posture is generally the behavior or posture of birds during sleep is done with a sitting position with wings folded over his back, it neck folded like an S curve with the nape attached to the back or at the base of the neck, and its head place horizontally with a beak leaning against the neck. Every now and then the bird stretches its neck, puts its beak on the ground, and the neck is stretched straight in front of the body with the entire ventral surface on the ground. It is possible that birds use different sleep positions during the day and night. However, this is uncertain, as birds are not observed at night during this research. During the day, the bird will sleep intermittently, the neck is lifted upright and his eyes are open and closed every few seconds. Sleep behavior is done as much as 5% (Figure 2).

3.2.2. Incubate and Standing. Beside sleep, other self-comfort behaviors is incubating and standing in the tree or around the nest. Incubating in breeding behavior is done by sitting on the egg periodically i.e. sitting up and standing up and sitting back. But in this case incubate as the body's comfort behavior aims to keep body temperature and the nest remains stable. Birds will pull both wings covering his body with his legs bent like a sitting position and head bowed, once in a while lifted up and aligned with the body. After incubating, bird is often seen standing at the tip of the tree and the area around the nest that is not too dense. Birds stand at the tip of a tree to observe the area, whether it's for prey, watching for predators or enjoying sun exposure. Standing and incubating behavior was done as much as 52% and 42% (Figure 2). Standing is a behavior performed by birds to indicate the presence of in an area in this case the nest [6].
Figure 2. Diagrams of Grey heron maintenance behavior

Self-comfort behaviors consisting of standing, incubating and resting or sleeping are also seen during the research. During standing activity, bird usually will stand on the end of a tree that is not too dense, alone or with some other birds. The bird will stand facing the direction of the wind with its head held high and sometimes forming the S curve, observing its surroundings occasionally followed by opening the beak and moving its mandible. Incubating is seen when the bird is in the nest, the bird will bend with the wings formed wrapped around its body followed by the position of the head pulled in and slightly lowered. It is used by birds to keep body heat as well as humidity and temperature of the nest. Resting activity was more rarely seen during the research than the two self-comfort behaviors above. Birds are seen sleeping near the nest with their heads pulled in and hidden under the wings. The bird sleeps by lifting one of its legs, but sometimes also does not seem to lift one leg at all. Sleeping birds were observed during the research around 10.00 AM - 02.00 PM.

4. Conclusion

Based on the research results, it can be concluded that the individual behavior of Grey heron consists of: body care and body maintenance behaviors. The most dominant activity during observation is to preening the feathers and the rare activity is resting and shaking. The activity of Grey heron individual behavior is not much different from others waterbird in general.

Acknowledgement

My thanks go to the Rector of the Universitas of Sumatera Utara who has provided TALENTA 2017 research funding.

References

[1] Byrnes P E 1997 Habitat Use Behavior And Morphology Of Herons And Egrets In Elkhorn Slough California (California: San Francisco State University)
[2] Reyes R, Jimenez J E and Rozzi R 2014 Journal Polar Biol 38 401
[3] Jumilawaty E, Mardiastuti A, Prasetyo L B and Mulyani Y A 2011 Media Konservasi 16 108
[4] Nisbet I 2000 Waterbirds 23 312
[5] Borgmann K L 2012 A Review of Human Disturbance Impacts on Waterbirds (California: Audubon)
[6] Kushlan J A 2011 The terminology of courtship, nesting, feeding and maintenance in herons www.HeronConservation.org
[7] Raikow J R 1968 *Maintenance Behavior of The Common Rhea* (Michigan, Wayne State University: Departement of Biology)

[8] Coutlee L E 1963 *Maintenance Behavior Of The American Goldfinch* (California: Mount Saint Mary’s College)