



The nest of the gray-necked wood-rail. Clutch size varies from 5 to 7 eggs.



Incubation by the female gray-necked wood-rail lasts 19 to 20 days.

*captive management
of gray-necked*
WOOD-RAILS
(Aramides cajanea)

by Stephen H. Amos
Senior Aviculturist
National Aquarium, Baltimore, MD

The gray-necked wood-rail (*Aramides cajanea*) is a fairly large (length 14-15 inches), secretive, but common species of rail native to much of tropical America. Eight sub-species are distributed from northern Argentina to southern Mexico. This species normally frequents swamps, marshes and humid forest areas up to 1900 meters in elevation (Todd and Carriker, 1922), where it feeds primarily on arthropods

and small vertebrates, as well as some seeds and fruits. Locally, it is known as "cocaleca gris", derived from imitations of its calls.

The gray-necked wood-rail is a particularly striking bird, with coloration of the body primarily olive, with a rust-colored breast, and gray neck and head. Its legs are a brilliant pink, its beak yellowish-green, and iris reddish-

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The Amazon Rain Forest at the National Aquarium in Baltimore, home for the adult pair of gray-necked wood-rail, houses a mixture of neotropical birds, mammals, reptiles, amphibians, and insects. Vegetation is predominantly native to the South American tropical region.



On 14-day old chicks the pin feathers are just beginning to advance.



Subadult gray-necked wood-rails are maintained in large chain-link flight cages with perches and hiding boxes.

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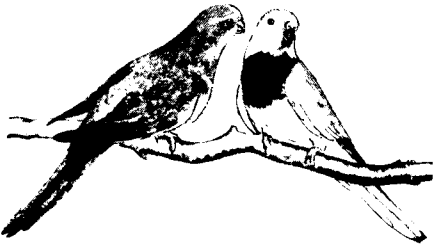
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orange. Sexes are similar in appearance, although the female may tend to be slightly larger.

Generally, the gray-necked wood-rail is a hardy species in captivity, but one which requires plenty of space, vegetation for cover, and water. Ripley (1977) notes one report of this species in a captive situation. The aviculturist referred to found the pair to be quite opposite in behavior—the female tended to be quite shy and secretive, while the male was unafraid of humans. Rutgers and Norris (1970) state that the gray-necked wood-rail was first bred in captivity in 1868 at the Jardin d'Acclimatation in Paris, but records show that they have not been kept or bred regularly by either zoological institutions or private aviculturists until recently. The July 1983 ISIS (International Species Inventory System) lists seven participating institutions presently holding this species. Two of these institutions (including the National Aquarium in Baltimore) have successfully reproduced the gray-necked wood-rail since July of 1978.

MANAGEMENT

One adult, wild-caught pair of gray-necked wood-rail has been housed at the National Aquarium in Baltimore in a 65,000 cubic foot tropical rain forest since July 1981, when the exhibit opened to the public. The glass-covered exhibit is pyramidal in shape, having an 80 foot by 80 foot by 115 foot ground plan, and is 70 feet high at the peak. The exhibit has been planted to show a naturalistic stratification of Neotropical ecological zones (emergent, canopy, lower tree, shrub, ground, field, and marsh). Fifteen-foot high concrete "gunnite" walls covered with vines and epiphytes surround the large central planted area, providing cliffs and outcroppings for additional habitat availability. Several pools approximately 6 feet in diameter and 3 feet deep, a 40 foot running stream and 2 waterfalls are also present. All water sources in the exhibit are maintained on a closed, filtered system.

Inhabitants of this exhibit include over 35 species of Neotropical waders, waterfowl, psittacines, softbills, and seedeaters, 4 species of iguanid lizards, and a two-toed sloth. Nearly all species are free-ranging throughout the exhibit. Only one pair of gray-necked wood-rail is housed in the tropical rain forest exhibit, as literature states that breeding adults are extremely territorial in a captive situation and throughout the year will attack and maim others of their

own kind without hesitation. Somewhat related species though, such as the purple gallinule (*Porphyryla martinica*) and the gray-winged trumpeter (*Psophia crepitans*) are successfully kept in the exhibit without ill effects.

Climate in the exhibit varies slightly with the seasons, but attempts are made to maintain a 75-80°F temperature and 60-70% relative humidity year round. Photoperiod is difficult to control, due to late night openings on weekends throughout the year. Twelve to fourteen hours of light are received on these weekend days, while a normal mid-Atlantic photoperiod is maintained on the remaining days.

The adult pair of gray-necked wood-rail tends to inhabit the heavier growth locations of the exhibit. High elevation and thickly planted beds of *Lantana* sp. plants are the primary habitat locations during mid-day hours, while lower elevation shadowed areas bordering the stream are favored during early morning and late afternoon hours. Preferred roosting areas at night are the upper exposed branches of emergent trees in the exhibit. Highest activity levels appear to occur in early morning and late afternoon when duetting vocalizations, "Keeko, Keeko, Keeko, Ko, Ko, Ko, Ko, Ko" are regularly heard. Frequency of vocalizations tends to increase during active reproductive periods.

The primary diet for the adult gray-necked wood-rail consists of soaked cat and dog chow, crickets, mealworms, waxworms, chopped smelt and krill, mixed into a standardized "insectile mix" base. The food is offered on the ground in metal trays twice daily in several designated food station locations throughout the exhibit.

REPRODUCTIVE SUCCESS

Due to the secretive nature of the species, little precopulatory or copulatory behavior, other than the duetting vocalizations mentioned previously, has been seen or heard.

At the National Aquarium in Baltimore, nests of the gray-necked wood-rail have normally been located in beds of bamboo, *Rhapis* sp. or *Lantana* sp. plants, raised approximately 14-24 inches off the ground. Nests are constructed of both green and dried viney vegetation, and are quite bulky, being roughly 18 inches in diameter and 6 to 8 inches deep. The cup itself is lined with slightly finer vegetation and measures 8 inches wide by 2 inches deep. Nests are almost always undetected from even a very close distance.

Normally 6 eggs are laid, although

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several clutches of 5 and one clutch of 7 eggs have been found at the National Aquarium in Baltimore. Eggs are oval in shape and are a beige color with rust-brown and purplish-gray mottling around the egg, primarily concentrated at the broader end. Interestingly, several eggs have been found with the mottling concentrated at the pointed end, indicating that the egg may have passed backwards through the uterus of the oviduct, where egg pigmentation occurs. Egg size varies from 44.5 mm to 48.5 mm x 32.5 mm to 37.5 mm, or an average of 46.0 mm x 35.0 mm for a 24-egg sample.

The incubation period for the gray-necked wood-rail housed at the National Aquarium in Baltimore averages 19 to 20 days. No down is used in the nest during the incubation period. All eggs to date have been parent-incubated, as the parents have continually proved to be excellent brooders. Since January 1982 when records were initiated, 10 clutches totalling 58 eggs have been produced by the adult breeding pair. As seen by Table 1, 51.7 percent of the eggs hatched and 26 chicks have been reared to date.

REARING

Eggs are pulled from the parents when they begin to pip. No parent-

rearing is presently attempted, as the normally secretive behavior of the adults is transformed into that of extremely aggressive and protective behavior when chicks are left for parent-rearing.

The chocolate brown down-covered chicks are hatched in a small Boekel model laboratory incubator adapted for hatching birds at a temperature of 98.5-99.5°F, and are left in the incubator until totally dry. Within 24 hours, the chicks are quite alert and can move about on their own. At this time, they are placed in a screened top brooder box measuring 17"W by 29"L by 16"H with a heat lamp adjusted to initially give a 96-98°F temperature. Gravel is placed in the bottom of a shallow dish and water is added to just above gravel level as a water source. The gravel serves both to keep chicks from getting too wet, and as a visible attractant to the water source. Temperature is gradually decreased to average room temperature over a three-week period.

As with most gruiformes and many other long-legged species, weight needs to be monitored and controlled during the active growth period. The gray-necked wood-rail chicks are stabilized at an average 9.5% increase in body weight per day. This prevents any

Table 1

Hatchability records for the gray-necked wood-rail (*Aramides cajanea*) at the National Aquarium in Baltimore

Hatching Date	No. Eggs	No. Eggs Fertile	% Fertility	No. Eggs Hatched	No. Chicks Reared	% Chicks Hatched & Reared
2-13-82	5	2	40.0%	2	1	50.0%
5-29-82	5	4	80.0%	3	3	100.0%
7-01-82	6	3	50.0%	3	3	100.0%
8-09-82	6	5	83.3%	3	3	100.0%
1-24-83	5	3	60.0%	3	3	100.0%
3-01-83	6	3	50.0%	3	3	100.0%
4-05-83	6	4	66.7%	4	3	75.0%
7-09-83	7	4	57.1%	3	1	33.3%
9-07-83	6	4	66.7%	2	2	100.0%
10-09-83	6	4	66.7%	4	4	100.0%
TOTALS	58	36	62.1% avg.	30	26	86.7%

Table 2

Growth rate information for the gray-necked wood-rail (*Aramides cajanea*) at the National Aquarium in Baltimore

Date	Low Weight	High Weight	Ave. Weight (n = 26)	Hypothetical Weight Increase Using 9.5% Per Day
hatching	16.7g	23.9g	20.3g	20.3g
7 days	23.9g	49.2g	32.9g	35.0g
14 days	37.1g	112.7g	68.2g	66.0g
21 days	83.0g	177.3g	126.3g	124.7g
28 days	102.9g	284.1g	198.2g	235.2g

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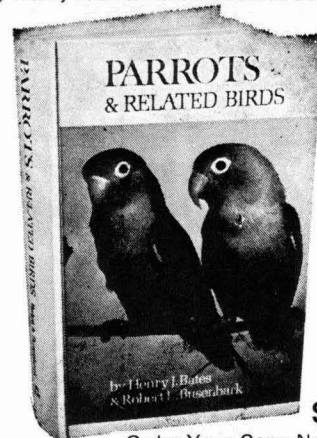
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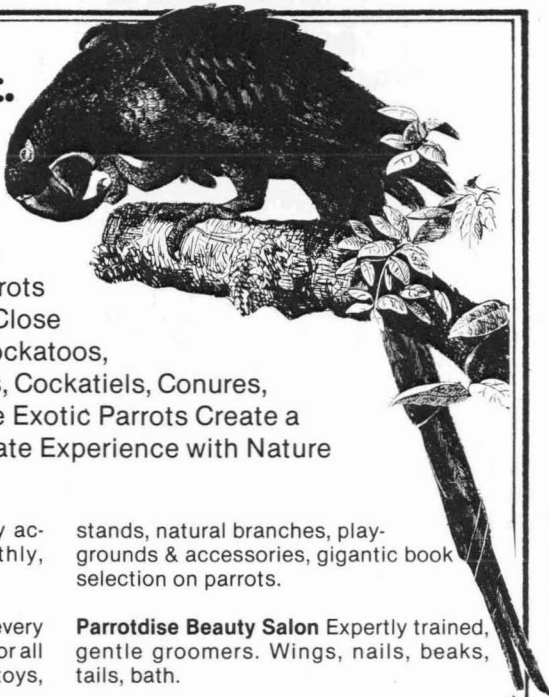
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potential problems with tendon slippage or leg rotation due to being overweight (see Table 2 for growth rate information).

A diet of 1 part millet to 3 parts ground Purina trout chow to 1 part Purina startena (0 to 2 weeks) or growena (2 weeks until adult), plus chopped hard-boiled egg, scalded 1-week crickets, small live mealworms, 1 leaf of finely chopped spinach, and a sprinkling of Vionate vitamin supplement and Calcium Phosphate powder is offered three times daily to the growing chicks. Weight is controlled through the diet amounts offered. Adjustments to the volume of the diet are made regularly to keep an average 9.5% increase on track. The chicks are weighed daily until they are 28 days of age, when they are considered past the critical development period. At that time they are moved from the brooder box into a flight pen approximately 4'W by 8'L by 6'H, with perches and several cardboard boxes for hiding. The chicks are slowly "weaned" over a two-week period to an adult diet at this time.

Development is surprisingly rapid. At hatching, the average chick weighs 20.3 grams and is covered with a fine chocolate-colored down. At seven days, the average 32.9 gram chick shows no significant feather change, with only the slightest beginnings of pin feathers appearing in the wing primaries. At fourteen days, the average chick weighs 68.2 grams. At this age the tail is about one-quarter of an inch long, and both wing primaries and secondaries are beginning to advance. At twenty-one days, muddy brown-colored feathers begin to appear in the head, neck and general body areas, and by twenty-eight days the chick is predominantly feathered and is approximately two-thirds grown. By thirty-five days the chick has reached three-quarters adult size and weight, and by forty-two days is comparable in weight to an adult bird. The dull plumage of the juvenile is retained until the bird is approximately sixty-three to seventy-seven days of age, when adult plumage, eye color, and beak and leg color appear.

Two occasional physical problems have occurred with rearing of the chicks. Either as a result of poor egg nutrition or developmental and hatching difficulties, several chicks have developed upon hatching a "curled toe" syndrome. Caught quickly at an early age, an easy remedy can be applied. A section of plastic hollow coffee

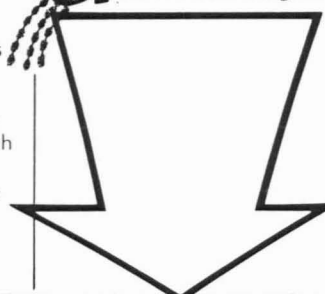
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stirrer cut to length of the toe and padded to protect the toe from sharp edges of the plastic is applied with tape for three days. This has corrected every toe problem encountered. On several occasions a chick has gained too much weight too quickly and has developed the beginnings of "splayed leg" syndrome. Again, this has been easily corrected by simply taping the shanks of the legs slightly apart with the splayed leg in the proper position. The chick quickly learns to compensate with this simplified splint, and within three days the leg has been corrected and the tape can be removed. All chicks with these physical impairments have been subsequently reared with no ill-effects or visible deformity. Of primary importance though is that one must act quickly to correct the impairments before the bones begin to calcify.

CONCLUSION

The gray-necked wood-rail, although somewhat time-consuming to manage when young, is a most welcome addition to the Neotropical rain forest exhibit at the National Aquarium in Baltimore as an adult. Its sometimes secretive behavior challenges the experienced bird-watcher, while its unique duetting vocalizations offer an audible "air" to the representation of exotic sounds in a naturalistic tropical exhibit.

BIOGRAPHY

Stephen H. Amos has a Bachelor's degree in Psychobiology from Hiram College, Ohio. He was previously employed with the Baltimore Zoo where he was Senior Keeper of Birds, working with gruiformes, rattites, waterfowl, penguins and African passerines. He has been employed as Senior Aviculturist at the National Aquarium in Baltimore for the past two years, working extensively with North Atlantic seabirds and a large neotropical rain forest exhibit. He is responsible for a diversity of birds, reptiles, amphibians, terrestrial mammals, tropical fish, insects, and plants exhibited in this large walk-through exhibit.

Amos is presently co-authoring the *Field Guide to Life of the Atlantic Coast*, to be published in 1985 as part of a habitat series by the Audubon Society.

Amos has travelled throughout the continental U.S. and Hawaii, South America, and Europe, where his interests in captive management procedures have allowed him to visit well over 150 zoological institutions and private collections. ●

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