



*Red-crested Cardinal*

## Breeding the Red-Crested Cardinal

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A pair of Red-Crested Cardinals (*Paroaria coronata*) at the Topeka Zoological Park have reproduced two years in a row in the large free flight Tropical Rain Forest exhibit. The exhibit is a circular structure 100 feet in diameter covered with a geodesic dome 31 feet high in the center. The dome is made of clear acrylic panels which allow 92% natural light transmission. The building is maintained at a temperature of 70° to 90°F and at 70% to 80% relative humidity. The interior of the exhibit contains a lush growth of tropical plants with trees 20–25 feet tall.

The birds are given free access to all parts of the building and forage for much of their food among the plants and on the ground. Food for the 50 plus birds of approximately 30 species is provided in a number of forms and locations throughout the building. The Red-Crested Cardinals eat seeds primarily, with some fruit and Soft-Billed Bird Diet.

The breeding pair begins increased vocalization and defense of territory followed by nest building in late April to early May. Both birds assist in nest construction. The nesting season may last until early October. The nest is an open cup-shape nest built in the small branches of a tree.

Measurements of one nest showed an overall diameter of 120mm and a height of approximately 40mm. The interior portion of the nest was 60mm in diameter with a depression about 25mm deep. Nest construction lasted about five to six days.

Nest site selection appeared to be somewhat determined by prior success or failure. Only successful nests or nest sites were reused. Of the four nest sites used in eight nestings only two nest sites were successful. (See Table 1.) All nest sites were located in the same general area of

the exhibit (see map).

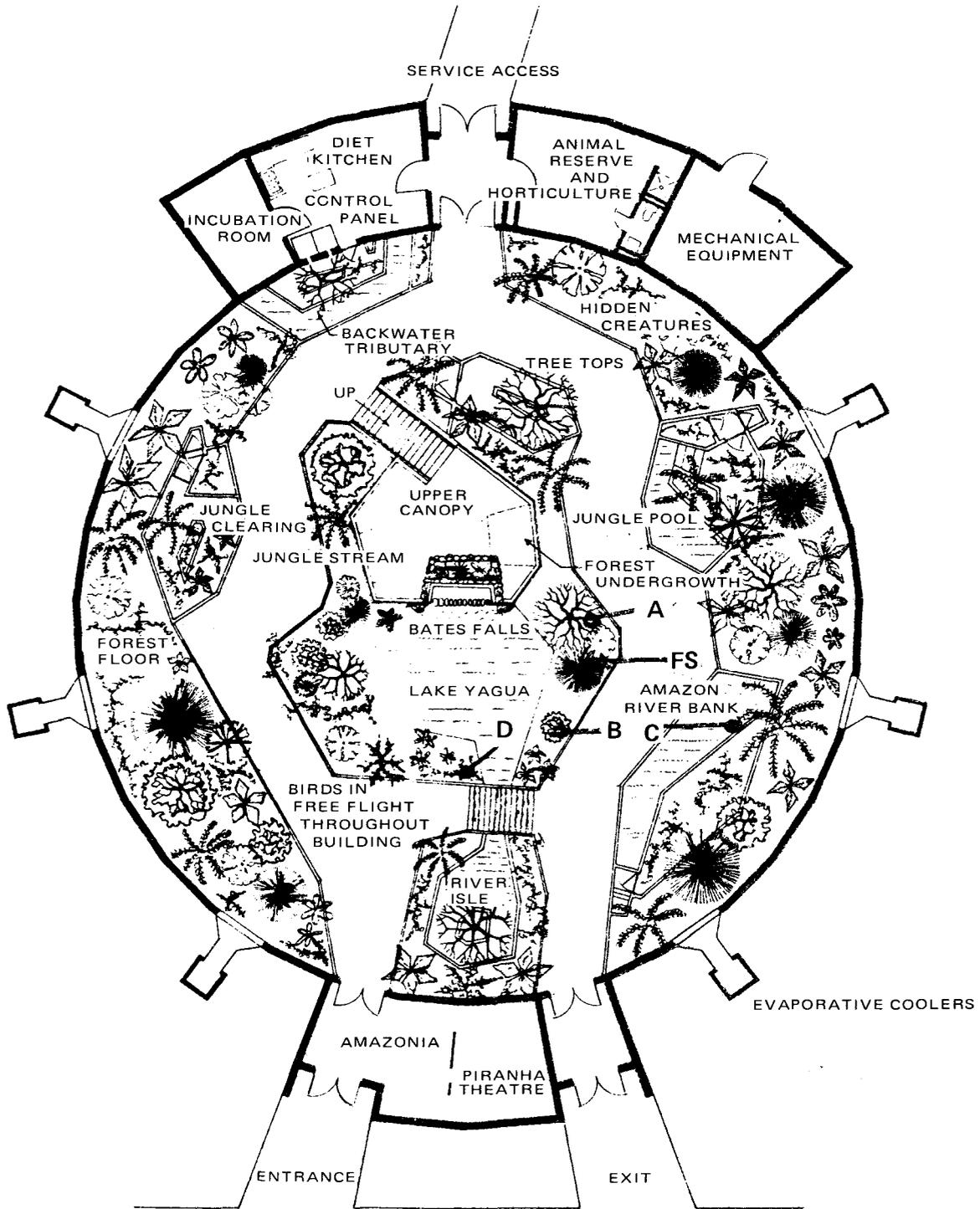
In eight clutches in two years the female laid a total of 21 eggs. The eggs are dark with light green ground color and heavily speckled with dark green and brown spots. The large end of the egg is generally the darkest part of the egg. The eggs are approximately 24mm long and 15mm in diameter at the widest portion.

The incubation period for the Red-Crested Cardinal is 12-14 days. One egg is laid each day until completion of the clutch. The average clutch size for eight nests was 2.6 eggs. In two breeding seasons the pair attempted four clutches each year. In 1974, 58% of the eggs laid hatched with only 28.5% of the chicks surviving. In this instance survival is defined as reaching an independent stage with good flying ability and being able to locate food unassisted. This stage was generally reached in two to three weeks after leaving the nest. In 1975, 77% of the eggs laid hatched with 85% of the chicks surviving.

It is interesting to note that the 1975 season lasted approximately five weeks longer than the 1974 season, even though the pair attempted the same number of clutches both years. The average time between clutches was 36 days in 1974 and 48 days in 1975. The longer period between clutches the second year allowed more time for the pair to care for the young after they left the nest. This extended parental care may have contributed to the higher survival rate of young the second year and may be a result of greater experience on the part of the breeding pair.

In 1975 only nine eggs were laid in four clutches compared to the 12 eggs in four clutches the previous year. (See Table 2.) Over the two year period the eight attempts averaged a survival rate of

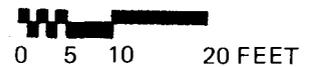
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**TROPICAL RAIN FOREST**

TOPEKA ZOOLOGICAL PARK

TOPEKA, KANSAS



MAP: Nest sites designated by letters A, B, C, D.

FS = Feeding Station, for mealworms for young.



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one chick per nest, with 0.5 chicks per nest in the first year and 1.5 chicks per nest in the second year.

The altricial young were fed insects by both parents. The parents preferred mealworms which were offered three times a day. Because of the closeness of all nests, a single feeding station for mealworms was set-up and used for both breeding seasons. It is possible that the availability of a food base prompted the pair to always select a nest site in the same area of the exhibit.

After 13–16 days the young left the nest. The parents fed the fledglings for one to two weeks while the youngsters learned to fly and gather food. The period immediately after leaving the nest was a critical time for the young birds' survival. Of the seven chicks hatched in the first year only two survived. Four chicks were killed by known predators during their first two weeks after fledging with the fifth chick lost for unknown causes. The survival of chicks the second year was much improved with six out of seven chicks surviving. This improved survival rate can be partly attributed to the removal of known and suspected predatory birds, primarily corvids.

Young Red-Crested Cardinals differ from the adults primarily in the color of the head and crest. Juvenile plumage consist of brown head, throat, and crest with gray upper body and white under body. The juveniles also lack the white spots on the nape. The post-juvenile moult occurs at about three months of age resulting in a mixture of brown and red feathers in head and crest. Adult plumage is reached in the second winter. Red-Crested Cardinals probably do not breed until they are at least two years old.

**PRODUCTS MENTIONED IN TEXT:**  
 Soft-Billed Bird Diet – ZU/PREEM  
 Hill's Division Riviana Foods, Inc.  
 401 Harrison  
 Topeka, Kansas 66601



Table 1 – NEST SITE SUCCESS FOR TWO YEARS

Nest Site	Number of Times Used	Number of Eggs	Number Hatched	Number Survived	Average Number of Chicks Survived/Nest
A	1	3	2	0	NA
B	4	10	7	5	1.25
C	1	3	1	0	NA
D	2	5	4	3	1.5

Table 2 – SUMMARY OF NESTING DATA (1974–1975)

Clutch Number	Nest Site	Clutch Size	Number Hatched	Number Survived
1 '74	A	3	2	0
2 '74	B	3	2	1
3 '74	C	3	1	0
4 '74	B	3	2	1
1 '75	B	1	1	1
2 '75	B	3	2	2
3 '75	D	3	2	2
4 '75	D	2	2	1
Total:		21	14	8