

HABITAT USE IN THE NORTHERN JACANA

Eden H. Abram, Mark E. Berry, Hannah M. Fouts, Aviva E. Liebert and Peter S. Woodson

ABSTRACT (HMF)

We examined the distribution of jacanas (*Jacana spinosa*) in several habitats within the marsh at Palo Verde, Costa Rica. We hypothesized that the population would be disproportionately distributed over the different substrates, and that adults and juveniles would differ in their substrate use. Because of their foraging patterns and morphological adaptations, we predicted that all jacanas would occur disproportionately in the water lily habitat. As predicted, adult and juvenile jacanas concentrated their foraging on large lilies while tending to avoid taller substrates and open water. Counter to our predictions, adults used preferred habitats (large lily pads) less than juveniles, perhaps indicating an ontogenetic shift in foraging habits.

Key Words: *Jacana spinosa*, habitat usage, spatial distribution

INTRODUCTION (AEL)

Northern Jacanas (*Jacana spinosa*) are found in marsh habitats throughout Costa Rica (Jenni, 1983). Their elongated toes allow them to walk on floating plants from which they forage on insects, snails, seeds, and small fish (Stiles and Skutch, 1989). Our initial observations of jacanas suggested that they were aggregated in certain areas of the marsh, and that there were aggressive interactions between adults and juveniles that might affect their distributions. These initial observations led to two questions: 1) In which substrate are jacanas most abundant, and 2) Are adults and juveniles differentially distributed across habitats? Specifically, we hypothesized that jacanas would be disproportionally abundant on large lily pads, because this habitat in combination with a source of food would provide a suitable foraging substrate. Assuming that adults are dominant over juveniles, we further predicted that adults would occur in the more preferred habitat (e.g. water lilies) to a greater

extent than juveniles.

METHODS (PSW)

We studied habitat use by jacanas in a marsh within Palo Verde Wildlife Refuge, Costa Rica on 10-11 January, 1994. All observations were made in three adjacent plots located east, west, and south of the observation tower \approx 50m south of the airstrip. Each plot was mapped and divided into 16 evenly distributed subplots. The percent vegetation cover of tall grass (cattails and *Thalia*), shrubs, intermediate grass (height > 50cm), hyacinth, short grass (height < 50cm), large lilies (diameter > 20cm), small lilies (diameter < 20cm), and open water (depth < 25cm, free of vegetation > 1cm in length or diameter) was estimated within a 2m radius from the center of each subplot. Data from the three plots were combined to get an estimation of percent vegetation over the entire observation area.

Starting at 07:30, four censuses of jacanas were taken at 10 minute intervals. We com-

Table 1: Summary of vegetation type and bird distribution. (df = 6)

Vegetation type	%veg. in total study area	%Birds of total (n = 159)	Total Observed	
			adults (n = 78)	juvenile (n = 81)
Shrub	0.6	0.0	0.0	0.0
Tall growth	21.3	1.1	0.67	0.58
Intermediate growth	26.7	17.4	20.6	11.0
Shorth growth	4.8	4.0	8.3	0.0
Large lily	18.3	48.6	37.4	61.7
Small lily	8.8	15.3	7.0	17.0
open water	29.2	13.7	18.7	9.7
chi-square ^a		155.4	72.8	166.9
p		<0.001	<0.007	<0.001

^aChi-square tested null hypothesis that jacanas habitat use was in proportion to habitat abundance.

bined data from the three plots to determine the numbers of adults, juveniles, and total jacanas in each vegetation type.

The data were analyzed using a Chi-square test.

RESULTS (EHA)

We found a significant difference between the distribution of jacanas and substrate availability in our study area (Table 1). Jacanas were found more frequently on large and small lilies than predicted by their relative abundance. Jacanas were underrepresented on tall growth, intermediate growth, and open water areas. The distributions of adult and juvenile jacanas among vegetation types also differed ($X^2 = 104.87$, $df = 6$, $p < 0.001$). The greatest difference was in large lilies, where juveniles were more abundant than adults. Adults, however, were more abundant in intermediate length grass and open water than juveniles.

We found a significant difference between the distribution of jacanas, (juveniles, adults, and total birds) and substrate availability in our study area (Table 1). Jacanas were more frequent on large and small lilies than predicted by their relative abundance. Jacanas were underrepresented on tall growth, intermediate growth, and open water areas. The distribution of adult and juvenile jacanas among vegetation types also differed ($X^2 = 101.87$, $df = 6$, $p < 0.001$). The greatest difference was found for large lilies, where juveniles were relatively more abundant than adults. Adults, tended to be found in intermediate length grass and open water more than juveniles.

DISCUSSION (MEB)

Our results show that jacanas spend disproportionately more time on large lilies than in other habitats. This was consistent with our prediction that lilies should provide the best

foraging substrate. Juveniles, however, were relatively more abundant than adults on lilies. Adults may appear less often on lilies because they prefer other substrates (or edges) that provide better foraging or protection from predators (juveniles appear to be more cryptic than adults). Further work on behavioral interactions among age classes and foraging success in different habitats could help explain the observed distributions.

LITERATURE CITED

- Jenni, D.A. 1983. Jacana spinosa. Pages 584-586 in D.H. Janzen, editor. Costa Rican Natural History 1983. University of Chicago Press: Chicago and London.
- Stiles, G.F. and A.F. Skutch. 1989. A Guide to the Birds of Costa Rica. Comstock Publishing Associates: Ithaca, NY.