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ABSTRACT: Black-crowned night heron (*Nycticorax nycticorax*) droppings are a problem on Fort Loudoun Hydroelectric Dam. Annual and daily use patterns were monitored to determine when and what areas of the dam the herons were using. The dam was used primarily during the breeding season (April-July) and received 24.2% more use in the evenings than in the morning. The most use occurred in June with a high of 211 birds 12 June 1991 and 266 birds 5 June 1992. Herons used band railings on the dam the most (66%) for perching. About 12% of the night herons using the dam were juveniles. Because most of the use occurred in April through June, we suggest that damage control efforts be concentrated at this time and we suggest methods of control.

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Wading bird predation at fish rearing facilities is a common problem faced by wildlife managers (Mort 1978, Hoy et al. 1989), however, wading birds can also create sanitation problems or cause property damage. Black-crowned night heron droppings have become a problem at the Fort Loudoun Hydroelectric Plant operated by the Tennessee Valley Authority (TVA) located in Lenoir City in Loudon County, Tennessee. The plant is part of Fort Loudoun Dam which impounds the Tennessee River to form Fort Loudoun Lake. The herons feed in the tailwaters below the dam where they find an abundant supply of shad (*Dorsoma* spp.) and have established a rookery about 1 km from the dam. The railings on the facility are used by the herons as perches when they are not feeding and their droppings collect on the railings, the sidewalk and the face of the dam. The droppings corrode the railings, produce a foul odor, and represent a potential health risk to people. There is also the potential of the night herons colliding with and damaging electrical equipment at the facility (Enck 1989).

United States Department of Agriculture, APHIS, Animal Damage Control (ADC) personnel began efforts to reduce night heron damage in 1990 with the use of pyrotechnics, recorded distress calls, and other harassment measures, but were unsuccessful (K.M. Blanton, pers. commun.). An experimental trapping and translocation program was attempted in 1991, but the herons responded poorly to the bait of live shad and only 8 were trapped and translocated. In late winter of 1992 ADC and TVA discussed the use of alternate perches and exclusion techniques to reduce the heron damage (K.M. Blanton, pers. commun.). In February TVA installed a 15 m section of pipe on the railings of the lower deck of the powerhouse, which extended a few meters out over the water. After the night herons were seen using the pipe as a perch, plans were made to extend the pipe across the entire width of the darn and to use netting and monofilament or wire exclusion to force herons off the railings and onto the alternate perch. Before further control methods were undertaken, a more thorough assessment of the night heron use of dam facility was initiated.

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METHODS

Night heron use of Fort Loudoun dam tailwaters were monitored twice weekly beginning 29 April 1991 and ending 22 April 1992. Ancock and Kushlan (1984) reported that black-crowned night herons feed most crepuscularly and at night. Because accurate counts could not be made at night, 1 15 minute count was made at sunrise once per week and 1 15 minute count was made 1 hour before sunset once per week. Specific location and age of herons using the dam was recorded.

Because greatest heron use was found to occur at sunset the morning counts were discontinued. One 15 minute count was made 1 hour before sunset per week May - August 1992. Herons were similarly monitored in 1993 from 22 July through 22 August.

The number of herons nesting and produced in the rookery was estimated during the 1991 and 1992 nesting season (May June). In 1993 the rookery was checked in August to determine if it was still active. Only 1-4 visits per nesting season were made to the rookery to limit any adverse effects the visits might have on renesting attempts (Tremblay and Ellison 1979).

RESULTS

Night herons used the dam most in June in 1991 and 1992 with extensive use made April through July (Fig. 1.). The average number of night herons using Fort Loudoun Dam 1 hour before sunset from May 1991 to April 1992 was 55.8, 24.2% higher than the average of 42.3 counted at sunrise. The annual average number of adults using the dam May 1991 through April 1992 was 45.7 (82.0%) compared to the average of 10.1 (18.0%) juveniles using the dam. The maximum number of herons counted during one observation was 211 on 12 June 1991 and 266 on 5 June 1992. The dam received low use during the winter months (Fig. 1.) as night herons are migratory. The birds using the dam in the winter may be migrants from farther north (Hancock and Kushlan 1984). The nightly average May through August 1992 was 107.3 herons, a 9% increase over an average of 97.8 for the same period in 1991. The nightly average number of juveniles using the dam area during this period increased slightly from 11.8 in 1991 to 12.8 in 1992. In 1991 11.9% of the total night herons using the dam were juveniles and 12.0% were juveniles in 1992. Night herons perched on the dam's railings comprised 65.9% of the birds observed and 20.8% used rocks below the dam while feeding on shad.

The nightly average of night herons observed 22 July 1993 through 22 August 1993 was 42.8. This is a 6.5% decrease from an nightly average of 45.8 during the same period in 1992. During this period 12.9% of the birds observed were juveniles.

Approximately 200 nestlings were counted in the night heron rookery during both the 1991 and 1992 nesting season. Many of the trees in the rookery had fallen in 1993 as a result of a spring blizzard and the rookery bad been abandoned. It appeared that at least part of the population had relocated to nest in a great blue heron (*Ardea herodias*) rookery approximately 9.6 km downstream from the dam.

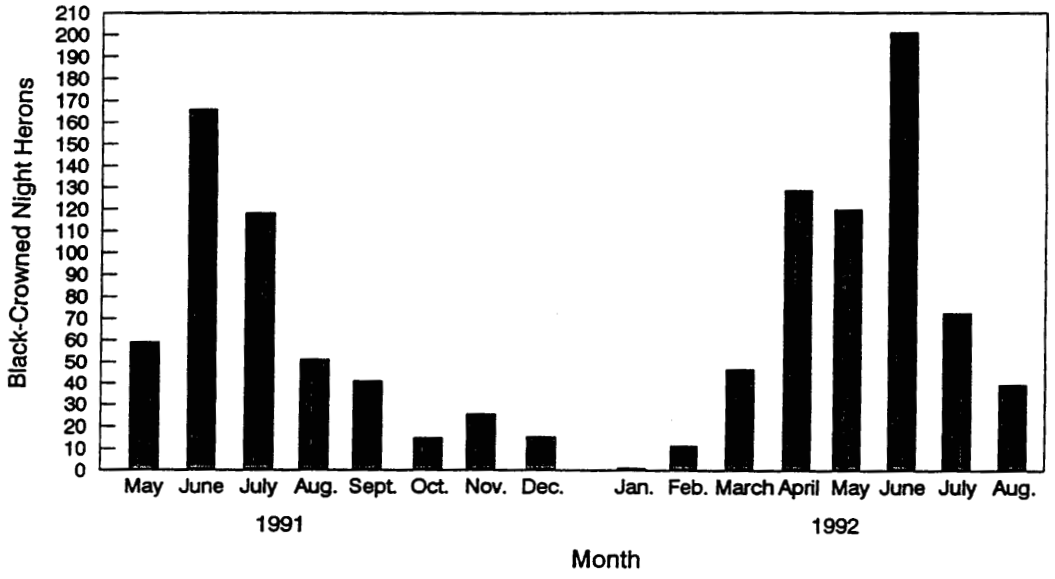

Fig. 1. Monthly averages of evening counts of black-crowned night herons using Fort Loudoun Hydroelectric Facility, Loudon County, Tennessee, May 1991 - August 1992.

DISCUSSION

The concentration of shad below Fort Loudoun Dam provides an abundant food source for the night herons and is likely the reason the birds established a rookery nearby and concentrate around the dam. Instead of trying to drive the herons away which would be difficult as long as the food source exists, we recommend habitat modification to reduce the damage problems. Construction of alternate perches and use of exclusion devices may help reduce the herons use of the railings as perches. Periodic washing of the decks and rails with a powerwasher as needed would reduce much of the odor and corrosion problems associated with the heron droppings.

The abandonment of the original rookery upstream from the dam and establishment of new rookery further downstream may effect night heron use patterns in the dam area. The slight drop in use July - August 1993 may indicate a change in use patterns. The use of the dam area should be monitored in 1994 to measure changes in use and to measure effectiveness of the alternate perches that are to be constructed by TVA in 1994. A decision on remedial action could be made after the 1994 assessment.

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