

Fish and Wildlife Service
Patuxent Wildlife Research Center
Environmental Contaminants Evaluation Program

RESEARCH STUDY PLAN

Project:

Work Unit:

Study Plan:

Effects of organochlorine pollutants on black-crowned night herons in the Pacific Northwest.

Plan of work:

Justification: Population declines of black-crowned night herons (*Nycticorax nycticorax*) have been reported or suspected in New England and in Michigan. Ohlendorf et al. (1978, Wading Birds, National Audubon Society) conducted a preliminary study to determine whether these declines might be related to adverse effects of environmental pollutants. They collected eggs in the east and analyzed them for organochlorines and certain heavy metals. They could not positively relate the organochlorines or heavy metal residues to declines of night heron populations that had been reported. However, they indicated that circumstantial evidence suggests that environmental pollutants may contribute to impaired reproduction in the more contaminated areas.

In 1977 a few black-crowned night heron eggs were collected in the Upper Klamath Basin (PNW, Quarterly Report 2(3):1978), and in 1978 a few more were collected in the Columbia Basin (PNW, Quarterly Report 2(4):1978). Residues of DDE ranged to a high of 19 ppm (wet weight) in eggs, and eggshell thinning averaged 14 percent. Furthermore, a report from Idaho (10 eggs analyzed at Patuxent) showed eggs with levels of DDE up to 170 ppm wet weight, with a maximum of 31 percent eggshell thinning. In addition, our Rocky Mountain Field Station in Colorado (Quarterly Report July-September 1978) showed residues of DDE ranging to a high of 31 ppm wet weight. It appears that the black-crowns in the west may have as high or higher residues of DDE (in 1977-78) than recorded for many populations along the Atlantic coast in 1972-73. Furthermore, in 1975 an adult black-crowned night heron was found dead near Ruby Lake NWR, Nevada (one of the anticipated study colonies) with 230 ppm DDE (wet weight) in the brain (PWRC unpublished). It apparently died of DDE poisoning.

Objective:

To determine the effects of organochlorine pollutants on black-crowned night herons nesting in the Pacific Northwest, and to determine the wintering localities for these populations.

Procedures:

The study will be initiated in the spring of 1979 and will continue for two nesting seasons. Approximately 6 to 10 nesting colonies will be studied in Oregon, Washington, and Nevada. Nests will be marked for individual identification, one egg will be collected from each clutch for residue analyses, reproductive success will be recorded, and young will be banded to determine wintering localities. Residues in the single egg from each nest will be compared to success of the nest to ascertain whether residues are correlated with nest success. It is believed that organochlorine residues may be high enough in this study to determine critical levels in eggs for black-crowned night herons.

In the selection of nesting colonies, we will consider pesticide use in the immediate vicinities, i.e., several colonies are associated with sumps which are far removed from any agriculture or forests and thus should have no history of DDT use. Other sites will be associated with agriculture and forests. Heron food samples will be collected at each colony (either regurgitated food, or prey species from the vicinity of the colony) in an attempt to determine the source of the contamination (i.e., local or wintering area). Five pooled food samples will be analyzed per colony. Hopefully, the colonies chosen will differ in pesticide residue profiles. Only two winter band recoveries are available from black-crowns fledged in the Pacific Northwest: (1) banded in Idaho, recovered in Nayarit, Mexico, and (2) banded in Washington, recovered in Nayarit, Mexico. Thus, this limited recovery data show that at least some Pacific Northwest birds are wintering along the west coast of Mexico.

Location:

Patuxent Wildlife Research Center, Pacific Northwest Field Station, Corvallis, Oregon.

Work Schedule:

Approximately six weeks of field work during the spring and summer of both 1979 and 1980.

Investigators:

Charles J. Henny, Lawrence J. Blus, and chemists.

Estimated Annual Costs:*

Salaries:

Research Biologist, GS-13, 1/8 time	\$ 3,500
Research Biologist, GS-12, 1/8 time	3,500

Expenses:

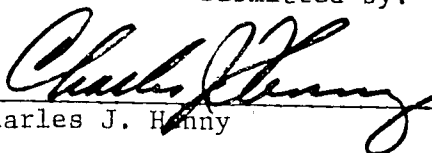
Equipment and supplies	1,000
Travel	1,000
** Chemical analyses (100) - analyses to be performed at PWRC; costs are covered under other study plans	

TOTAL	\$ 9,000
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*Predicted costs at operating level. They do not indicate support service costs or equipment costs and are not intended for budgetary use.

**Approximately 100 eggs will be analyzed for residues or organochlorine pollutants.

Submitted by:

 Feb. 1, 1979
Charles J. Henry Date

Lawrence J. Blus Date

Approved by:

Lucille F. Stickel Date
Director, Patuxent Wildlife Research Center

Concurrence:

Donald R. Clark Date
Project Leader