CONTAMINANT CONCENTRATIONS IN PEREGRINE FALCON EGGS FROM VERMONT

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PREFACE

Information presented in this report is final documentation of the 1991 environmental contaminants evaluation of Peregrine Falcon eggs from Vermont under PACF Catalog Number 5030004, Regional ID Number 5212. Study design, implementation, data analysis, and reporting were completed by Environmental Contaminants and Endangered Species personnel in the New England Field Offices, U.S. Fish and Wildlife Service, Department of the Interior. Funding for the project was provided by the division of Environmental Contaminants.

Questions, comments, and suggestions related to this report are encouraged. Written enquiries should refer to Report Number RY92-NEFO-3-EC and be directed to the Service at the following address:

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INTRODUCTION

During the 1991 breeding season, three addled peregrine falcon (*Falco peregrinus*) eggs were collected from two sites in Vermont (Figure 1). At one site (Deer Leap), the breeding pair renested after abandoning their first clutch of two eggs. At the second site (Bird Mtn.), a single egg was recovered after the pair failed to produce any offspring (Gaine and Rimmer 1992). The objective of this study was to determine if there was a contaminant basis for the failure of these three eggs.

METHODS

The two eggs from the Deer Leap (DL) nest were collected on June 18, 1991, and the egg from the Bird Mtn. (BM) site was collected on June 21, 1991. Eggs were wrapped in aluminum foil in the field and brought back to the lab where the egg contents were placed in chemically clean jars and frozen. Organochlorines, Aroclor specific PCBs, and mercury analyses were conducted by Hazelton Laboratories using procedures described by Cromartie et al. (1975).

RESULTS AND DISCUSSION

Results are shown in Table 1. The egg from Bird Mountain had the highest level of organic contamination of the three eggs. In the case of Aroclor 1260 (10.56 ppm wet wt.) and ΣDDT (14.21 ppm wet wt.), the levels were ten times as high as found in the other two eggs. The PCB levels in the Bird Mtn. egg are similar to levels found in bald eagle (*Haliaeetus leucocephalus*) eggs from Maine (Wiemeyer et al. 1992). Wiemeyer et al. (1984) reported that production in bald eagles was reduced by half at DDE egg concentrations greater than 5.1 ppm (wet wt.), and that production failed completely when egg DDE concentrations exceed 15.0 ppm. If a similar relationship holds for peregrine falcons, it is likely that the 14.1 ppm of DDE in the Bird Mtn. egg contributed significantly to the failure of that egg to hatch.

The relationship of egg PCB residues to egg viability is less clear. Lowe and Stendell (1991) reported minimal egg shell thinning in American kestrels (*Falco sparverius*) fed Aroclor 1248, while Peakall et al. (1972) reported delayed growth and development in embryos of ringed turtle-doves (*Streptopelia risoria*) when eggs of the preceding clutch contained 16.0 ppm of Aroclor-1254. Other researchers (Wiemeyer et al. 1992) have noted that they are unable to distinguish the potential impacts of PCBs on embryo health from those co-occurring contaminants such as DDE. In the case of the peregrine falcon egg from Bird Mtn., we do not know if the moderately high egg PCB concentration contributed to the presumed toxicity of DDE.

Figure 1. Location of Peregrine Falcon nests where eggs were collected from.

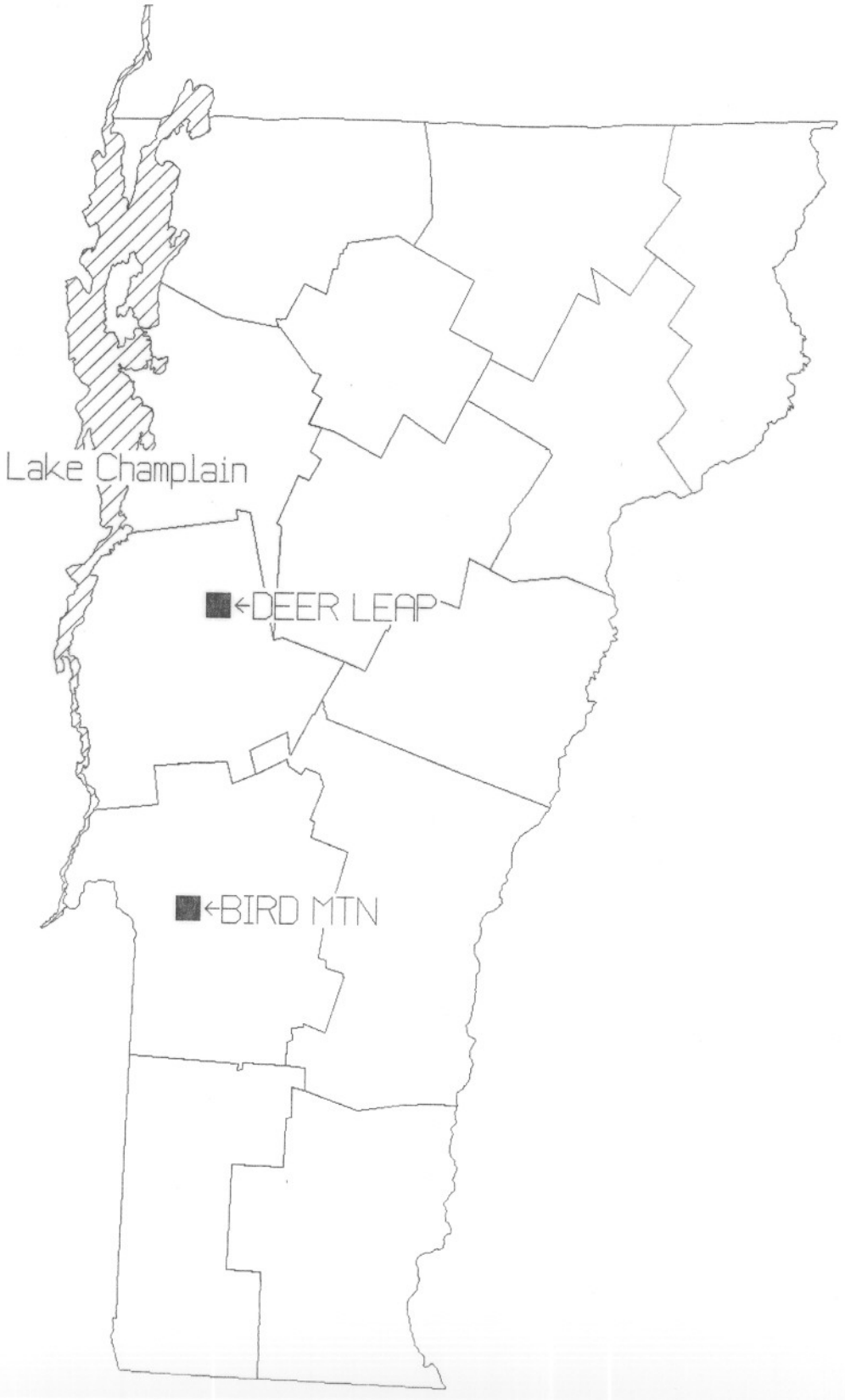

Table 1. Organochlorine and mercury residue levels (expressed as ppm fresh egg weight[a]) in three Peregrine Falcon eggs from Vermont, 1991.

Sample	HCB	PCB-1260	Dieldrin	Mirex	DDT[b]	Chlordanes[c]	Mercury
BM	0.026	**10.56**	0.423	0.423	**14.21**	0.988	0.063
DL1	BDL[d]	0.839	0.067	0.041	1.091	0.385	0.052
DL2	BDL	0.908	0.080	0.038	1.117	0.388	0.077

[a]as discussed in Stickel et al. (1973).
[b]Σ DDD, DDE, and DDT.
[c]Σ Heptachlor epoxide, oxychlordane, alpha chlordane, and trans-nanachlor.
[d]Below detection limit (0.01 ppm).

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Appendix 1. Sample information.

Sample[a]	Weight (g)	Percent Moisture	Percent Lipid	Length (mm)	Width (mm)
BM	36.0	78.05	7.3	51.3	39.5
DL1	37.0	82.93	6.0	51.4	41.0
DL2	36.0	82.04	5.6	51.1	40.9

[a]BM - Bird Mountain, DL - Deer Leap.