

**U.S. Department of the Interior
U.S. Geological Survey**

Field Manual of Wildlife Diseases

General Field Procedures and Diseases of Birds

**Biological Resources Division
Information and Technology Report 1999-001**

Milton Friend and J. Christian Franson, Technical Editors

Elizabeth A. Ciganovich, Editor

Phillip J. Redman, Design and layout

Rosemary S. Stenback, Illustrator

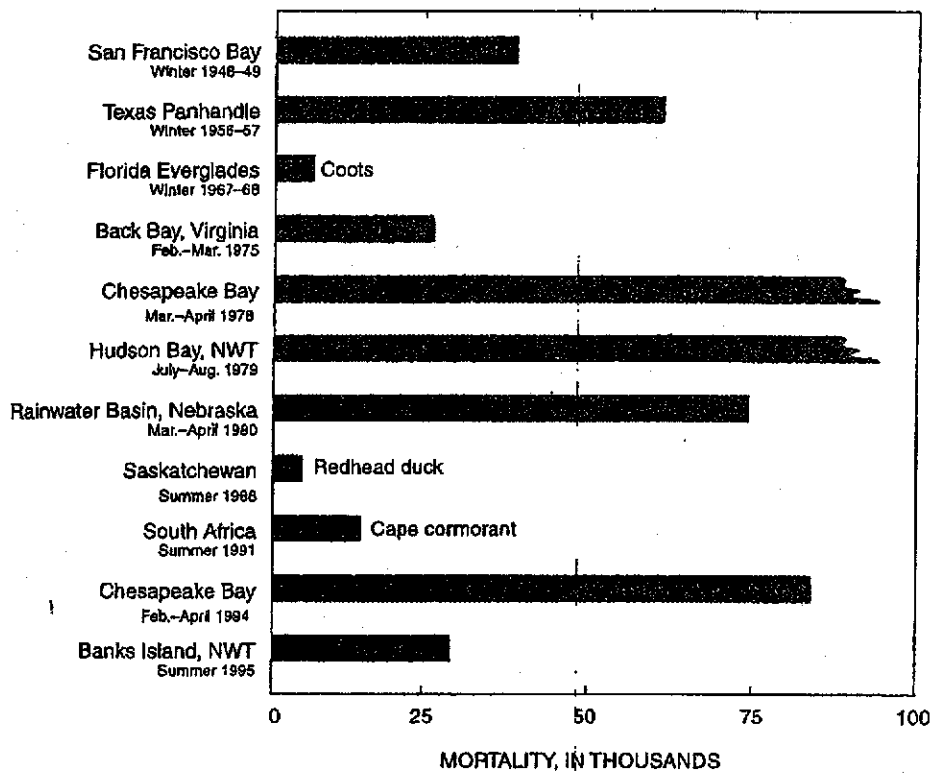


Figure 7.8 Examples of major avian cholera outbreaks in wild birds. (Broken bars indicate very high but indeterminate mortality.)



Photo by Milton Friend



Photo by James Hunt, Nebraska Game and Parks Commission

Figure 7.9 (A) Dense aggregations of waterfowl facilitate the rapid spread of avian cholera because of the highly infectious nature of this disease. (B) Large-scale mortality has occurred in such situations.

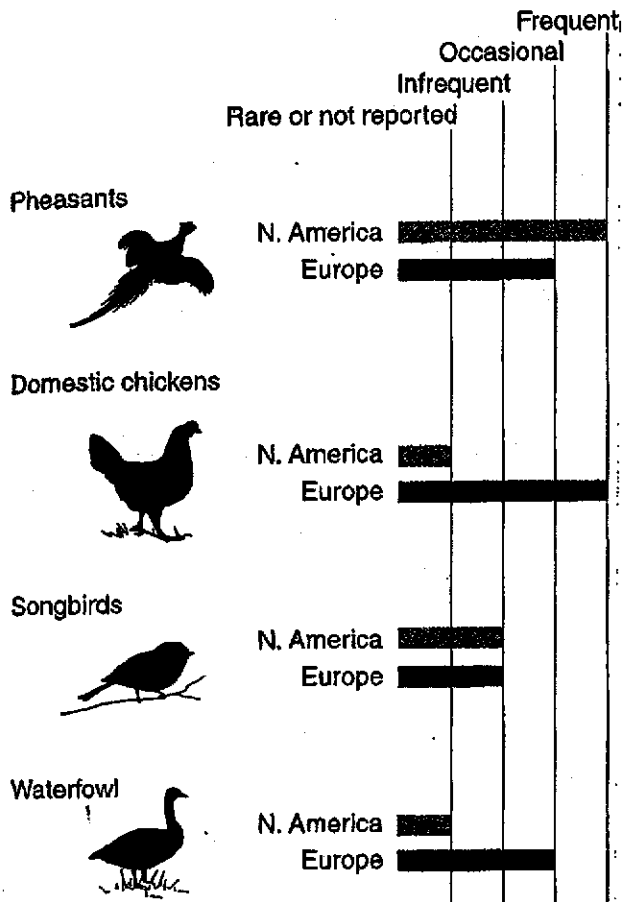


Figure 38.6 Frequency of botulism in captive birds.

Table 38.3 Major waterfowl botulism outbreaks in the United States and Canada.

Utah and California	1910	"Millions"
Lake Malheur, Oregon	1925	100,000
Great Salt Lake, Utah	1929	100,000– 300,000
Tulare Basin, California	1941	250,000
Western United States	1952	4–5 million
Montana	1978	50,000
Montana	1979	100,000
Great Salt Lake, Utah	1980	110,000
Canada (Alberta)	1995	100,000
Canada (Manitoba)	1996	117,000
Canada (Saskatchewan)	1997	1 million
Great Salt Lake, Utah	1997	514,000