



Project Summary

Wildlife Exposure Factors Handbook

Margaret McVey and Susan Braen Norton

The Wildlife Exposure Factors Handbook is a compendium of data and references for conducting exposure and risk assessments for wildlife species exposed to toxic chemicals in their environment. We hope that this project will (1) promote the application of risk assessment methods to wildlife species, (2) foster a consistent approach to wildlife risk assessments, and (3) increase the accessibility of the literature applicable to these assessments.

This Project Summary was developed by EPA's Office of Health and Environmental Assessment, Washington, DC, to announce key findings of the research project that is fully documented in a separate report of the same title (see Project Report ordering information at back).

Purpose

The purpose of the Handbook is to provide a convenient source of information and an analytic framework to facilitate screening-level risk assessments for common wildlife species. These screening-level risk assessments may be used to support site-specific decisions (e.g., for hazardous waste sites), to support the development of water quality or other media-specific criteria for limiting environmental levels of toxic substances to protect wildlife species, or to focus research and monitoring efforts.

Contents

The Handbook primarily summarizes values for parameters useful for the exposure assessment component of risk assessment. In addition, data provided in the Handbook on population parameters (e.g., birth and death rates) may be useful for placing estimates of risks in a broader ecological context. Values and extrapolation

methods required for the toxicity assessment component are not covered in this Handbook. In addition no chemical-specific parameters (e.g., bioavailability factors) are provided.

Species

This Handbook focuses on a selected group of mammals, birds, amphibians and reptiles. Fish and aquatic or terrestrial invertebrates were not included in the current effort. We do not intend to imply that risk assessments for wildlife should be restricted to the species described here, or should always be conducted for these species. In addition, the species included in the Handbook have broad geographic ranges, and the parameter values presented may not be representative for all parts of their ranges.

Organization

Section 1 provides an overview of the Handbook. Section 2 presents values for the exposure factors for the selected species and brief descriptions of relevant aspects of their natural history.

Contents of Section 2: Species Profiles

For 34 Selected Species (Table 1):

- Description of natural history
- List of similar species
- Exposure factor values (Table 2)
- Selected bibliography

The summary for each species includes an introduction to the general taxonomic group, a qualitative description of the species, tabulated values for the exposure factors, a list of similar species, and a selected bibliography for that species.

Section 3 provides allometric models that may be used to estimate various ex-



posure factors on the basis of body size. Section 3 also provides equations for estimating food ingestion rates on the basis of metabolic rate and diet.

Contents of Section 3: Allometric Equations

- Food ingestion rates
- Water intake rates
- Inhalation rates
- Surface areas
- Metabolic rates

The Handbook includes an appendix that presents all of the parameter values identified in our literature survey, with more details concerning sample size, methods and qualifying information than listed in the main Handbook.

Section 4 provides common equations used to estimate exposure of wildlife species. Section 4 also discusses available information on soil and sediment ingestion by wildlife species.

Contents of Section 4: Exposure Equations

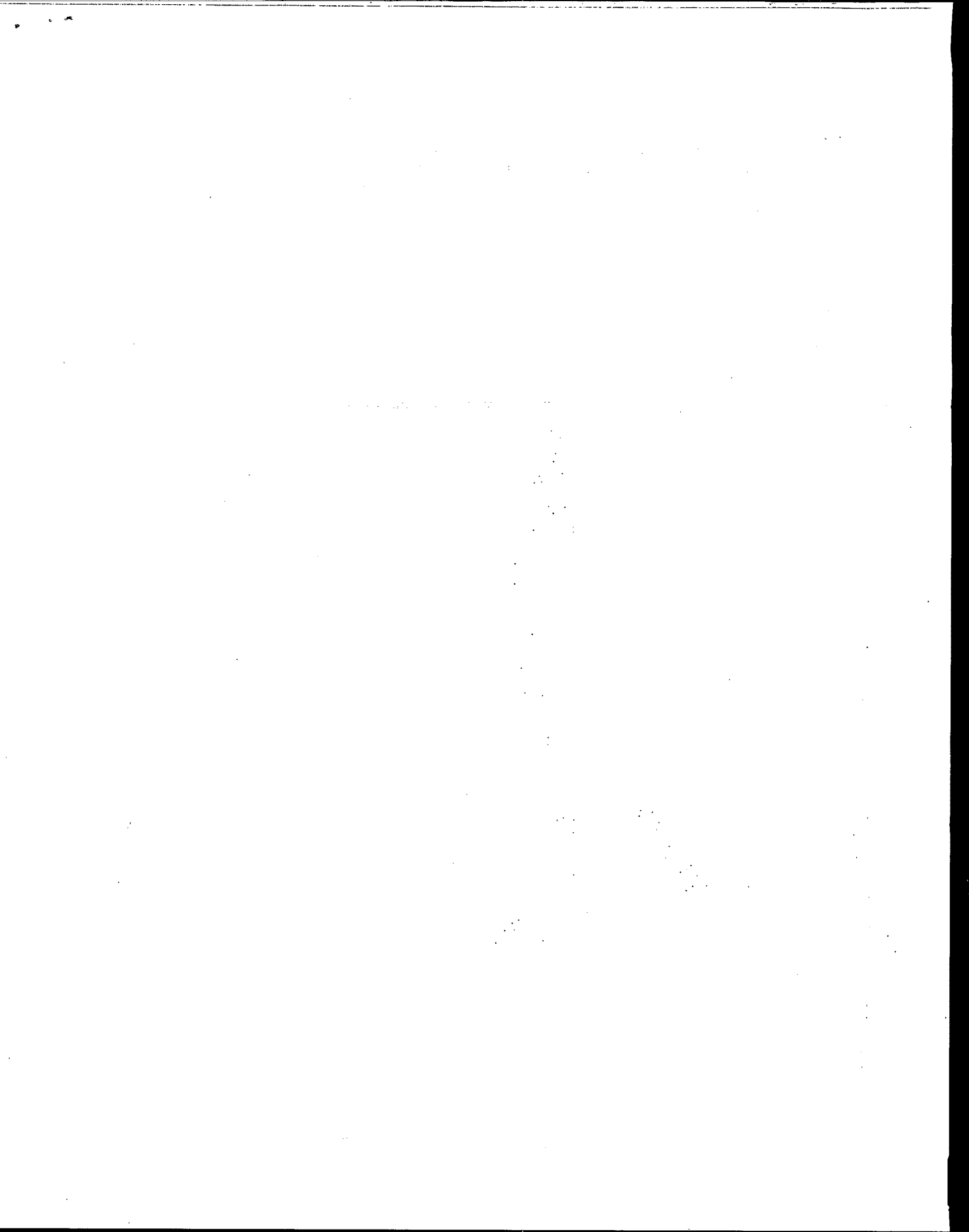
- General exposure equations
- Drinking water
- Diet
- Soil and sediment ingestion
- Air
- Dermal exposure
- Caloric and water content of various diets
- Analysis of uncertainty

Table 1. Species included in EPA's Wildlife Exposure Factors Handbook

Birds	Mammals	Reptiles and Amphibians
Great Blue Heron	Short-tailed Shrew	Snapping Turtle
Canada Goose	Red Fox	Painted Turtle
Mallard	Raccoon	Eastern Box Turtle
Lesser Scaup	Mink	Racer Snake
Osprey	River Otter	Water Snake
Red-tailed Hawk	Harbor Seal	Eastern Newt
Bald Eagle	Deer Mouse	Green Frog
American Kestrel	Prairie Vole	Bullfrog
Northern Bobwhite	Meadow Vole	
American Woodcock	Muskrat	
Spotted Sandpiper	Eastern Cottontail	
Herring Gull		
Belted Kingfisher		
Marsh Wren		
American Robin		

Table 2. Exposure Factors Included in the Handbook

Normalizing & Contact Rate Factors	Dietary Composition	Population Dynamics	Timing of Seasonal Activities
body weight	by season:	home range size	mating
metabolic rate	spring	population	nesting/egg laying
surface area	summer	density	parturition/
water ingestion rate	winter	litter/clutch	hatching
inhalation rate	fall	per year	hibernation
food ingestion rate	by habitat/	growth rates	dispersal
	location	annual mortality	migration
		rates	



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The complete report, entitled "Wildlife Exposure Factors Handbook,
Volume I: (Order No. PB94-174778; Cost: \$61.00, subject to change);
Volume II: (Order No. PB94-177789; Cost \$52.00, subject to change) will be
available only from:

National Technical Information Service
5285 Port Royal Road
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