

VERTEBRATE PEST MANAGEMENT

INTRODUCTION	
HOW TO USE THIS MANUAL	vii
CHAPTER 1: LEGALITIES OF VERTEBRATE PEST MANAGEMENT	1
State and Federal Laws.....	1
Federal Laws.....	2
FIFRA	2
OSHA.....	2
Endangered Species Act.....	2
Federal Migratory Bird Treaty Act.....	2
State Laws.....	2
Natural Resources and Environmental Protection Act.....	2
Regulation 636 (Pesticide Applicators).....	3
Michigan Occupational Safety and Health Act.....	3
Regulation 637 (Pesticide Use) Requirements	3
Part 401 of Act 451—Wildlife Conservation: Wildlife Damage and Nuisance Control Regulations.....	5
Wildlife Damage Control Rules and Regulations.....	6
Special Permits.....	7
Euthanasia of Animals.....	8
Animals That Have Bitten a Person.....	8
Disposal of Carcasses.....	8
Live Animals and Sale of Animals.....	9
Summary.....	9
Review Questions.....	10
CHAPTER 2: BIRDS	13
Pigeons.....	13
Habits of Pigeons.....	14
Starlings.....	14
Habits of Starlings.....	15
House Sparrows.....	15
Habits of House Sparrows.....	15
Other Birds.....	16
Health Hazards Associated with Birds.....	16
Histoplasmosis.....	16
Cryptococcosis.....	16
Ectoparasites.....	16
Defacement and Damage to Structures and Equipment	17
Legal Considerations.....	17
Federal Laws.....	17
State and Local Laws.....	17
Tools and Methods for Managing Pest Birds	17
Inspection.....	17
Habitat Modification.....	18
Exclusion.....	18
Ultrasonic Devices.....	19
Trapping.....	20
Lethal Alternatives.....	20
Avitrol.....	20
Toxic Perches.....	21
Ornitrol.....	21
Shooting.....	21
Risks to Non-targets.....	21
Public Relations.....	22
Bird Droppings Removal and Cleanup.....	22
Control of Pest Birds in Agricultural Areas.....	22
Exclusion.....	22
Frightening Devices.....	23
Chemicals.....	23
Cultural Practices	23
Summary	23
Review Questions.....	23
CHAPTER 3: DOMESTIC RODENTS	27
Rodents: Pictorial Key to Some Common U.S. Genera	28
Rats and Mice as Disease Carriers.....	29
Rat-bite Fever.....	29
Salmonella Food Poisoning.....	29
Leptospirosis or Weil’s Disease.....	29
About Rabies	29

Rat-spread Diseases.....	29	Curiosity.....	38
Plague.....	29	Physical Abilities.....	38
Murine Typhus Fever.....	29	Food and Water.....	39
Trichinosis.....	29	Range.....	39
Mouse-spread Diseases.....	30	Nests.....	39
Rickettsial Pox.....	30	Inspection.....	39
Meningitis.....	30	Sounds.....	39
Dermatitis.....	30	Droppings.....	39
Ray Fungus and Ringworm.....	30	Urine.....	39
The Norway Rat.....	30	Grease Marks.....	39
Habits of Rats.....	30	Runways.....	39
Life Cycle.....	30	Tracks.....	39
Social Behavior.....	30	Gnawing Damage.....	39
Senses of Rats.....	31	Visual Sightings.....	39
Fear of New Objects.....	31	Nest Sites.....	39
Physical Abilities.....	31	Pet Excitement.....	40
Food and Water.....	31	Mouse Odors.....	40
Range.....	31	Estimating Numbers of Mice.....	40
Nests.....	31	Control and Management of House Mice.....	40
Inspection.....	32	Sanitation.....	40
Flashlight.....	32	Mouse-proofing.....	40
Sounds.....	32	Traps.....	40
Droppings.....	32	Rodenticides.....	41
Urine.....	32	Summary.....	42
Grease Marks.....	32	Review Questions.....	43
Runways.....	32		
Tracks.....	33	CHAPTER 4: WILD RODENTS.....	47
Gnawing Damage.....	33	Wild Rodents as Disease Carriers.....	47
Burrows.....	33	Hantavirus Pulmonary Syndrome.....	47
Pet Excitement.....	33	The Deer Mouse.....	48
Odor.....	34	The White-footed Mouse.....	48
Estimating Rat Numbers.....	34	How is Hantavirus Transmitted?.....	48
Control and Management of Rats.....	34	Symptoms.....	48
Sanitation.....	34	Prevention.....	48
Eliminate Hiding Places.....	34	Voles.....	49
Rat-proofing (Exclusion).....	34	Control and Management of Voles.....	50
Traps.....	35	Exclusion.....	50
Rodenticides.....	36	Habitat Modification.....	50
The House Mouse.....	37	Repellents.....	50
Losses Due to Mice.....	37	Rodenticide.....	50
Habits of House Mice.....	38	Trapping.....	50
Life Cycle.....	38	Tree Squirrels.....	50
Social Behavior.....	38	Control and Management of Tree Squirrels.....	51
Senses of Mice.....	38	Exclusion.....	51

Repellents	51	Control and Management of Skunks, Raccoons, and Opossums.....	65
Trapping.....	51	Trapping.....	66
Ground Squirrels and Chipmunks	51	Shooting.....	67
Control and Management of Ground Squirrels and Chipmunks.....	52	Prevention through Habitat Modification	67
Ground Squirrels	52	Rabbits.....	67
Habitat Modification	52	Control and Management of Rabbits.....	68
Trapping.....	52	Exclusion	68
Rodenticides	53	Habitat Modification	68
Fumigation	53	Repellents	68
Chipmunks	53	Trapping.....	68
Exclusion	53	Shooting.....	69
Trapping.....	53	White-tailed Deer.....	69
Woodchucks	53	Lyme Disease.....	69
Control and Management of Woodchucks	54	Prevention of Lyme Disease	70
Exclusion	54	Control and Management of Deer	70
Fumigants	54	Exclusion	70
Trapping.....	54	Repellents	72
Shooting.....	54	Live Capture	72
Muskrats	55	Shooting.....	72
Control and Management of Muskrats	55	Snakes	73
Exclusion	56	Control and Management of Snakes	73
Habitat Modification	56	Summary.....	73
Rodenticides	56	Review Questions	74
Trapping.....	56		
Shooting.....	57		
Summary.....	57		
Review Questions	57		
CHAPTER 5: OTHER VERTEBRATE PESTS	61	APPENDICES	
Bats	61	Appendix A: Answers to Study Questions.....	79
Bats and Disease	62	Appendix B: Glossary	84
Habits of Bats.....	62	Appendix C: DNR Permit Forms.....	89
Inspection.....	62	Appendix D: Damage Prevention and Control Methods.....	92
Control and Management of Bats.....	63	Appendix E: Selected Bibliography.....	95
Exclusion	63	Appendix F: Resources.....	97
Repellents	63	Appendix G: Vertebrate Pests.....	99
Moles	64		
Control and Management of Moles	64		
Skunks, Raccoons, and Opossums	64		
Skunks.....	64		
Raccoons.....	65		
Opossums.....	65		