Restraint and Handling of Wild and Domestic Animals
CONTENTS

Preface to the First Edition, vii
Preface to the Second Edition, ix
Preface to the Third Edition, xi
Acknowledgments, xiii

Part 1. GENERAL CONCEPTS

1. Introduction, 5
2. Tools of Restraint, 11
3. Rope Work, 25
4. Thermoregulation, 45
5. Understanding Behavior for Restraint Purposes, 53
6. Training for Restraint Procedures, 59
7. Stress, 65
8. Animal Welfare Concerns During Restraint, 69
9. Medical Problems During Restraint, 73

Part 2. DOMESTIC ANIMALS

10. Horses, Donkeys, Mules, 97
11. Cattle and Other Domestic Bovids, 117
12. Sheep and Goats, 139
13. Swine, 149

Part 3. WILD ANIMALS

19. Delivery Systems, 219
20. Chemical Restraint, 227
21. Monotremes and Marsupials, 249
22. Small Mammals, 257
23. Carnivores, 275
24. Nonhuman Primates, 293
25. Marine Mammals, 307
26. Elephants, 321
27. Other Megavertebrates (Hoofed Stock), 343
28. Hoofed Stock (Other than the Megavertebrates), 355
29. Birds, 377
30. Reptiles, 411
31. Amphibians and Fish, 439

Appendices, 449
Index, 457
Beaver, 257, 267.
Bees, 8, 13-14
Behavioral factors, 6-8
Barracuda, 443.
Basal metabolism (BMR), 51
Barriers, 19-20, 330, 330f, 356f
Bat
Babirusa, 358, 358f, 359.
Barbiturates, 242, 244-45
Bandicoot, 249.
Banteng, 117, 119, 372t.
Bag, 15-16, 196.
Back splice, 28, 29f
Azium, 87
AZA.
Azaperone, 238, 338, 367
Atropine sulphate, 88, 239, 289
Audicoptic mange, 58
Autonomic nervous system, 66-67
Azaperone, 238, 338, 367
Atipamezole, 237
Ataxia, 84, 89, 92, 334f
Ataxic myoglobinuria, 89
Ataxia, 84, 89, 232
Ataxia: myoglobinuria, 89
Atropine sulphate, 88, 239, 289
Audiometric range, 58
Autonomic nervous system, 66-67
Averin. See Tribromoethanol
AWA. See Animal Welfare Act
AZA. See American Zoos and Aquariums
Association
Azulone, 238, 338, 367
Azurom, 87
AZA.
Azulone, 238, 338, 367
Hobbles, 31, 33, 76
Histamine, 67
Hitch, 32, 43.
Highway flares, 21
Hippopotamus, 14, 25, 40, 323, 343,
Hemp, 27
Hemorrhage, 74, 78, 91
Hemolytic anemia, 49
Hemogram, 75
Hemoglobinuria, 49
Hemoconcentration, 48, 87
Heron, 377.
Hierarchical status, 6, 57, 75
Helicopter
Heroin, 244
Hematoma, 74, 80
Hellbender, 440
Heat, 45, 48
Health status, 7
Head screens, 20
Hedgehog, 257.
Heaving line, 42
Hawk, 48, 377.
Hardwood dowels, 22f
Hard fibers, for rope, 26t, 27f
chain hobbles, 127f
Cattle, domestic, 123, 127f, 134
Elk, 367f
transport, 348
Pygmy, 348, 348f
physical restraint, 399f
chemical restraint, 225
anaesthesia, 399f
Horse evacuation, 108
Net firing, 365f
physical restraint, 257-58, 258f
Sheep herding, 373
chemical restraint, 258, 258f
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
Hoof, 30-31, 30f
physical restraint, 392, 393f, 395f
behavior, 199
Danger potential, 257-58, 258f
sex differentiation, 258
Helicopter
chemical restraint from, 225
elk, 364f
chemical restraint from, 225
Horse, wild.
Human injury, during restraint, 91-92
Humane considerations, 7-8
Hoven, 90-91
Horse, domestic, 47, 59, 79
Hornbill, 20, 377, 400, 400f, 401f
Horns
Hoofed stock, 14-15, 17, 356f.
**Index**

- **KCl.**
- Kangaroo, 84, 257
- Ketalar.
- Ketaject.
- Jays, 408
- Kangaroo.
- Ionotropic agents, 87
- Isoflurane
- Ischemia, 80, 87, 89, 91
- Invertebrates, 13-14
- Isolation, 87
- Ioofurine
- bat, 260
- birds, wild, 380-81
- birds, wild, long-billed, 399
- edentates, 263
- elephant, 338
- insectivores, 258
- lizards, 421
- marine mammals, 318f
- penguins, 382
- primates, 318
- primates, 304-5
- rats, 255
- rabbits, 264
- raptors, 405f
- snakes, 436, 436f
- sloth, 262
- snakes, 436-37
- waterfowl, domestic, 216
- Isopropl alcohol, 434
- Jays, 408
- Kangaroo. See also Marsupials
- anatomy, 250
- behavior, 250
- blood collection, 255
- chemical restraint, 255-56, 255f
- danger potential, 250
- gender names, 249
- physical restraint, 253-55, 253f, 254f
- transport, 255
- Kangee, 84, 257
- KCL. See Potassium chloride
- Ketajet. See Ketamine hydrochloride
- Ketamine. See Ketamine hydrochloride
- Ketamine hydrochloride, 231-33, 245
- cats, 259-60
- bears, 289
- birds, wild, 377, 381
- cat, domestic, 198
- chelonians, 418
- felines, 288
- fish, 446
- insectivores, 258
- lizards, 411
- marsupials, 255-56
- mink, 282
- pangolins, 264
- porcupine, 270-71
- poultry, domestic, 216
- primates, 303
- raptors, 396
- skunk, 281
- sloth, 262
- snake, 436, 437f
- wolverine, 283
- Laben, 30lf, 305, 305f
- Laber, 203, 203f
- Laber, 203, 203f
- lamas, 172f, 243-44
- larvae, 36f, 43
- Lamb.
- Lagomorpha.
- Laminitis, 79-80
- Lactated Ringer’s solution, 86, 87
- Lactate dehydrogenase (LDH), 89
- Laceration, 47, 74, 75
- Lactate dehydrogenase (LDH), 89
- Lactated Ringer’s solution, 86, 87
- Lagemorph. See Rabbit
- Lamb. See Sheep, domestic
- Laminitis, 79-80
- Laryngespasm, 83
- Laryngoscope, 179f, 243f
- Laying ropes, 43
- LDH. See Lactate dehydrogenase
- Looming, 26lf. See also Rodents
- Loomer, 209f. See also Primates
- Leopard, 383. See also Felids
- Lidocaine, 446
- Light squeeze cages, 16f
- Litter, 43. See also Rope
- Lion, behavior, 12, 15, 88
- Live traps, 253f
- Lizards, 14
- blood collection, 220-22, 222f
- chemical restraint, 221-22, 222f
- danger potential, 14, 419
- gecko, 419f
- Gila monster, 419, 420, 422f
- hypocalcemia, 83
- iguana, 420f, 421f, 422f
- Mexican beaded, 419
- physical restraint, 419-21, 419f
- poisonous, 420
- sedation, 422f
- snakes, 420, 421f
- squaw, 419f
- llama, 162f. See also Camels
- anatomy, 177f
- behavior, 53f, 54f, 55f, 56, 57, 167
- blood collection, 165f, 172f, 173, 176, 177f
- casting, 173
- chemical restraint, 178f
- chems, 166
- danger potential, 14, 161-63
- eating, 168, 168f
- intubation, 172f, 243-44
- juveniles, 172f, 173f
- laminitis, 79
- muzzle, 165f
- physical restraint, 163f, 164f, 166-69, 169f, 171f, 174f, 175f
- soft palate, 244f
- transport, 174f, 175f
- vocalization, 167
- Long splices, 25, 27, 28f
- Loon, 377. See also Birds, wild, water
- Loops, 17-19. See also Rope work
- Loops, 402. See also Birds, wild, pittacine
- LSD, 244
- Lymphocytes, 67
- Lymphocytosis, 85
- Lymphopenia, 69, 67-68
- Lysoosomal membranes, 67
- M99. See Procyonids
- Macaque, 402, 209f. See also Birds, wild, pittacine
- Maret, 15, 21. See also Birds, wild, pittacine
Medetomidine, 29, 255, 256, 256f.

Matthew Walker knot, 29f.

Marsupium, 250, 255, 256, 256f.

Megavertebrates, 10.

Medical problems, during restraint.

Marsupials, 47, 84, 238, 289.

Milk fever, 83.

Mink, 282, 283, 283f.

Mistletoe, 19.

Mocca, 250, 251, 254, 256.

Monotremes. See also Echidna; Platypus.

Moose, 257, 258, 258f.

Moiré, 76.

Morphology, 8.

Motor cortex, 67f.

Myoglobinuria, 49, 89.

Myopathy, 73, 81, 89-90, 91, 255, 371, 399.

Naloxene hydrochloride, 236.

Naltrazem HCl, 236, 241, 337.

Narcan. See Naloxone hydrochloride.

Narcosis, 245.

Narcotic, 245.

Natural selection, 8.

Nebulization chamber.

Net gun, 243.

Nicotine alkaloids, 240.

Nicotine alkaloids, 240.

Nephritis, 84.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

cervical, 89-90.

Negative reinforcement, 60.

Negative reinforcement, 60.

Net gun, 365f.

Nets, 13, 18-19, 18f, 19f, 360f.

Net gun, 365f.

Nipple, 79.

Necevatic acid, 237.

Nestgast, 243.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.

Net invasion, associated with restraint, 76-78.

Necrosis, 87, 91.

Nekkirae, 29.

Neuroendocrine system, 66, 67f.

Neuroleptanalgesia, 245.

Neuroleptic, 245.

Neuroleptanalgesia, 245.

Nicotine alkaloids, 240.

Nocturnal animals, 6, 15.

Noxious phlegm, 23.
INDEX

Tortoise (continued) 415, 417
Toward, 411
Towardness, 70
Training, for restraint procedures, 59-63
Tramipril. See Diazepam
Tramipril. See Diazepam
Tremor. See Perphenazine enanthate
Translocation, 5
Transfer cage, 16f, 22, 300f
Tubes, for snake restraint, 17f
Tuna, 444
Tubalidentata. See also Camelids
Turkey. See Galliformes
Turaco, 396
Tubes, for snake restraint, 17f
Tuba, 36, 161, 171, 17f. See also Camels
Viper. See also Snakes
Viverrids, 275, 280t, 283
Viverridae. See also Canivores
Vocalization
camels, 163
cat, domestic, 198
elephant, 54-55
goat, 145
lamba, 167
Voice, 11
Vomiting, 77, 82, 85, 88
Vulture. See also Birds, wild, shore
Vulturiformes. See also Birds, wild, shore
Waddles, 209-10
Walls, 217-447
water; Poultry, domestic
Wallaby, 249, 253, 253F, 255
Wallace, 14, 249, 253F. See also Marsupials
Wallaroo, 14, 249, 253F. See also Marsupials
Wallow, 28f
Walrus, 307, 314-16. See also Pinnipeds
Wegiel, 355, 365f, 366f. See also Elek
Warbler, 408. See also Birds, wild
Wariness, 56
Wart hog, 358, 358F. See also Suids
Wasps, 13-14
Wastewater, domestic. See also Birds, wild, shore
water, Poultry, domestic anesthesia, 216
behavior, 209-10
chemical restraint, 216
classification, 209
danger potential, 209
gender names, 209
books, 214f
physical restraint, 213-15
physiology, 208-10
releasing, 215
transport, 215-16
weights, 209
Turkey fish, 444f
Turkey, 444. See also Galliformes
Turkey. See also Poultry, domestic
artificial insemination, 212, 213f
blood collection, 212
chemical restraint, 216
classification, 209
danger potential, 209
gender names, 209f
medication, oral, 212
physical restraint, 210-12, 212f
releasing, 215
transport, 215-16
weights, 209
Turkey fish, 444f
Turbo, 411. See also Chelonians
sea, 417
side-necked, 415
snapping, 415, 416, 416f, 417f
soft-shell, 415-16
western pond, 415
Twine, 43
Twisted loop, 55f
Twitching, muscle, 83
Tympany, 90-91
Ulceration, gastrointestinal, 67-68
Unconditioned stimulus, 60
Uruguay, 345, 348, 356, 372f. See also Hoofed stock
Urea, 85, 86
Urine, 14
Urticaria. See Bear

Vaccines, 62
Vagal reflex, 87
Valium. See Diazepam
Vasoconstriction, 46, 87, 92
Vasodilation, 80
Vasomotor collapse, 86
Ventricular fibrillation, 73, 74, 82, 89
Verse, See Mifuroxime hydrochloride
Vicuna, 56, 161, 171, 17f. See also Camels
Viper. See also Snakes
Viverrids, 275, 280f, 283. See also Camivores
Voice, 11
Vomiting, 73, 74, 82, 89
Vocalization
camels, 163
cat, domestic, 198
elephant, 54-55
goat, 145
lamba, 167
Voice, 11
Vomiting, 77, 82, 85, 88
Vulture, 392. See also Birds, wild, shore
Vulcan. See also Marsupials
danger potential, 250
seto, 229
physical restraint, 232-53
squeeze cages, 253
Woodchuck, 296f. See also Rodents
Woodchuck, 296. See also Rodents
Wound. See also Abraion; Fracture; Laceration
X-ray
pinnipeds, 31f
sea lion, 319f
Kykales, 233-34
bovids, wild, 373
camelids, 178
cattle, domestic, 137
cervids, 367
dog, domestic, 191
elephant, 338, 338f
equus, 345
felids, 289
fish, 446
gastrotites, 351
goats, domestic, 148
horse, domestic, 114-15
marsupials, 255
raptors, 396
sheep, domestic, 148
Yak, 7, 117, 119f, 370. See also Bovids, wild; Cattle, domestic
Yohimbine, 236-37
Zebra, 343. See also Equids, wild; Hoofed stock
behavior, 12
blindfields, 344f
chemical restraint, 343-45, 344f, 344t
cholesteric bradycardia, 88
danger potential, 343
mestemach, 88
physical restraint, 343
transport, 343
Zebra fish, 444, 444f. See also Fish
Zebras, 117f
Zolazepam hydrochloride, 148, 191, 208, 223, 389, 396, 415
Zoletil. See Zolazepam hydrochloride