# Index

<table>
<thead>
<tr>
<th>A</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthocephaliasis</td>
<td>189, 241–243</td>
</tr>
<tr>
<td>Acanthocephaliasis</td>
<td></td>
</tr>
<tr>
<td>Acanths</td>
<td>see Acanthocephaliasis</td>
</tr>
<tr>
<td>Acaricides</td>
<td>285</td>
</tr>
<tr>
<td>Acid precipitation</td>
<td>339</td>
</tr>
<tr>
<td>Aflatoxicosis, see Aflatoxin poisoning</td>
<td></td>
</tr>
<tr>
<td>Aflatoxin poisoning</td>
<td>129, 260, 267–269</td>
</tr>
<tr>
<td>Agricultural waste</td>
<td>131</td>
</tr>
<tr>
<td>Air, gasping for</td>
<td>105</td>
</tr>
<tr>
<td>Air sacs, cheesy plaques in</td>
<td>131–132</td>
</tr>
<tr>
<td>Alachlor</td>
<td>285</td>
</tr>
<tr>
<td>Albatross</td>
<td></td>
</tr>
<tr>
<td>plastic debris in stomach of</td>
<td>363</td>
</tr>
<tr>
<td>tick paralysis in</td>
<td>258</td>
</tr>
<tr>
<td>Alcids, chlamydiosis in</td>
<td>111</td>
</tr>
<tr>
<td>Aldicarb</td>
<td>285, 287, 292, 351</td>
</tr>
<tr>
<td>Aldrin</td>
<td>295–297, 303</td>
</tr>
<tr>
<td>Algacides</td>
<td>285</td>
</tr>
<tr>
<td>Algal bloom</td>
<td>261, 263–264</td>
</tr>
<tr>
<td>Algal toxins</td>
<td>261, 263–266</td>
</tr>
<tr>
<td>Alkali poisoning, see Avian botulism</td>
<td></td>
</tr>
<tr>
<td>Allergic disease</td>
<td>128</td>
</tr>
<tr>
<td>All-terrain vehicle</td>
<td>21, 27</td>
</tr>
<tr>
<td>disinfection of</td>
<td>33</td>
</tr>
<tr>
<td>transport of live animals in</td>
<td>64–65</td>
</tr>
<tr>
<td>American avocet, lead poisoning in</td>
<td>320</td>
</tr>
<tr>
<td>American black duck</td>
<td></td>
</tr>
<tr>
<td>duck plague in</td>
<td>143</td>
</tr>
<tr>
<td>sarcocystis in</td>
<td>220</td>
</tr>
<tr>
<td>American coot</td>
<td></td>
</tr>
<tr>
<td>algal toxin poisoning in</td>
<td>264</td>
</tr>
<tr>
<td>aspergillosis in</td>
<td>130</td>
</tr>
<tr>
<td>gizzard worms in</td>
<td>236</td>
</tr>
<tr>
<td>lead poisoning in</td>
<td>320</td>
</tr>
<tr>
<td>salmonellosis in</td>
<td>103</td>
</tr>
<tr>
<td>trematodes in</td>
<td>251, 253</td>
</tr>
<tr>
<td>American egret, chlamydiosis in</td>
<td>112</td>
</tr>
<tr>
<td>American goldeneye, avian pox in</td>
<td>163</td>
</tr>
<tr>
<td>American goldfinch, mycoplasmosis in</td>
<td>115</td>
</tr>
<tr>
<td>American kestrel</td>
<td></td>
</tr>
<tr>
<td>chlorinated hydrocarbon poisoning in</td>
<td>296</td>
</tr>
<tr>
<td>staphylococcosis in</td>
<td>123</td>
</tr>
<tr>
<td>American wigeon</td>
<td></td>
</tr>
<tr>
<td>algal toxin poisoning in</td>
<td>264</td>
</tr>
<tr>
<td>nasal leeches in</td>
<td>245</td>
</tr>
<tr>
<td>sarcocystis in</td>
<td>220</td>
</tr>
<tr>
<td>American woodcock, woodcock reovirus</td>
<td></td>
</tr>
</tbody>
</table>

## disease in 185–186
| Amidostomiasis | see Gizzard worms |
| Amidostomum | see Gizzard worms |
| Amphibians, Eustrongylides in | 223–224 |
| Analytical laboratories | 371–372 |
| Anatoxin | 263, 265 |
| Anesthesia |  |
| as chemical restraint | 58 |
| euthanasia with inhalant anesthetics | 50 |
| Animal Care and Use Committees, institutional | 54 |
| Animal containers | 65–66 |
| Animal lists | 19 |
| Animal marking | 44, 61–63 |
| criteria for | 61–62 |
| professional and ethical considerations in | 62–63 |
| Animal population data | 19, 22 |
| Animal release guidelines | 70 |
| Animal relocation | 32–34, 69 |
| Animal Welfare Act (1985) | 53–54, 71 |
| Anoxia | 344 |
| Antimycin | 285 |
| Apapane, hemosporidiosis in | 194, 196–197 |
| Appearance, unthrifty | 95, 105, 208, 257 |
| Appetite, loss of | 118, 154, 195, 223, 268 |
| Arbovirus | 171 |
| Aroclor® | 303, 305 |
| Arsenic | 285 |
| Arthritis | 107, 185 |
| Ascites | 172 |
| Aspergillosis | 96, 127–133 |
| Aspergilloss, see Aspergillosis |
| Aspergillossus flavus, see Aflatoxin poisoning |
| Aspergillossus niger | 137 |
| Aspergillossus parasiticus, see Aflatoxin poisoning |
| Asper mycosis | see Aspergillosis |
| Asphyxiation | 129 |
| Ataxia | 172, 177, 290 |
| Atrazine | 285 |
| Auk |  |
| avian cholera in | 79 |
| oil toxicosis in | 311 |
| Avian botulism | 4, 55, 74, 260, 271–281 |
| Avian cholera | 74–92 |
| Avian diphtheria, see Avian pox |
| Avian hemorrhagic septicemia, see Avian cholera |
| Avian influenza | 140, 181–184 |
Avian malaria, see Hemosporidiosis
Avian pasteurellosis, see Avian cholera
Avian pox 140, 163–169
Avian trichomoniasis, see Trichomoniasis
Avicides 285
Avitrol® 285
Azinphos-methyl 287

B
Bacillary white diarrhea, see Salmonellosis
Bacterial diseases 74
Bald eagle
   avian pox in 163, 165, 168
   barbiturate poisoning in 349–350
   chlorinated hydrocarbon poisoning in 296, 298
   cyanide poisoning in 342
   electrocution of 359
   eustrongylidiosis in 225
   herpesvirus disease in 159
   lead poisoning in 317, 319–321
   mercury poisoning in 338–339
   oil toxicosis in 314
   pesticide poisoning in 292
   scoliosis in 355, 367
   staphyllococcosis in 123
Ballast waters 264
Band-tailed pigeon, trichomoniasis in 201, 203
Barbiturate poisoning 349–350, 353
Barn owl, chlorinated hydrocarbon poisoning in 296
Barred owl, avian pox in 165
Bay ducks
   lead poisoning in 318
   oil toxicosis in 311
Bayluscide® 285
Bean goose, heartworm of swans and geese in 234
Beaver, tularemia in 124
Behavior, altered 290
Benzene hexachloride 303
Beuthanasia-D Special® 51
Bewick’s swan, heartworm of swans and geese in 234
Big game, Pasteurella multocida in 77
Bill
   blood-stained 146
   cheesy lesions around 203
   discharge from 122, 319
   rapid opening and closing of 131
   scratching at 245
Bioaccumulation 295
Biomagnification 295
Biotoxins 260–261
Bird banding activity 109, 123
Birds of prey
   acanthocephaliensis in 242
   avian cholera in 75
   eustrongylidosis in 223
   mycoplasmosis in 115–116
   trichomoniasis in 203, 206
   tuberculosis in 93–94
Bird tick 257
Biting fly 193
Biting louse 233–234
Biting midge 193, 195
Bittern, oil toxicosis in 311
Blackbird
   aspergillosis in 130
   erysipelas in 121
   pesticide poisoning in 288
   salmonellosis in 100, 103
Black-crowned night heron, mercury poisoning in 338
Black duck
   aflatoxin poisoning in 267
   chlorinated hydrocarbon poisoning in 301
   duck plague in 143–144
   lead poisoning in 321
   mercury poisoning in 340
   necrotic enteritis in 122
   trematodes in 249
Black fly 193–195
Black-footed albatross, chlorinated hydrocarbon poisoning in 295
Black-footed penguin, herpesvirus disease in 159
Black-necked stilt, lead poisoning in 320
Blindness 105, 118, 247, 267, 290
Blood, thin and watery 195, 197
Blood lead level 323, 332
Blood sample 8
   collection from live animals 57–59
   shipment of blood tubes 14–15
Blood smear, in hemosporidiosis 198
Bluebird, pesticide poisoning in 288
Blue-green bloom 261
Blue grouse, tularemia in 124
Blue jay
   chlorinated hydrocarbon poisoning in 296
   mycoplasmosis in 119
Blue-winged teal
   aflatoxin poisoning in 267
   avian pox in 164
   chlorinated hydrocarbon poisoning in 296
   duck plague in 141
   trematodes in 249
Bobwhite quail
   avian pox in 164, 169
   chlorinated hydrocarbon poisoning in 297, 301
   gizzard worms in 236
herpesvirus disease in 159
histomoniasis in 257
lead poisoning in 320, 333
polychlorinated biphenyl poisoning in 305
tularemia in 124
Body temperature, reduced ability to regulate 290
Bomyl® 285
Booted eagle, herpesvirus disease in 159
Botulinum toxin 271–281
Botulism, avian, see Avian botulism
Brachial vein, blood collection from live animals 57
Brain
cholinesterase levels in 375–376
reddening of surface of 348
Brandt's cormorant, algal toxin poisoning in 264
Brant's goose, lead poisoning in 318
Breathing
impaired 165, 168, 195, 223, 247, 290
rapid 105, 290
Brevetoxin 263–265
Broadifacoum 285
Brolga crane, inclusion body disease of cranes in 153
Brooder pneumonia, see Aspergillosis
Brown-headed cowbird
polychlorinated biphenyl poisoning in 305
salmonellosis in 104
Brown pelican
algal toxin poisoning in 264–265
erisipelas in 121
lead poisoning in 317, 321
mercury poisoning in 338
oil toxicosis in 311
Budgerigar, candidiasis in 135
Bufflehead, nasal leeches in 245
Buildings, collisions with 365
Bullfinch, avian pox in 169
Bumblefoot 123
Burial of carcasses 21, 32
Burn marks 359–360
Bursa of Fabricus, atrophy of 305–306
Buteo, electrocution of 357
Buzzard, tuberculosis in 93–94

C
Cadmium 285
California gull, lead poisoning in 320
California herring gull, Newcastle disease in 175
California quail, chlorinated hydrocarbon poisoning in 297
Call, change in tone of 319
Canada goose
aflatoxin poisoning in 267–268
aspergillosis in 130
avian cholera in 81, 91
avian pox in 163–164
captured in plastic debris 363
chlorinated hydrocarbon poisoning in 296–297
duck plague in 141, 143, 146
gizzard worms in 236, 238
heartworm of swans and geese in 234
histomoniasis in 257
ingestion of dry soybeans 356
lead poisoning in 317–319, 321, 324, 327, 331, 333
necrotic enteritis in 122
oil toxicosis in 313–314
transport of live animals 66
tumor in 364
weather-related losses of 366
Canary
erisipelas in 121
herpesvirus disease in 159
salmonellosis in 100
Candida albicans, see Candidiasis
Candidiasis 128, 135–136
Canker, see Trichomoniasis
Cannon net 35
Canvasback
gizzard worms in 236
nasal leeches in 245
oil toxicosis in 311
Cape cormorant, avian cholera in 81
Captan 285
Captive-reared animals, release of 70
Capture devices 33, 35–36
Capture myopathy 58, 60, 364
Carbamate pesticides 4, 287–293, 351
Carbaryl 287
Carbofuran 285, 287, 289, 292, 351
Carbon dioxide, euthanasia with 50–51
Carbon dioxide projected dart 61
Carbon-in-pulp mill process 342, 345
Carbon monoxide, euthanasia with 50–51
Carcass, see also Specimen
disposal of 21–32, 43
dogs to aid in locating 21
euthanized, barbiturate poisoning in scavengers 349–350
fish 280
labeling of 12
lines of dead birds 276, 278
removal of 21, 41, 43
plastic bags/containers 21, 25, 43
specimen to submit to laboratory 7
transport of 21, 25
vertebrate 272, 279–280
Carcass-maggot cycle, of avian botulism 272–273, 279
Carnivores
Pasteurella multocida in 77
Sarcocystis in 219–222
Cassin’s finch, salmonellosis in 104
Castor beans 261, 356
Cat(s), Mycobacterium avium in 93
Catalogued collections 56–58
Cattle, see Livestock
Cecal cores 257
Cedar waxwing
avian cholera in 80
salmonellosis in 104
Ceratopagonid fly 193–195
Cervical dislocation, as euthanasia method 49–50
Cestodes 189, 254
Cheilospirura spinosa, see Gizzard worms
Chemical euthanasia 50–51
Chemical ice pack 14
Chemical names 382–384
Chemical restraint 58, 61
Chemical toxins 284–285
miscellaneous 351–353
sources of assistance for investigating mortality events 370–372
Chestnut-backed chickadee, salmonellosis in 104
Chicken
aspergillosis in 130
avian botulism in 275
avian cholera in 82
avian influenza in 181, 183
avian pox in 165
candidiasis in 135
erysipelas in 121
herpesvirus disease in 157–158
histomoniasis in 257
inclusion body disease of cranes in 153–154
intestinal coccidiosis in 210
mycoplasmosis in 115–116
nematodes in 255
Newcastle disease in 175–179
new duck disease in 122
salmonellosis in 100
ticks on 257
tracheal worms in 229
trichomoniasis in 203
tuberculosis in 94
ulcerative enteritis in 123
Chipping sparrow, salmonellosis in 104
Chlamydia psittaci, see Chlamydiosis
Chlamydiosis 74, 111–114
Chlordane 296–297, 301, 303
Chloride poisoning 353
Chlorinated hydrocarbon poisoning 295–302, 352
Chlorine 285
Chlorine bleach 33–34
Chlorophaconine 285
Chlorpyrifos 289, 292, 352
Choke cherry 261
Cholera, avian, see Avian cholera
Cholinesterase, brain levels, normal values 375–376
Cholinesterase inhibitors 287–293
Chromium 285
Chronic respiratory disease, see Mycoplasmosis
Chukar partridge
chlorinated hydrocarbon poisoning in 296–297
eastern equine encephalomyelitis in 171
mercury poisoning in 338
mycoplasmosis in 117–118
tuberculosis in 96
ulcerative enteritis in 122
Ciguatoxin 264
Circular movements, involuntary 172
Cloaca, cheesy plaques in 151
Cloacotaenia 254
Clophens® 305
Clostridial enterotoxemia 74
Clostridium botulinum, see Avian botulism
Clostridium colinum, see Ulcerative enteritis
Clostridium perfringens, see Necrotic enteritis
Closure of area 33–34
Clothing, protective, see Protective clothing
Coccidian 189
Coccidiiasis, see Intestinal coccidiosis
Coccidiosis
intestinal, see Intestinal coccidiosis
renal, see Renal coccidiosis
Cockatiel, chlamydiosis in 111
Cold stress, reduced tolerance to 290
Colibacillosis 125–126
Colonial nesting birds
avian pox in 164
salmonellosis in 99, 103–105
Comatose bird 349
Common buzzard, herpesvirus disease in 159
Common crane, inclusion body disease of cranes in 153–154
Common egret
chlamydiosis in 114
europsychogalacto in 225
mercury poisoning in 338
Common eider
acanthocephaliasis in 242
intestinal coccidiosis in 211
lead poisoning in 317
Common goldeneye, avian pox in 164
Common loon
lead poisoning in 317, 320–321
mercury poisoning in 338
Common merganser
erysipelas in 121
mercury poisoning in 338
Common moorhen, trematodes in 252
Common murre
  algal toxin poisoning in 264
  avian pox in 164, 169
Common names of wildlife 377–381
Common scoter, avian pox in 164
Common tern
  algal toxin poisoning in 264
  avian pox in 183
  mercury poisoning in 338–339
Composting of carcasses 21, 32–33
Conjunctivitis, herpesvirus 158
Conversion table, of units of measurement 385–386
Convulsions 83, 85, 105, 107, 146, 208, 265, 290, 298, 300, 306
Cooper's hawk, chlorinated hydrocarbon poisoning in 296
Coot
  avian cholera in 78–81, 91
  chlorinated hydrocarbon poisoning in 296
  gizzard worms in 236–237
  inclusion body disease of cranes in 153
  lead poisoning in 319
  mycoplasmiosis in 117
  pesticide poisoning in 288
  salmonellosis in 100, 103
  selenium poisoning in 335
  trematodes in 249, 252
Copper 285
  Copper sulfate 285
Cormorant
  avian cholera in 79
  chlorinated hydrocarbon poisoning in 298
  erysipelas in 121
  eustrongylidiosis in 225
  herpesvirus disease in 158–159
  mercury poisoning in 338
Newcastle disease in 175–176
  oil toxicosis in 311
  polychlorinated biphenyl poisoning in 303
  renal coccidiosis in 216
  salmonellosis in 100, 103
Corn
  aflatoxin in 267–268
  fusariotoxin in 269
Cornea, cloudy 247
Coturnix quail, polychlorinated biphenyl poisoning in 303
Coughing 231
Coumaphos 352
Counter® 285
Cowbird
  aspergillosis in 130
  salmonellosis in 103
  Cracker shell 32, 34
Crane
  avian cholera in 79–80
  avian influenza in 181
  capture myopathy in 364
  chemical poisoning in 353
  chlamydiiosis in 112
  disseminated visceral coccidiosis of cranes in 207, 212
  eastern equine encephalomyelitis in 171–173
  erysipelas in 121
  herpesvirus disease in 157–159
  inclusion body disease of cranes in 140, 153–156
  intestinal coccidiosis in 207, 210–211
  lead poisoning in 319
  oil toxicosis in 311
  organophosphate poisoning in 352
  salmonellosis in 100, 103
  tuberculosis in 93–94
Crane herpes, see Inclusion body disease of cranes
Crop, sour, see Candidiasis
Crow
  aspergillosis in 130
  avian cholera in 78–80, 85, 91
  candidiasis in 135
  carbamate poisoning in 351
  chemical poisoning in 353
  erysipelas in 121
  organophosphate poisoning in 352
  pesticide poisoning in 288
  rodenticide and repellent poisoning in 353
  salmonellosis in 103
  tuberculosis in 93–94
Crustaceans, acanthocephalans in 242
Cryptosporidium, see Intestinal coccidiosis
Curlew, salmonellosis in 100
Cyanide poisoning 261, 341–345, 353
Cyanobacterial bloom 263, 265
Cyanobacterial toxins 264
Cyanosis 257
Cyathocotyle buchiensis 249–251
Cyathostoma bronchialis, see Tracheal worms
Cylindropermopsis 264

D
Dabbling ducks, sarcocystis in 220
Dactylaria gallopova 137
Daphnia, as nematode host 255
DDD 295–296
DDE 295, 298, 300
DDT 287, 296–298, 301
Decapitation 50
Deer, Mycobacterium avium in 93
Definitive host 188
Deformity 306, 335, 367
Dehydration 207–208, 250
Demeton 285
Demoiselle crane, inclusion body disease of cranes in 153
Deoxynivalenol 269
Depression 105, 118, 122, 157, 172, 257, 267, 300
Diacetoxyscirpenol 269
Diagnostic assistance, sources of 370–372
Diarrhea 95, 105, 122, 172, 290
bright green 319
greenish 122
rust-colored 112
watery 208
Diazinon 285, 289, 292, 351–352
Dicrotophos 292
Dieldrin 287, 295–297, 300–301, 303, 352
Die-off, description of location of 5–6
Digestive tract, see Gastrointestinal tract; Intestine
Dimethoate 287, 292, 352
Dinoflagellate bloom 259, 263
Diphacinone 285
Diphtheria, avian, see Avian pox
Diquat® 285
Direct life cycle 188–190
Disease control operations
analyses 42
disease outbreak summary 48
field communications systems 44
during field research 67–69
planning phase of
biological data records 19, 22–23, 41
identification of needs 19–20, 41
response activities
animal relocation 32–34
carcass disposal 21–32, 43
carcass removal 21, 41, 43
disinfection 33–34, 38–39, 43
establishing control of area 41
personnel for 34, 40
problem identification 21, 41
response modifications 40
for specific diseases
for acanthocephalasis 243
for aflatoxin poisoning 268
for algal toxins 266
for aspergillosis 131
for avian botulism 279–280
for avian cholera 88–91
for avian influenza 184
for avian pox 169
for barbiturate poisoning 350
for chlamydioidis 113
for chlorinated hydrocarbon poisoning 302
for cyanide poisoning 345
for duck plague 39, 151
for eastern equine encephalomyelitis 174
in electrocutions 360
for eusstrongylidiosis 225
for fusariotoxin poisoning 270
for gizzard worms 239
for hemoplasmodiosis 199
for herpesvirus disease 160
for inclusion body disease of cranes 154–156
for intestinal coccidiosis 211–213
for lead poisoning 332–333
for mercury poisoning 340
for mycoplasmosis 119
for nasal leeches 248
for Newcastle disease 178–179
for oil toxicosis 313–314
for pesticide poisoning 292–293
for polychlorinated biphenyl poisoning 306–307
for renal coccidiosis 218
for salmonellosis 107–109
for salt poisoning 348
for sarcocystis 221–222
for selenium poisoning 336
for tracheal worms 231
for trichomoniasis 206
for tuberculosis 95–96
for woodcock reovirus disease 186
station disease contingency plan 45–47
surveillance activities 42, 44
wildlife population and habitat management 44
wildlife sampling and monitoring 44
Disease introduction 67–69
Disease onset, estimation of 4
Disinfectant 33–34
Disinfection 33–34, 38–39, 43
Dissection of bird 10–11
Disseminated visceral coccidiosis of cranes 207, 212
Disulfoton 292, 352
Diving birds
mercury poisoning in 338
oil toxicosis in 311
Diving ducks
aspergillosis in 130
gizzard worms in 237
lead poisoning in 318, 332
nasal leeches in 245
pesticide poisoning in 288
sarcocystis in 221
trematodes in 249
Dog
location of carcasses by 21
Mycobacterium avium in 93
Domestic animal disease programs 370
Domoic acid 263–265
Double-crested cormorant

- entangled in fishing line 362
- lead poisoning in 320–321
- mercury poisoning in 338
- Newcastle disease in 175–178
- polychlorinated biphenyl poisoning in 303
- renal coccidiosis in 217
- salmonellosis in 103

Dove

- avian cholera in 79
- carbamate poisoning in 351
- chemical poisoning in 353
- chlamydia in 111
- erysipelas in 121
- hemoplasmosis in 194
- herpesvirus disease in 158
- intestinal coccidiosis in 210
- lead poisoning in 319, 332–333
- Newcastle disease in 176
- organophosphate poisoning in 352
- pesticide poisoning in 288
- salmonellosis in 103
- trichomoniasis in 201–203, 206

Drive trap 36

Droopiness 105, 122, 146
Drop net 33

Droppings

- blood-stained 83
- fawn-colored or yellow 83

Drowning 148, 277–279, 309–310, 356, 367

Drowsiness 83, 172, 349

Dry ice

- euthanasia with 51
- for specimen shipment 14, 17

Duck

- acanthocephaliasis in 242
- aflatoxin poisoning in 267
- algal toxin poisoning in 264
- aspergillosis in 130
- avian botulism in 277
- avian cholera in 78–79
- candidiasis in 135
- chlamydia in 111, 114
- chlorinated hydrocarbon poisoning in 296
- duck hepatitis in 361
- duck plague in 141–151
- erysipelas in 121
- gizzard worms in 236–237
- hemoplasmosis in 194–195
- herpesvirus disease in 157
- intestinal coccidiosis in 210
- lead poisoning in 318
- mycoplasmosis in 115, 117
- nasal leeches in 248

- necrotic enteritis in 122
- nematodes in 255
- Newcastle disease in 175
- new duck disease in 122
- oil toxicosis in 311
- renal coccidiosis in 216–217
- rictin poisoning in 356
- salmonellosis in 100, 103, 107
- salt encrustation of 347
- staphylococcosis in 123
- tracheal worms in 229
- tularemia in 124

Duck disease, see Avian botulism
Duck hepatitis 361–362
Duck leeches, see Nasal leeches
Duck plague 39, 140–151
Duck virus enteritis, see Duck plague
Dung piles 101
Dusky song sparrow, salmonellosis in 104
DVE, see Duck plague

E

Eagle

- avian cholera in 78–79, 91
- carbamate poisoning in 351
- chemical poisoning in 353
- chlorinated hydrocarbon poisoning in 352
- cyanide poisoning in 342
- electrocution of 357
- erysipelas in 121
- herpesvirus disease in 158
- lead poisoning in 317, 322
- organophosphate poisoning in 352
- pesticide poisoning in 288
- rodenticide and repellent poisoning in 353
- salmonellosis in 100
- staphylococcosis in 123
- streptococcal poisoning in 351
- tularemia in 124

Eagle owl, herpesvirus disease in 159

Eared grebe

- algal toxin poisoning in 264
- erysipelas in 121
- salmonellosis in 103

Earthworms

- chlorinated hydrocarbons in 295
- histomonads in 257
- tracheal worm carriage 229–230

East African crowned crane, inclusion body disease of cranes in 153

Eastern equine encephalomyelitis 140, 171–174

Eastern screech owl, avian pox in 165

Eastern sleeping sickness of horses, see Eastern equine encephalomyelitis
Echinuria uncinata 255–256
Ectoparasites 188, 249, 257–258
Edema 305–306, 344
EEE, see Eastern equine encephalomyelitis
Egg production, decreased 183
Eggshell, thin 298–300, 303, 306
Egret
  avian cholera in 79
  chemical poisoning in 353
  chlamydiosis in 112
  chlorinated hydrocarbon poisoning in 298
  eustrongylidiosis in 225
  lead poisoning in 321
  oil toxicosis in 311
  salmonellosis in 99–100, 103
Eider
  aspergillosis in 131
  avian cholera in 80, 82, 91
  oil toxicosis in 311
  renal coccidiosis in 217
Eimeria, see Intestinal coccidiosis; Renal coccidiosis
Electrocution 356–360
Embryo mortality 306, 335
Embryonic deformity 335
Emerging infectious disease 140
Emu, eastern equine encephalomyelitis in 171
Encephalomyelitis 158
Endoparasites 188, 249
Endosulfan 297
Endrin 295–297, 301
Enflurane 50
English sparrow, salmonellosis in 104, 106
Enteritis 211, 249
  duck virus, see Duck plague
  necrotic, see Necrotic enteritis
  ulcerative, see Ulcerative enteritis
  woodcock reovirus 185
Environmental factors, records of 4
Epithelioma, contagious, see Avian pox
Epizootiology 3
Epomidiostomum, see Gizzard worms
Erysipelas 121
Erysiplokhrix rhusopathiae, see Erysipelas
Escherichia coli, see Colibacillosis
Esophagus
  cheesy, raised plaques along 146, 150–151
  hard, cheesy lesions of 205
  impaction of 320, 328–329
  light-colored granulomas in 211–212
  yellow, cheesy nodules in 106
Ethion 287
Ethylene glycol poisoning 285, 353
European blackbird, erysipelas in 121
European bullfinch, salmonellosis in 100
European jay, aspergillosis in 130
European starling
  mycoplasmosis in 116, 118
  polychlorinated biphenyl poisoning in 305
  salmonellosis in 103
European thrush, acanthocehaliasis in 242
Eusstrongylides, see Eustrongylidiosis
Eustrongylidiosis 223–228
Euthanasia 7, 32, 49–51
  chemical 50–51
  guidelines for field research 54, 67, 70
  physical 49–50
  selection of method of 49
Euthanasia agents 50–51, 285
  barbiturate poisoning of scavengers 349–350
Eutrophication 225, 261
Evening grosbeak, salmonellosis in 104, 106
Exertional myopathy, see Capture myopathy
Exhaustion 309–310
Exsanguination 50
Eye
  cheesy plaques in 131
  discharge from 112, 122
  drainage from 118
  erosions on surface of 348
  inflamed 118
  leeches in 245, 247
  protrusion of 290
  puffy 118
  swollen 118
Eyelids
  crusty 118
  drooping of 290, 339
  paralysis of 277–278
  pasted 105
  swollen 118
F
Face, puffy 203–204
Falcon
  avian cholera in 78–79
  electrocution of 357
  herpesvirus disease in 157–159
  intestinal coccidiosis in 210
  pesticide poisoning in 288
  salmonellosis in 100, 103
  trichomoniasis in 203
  tuberculosis in 93
Famphur 289, 292, 351–352
Favus, fowl, see Ringworm
Feathers
  burn marks on 359
loss of 137, 258
oil contamination of 309–310, 312
ruffed 105, 112, 122, 135, 183, 257, 339

Feces
bile-stained 319
green-colored 319, 325

Feeding difficulties 112, 165
Fenamiphos 292
Fences, collisions with 365
Fenclos® 305
Fensulfothion 292
Fenthion 285, 289, 292, 352
Ferruginous hawk
avian pox in 165
staphylococcosis in 123

“Field hospital,” for waterfowl 55

Field research
animal disposal at completion of study 70
animal marking 61–63
blood and tissue collections 57–59
conditions for confined wildlife 54–55, 63–64
disease considerations 67–69
euthanasia 67, 70
housing and maintenance of field sites 54–55, 63–64
investigator disturbance and impacts 56
professional society guidelines for 71
restraint and handling of wildlife 58–60
safety of personnel 70
surgical and medical procedures 65–67
transport of live animals 64–65
wildlife in 53–71
wildlife observations and collections 56–58
Wildlife Society guidelines for 53–71

Filarial heartworm, see Heartworm of swans and geese
Finch
avian cholera in 79
avian pox in 164
erysipelas in 121
herpesvirus disease in 159

Fish
acanthocephalans in 242
Eustrongylides in 223–225
mercury in 339
Pfiesteria mortality in 265

Fish-eating birds
chlorinated hydrocarbon poisoning in 295
eustrongylidosis in 225
polychlorinated biphenyl poisoning in 303
renal coccidiosis in 216

Fishing line, discarded 362
Fishing sinkers 333

Flamingo
capture myopathy in 364
lead poisoning in 320

Flea 258

Flight
awkward 265
erratic 83, 319
inability to fly 146, 148, 267, 277–278, 309
reluctance to fly 318

Flukes, see Trematodes
Fluorine poisoning 353
Fly 258
Fly larvae, tracheal worm carriage 229–230
Fonofos 292, 352
Food chain 295, 303, 337
Foot webs, congestion in 265
Formalin 8
Fowl cholera, see Avian cholera
Fowl favus, see Ringworm
Fowl pest, see Avian influenza
Fowl plague, see Avian influenza
Fowl pox, see Avian pox
Fowl tick 257
Fowl typhoid, see Salmonellosis
Francisella tularensis, see Tularemia
Franklin’s gull, algal toxin poisoning in 264
Frogs, acanthocephalans in 242
Frounce, see Trichomoniasis
Fulmar, mercury poisoning in 338
Fulvous whistling duck, chlorinated hydrocarbon poisoning in 296–297

Fungal disease 128
cutaneous 137
miscellaneous 137
subcutaneous 137
systemic 137

Fungicides 285
Funnel trap 35–36

Fusariomycotoxicosis, see Fusariotoxin poisoning
Fusariotoxin poisoning 269–270
Fusarium, see Fusariotoxin poisoning

G
Gadwall
aflatoxin poisoning in 267
duck plague in 141
nasal leeches in 245
sarcocystis in 220

Gait
abnormal 112
unsteady 319

Gallbladder, distended and bile-filled 320, 330

Gallinaceous birds
chlorinated hydrocarbon poisoning in 295, 298
mercury poisoning in 338

Gannet
mercury poisoning in 338
Newcastle disease in 177
salmonellosis in 103
Gapes, see Tracheal worms
Gape worm, see Tracheal worms
Gaping 131, 229, 247
Gastotaenia 254
Gastrointestinal tract, see also Intestine
dye in 291
hemorrhage in 146, 149, 151, 269, 309
inflammation and ulceration of 269–270
inflammation of 310
moist, necrotic lesions of 165
Geographic distribution
of aflatoxin poisoning 267–269
of aspergillosis 130
of avian botulism 275–277
of avian cholera 76, 80–84
of avian influenza 182–183
of avian pox 164–166
of candidiasis 135
of chlamydia 111
of chlorinated hydrocarbon poisoning 295
of cyanide poisoning 342–344
of duck plague 141–145
of eastern equine encephalomyelitis 171
of electrocution 358
of eustrongylidosis 223, 226–227
of fusariotoxin poisoning 269
of heartworm of swans and geese 234
of hemosporidiosis 195
of herpesvirus disease of cranes 157, 159
of inclusion body disease of cranes 153–154
of intestinal coccidiosis 208, 210
of lead poisoning 322–323, 333
of mercury poisoning 339
of mycoplasmosis 117
of nasal leeches 245–246
of Newcastle disease 176–178
of oil toxicosis 311–312
of pesticide poisoning 289
of polychlorinated biphenyl poisoning 303–305
of renal coccidiosis 217
of salmonellosis 100, 104
of salt poisoning 347
of sarcocystis 220
of selenium poisoning 335
of tracheal worms 229
of trichomoniasis 201, 203–204
of tuberculosis 94
of woodcock reovirus disease 185
Gizzard
green-stained 320, 330
hemorrhages on surface of 83
lead pellets in 320, 331
Gizzard pads, inflammation of 254
Gizzard worms 235–239
Glaucous-winged gull, lead poisoning in 320
Globe, collapse of 247
Glossy ibis, eastern equine encephalomyelitis in 171
Gloves 7, 21
disposable and reusable 21, 24
Goats, see Livestock
Golden eagle
avian pox in 165
barbiturate poisoning in 349–350
electrocution of 357–358
herpesvirus disease in 159
lead poisoning in 317, 319–320
mercury poisoning in 338–339
staphylococcosis in 123
Goldfinch, salmonellosis in 100, 104
Gold mining 341–345
Goose
acanthocephaliasis in 242
algal toxin poisoning in 264
avian cholera in 79
candidiasis in 135
chlamydia 111
duck plague in 141–151
erysipelas in 121
fusariotoxin poisoning in 269
gizzard worms in 236–237
heartworm of swans and geese in 233–234
hemosporidiosis in 194–195
intestinal coccidiosis in 210
lead poisoning in 318
mycoplasmosis in 115
nasal leeches in 245
nematodes in 254–255
oil toxicosis in 311
pesticide poisoning in 288
renal coccidiosis in 216–217
salmonellosis in 100, 103
sarcocystis in 221
tracheal worms in 229
tularemia in 124
Goshawk
chlorinated hydrocarbon poisoning in 296
mercury poisoning in 339
Gout 367
visceral 172–173, 348
Grackle
aspergillosis in 130
avian cholera in 79–80
salmonellosis in 103
Grain
aflatoxin in 267
drugged, to capture birds 36
fusariotoxin in 269–270
mercury-treated 339
moldy 129, 131
Grain storage facility 206
Granuloma 131, 225
Grasshopper, gizzard worm carriage 236, 239
Gray partridge, chlorinated hydrocarbon poisoning in 297
Great blue heron
eustrongylidiosis in 223, 226
lead poisoning in 320–321
mercury poisoning in 338
Great cormorant, algal toxin poisoning in 264
Great egret
eustrongylidiosis in 225
lead poisoning in 320
Greater sandhill crane, lead poisoning in 320
Great horned owl
chlorinated hydrocarbon poisoning in 296
electrocution of 357
herpesvirus disease in 159–160
Grebe
avian cholera in 79
chemical poisoning in 353
chlorinated hydrocarbon poisoning in 296
erysipelas in 121
gizzard worms in 236
nasal leeches in 245
oil toxicosis in 311
Green-winged teal
aflatoxin poisoning in 267
avian botulism in 281
avian pox in 163–164
erysipelas in 121
trematodes in 249
Grinding pads, degeneration of 237–238
Grouse
candidiasis in 135
gizzard worms in 235
histomoniasis in 257
lead poisoning in 317, 319, 332
mercury poisoning in 338
nematodes in 254–255
salmonellosis in 100, 103
tularemia in 124
ulcerative enteritis in 123
Growth retardation 135
Guillemot
oil toxicosis in 311
salmonellosis in 103
Guinea fowl
candidiasis in 135
duck hepatitis in 361
erysipelas in 121
herpesvirus disease in 157
mycoplasmosis in 115–116
nematodes in 255
salmonellosis in 100
Gull
algal toxin poisoning in 264
aspergillosis in 130
avian botulism in 274
avian cholera in 78–80, 91
avian influenza in 181, 183
candidiasis in 135
capture myopathy in 364
carbamate poisoning in 351
chemical poisoning in 353
chlamydioidis in 111–112
chlorinated hydrocarbon poisoning in 298
eastern equine encephalomyelitis in 171–172
erysipelas in 121
gizzard worms in 237
intestinal coccidiosis in 210
lead poisoning in 319, 321
mercury poisoning in 338
oil toxicosis in 311
pesticide poisoning in 288
renal coccidiosis in 216
salmonellosis in 99–100, 103–104, 107
sarcocystis in 221
tuberculosis in 93–94
tularemia in 124
Gunshot, as euthanasia method 50, 56
Gyrfalcon, herpesvirus disease in 159
H
Haemoproteus, see Hemosporidiosis
Halothane 50
Handling of live animals 58–60
disease due to 364
Harlequin duck, avian pox in 164
Hatchet-breast appearance 319, 325
Hatchlings, disease in 361
Hawaiian forest birds
avian pox in 166
hemopiridiosis in 195
Hawaiian goose, avian pox in 163
Hawk
avian cholera in 79
carbamate poisoning in 351
chemical poisoning in 353
erysipelas in 121
intestinal coccidiosis in 210
lead poisoning in 319
organophosphate poisoning in 352
pesticide poisoning in 288
rodenticide and repellent poisoning in 353
salmonellosis in 100, 103
trichomoniasis in 203
tuberculosis in 94
tularemia in 124
Hawk-headed parrot, salmonellosis in 100
Hazardous Materials Regulations 17
Hazing 32
Head
arched back 290
fluid beneath skin of 269–270
inability to hold erect 277
puffy or swollen 319, 327
pulled back and twisted to side 148
resting on back 83, 85
shaking of 157, 223, 231, 245
side-to-side movement of 265
twisting of 177–179, 265
unnatural positioning of 131
Head droop 265, 269
Head restraint 59
Heap leach system 341–345
Heart
enlarged 234
excess fluids around 305
fibrinous covering on surface of 122
hemorrhage on surface of 83, 86–87, 146, 150
light patches on 211, 213
pale foci or spots on 234
Heartworm 188
Heartworm of swans and geese 233–234
Hemorrhage
in gastrointestinal tract 146, 149, 151, 269, 309
on gizzard surface 83
on heart surface 83, 86–87, 146, 150
in intestine 154, 249–251, 268, 291, 293
in liver 265, 268, 361
in thymus gland 154
trauma-related 366
Hemorrhagic septicemia, avian, see Avian cholera
Hemoplasmosis 187–189, 193–199
Hemozoin pigment 195, 199
Hepatitis
duck, see Duck hepatitis
herpesvirus 157–158
woodcock reovirus 185
Hepatomegaly 112–113, 172
Heptachlor 296–297, 301, 352
Herbicides 285
Heron
aspergillosis in 130
avian botulism in 274
avian cholera in 79
chlamydiosis in 111–112
chlorinated hydrocarbon poisoning in 298
eustrongylidiosis in 225
oil toxicosis in 311
salmonellosis in 99–100, 103
Herpesvirus
duck plague 141–151
inclusion body disease of cranes 153–156
Herpesvirus disease 157–161
Herring gull
algal toxin poisoning in 264
aspergillosis in 131
avian influenza in 183
erysipelas in 121
lead poisoning in 320
mercury poisoning in 338
oil toxicosis in 314
salmonellosis in 99
staphylococcosis in 123
Heterakis gallinarum, as vector for Histomonas 257
Hexaconazole 285
High voltage transmission lines 357–360
Histomonas meleagridis, see Histomoniasis
Histomoniasis 256–257
History, see Specimen history
Holding devices 58–59
Hooded crane, inclusion body disease of cranes in 153
Horned lark, chlorinated hydrocarbon poisoning in 297
Horse, see Livestock
House finch
avian pox in 169
mycoplasmosis in 115–119
salmonellosis in 104
House finch conjunctivitis, see Mycoplasmosis
House sparrow
chlorinated hydrocarbon poisoning in 297
eastern equine encephalomyelitis in 171
salmonellosis in 104, 107
Housing, of confined wildlife 54–55, 63
Huddling together 105
Human health risks
of aflatoxin 269
of algal toxins 266
of aspergillosis 133
of avian botulism 280
of avian cholera 91–92
of avian influenza 184
of avian pox 169
of bacterial diseases 74
of candidiasis 136
of chlamydiosis 113–114
of chloramphenicol 302
of cyanide 345
of eastern equine encephalomyelitis 174
of eustrongylidiosis 227
of fusariotoxin 270

Index 411
of lead 333–334
d of mercury 340
do of Newcastle disease 179
do of oil pollution 314
do of pesticides 293
do of polychlorinated biphenyls 307
do of salmonellosis 100, 109
do of selenium 336
do of staphylococcosis 123–124
do of tuberculosis 98

Hungarian partridge
histomoniasis in 157
lead poisoning in 320
Newcastle disease in 175
transport of live animals 66

Hydrocyanic acid poisoning, see Cyanide poisoning
Hydrogen sulfide poisoning 353
Hydropericardium 185
Hypothermia 309–310, 312, 350
Hypovolemic shock 249

I
Ibis
chlamydiosis in 112
eusstrongylidiosis in 225
Ice-related problems 365–367
Inactivity 208
Incineration of carcasses 21, 28–31
above-ground methods for 21, 29–30
in-trench methods for 21, 29
layering of carcasses for 32
Incinerator, portable 21, 28
Inclusion body, intranuclear 160
Inclusion body disease of cranes, see Herpesvirus disease
Indian blue peafowl, mycoplasmosis in 118
Indirect life cycle 188–191
Infectious laryngotracheitis 158
Infectious sinusitis, see Mycoplasmosis
Influenza, avian, see Avian influenza
Inhalant anesthetics, euthanasia with 50
Insecticide poisoning 295–302
Intermediate host 188
Intestinal coccidiosis 207–213
Intestine
fibrous-to-caseous core of necrotic debris in 252–253
hemorrhage in 154, 249–251, 268, 291, 293
lesions of enteritis 122–123
light-colored areas in 211
necrosis of 157
necrotic, crumbly cores in 106–107
nODULES in 95
raised tunnels on 223, 225, 227
redden 291, 312
thick, yellowish fluid in 88
white nodules on 242
Isazophos 285
Isoflurane 50
Iso-neosolanoi 269
Isospora, see Intestinal coccidiosis

J
Jackdaw
candidiasis in 135
salmonellosis in 100
tracheal worms in 229
Japanese quail, polychlorinated biphenyl poisoning in 305
Java finch, chlamydiosis in 112
Jay
avian cholera in 79
pesticide poisoning in 288
Jugular vein, blood collection from live animals 57

K
Kanechlor® 305
Keel, prominent 217
Kesterson Reservoir 335
Kestrel
chlorinated hydrocarbon poisoning in 298
herpesvirus disease in 159
tuberculosis in 93
Kidney
congested 300
enlarged 217, 305
Kill trap 56
Kingfisher, intestinal coccidiosis in 210
King parrot, chlamydiosis in 112
Kite, candidiasis in 135
Kittiwake, avian influenza in 183

L
Lameness 95, 195, 208, 220
Landfill 101, 107, 303, 349–350
Laryngotracheitis, infectious 158
Lasso 285
Laughing gull, lead poisoning in 320
Laysan albatross
avian pox in 164–165, 167–169
lead poisoning in 317, 320–321
Laysan duck, nematodes in 255–256
Lead poisoning 285, 317–334
Leaf litter 295
Leeches, nasal, see Nasal leeches
Leech fixation procedure 248
Leg, extended to rear 265
Lesser sandhill crane, lead poisoning in 320
Lesser scaup
  aflatoxin poisoning in 267
  algal toxin poisoning in 264–265
  intestinal coccidiosis in 207
  nasal leeches in 245
  trematodes in 251
Lethal injection 51
Lethargy 83, 85, 95, 118, 154, 242, 249, 267, 290, 298, 300, 305–306
Leucocytozoon, see Hemosporidiosis
Leyogonimus polyoon 252–253
Lice 258
Life cycle
  of acanthocephalans 241–242
  of coccidia 207–209, 215–216
  direct 188–190
  of Echinuria uncinata 255
  of Eustrongylides 223–224
  of gizzard worms 235–236
  of hemosporidia 193–194
  of Histomonas meleagridis 256
  indirect 188–191
  of Sarcocystis 219–220
  of Sarconema 233–234
  of tracheal worms 229–230
  of trematodes 249–252
  of Trichostrongylus tenuis 254
Light sensitivity 146
Limberneck, see Avian botulism
Lindane 297
Listlessness 122, 135, 195, 203
Little blue heron, chlamydiosis in 113
Liver
  amyloid deposits in 96
  bile stained 125–126
  congested 123, 300
  enlarged 195–196, 305
  enlarged, swollen pale 268
  fibrinous covering on surface of 122
  gray spots within 123
  hemorrhage in 265, 268, 361
  large, pale grey areas of necrosis in 257
  light patches on 211, 213
  necrotic lesions of 150, 160
  nodules in 95
  paratyphoid nodules in 106
  swollen 125–126, 154
  white-to-yellow spots on 83, 87, 124, 154–155
  yellow areas of tissue death in 123
Livestock
  avian influenza virus in 184
  botulism in 274
  eastern equine encephalomyelitis virus in 172–173
euthanized carcasses 349–350
Mycobacterium avium in 93–94
Pasteurella multocida in 77
Salmonella in 107–108
Live trap 56–57
Living conditions, of confined wildlife 54–55, 63
Long-billed dowitcher, lead poisoning in 320
Long-eared owl, herpesvirus disease in 159
Loon
  aspergillosis in 130
  avian botulism in 274
  avian cholera in 79
  eustrongylidiosis in 225
  mercury poisoning in 339
  nasal leeches in 245
  oil toxicosis in 311
  renal coccidiosis in 216
  ringworm in 137
Lorikeet, candidiasis in 135
Lory, candidiasis in 135
Louisiana pneumonitis, see Chlamydiosis
Louse fly 193–194
Lovebird, candidiasis in 135
Lung
  cheesy plaques in 131–132
  congested 113, 300, 344
  dark red, granular 131, 133
  fluid accumulation in 348
  nodules in 95
  purple areas of firmness in 183
M
M-44 sodium cyanide ejector 341–345
Macaw
  chlamydiosis in 111
  tuberculosis in 93
Maggots, carcass-maggot cycle of avian botulism 272–273, 279
Maggpie
  avian cholera in 79
  mercury poisoning in 339
  pesticide poisoning in 292
  salmonellosis in 100, 103
Malaria, avian, see Hemosporidiosis
Mallard
  aflatoxin poisoning in 267
  aspergillosis in 129, 131
  avian botulism in 281
  avian cholera in 85
  avian influenza in 181, 183
  avian pox in 163–164
  chlorinated hydrocarbon poisoning in 296–297, 299
  duck hepatitis in 361–362
  duck plague in 141, 143–144, 146, 151
lead poisoning in 317, 321, 324, 328, 330
mercury poisoning in 340
mycoplasmosis in 117
nasal leeches in 247
necrotic enteritis in 122
Newcastle disease in 175, 177, 179
pesticide poisoning in 287, 292
polychlorinated biphenyl poisoning in 303, 305
sarcocystis in 220
selenium poisoning in 335
staphylococcosis in 123
trematodes in 249

Malnutrition 367
Manchurian crane, inclusion body disease of cranes in 153
Mange 258
Man-made structures, collisions with 365–366
Manure, contaminated 97, 107
Maps 19, 23
Marbled godwit, lead poisoning in 320
Marek's disease 158, 364
Marine birds
aspergillosis in 130
avian influenza in 181, 183
avian pox in 163, 166, 169
eastern equine encephalomyelitis in 171
herpesvirus disease in 158
oil toxicosis in 311
renal coccidiosis in 216
tick paralysis in 258
Marking, see Wildlife marking
Martin, avian cholera in 79
Measurement, units of, conversion table 385–386
Medial-metatarsal vein, blood collection from live animals 57
Medical procedures, wildlife 65–67
major procedures 67
minor procedures 67
Meningoencephalitis 131, 183
Mercury poisoning 337–340
Merganser
eustrongylidiosis in 225
lead poisoning in 318
mercury poisoning in 338
nasal leeches in 245
oil toxicosis in 311
sarcocystis in 221
Metals 285
Methamidiphos 292
Methiocarb 285, 287, 292, 351
Methoxyflurane 50
Mexacarbate 287
Microcystin 263
Microsporum gallinae 137
Minimata disease, see Mercury poisoning
Mink
botulism in 274
Mycobacterium avium in 93
polychlorinated biphenyl poisoning in 303

Minnows, Eustrongylides in 223–224
Mirex 297
Mite 258
Mollusc(s), as trematode hosts 249
Molluscicides 285
Moniliasis, see Candidiasis
Monocrotophos 289, 292, 352
Motor vehicle
disinfection of 33, 38
transport of live animals in 64–65
Mottled duck, sarcocystis in 220
Mourning dove
avian pox in 164, 169
lead poisoning in 320, 333–334
salmonellosis in 103
trichomoniasis in 201, 203–205
Mouth
hard, cheesy lesions of 205
inflammation of 205
inflammation and ulceration of 269–270
lesions of 205
moist, necrotic lesions of 165
mucous discharge from 83
Murre
avian influenza in 183
oil toxicosis in 311
Muscle
cyst-like bodies in 195, 197
necrosis of 364
rice-grain cysts in 220–221
wasting of 95
Muscovy duck
algal toxin poisoning in 265
duck plague in 141, 151
inclusion body disease of cranes in 153–154
Museum collections 56–57
Mute swan
avian pox in 163–164, 169
heartworm of swans and geese in 234
lead poisoning in 318, 321
salmonellosis in 103
staphylococcosis in 123
trematodes in 249
Mycobacteriosis, see Tuberculosis
Mycobacterium avium, see Tuberculosis
Mycoplasma gallisepticum, see Mycoplasmosis
Mycoplasma meleagridis, see Mycoplasmosis
Mycoplasma synovia, see Mycoplasmosis
Mycoplasmosis 74, 115–119
Mycosis, see Fungal disease
Mycotic pneumonia, see Aspergillosis
Mycotoxicosis 128
Mycotoxins 137, 260–261, 267–270
Myiasis 258
Mynah, chlamydiosis in 111
Myocarditis 185
Myopathy, capture, see Capture myopathy
N
Nares, bleeding from 290
Nasal discharge 265
  thick, mucous-like, roppy 83
Nasal leeches 188, 245–248
National Response Center 313
National Wildlife Health Center, shipment of specimens to 14–16
ND, see Newcastle disease
Neck
  abnormal position of 319
  fluid beneath skin of 269–270
  paralysis of muscles of 277–278
  twisting of 157, 177–179
Necropsy kit 8
Necrotic enteritis 74, 122
Nematocidices 285
Nematodes 189, 254–256
  eustrongylidiosis 223–228
  gizzard worms 235–239
  tracheal worms 229–231
Nene goose, tuberculosis in 93
Neosaxitoxin 264
Neosolaniol 269
Nervous system disorder 122
Nesting, on power poles 357–360
Neurologic symptoms 172–173, 265, 269, 290
Newcastle disease 140, 175–179
  asymptomatic lentogenic 176
  lentogenic 175–176
  mesogenic 176
  neurotrophic velogenic 175–176
  velogenic 175
  viscerotrophic velogenic 176
New duck disease 122
Nictitating membrane
  paralysis of 277
  stringy, cheeselike material beneath 247
Nitrapyrin 285
Nitrous oxide 50
Nodularin 263
Northern cardinal, salmonellosis in 104
Northern fulmar, algal toxin poisoning in 264
Northern harrier
  avian cholera in 78
  lead poisoning in 320
Northern mockingbird, salmonellosis in 104
Northern pintail
  avian cholera in 85
  lead poisoning in 317, 325
  nasal leeches in 245
  sarcocystis in 220
Northern shoveler
  erysipelas in 121
  nasal leeches in 245
  sarcocystis in 220, 222
No-see-ums 194–195
Nuthatch, avian cholera in 79
Nutritional disease 356, 367
Nutritional needs, of confined wildlife 63–64
NVND, see Newcastle disease
O
Observation of wildlife, guidelines for field research 56–58
OCs, see Chlorinated hydrocarbon poisoning
Ocular discharge 265
Oil Pollution Act (1990) 313–314
Oil spill 130, 164, 283, 309–315
Oil toxicosis 285, 309–315
Okadaic acid 264
Olsquaw
  avian cholera in 81
  oil toxicosis in 311
Oligochaetes, Eustrongylides in 223–225
Opisthotonos 361
Opportunistic infection 128, 137
Oral discharge 265
Organochlorines, see Chlorinated hydrocarbon poisoning
Organophosphorus pesticides 4, 287–293, 352
Oriole, avian cholera in 79
Ornithosis, see Chlamydiosis
Osmoregulatory dysfunction 309–310
Osprey
  chlorinated hydrocarbon poisoning in 298
  mercury poisoning in 338
Osteoporosis 185
Ostrich
  avian influenza in 181
  eastern equine encephalomyelitis in 171
  intestinal coccidiosis in 210
  salmonellosis in 100
Over-straining disease, see Capture myopathy
Owl
  avian cholera in 79
  chemical poisoning in 353
  chlorinated hydrocarbon poisoning in 301, 352
  electrocution of 357
  herpesvirus disease in 157–159
  intestinal coccidiosis in 210
lead poisoning in 319  
mercury poisoning in 338–339  
organophosphate poisoning in 352  
pesticide poisoning in 288  
renal coccidiosis in 216  
salmonellosis in 100, 103  
trichomoniasis in 203  
tuberculosis in 94  
Owl herpesvirus, see Herpesvirus disease  
Oxamyl 292  

P  
Pacific loon, algal toxin poisoning in 264  
Parakeet  
candidiasis in 135  
chlamydiosis in 111, 113  
erysipelas in 121  
gizzard worms in 235  
Paralysis 157, 172, 177, 179, 220, 265, 269, 277, 290  
Paralytic shellfish poisoning 261, 263–264  
Paramyxovirus-1, see Newcastle disease  
Parasitic disease 188–189  
Paratenic host 188, 192  
Parathion 289, 292, 352  
Paratyphoid, see Salmonellosis  
Parrot  
candidiasis in 135  
chlamydiosis in 111–113  
erysipelas in 121  
intestinal coccidiosis in 210  
mycoplasmosis in 115  
salmonellosis in 100  
tuberculosis in 93  
Parrot disease, see Chlamydiosis  
Parrot-fever, see Chlamydiosis  
Partridge  
candidiasis in 135  
gizzard worms in 235  
histomoniasis in 257  
lead poisoning in 317  
mercury poisoning in 339  
mycoplasmosis in 115–116  
salmonellosis in 100, 103  
tuberculosis in 94  
ulcerative enteritis in 123  
Passerines  
chlorinated hydrocarbon poisoning in 296  
pesticide poisoning in 287–288  

PCBs, see Polychlorinated biphenyls  
Peafowl  
candidiasis in 135  
erysipelas in 121  
herpesvirus disease in 157  
mycoplasmosis in 115, 117  
salmonellosis in 100  

Peanuts  
aflatoxin in 267  
fusariotoxin in 269–270  
Pectoral sandpiper, lead poisoning in 320  
Pelican  
avian cholera in 79  
chemical poisoning in 353  
chlorinated hydrocarbon poisoning in 298  
erysipelas in 121  
eustrongylidiosis in 225  
gizzard worms in 237  
testinal coccidiosis in 210  
mercury poisoning in 338  
oil toxicosis in 311  
sarcocystis in 221  
Penguin  
aspergillosis in 130  
avian cholera in 79  
erysipelas in 121  
hemoplasmosis in 195  
oil toxicosis in 311  
salmonellosis in 103–104  

Penis, prolapsed 146–147  
Pentobarbital poisoning, see Barbiturate poisoning  
Peregrine falcon  
avian pox in 165  
capture myopathy in 364  
chlorinated hydrocarbon poisoning in 296, 301  
herpesvirus disease in 159–160  
lead poisoning in 320  
mercury poisoning in 339  
mycoplasmosis in 115  

Pericarditis 113, 125, 185  
Perihepatitis 125  
Peritonitis 225, 227  
verminous, see Eustrongylidiosis  

Permethrin 285  
Pesticides 4, 284–285, 287–293, 351  
Petrel, tick paralysis in 258  

Petroleum, see Oil toxicosis  
Pfiesteria, in fish 265  
Pfiesteria toxin 264  
Pheasant  
avian botulism in 274–275  
avian cholera in 79  
avian influenza in 181, 183  
candidiasis in 135  
chlorinated hydrocarbon poisoning in 297, 299, 301  
duck hepatitis in 361  

416 Field Manual of Wildlife Diseases: Birds
eastern equine encephalomyelitis in 171–173
ersipelas in 121
gizzard worms in 235
herpesvirus disease in 157–158
histomoniasis in 257
intestinal coccidiosis in 210
lead poisoning in 317, 319, 332
mercury poisoning in 339–340
mycoplasmosis in 115, 117–118
Newcastle disease in 175
new duck disease in 122
salmonellosis in 100, 103
salt poisoning in 347
tracheal worms in 229, 231
trichomoniasis in 203
tuberculosis in 93–94, 96
tularemia in 124
ulcerative enteritis in 123
Phenoclors® 305
Phenol 285
Phorate 287, 289, 292, 352
Phosmet 285
Phosphamidon 292
Photographic record 3–4, 8
Phycotoxins, see Algal toxins
Physical euthanasia 49–50
Physical restraint 58–59
Pigeon
avian cholera in 79
candidiasis in 135
chlamydiosis in 111–112
chlorinated hydrocarbon poisoning in 301
eastern equine encephalomyelitis in 171
ersipelas in 121
gizzard worms in 236
hemoplasmosis in 194
herpesvirus disease in 157–159
intestinal coccidiosis in 210
lead poisoning in 332
mercury poisoning in 339
mycoplasmosis in 115–116
nematodes in 255
Newcastle disease in 176
salmonellosis in 103, 107
trichomoniasis in 201–203, 205–206
tuberculosis in 94
ulcerative enteritis in 123
Pigeon herpes encephalomyelitis virus, see Herpesvirus
disease
Pigs, see Livestock
Piloerection 290
Pine sisken, salmonellosis in 104
Pinnipeds, Pasteurella multocida in 77
Pintail
avian botulism in 281
duck plague in 141
lead poisoning in 326
Piscicides 285
Pitfall, as live trap 57
Plague, fowl, see Avian influenza
Plant toxins 261
Plasmodium, see Hemoplasmosis
Plastic debris 361–363
Plover, oil toxicosis in 311
Plumbism, see Lead poisoning
Pneumonia
brooder, see Aspergillosis
mycotic, see Aspergillosis
Pneumonitis, Louisiana, see Chlamydiosis
Pododermatitis, see Bumblefoot
Poison Control Centers 371
Poisonous organism 260
Polychlorinated biphenyls 284, 303–307
Population movement, documentation of 5
Posture, aberrant 299
Potassium bromide 285
Pouch scratching 265
Poultry
avian botulism in 274
avian cholera in 77–78, 80, 82, 89
avian influenza in 183–184
candidiasis in 135
ersipelas in 121
fusariotoxin poisoning in 269
herpesvirus disease in 158
intestinal coccidiosis in 210
mycoplasmosis in 115, 117–118
nematodes in 254
Newcastle disease in 175–179
salmonellosis in 99–100, 103–105, 107, 109
subcutaneous mycosis in 137
tracheal worms in 229
trichomoniasis in 203, 206
tuberculosis in 94
tumor in 364
Poultry slaughterhouse 114
Power lines 280, 357–360
Power poles 357–360
Pox, avian, see Avian pox
Prairie falcon
herpesvirus disease in 159
lead poisoning in 320
Problem area
closure of 33–34
description of location of 5–6
Propane exploder 32, 34
Protective clothing 7, 21, 24
disinfection of 33, 38
Protein imbalance 367
Protozoan parasites 189, 256–257
Proventriculus
  cheesy, raised plaques along 146, 150
  impaction of 320, 328–329
  nematodes in 255–256
  raised tunnels on 223, 225
Prussic acid poisoning, see Cyanide poisoning
Pseudotuberculosis, see Aspergillosis
Psittacine herpesvirus, see Herpesvirus disease
Psittacosis, see Chlamydiosis
Ptarmigan, tularemia in 124
Puddle ducks
  avian cholera in 81
  gizzard worms in 237
  lead poisoning in 318, 332
  nasal leeches in 245
  sarcocystis in 221
Puffin
  avian influenza in 183
  oil toxicosis in 311
  renal coccidiosis in 216
Pullorum disease, see Salmonellosis
Punkies 194
Pupils, contraction of 290
Purple finch, salmonellosis in 104
Pyralenes® 305

Q
Quail
  avian cholera in 80
  avian influenza in 181
  avian pox in 164
  candidiasis in 135
  chemical poisoning in 353
  chlorinated hydrocarbon poisoning in 296
  gizzard worms in 235
  herpesvirus disease in 158
  intestinal coccidiosis in 210
  lead poisoning in 319
  mercury poisoning in 338
  mycoplasmosis in 115
  nematodes in 255
  salmonellosis in 100, 103
  trichomoniasis in 203
  tuberculosis in 93–94
  ulcerative enteritis in 122–123
Quail disease, see Ulcerative enteritis

R
Rabbit
  Mycobacterium avium in 93
  Pasteurella multocida in 77
  Raccoon, Pasteurella multocida in 78
Rail
  avian cholera in 79
  intestinal coccidiosis in 210
  lead poisoning in 319
Raptors
  aspergillosis in 130
  avian botulism in 274
  avian cholera in 80, 89
  avian influenza in 181
  avian pox in 163, 166
  chlamydiosis in 112
  chlorinated hydrocarbon poisoning in 295, 298
  eastern equine encephalomyelitis in 171
  electrocution of 357
  gizzard worms in 237
  herpesvirus disease in 158–159
  lead poisoning in 317, 319, 332
  mercury poisoning in 338–339
  mycoplasmosis in 119
  pesticide poisoning in 287–288, 291
  sarcocystis in 221
  traumatic injuries in 365
  trichomoniasis in 202–203
  tuberculosis in 94, 97
  tularemia in 124
Ratites, avian influenza in 181
Raven
  aspergillosis in 130
  erysipelas in 121
Razorbill, salmonellosis in 103
Red blood cells, in hemosporidiosis 198–199
Red-breasted merganser
  eustrongylidiosis in 226
  lead poisoning in 321
  mercury poisoning in 338
Red-crowned crane, inclusion body disease of cranes in 154
Red grouse, nematodes in 255
Redhead
  avian cholera in 81
  avian pox in 164
  duck plague in 141
  lead poisoning in 317, 321
  nasal leeches in 245–246
  staphylococcosis in 123
Red-headed falcon, herpesvirus disease in 159
Red-tailed hawk
  avian pox in 165
  lead poisoning in 320
  mercury poisoning in 340
  staphylococcosis in 123
Red-tailed tropicbird, avian pox in 164–165
Red-throated loon, mercury poisoning in 338
Red tide 261, 265

418  Field Manual of Wildlife Diseases: Birds
Red tide toxins, see Algal toxins
Red-winged blackbird
  pesticide poisoning in 287
  polychlorinated biphenyl poisoning in 305
Regurgitation of food 223
Rehabilitation, of oiled birds 314–315
Renal coccidiosis 215–216
Rendering of carcasses 21, 32
Reovirus, woodcock 140, 185–186
Repellents 353
Reproductive impairment 290, 309–310, 335
Reptiles
  Eustrongylides in 223–224
  Salmonella in 99
Research, see Field research
Respiratory distress 118, 131, 157, 183, 229
Respiratory syndromes 125, 185
Respiratory tract, moist, necrotic lesions of 165
Restrain 58–60
  for blood and tissue collection from live animals 57
    chemical 58, 61
    physical 58–59
Rhea, avian influenza in 181
Rice breast disease, see Sarcocystis
Rictin poisoning 356
Righting reflex, loss of 265
Ring-billed gull
  chlamydirosis in 113
  Newcastle disease in 175
  staphylococcosis in 123
Ring-dove
  polychlorinated biphenyl poisoning in 303
  salmonellosis in 100
Ringed turtle dove, herpesvirus disease in 159
Ring-necked duck, nasal leeches in 245
Ring-necked pheasant
  eastern equine encephalomyelitis in 172
  lead poisoning in 320
  mercury poisoning in 338
  mycoplasmosis in 118
  pesticide poisoning in 287
  polychlorinated biphenyl poisoning in 305
  tracheal worms in 231
Ringworm 137
Road kill 365
Road salt 347–348
Robin
  chlorinated hydrocarbon poisoning in 296
  gizzard worms in 235
  salmonellosis in 104
  ulcerative enteritis in 123
Rock dove
  lead poisoning in 323
  salmonellosis in 100
salt poisoning in 347
Rocket net 33, 35
Rodent(s)
  eastern equine encephalomyelitis virus in 172
  Pasteurella multocida in 77–78
  Salmonella in 99, 107, 109
Rodenticides 285, 353
Rook
  salmonellosis in 100, 103
  tracheal worms in 229
Rosella, candidiasis in 135
Ross’ goose, lead poisoning in 318
Rotenone 285
Rough-legged hawk
  avian pox in 165
  lead poisoning in 320
Roundworm, see Nematodes
Royal tern, lead poisoning in 320–321
Ruddy duck, nasal leeches in 245
Ruddy turnstone, avian influenza in 183
Ruffed grouse
  avian pox in 169
  gizzard worms in 235–236
  tularemia in 124
  tumor in 365
Rufous-sided towhee, salmonellosis in 104
S
Sage grouse, tularemia in 124
Saker falcon, mycoplasmosis in 117–118
Salmonellosis 74, 99–109
Salt encrustation 347–348
Salt gland 347
  disruption of 300
  impaired functioning of 310
  swollen 312–313
Salt poisoning 284, 347–348, 353
Sandflyn 193
Sandhill crane
  aflatoxin poisoning in 267
  chlorinated hydrocarbon poisoning in 297
  fusariotoxin poisoning in 269–270
  inclusion body disease of cranes in 153–154
  intestinal coccidiosis in 207–208
  lead poisoning in 321
  tracheal worms in 229
  tumor in 365
Sandpiper, oil toxicosis in 311
Sarcocystis 188, 219–222
Sarcocystis rileyi, see Sarcocystis
Sarcocystosis, see Sarcocystis
Sarcozystosis, see Sarcocystis
Sarcosporidiosis, see Sarcocystis
Sarus crane, inclusion body disease of cranes in 153
Saxitoxin, see also Paralytic shellfish poisoning 264–265
Scaled quail, lead poisoning in 320, 333
Scare devices 32, 34
Scaup
  aspergillosis in 130
  lead poisoning in 317
  oil toxicosis in 311
Scavenger species
  avian cholera in 78, 89
  barbiturate poisoning in 349–350
  cyanide poisoning in 342
  lead poisoning in 332
  Pasteurella multocida in 75
  tuberculosis in 94
  tularemia in 124
Scientific names of wildlife 377–381
Scoliosis 355, 367
Scoter
  avian cholera in 81
  avian pox in 163
  oil toxicosis in 311
Seabirds
  mercury poisoning in 338–339
  oil toxicosis in 311
Sea ducks
  avian cholera in 82
  gizzard worms in 237
  lead poisoning in 318
  nasal leeches in 245
  oil toxicosis in 311
  sarcocystis in 221
  tuberculosis in 96
Seasonality
  of acanthocephaliasis 242
  of aflatoxin poisoning 267–269
  of aspergillosis 130
  of avian botulism 271, 276
  of avian cholera 82
  of avian influenza 183
  of avian pox 164–166
  of barbiturate poisoning 349
  of chlamydiosis 112
  of chlorinated hydrocarbon poisoning 295–298
  of cyanide poisoning 342
  of duck plague 144–145
  of eastern equine encephalomyelitis 172
  of electrocutions 358
  of eustrongylidiosis 223
  of fusariotoxin poisoning 269
  of heartworm of swans and geese 234
  of hemosporidiosis 195
  of herpesvirus disease 157
  of intestinal coccidiosis 208
  of lead poisoning 318
  of mercury poisoning 339
  of mycoplasmosis 118
  of nasal leeches 245–246
  of Newcastle disease 177
  of oil toxicosis 311
  of pesticide poisoning 290
  of renal coccidiosis 217
  of salmonellosis 104–105
  of salt poisoning 347
  of sarcocystis 220
  of tracheal worms 229
  of tuberculosis 94–95
  of woodcock reovirus disease 185
Sedation 58, 349
Seed-eating birds, pesticide poisoning in 288
Seed treatment 295, 337, 339
Seizures, see Convulsions
Selenium poisoning 284–285, 335–336, 353, 367
Selenosis, see Selenium poisoning
Serovars, Salmonella 99
Sewage effluent 107
Sewage lagoon 101
Sewage sludge 99
Sewage treatment plant 108
Sewage wastewater 107
Sharp-tailed grouse
  chlorinated hydrocarbon poisoning in 297, 301
  tularemia in 124
Shearwater
  mercury poisoning in 338
  renal coccidiosis in 216
Sheep, see Livestock
Shipment of live animals 64–66
Shipment of specimen 13–17
  basic supplies for 13, 373–374
  blood tubes 14–15
  by commercial carrier 17
  containers for 13–16
  cooling and refrigeration 14–16
  federal regulations for 17
  labeling requirements for 17
  to National Wildlife Health Center 14–16
  preventing breakage and leakage 13
Shivering 105
Shorebirds
  aspergillosis in 130
  avian botulism in 274
  avian cholera in 79–80
  avian influenza in 181, 183–184
  avian pox in 163
  candidiasis in 135
chemical poisoning in 353
chlamydiosis in 111–112
eastern equine encephalomyelitis in 171–172
gizzard worms in 237
intestinal coccidiosis in 210
lead poisoning in 319, 332
necrotic enteritis in 122
organophosphate poisoning in 352
pesticide poisoning in 288
sarcocystis in 221
Short-eared owl, avian cholera in 78
Shoveler
avian botulism in 281
chlorinated hydrocarbon poisoning in 296
lead poisoning in 318
mycoplasmosis in 117
Shrike, tularemia in 124
Silver mining 341–345
Sinusitis, infectious, see Mycoplasmosis
SI units, conversion table 385–386
Six-pack ring 363
Skin
burn marks on 359–360
nodular tubercular lesions on 95–96
wart-like nodules on featherless areas 165, 167
Skua
avian cholera in 79
salmonellosis in 104
Skull, fluid accumulation in 335
Skunk 219
Sleepaway® 51
Slug, tracheal worm carriage 229–230
Slurry runoff 99
Snails
tracheal worm carriage 229–230
as trematode hosts 249–250, 252
Snake, acanthocephalans in 242
Sneezing 231, 245
Snow goose
aflatoxin poisoning in 267
avian cholera in 75, 77, 79, 81, 91
chlamydiosis in 114
chlorinated hydrocarbon poisoning in 296
gizzard worms in 236, 239
heartworm of swans and geese in 234
lead poisoning in 317–318, 324, 328
necrotic enteritis in 122
new duck disease in 122
Snowy egret
chlamydiosis in 112, 114
eustrongylidiosis in 226–227
lead poisoning in 320
Snowy owl, herpesvirus disease in 159
Sodium pentobarbital poisoning, see Barbiturate poisoning
Songbirds
algal toxin poisoning in 264
aspergillosis in 130
avian botulism in 274–275
avian cholera in 80
avian influenza in 181
avian pox in 163, 166, 169
candidiasis in 135
carbamate poisoning in 351
chemical poisoning in 353
chlamydiosis in 111–112
chlorinated hydrocarbon poisoning in 298, 352
eastern equine encephalomyelitis in 171–173
erysipelas in 121
herpesvirus disease in 158
intestinal coccidiosis in 210
mycoplasmosis in 115–116
organophosphate poisoning in 352
rodenticide and repellent poisoning in 353
salmonellosis in 103–107
tick paralysis in 257
tracheal worms in 229
trichomoniasis in 203
tuberculosis in 94
Sooty shearwater, algal toxin poisoning in 264
Sora rail, lead poisoning in 320
Sour crop, see Candidiasis
Sparrow
avian cholera in 79–80
candidiasis in 135
salmonellosis in 100, 107
tuberculosis in 93
Sparrowhawk, mercury poisoning in 339
Specimen
choice of 7–9
collection of 7–12
basic supplies and equipment for 8, 373–374
killed specimens for catalogued collections/museums 56–58
dissection of bird 10–11
labeling of 8, 12
preservation of 7–12, 373–374
shipment of, see Shipment of specimen
Specimen history 3–6
Specimen history form 369
Spectacled eider, lead poisoning in 317
Sphaeridiotrema globulus 249, 251–252
Spleen
amyloid deposits in 96
atrophy of 305–306
congested 123
necrotic lesions of 160
nodules in 95
swollen 154
yellow-white spots on 154–155
Splenomegaly 112–113, 172, 195–196
Spoonbill, eustrongyliodiosis in 225
Spore, Clostridium botulinum 271
Squeeze chute 59
Staggering 105
Stanley crane, inclusion body disease of cranes in 153
Staphylococcosis 123–124
bumblefoot 123
septicemic 123–124
Starlicide® 285
Starling
avian cholera in 79–80
candidiasis in 135
chlorinated hydrocarbon poisoning in 296
erysipelas in 121
mercury poisoning in 340
salmonellosis in 103
tracheal worms in 229
tuberculosis in 93
Starvation 309
Station brochures 19
Stellar’s jay, aspergillosis in 130
Sternum, light-colored granulomas of 211–212
Stilt, avian cholera in 79
Stomach worm, see Gizzard worms
Stork
erysipelas in 121
herpesvirus disease in 158–159
Strychnine 351
Stunning and exsanguination 50
Styrofoam coolers, for shipment of specimens 13–15
Subcutaneous fat, loss of 319–320, 326
Suffocation 205
Surf scoter, nasal leeches in 245
Surgical procedures, wildlife 65–67
Swallow
chemical poisoning in 353
pesticide poisoning in 288
Swallowing difficulty 205, 223
Swan
acanthocephaliasis in 242
avian cholera in 79
duck plague in 141, 151
erysipelas in 121
gizzard worms in 236–237
heartworm of swans and geese in 233–234
hemoporidiosis in 194
lead poisoning in 317–318, 333
nasal leeches in 245, 248
oil toxicosis in 311
renal coccidiosis in 216
salmonellosis in 100, 103
sarcocystis in 221
tracheal worms in 229
trematodes in 249
Swift, avian cholera in 79
Swim-in trap 33
Swimming, circular 83, 85, 148
Syngamiasis, see Tracheal worms
Syngamus trachea, see Tracheal worms
Systox® 285
T
T-2 toxicosis, see Fusariotoxin poisoning
Tailings ponds 342
Tail vein, blood collection from live animals 59
Talon (claw), vegetation clenched in 290–291
Talon® (pesticide) 285
Tapeworms, see Cestodes
Tarsal vein, blood collection from live animals 59
TB, see Tuberculosis
Teal
lead poisoning in 318
nasal leeches in 245
sarcocystis in 220
Tears, excessive 290
Temephos 287
Temik 285
Tenosynovitis 185
Terbufos 285, 292, 352
Tern
avian cholera in 91
carbamate poisoning in 351
chemical poisoning in 353
chlamydiosis in 111–112
erysipelas in 121
gizzard worms in 237
mercury poisoning in 338
salmonellosis in 99–100, 103–104
sarcocystis in 221
tularemia in 124
Theromyzon, see Nasal leeches
Thiram 285
Thirst 146, 290
Thorny-headed worms, see Acanthocephaliasis
Thrasher, avian cholera in 79
Throat, inflammation of 205
Thrash (bird)
avian cholera in 79
pesticide poisoning in 288
Thrash (disease), see Candidiasis
Thymus gland
atrophy of 185
hemorrhage in 154
Tick 69, 124, 257–258
Tick paralysis 257–258
Tissue sample
collection of 7–9
collection from live animals 57–58
containers for 8–9
fixation of 8
labeling of 12
Toes, clenched 177, 265
Tongue, ulcerative “cold sore” under 146–148
Toxaphene 296–297
Toxic gas, euthanasia with 50–51
Tracheal worms 229–231
Tranquilizer gun 58
Transformers 357–360
Transmission lines 357–360
Transport host 188, 192
Transport myopathy, see Capture myopathy
Transport of live animals 64–65
confinement during shipping 65–66
Trapping of wildlife 33, 35
Traumatic injury 290, 356, 365–366
Tree sparrow, salmonellosis in 104
Trematodes 189, 249–253
Tremors 105, 172, 177, 208, 265, 267, 290, 298, 300, 305–306, 339
Trichomonas gallinae, see Trichomoniasis
Trichomoniasis 188–189, 201–206
Trichophytton gallinae, see Ringworm
Trichostrongylidosis 254–255
Trichostrongylus tenuis, see Trichostrongylidosis
Trichothece 260, 269
Trichothece mycotoxicosis, see Fusariotoxin poisoning
Triumph® 285
Trumpeter swan
acanthocephaliasis in 242
avian pox in 163–164
heartworm of swans and geese in 234
lead poisoning in 321
nasal leeches in 245, 247
Tuberculosis 93–98
Tularemia 124
Tumbling 107
Tumors 356, 364–365
herpesvirus-related 157
Tundra swan
aspergillosis in 130
avian pox in 163–164
heartworm of swans and geese in 234
lead poisoning in 317–318, 321, 324, 328
nasal leeches in 245
Turkey
avian cholera in 82
avian influenza in 181, 183
avian pox in 165
candidiasis in 135
chlamydiosis in 111
erysipelas in 121
hemosporidiosis in 197–198
herpesvirus disease in 158
histomoniasis in 257
intestinal coccidiosis in 210
lead poisoning in 319
mercury poisoning in 339
mycoplasmosis in 115–116
nematodes in 255
Newcastle disease in 176
new duck disease in 122
salmonellosis in 99–100
ticks on 257
tracheal worms in 229
trichomoniasis in 203
tuberculosis in 93–94
wild, see Wild turkey
Turkey vulture
lead poisoning in 320
mercury poisoning in 339
Turtles, Salmonella in 99
Typhoid, fowl, see Salmonellosis

U
Ulcerative enteritis 74, 122–123
Upland gamebirds
aspergillosis in 130
avian botulism in 274
avian cholera in 80
avian influenza in 181, 183
avian pox in 163, 166, 169
chlamydiosis in 111–112
eastern equine encephalomyelitis in 171–172
lead poisoning in 319, 333
mycoplasmosis in 115, 119
pesticide poisoning in 288
ulcerative enteritis in 123
Uric acid salts 217, 348

V
Venipuncture 57–58
Venomous organism 260
Vent
bloodstained 249
bloody discharge from 146
bright green staining of 327
pasted 105
Ventricular nematodiasis, see Gizzard worms
Ventriculus, raised tunnels on 223, 225
Verminous peritonitis, see Eustrongylidiosis
Viral disease 140
Visceral gout 172–173
Vision, impaired 118
Vitamin deficiency 367
Voice changes 172
Vomiting 265, 269, 290
Vomitoxicosis, see Fusariotoxin poisoning
Vomitoxin 269
Vulture
   avian botulism in 274
   avian cholera in 78
   pesticide poisoning in 288
   tuberculosis in 94
VVND, see Newcastle disease

W

Wading birds
   avian cholera in 79–80
   avian pox in 163
   eustrongylidiosis in 223, 225, 227
   gizzard worms in 237
   mercury poisoning in 338
   necrotic enteritis in 122
   oil toxicosis in 311
   pesticide poisoning in 288
   sarcocystis in 220–221
Walk-in trap 33
Warfarin 285
Wariness, loss of 146
Warty nodules, on featherless areas 165, 167
Wastewater discharge 97, 101, 107, 225, 280, 309, 335
Wastewater pits, oil-field 312
Wastewater sites 94
Watercraft
   for carcass collection 21, 26
   disinfection of 33
   transport of live animals in 64–65
Water deprivation, see Salt poisoning
Water drawdown 279
Waterfowl
   aspergillosis in 130
   avian botulism in 274–275
   avian cholera in 75, 78, 80, 91
   avian influenza in 181, 183–184
   avian pox in 163, 169
   capture myopathy in 364
   carbamate poisoning in 351
   chemical poisoning in 353
   chlamydiosis in 111–112
   chlorinated hydrocarbon poisoning in 296, 298, 301
   eastern equine encephalomyelitis in 171–172
   fusariotoxin poisoning in 269
   gizzard worms in 235
   hemosporidiosis in 194
   herpesvirus disease in 158–159
   intestinal coccidiosis in 208
   lead poisoning in 317, 321–322, 332
   mycoplasmosis in 116
   nasal leeches in 245
   necrotic enteritis in 122
   new duck disease in 122
   organophosphate poisoning in 352
   pesticide poisoning in 287–288, 293, 351
   renal coccidiosis in 216
   rodenticide and repellent poisoning in 353
   sarcocystis in 220
   tracheal worms in 229
   trematodes in 249
   trichomoniasis in 203
   tuberculosis in 94

Water quality 4
Waxwing, avian cholera in 79
Weakness 112, 195, 220, 237, 269, 290, 339
Weather 356, 365–367
Weaver, herpesvirus disease in 159
Weight loss 112, 118, 195, 203, 208, 231, 250, 257, 268, 290, 306
Wenyonella, see Intestinal coccidiosis
Western duck sickness, see Avian botulism
Western grebe, chlorinated hydrocarbon poisoning in 296
Western sandpiper, lead poisoning in 320
Wet pox 165, 168–169
Whirl-Pak bags 8–9
Whistling duck, lead poisoning in 318
White-faced ibis, chlorinated hydrocarbon poisoning in 299
White-fronted goose
   avian cholera in 80
   heartworm of swans and geese in 234
   necrotic enteritis in 122
White ibis, lead poisoning in 320–321
White-naped crane, inclusion body disease of cranes in 153
White Pekin duck
   algal toxin poisoning in 265
   duck plague in 141, 143–144, 151
   eastern equine encephalomyelitis in 171
   inclusion body disease of cranes in 153–154
   trematodes in 250
White pelican
   entangled in fishing line 362
   lead poisoning in 320–321
   mercury poisoning in 338
   Newcastle disease in 175
   polychlorinated biphenyl poisoning in 303
White-tailed eagle, mercury poisoning in 339
White-tailed tropicbird, avian pox in 169
White-winged dove, chlamydiosis in 114
White-winged scoter, nasal leeches in 245
Whooper swan, lead poisoning in 321
Whooping crane
   avian cholera in 91
   capture myopathy in 60
<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>eastern equine encephalomyelitis</td>
<td>171–173</td>
</tr>
<tr>
<td>intestinal coccidiosis</td>
<td>207</td>
</tr>
<tr>
<td>traumatic injuries</td>
<td>366</td>
</tr>
<tr>
<td>tuberculosis</td>
<td>97</td>
</tr>
<tr>
<td>Wildlife, in field research</td>
<td>53–71</td>
</tr>
<tr>
<td>Wildlife disease programs</td>
<td>370</td>
</tr>
<tr>
<td>Wildlife marking</td>
<td>44, 61–63</td>
</tr>
<tr>
<td>Wildlife Society, guidelines for use of wildlife in field research</td>
<td>53–71</td>
</tr>
<tr>
<td>Wild turkey</td>
<td></td>
</tr>
<tr>
<td>avian pox</td>
<td>164–165</td>
</tr>
<tr>
<td>capture myopathy</td>
<td>364</td>
</tr>
<tr>
<td>gizzard worms</td>
<td>235</td>
</tr>
<tr>
<td>hemosporidiosis</td>
<td>194</td>
</tr>
<tr>
<td>herpesvirus disease</td>
<td>159</td>
</tr>
<tr>
<td>histomoniasis</td>
<td>257</td>
</tr>
<tr>
<td>lead poisoning</td>
<td>320</td>
</tr>
<tr>
<td>mycoplasmosis</td>
<td>115</td>
</tr>
<tr>
<td>tracheal worms</td>
<td>229</td>
</tr>
<tr>
<td>Wing(s)</td>
<td></td>
</tr>
<tr>
<td>flapping of</td>
<td>267</td>
</tr>
<tr>
<td>roof-shaped</td>
<td>319, 324</td>
</tr>
<tr>
<td>violent beating</td>
<td>300</td>
</tr>
<tr>
<td>Wing droop</td>
<td>105, 131, 177–179, 257, 269, 319, 321, 324</td>
</tr>
<tr>
<td>Woodcock</td>
<td></td>
</tr>
<tr>
<td>lead poisoning</td>
<td>319</td>
</tr>
<tr>
<td>renal coccidiosis</td>
<td>216</td>
</tr>
<tr>
<td>woodcock reovirus</td>
<td>185–186</td>
</tr>
<tr>
<td>Woodcock reovirus</td>
<td>140, 185–186</td>
</tr>
<tr>
<td>Wood duck</td>
<td></td>
</tr>
<tr>
<td>aspergillosis</td>
<td>131</td>
</tr>
<tr>
<td>avian pox</td>
<td>164</td>
</tr>
<tr>
<td>duck plague</td>
<td>141</td>
</tr>
<tr>
<td>lead poisoning</td>
<td>318, 321</td>
</tr>
<tr>
<td>Woodpecker</td>
<td></td>
</tr>
<tr>
<td>avian cholera</td>
<td>79</td>
</tr>
<tr>
<td>intestinal coccidiosis</td>
<td>210</td>
</tr>
<tr>
<td>Wood pigeon</td>
<td></td>
</tr>
<tr>
<td>candidiasis</td>
<td>135</td>
</tr>
<tr>
<td>erysipelas</td>
<td>121</td>
</tr>
<tr>
<td>salmonellosis</td>
<td>100</td>
</tr>
<tr>
<td>tuberculosis</td>
<td>95</td>
</tr>
<tr>
<td>Written history</td>
<td>3</td>
</tr>
</tbody>
</table>

### Y

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellowleg, avian cholera</td>
<td>79</td>
</tr>
<tr>
<td>Yellow-naped Amazon parrot</td>
<td>115</td>
</tr>
<tr>
<td>Young birds, disease</td>
<td>361</td>
</tr>
</tbody>
</table>

### Z

<table>
<thead>
<tr>
<th>Term</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zearalenone</td>
<td>269</td>
</tr>
<tr>
<td>Zearalenone toxicosis, see Fusariotoxin poisoning</td>
<td></td>
</tr>
<tr>
<td>Zectran®</td>
<td>285</td>
</tr>
<tr>
<td>Zinc</td>
<td>285</td>
</tr>
</tbody>
</table>
### Field Manual of Wildlife Diseases: General Field Procedures and Diseases of Birds

#### Title and Subtitle
Field Manual of Wildlife Diseases, General Field Procedures and Diseases of Birds

#### Authors
Milton Friend and J. Christian Franson, Technical Editors

#### Performing Organization Name(s) and Address(es)
U.S. Geological Survey, Biological Resources Division, National Wildlife Health Center, 6006 Schroeder Rd., Madison, WI 53711

#### Sponsoring/Monitoring Agency Name(s) and Address(es)
U.S. Geological Survey, 12201 Sunrise Valley Dr., Reston, VA 20192

#### Supplementary Notes

#### Abstract
The “Field Manual of Wildlife Diseases, General Field Procedures and Diseases of Birds” presents practical, current information and insights about wild bird illnesses and the procedures to follow when ill birds are found or epidemics occur. Section 1 of the Manual provides information about general field procedures. Sections 2 through 5 describe various bird diseases. Sections 6 and 7 provide information about toxins that affect birds, and Section 8 describes miscellaneous diseases and hazards that affect birds. Manual lists institutions and laboratories that offer diagnostic services; sources of supplies for collecting, preserving, and shipping specimens; and it contains color illustrations for dissection.

#### Subject Terms
- Bird diseases; wildlife diseases; bacterial diseases; fungal diseases; viral diseases; parasitic diseases; biotoxins; chemical toxins; general field procedures.

#### Number of Pages
440

#### Price Code
Unclassified