Golden Eagle Disease & Contaminant Surveillance

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Wildlife Investigations Laboratory
California Department of Fish & Wildlife
Overview

- Wildlife Investigations Lab
- Collaboration
- Wildlife Rehabilitation Facilities
- Data Collection
- Future Goals
- Recent investigations
- Emerging concerns
Fish & Wildlife Code WIL Mandate:
“investigate all diseases of, & problems relating to, birds, mammals, or fish, & maintain laboratories to assist in such investigation”
Collaboration

D.I.E.D.

National Eagle Repository

Pesticides?

Museum of Wildlife and Fish Biology
University of California, Davis
Western Foundation of Vertebrate Zoology
Collections & Museums

EPA

dpr

OFFICE OF THE AGRICULTURAL COMMISSIONER

CALIFORNIA DEPARTMENT OF FISHERIES AND WILDLIFE

U.S. FISH & WILDLIFE SERVICE

CALIFORNIA COUNCIL FOR WILDLIFE REHABILITATORS

MENDOCINO COUNTY CALIFORNIA
Wildlife Rehabilitation Facilities

- 96 centers
- Permitted by CDFW & USFWS
- ~70,000 animals / year
  - 70-75% birds
  - 1-5 GOEA / center / year

<table>
<thead>
<tr>
<th>Year</th>
<th>Intake</th>
<th>Released</th>
<th>Euthanized</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>46</td>
<td>9</td>
<td>25</td>
<td>12</td>
</tr>
<tr>
<td>2009</td>
<td>45</td>
<td>8</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>2010</td>
<td>50</td>
<td>13</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>2011</td>
<td>33</td>
<td>4</td>
<td>20</td>
<td>9</td>
</tr>
</tbody>
</table>
Dead Eagles

- Date/Location
- Age & sex
- Body measurements
- Photos
- Genetics: feathers, muscle
- Isotopes: feathers
- Disease: tissues
- Contaminants: tissues
- Determine COD
# Dead Eagles

<table>
<thead>
<tr>
<th>Disease</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viruses</td>
<td>West Nile virus, Avian paramyxovirus-1, &amp; Avian influenza</td>
</tr>
<tr>
<td>Bacteria</td>
<td>Aerobic culture, <em>Salmonella</em> spp., &amp; <em>Chlamydiophila psittaci</em></td>
</tr>
<tr>
<td>Parasites</td>
<td>internal (<em>Sarcocystis</em> spp.) &amp; external parasites</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contaminants</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy metals</td>
<td>lead, manganese, iron, mercury, arsenic, molybdenum, zinc, copper, &amp; cadmium</td>
</tr>
<tr>
<td>Lead</td>
<td>recent (liver) &amp; chronic (bone) exposure</td>
</tr>
<tr>
<td>Selenium</td>
<td>deficiency or excess</td>
</tr>
<tr>
<td>Pesticides</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Anticoagulant rodenticides</td>
<td></td>
</tr>
<tr>
<td>brodifacoum, bromadiolone, chlorophacinone,</td>
<td></td>
</tr>
<tr>
<td>coumachlor, difethialone, diphacinone, &amp; warfarin</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>If indicated:</td>
<td></td>
</tr>
<tr>
<td>Brain cholinesterase</td>
<td></td>
</tr>
<tr>
<td>Indicator for organophosphate &amp; carbamate</td>
<td></td>
</tr>
<tr>
<td>insecticides</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Organochlorine insecticides &amp; metabolites</td>
<td></td>
</tr>
<tr>
<td>dieldrin, endosulfan I, endosulfan II, endrin,</td>
<td></td>
</tr>
<tr>
<td>hexachlorobenzene, heptachlor, heptachlor</td>
<td></td>
</tr>
<tr>
<td>epoxide, lindane, methoxychlor, mirex, aldrin,</td>
<td></td>
</tr>
<tr>
<td>BHC alpha, chlordane, p,p’-DDE, p,p’-DDD, p,p’-DDT,</td>
<td></td>
</tr>
<tr>
<td>Dicofol, o,p’-DDE, o,p’-DDD, o,p’-DDT, &amp; toxaphene</td>
<td></td>
</tr>
</tbody>
</table>
Future Goals

- Initiate live-eagle sample collection
- Wildlife Rehab Centers
- Coordination with ongoing research
- Sample collection
  - Feathers (genetics, isotopes)
  - Blood (genetics, antibodies, lead & AR screening)
- Sample storage
- Protocol & datasheet
- Summarize WIL’s historical eagle records
## Recent Investigations

### 2007 - 2013

<table>
<thead>
<tr>
<th>Finding</th>
<th>GOEA</th>
<th>BAEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Nile virus</td>
<td>2/4</td>
<td>2/6</td>
</tr>
<tr>
<td>Avian cholera</td>
<td></td>
<td>1/7</td>
</tr>
<tr>
<td>Sarcocystosis</td>
<td>2/3</td>
<td>1/4</td>
</tr>
<tr>
<td>Lead</td>
<td>1/5</td>
<td>2/6</td>
</tr>
<tr>
<td>Anticoagulant Rodenticides</td>
<td>2/4</td>
<td>3/4</td>
</tr>
<tr>
<td>Trauma RE</td>
<td>8/12</td>
<td></td>
</tr>
<tr>
<td>Trauma other</td>
<td></td>
<td>2/7</td>
</tr>
</tbody>
</table>

*positive/number evaluated
Mange in California

• Golden eagles
  • Severe feather loss on head, neck, legs, & lower abdomen
  • Poor feather condition
• Cases
  • Dec 2012; San Benito Co.
  • Jul 2013; Alameda Co.
  • Aug 2013; Monterey Co.
• Skin burrowing mite
  • *Knemidecoptes* spp.
  ➢ First occurrence

SPCA for Monterey Co., East Bay RPD, Calif. Dept. of Fish & Wildlife, & UC Davis
Ticks in Arizona

• Bald eagle nestlings
  • 8 deaths over 3 years

• Tick identification
  • *Argas radiates* & *A. ricei*
  • *Argas* spp. (2013, not yet identified)

• 2013, Golden eagle failed nest
  • Recovered *Argas* spp. at site
  • Unknown if ticks played a role in nest failure

Kenneth “Tuk” Jacobson
Raptor Management Coordinator
Arizona Game & Fish
Phone: (623) 236-7575
WNV in Utah

- Bald eagles
  - 54 found sick & dead from 1 Dec 2013 to present in 6 counties
  - Clinical signs: body tremors, paralysis & weakness in wings & legs, progressive seizures
  - COD: reported as West Nile virus\(^1,2\)

- Eared grebes
  - Great Salt Lake
  - >15,000 died in Nov & Dec 2013
  - COD: reported as West Nile virus\(^1,2\)

➢ Bald eagles presumably became infected from eating eared grebes

\(^1\)Utah Veterinary Diagnostic Laboratory, Logan, UT
\(^2\)National Wildlife Health Center, Madison, WI
Questions?

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