Snowy Owl (Bubo scandiacus) Morbidity and Mortality
Investigation in the DOS Region in the

Erica A. Miller*, Cindy P. Driscoll, Sherrill Davison, Lisa Murphy,
Ellen Bronson, Allison Wack, Annie Rivas, and Justin Brown
*1250 Corner Ketch Road
Newark, DE 19711

Abstract

This report presents a portion of the work done by veterinary team members from Project SNOWstorm during the Snowy Owl (Bubo scandiacus) irruption in the winter of 2013 – 2014 and the following winter of 2014 – 2015. The veterinary team conducted gross necropsies and morphometrics on 68 birds collected from seven states during these two seasons. This report focuses on the findings from three mid-Atlantic states (New Jersey, Maryland, Pennsylvania) between December 2013 and March 2014 only, as no dead owls were reported in these states in the winter of 2015 and no dead birds were collected from Delaware in either year. Specific diagnostics included radiographs, liver toxicology screens for heavy metals and second generation anti-coagulant rodenticides, histopathology, and parasite collection and identification. Authors also collected blood samples from live birds presenting to wildlife rehabilitators or captured in banding efforts during this time period. Findings include a compilation of the general causes of morbidity and mortality, body condition of the presenting animals, ante-mortem blood values, gross post-mortem and histopathology findings, and exposure levels to heavy metals and anti-coagulant rodenticides.

Background

Snowy Owl (Bubo scandiacus) population increases are usually tied to increased prey (mostly lemming) availability in the arctic – such as was observed in the summer of 2013 (Patapov & Sale 2012; Sutton & Sutton 2014). Snowy Owl irruptions into areas south of the boreal forest are rare with the last large irruption in the mid-Atlantic region occurring in the winter of 1926 – 1927 (Sutton & Sutton 2014). In late

2013 the first sightings of Snowy Owls were reported in this region and Project SNOWstorm was created to document the anticipated inundation and to band and track as many of the owls as possible. A sub-team of veterinarians was formed to develop medical data forms and protocols in conjunction with banding efforts, and to investigate any known mortalities. It is impossible to know the exact number of owls that visit-

Figure 1. Sightings of Snowy Owls in winter 2013 – 2014. Image provided by eBird (www.ebird.org) and created 24 August 2015.

Figure 2. Sightings of Snowy Owls in winter 2014 – 2015. Notably fewer sightings occurred in the MD-PA-NJ area than in the previous winter. Image provided by eBird (www.ebird.org) and created 24 August 2015.
ed our region; however, the birding website eBird logged hundreds of sightings (eBird 2015) (Figures 1 & 2). For comparison, Figure 3 shows the Snowy Owl sightings reported to eBird for the winter of 2012 – 2013. Birds were most commonly found (live and dead) at airports, on roadways, in open fields and on beaches, areas that had ample food resources and resembled the familiar arctic tundra.

**Figure 3.** Sighting of Snowy Owls in winter 2012 – 2013. Image provided by eBird (www.ebird.org) and created 24 August 2015.

**Methods**

Carcasses were collected between 3 Dec 2013 and 6 April 2014, when found dead or after being euthanized/died in care at wildlife rehabilitation facilities. Frozen carcasses were collected and stored in the freezer at the Frink Center for Wildlife in Newark, DE. Carcasses were thawed and radiographed to document extent of skeletal injuries and to survey for heavy metals or other foreign bodies (Figure 4). Carcasses were then taken to the Poultry Diagnostic Lab at New Bolton Center for necropsy and sample collection. External exam included measurements, body weight, collection of ectoparasites, and photos. Due to the high demand for skins and skeletons for taxidermy purposes, cosmetic necropsies were performed whenever possible. A single ventral midline incision was made from the cloaca to just cranial of the manubrium, and coelomic organs were examined in situ and then in more detail after removal. A single incision was made over the caudodorsal aspect of the head to assess the skull for evidence of trauma, but the skull was not incised nor was the brain removed.

**Figure 4.** Radiograph of a juvenile female Snowy Owl found on a runway in Maryland. Bones (food) are present in the gizzard and multiple bones are fractured in the bird’s body: bird was struck by a plane shortly after ingesting a tern.

All internal organs were examined and lesions photographed, meas-
the changes observed likely represent a stress education (WBC profile) stress profile. The changes observed likely represent a stress education and/or mental trauma. Thus, the results observed are consistent with the expected changes in WBC profile. The changes observed likely represent a stress education and/or mental trauma. Thus, the results observed are consistent with the expected changes in

**Hematology Results**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Range</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Hemoglobin</td>
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<td>4.2</td>
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<tr>
<td>MCV</td>
<td>80-100</td>
<td>92</td>
</tr>
<tr>
<td>MCH</td>
<td>26-30</td>
<td>30</td>
</tr>
<tr>
<td>Platelets</td>
<td>150-450</td>
<td>345</td>
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<tr>
<td>RBC</td>
<td>3.9-5.4</td>
<td>4.2</td>
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<tr>
<td>WBC</td>
<td>3.5-10</td>
<td>5.2</td>
</tr>
</tbody>
</table>

**Table 1:** Blood values obtained from the six lice weeks captured in March

**Discussion:** The lice samples were collected from the six lice weeks captured in March. The lice samples were collected from the six lice weeks captured in March.
Summary

Part of the findings are not only to human health, these findings are

motor vehicles or airplanes, possibly because these juvenile birds
in good body condition and most deaths occur due to trauma from
the impact on the windshield, a large amount of data was

Table 2. Age and gender distribution of the snowy owls by site in

Data from Figure 5)

Figure 5. Cause of death for the 14 snowy owls from the mid-Alpche

Additional findings:

Pathology findings
consistent with a previous study in Alberta, Canada, in which the leading cause of mortality among wintering Snowy Owls was determined to be trauma, and most of those owls were in excellent body condition (Kerlinger & Lein 1988). All of the owls examined in this study had external lice, and many also had internal parasites and exposure to potential toxins. It has not yet been determined if the birds were exposed to the parasites and toxins on their nesting grounds or, more likely, on their southern foray into more human-populated areas.

**Literature Cited**


