

## Wildlife Health Unit

New York State Department of Environmental Conservation  
108 Game Farm Road, Delmar NY 12054  
Phone: 518-478-3034/3038 Fax: 518-478-3035

### CASE REPORT

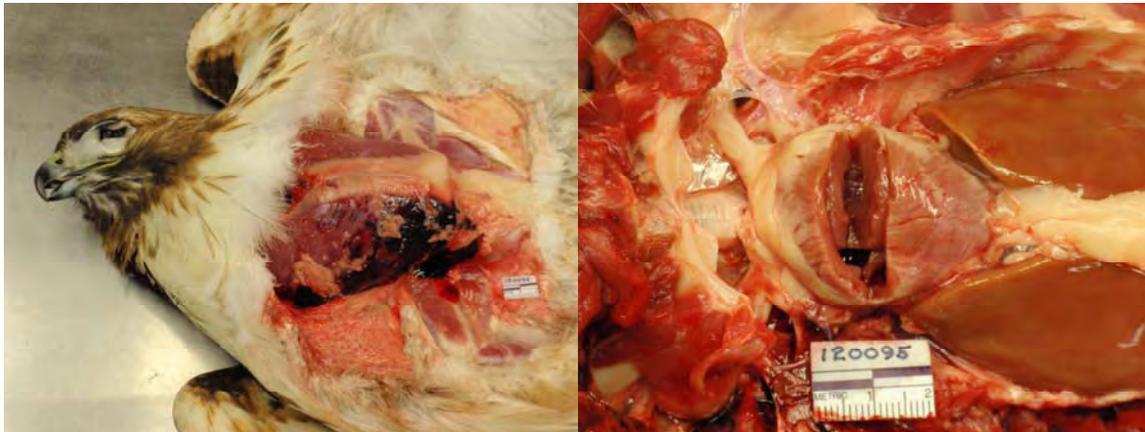
Species: Red-tailed Hawk  
County: New York Town: Manhattan  
Specific Location: Cedar Hill in Central Park  
Found: 2/26/12 Received: 3/1/12 Necropsy: 3/2/12 Prosector: Okoniewski  
Submitted by: Joseph Pane, R2

WHU No.: 120095

Coordinates:

**HISTORY (in brief):** This bird (reportedly the mate of celebrated NYC red-tailed hawk Pale Male) was found dead by unidentified park visitors who alerted [REDACTED] (hawk watcher/photographer). [REDACTED] collected the bird with the intention of finding assistance to determine the cause of death. This hawk was collected from [REDACTED] the following day by ECO Brent Wilson, and shipped with chain-of-custody to the NYSDEC WHU by wildlife manager Pane on February 29.

**NECROPSY FINDINGS:** This adult (ASY) female red-tailed hawk was in robust flesh and had large deposits of subcutaneous and visceral fat; gross weight: 1,700 g; wing cord: 395 mm. The inside of the mouth was pale. There was severe subcutaneous and intramuscular hemorrhage on the right side of the breast and adjoining abdomen. The heart, lungs, liver, spleen, kidneys and brain were pale. Only a scant trace of extremely watery blood was present in the heart. Enlarged ova (largest ~23mm diameter) and the condition of the oviduct indicated that egg-laying was about to commence. The crop contained about an ounce of tissue (skeletal and heart muscle, bone, and feather) from what was tentatively identified as a rock pigeon. The stomach was empty except for a trace of mammal hair (saved for possible identification). There was little in the intestine. There were no signs of infectious or parasitic disease.



**TOXICOLOGY (Analyses by the NYSDEC Shared Laboratory Facility):** Three anticoagulants were detected in the liver: bromadiolone (0.416 ppm, wet basis), brodifacoum (0.039 ppm), and difethialone (0.016 ppm).

RTHA 120095 continued.

DIAGNOSIS: Fatal hemorrhage related to exposure to the anticoagulant rodenticides, principally bromadiolone.

Joe Okoniewski  
March 27, 2012

**New York State Department of Environmental Conservation**

**Division of Air Resources**

**Bureau of Air Quality Surveillance, Shared Laboratory Facility**

SUNY Albany East Campus, Rm. D104

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Joe Martens  
Commissioner

**M E M O R A N D U M**

TO: Joe Okoniewski, Wildlife Pathology Unit

FROM: Peter Furdyna, EC II, BAQS Shared Laboratory Facility *PMF*

SUBJECT: Rodenticide Screening Results – WPU ID 120095  
Internal Laboratory ID 120024

DATE: **03/28/2011**

The sample was received at the laboratory on 03/07/2012 via hand delivery by Robert Benson. At the time of receipt, the sample cooler was noted to be 9°C but the sample itself appeared to have ice crystals present. The sample was identified as a red tailed hawk liver from a specimen collected at Central Park in New York City. Following receipt of the sample, it was maintained in secure frozen storage until the time of analysis.

Results on the sample are as follows:

Rodenticide	Concentration found (ppb, or ng/g)
Warfarin	ND < 10
Diphacinone	ND < 10
Chlorophacinone	ND < 10
<b>Bromadiolone</b>	<b>416</b>
Difenacoum	ND < 10
<b>Brodifacoum</b>	<b>39</b>
<b>Difethialone</b>	<b>16</b>

“ND” = “Not Detected” at < the specified reporting limit

The sample was prepared for analysis by the method of Vandebroucke, et. al<sup>1</sup>, modified by use of ascorbic acid<sup>2</sup> to aid in recovery of the indandione rodenticides diphacinone, and chlorophacinone. Briefly, the sample was thawed and homogenized with the addition of 100 mg of ascorbic acid. A portion of the homogenate was then extracted using acetone. Following clean-up procedures, the extract was diluted and analyzed by UPLC/MS-MS. To correct for matrix enhancing effects noted for the higher molecular weight compounds, matrix matched standards of the target chemicals were used for instrument calibration.

Quality control data associated with this analysis was reviewed and found to be acceptable, therefore this analysis is considered to be complete as of the date of this

<sup>1</sup> Journal of Chromatography B, 869 (2008) 101–110

<sup>2</sup> Journal of Chromatography, 437 (1988) 301 - 305

-Okoniewski-

March 28, 2012

memorandum. If you have questions on this matter, please contact me.

cc: S. Mo.  
Lab Data  
File  
PMF Daybook

## Wildlife Health Unit

New York State Department of Environmental Conservation  
108 Game Farm Road, Delmar NY 12054  
Phone: 518-478-3034/3038 Fax: 518-478-3035

### CASE REPORT

Species: Red-tailed Hawk WHU No.: 120097  
County: New York Town: Manhattan  
Specific Location: 101<sup>st</sup> and Central Park West – Central Park.  
Found: 2/10/12 Received: 3/2/12 Necropsy: 3/5/12 Prosector: Okoniewski  
Submitted by: [REDACTED]

**HISTORY:** This bird was reported by Urban Park Rangers to have been not acting right for about a week before it was captured for examination by [REDACTED] (wildlife rehabilitator). Blood work (by Antech) showed the hawk to be severely anemic (hematocrit: 20). It was given fluids subcutaneously and vitamin K by injection to the breast muscle but died the next day. It was held frozen prior to shipment to the Wildlife Health Unit.

**NECROPSY FINDINGS:** This immature (second year) female red-tailed hawk was in good flesh and had large subcutaneous and visceral fat deposits; gross weight: 1337 g; wing cord: 395 mm. The neck was nearly severed (bloodlessly) at the rear of the second cervical vertebra (probably caused by manipulating the frozen carcass for shipping). Some blood stains were present at the medial aspect of the right elbow (probably the blood draw site). Some belly feathers and undertail coverts were matted with blood. An accumulation of dried blood was present at the base of the talon on the left hallux. There was slight subcutaneous and intermuscular hemorrhage along the medial aspect of the left thigh and knee, and the adjacent abdominal wall. The liver was pale, tan-colored, and fairly small. The spleen and kidneys were pale. The lungs were pale and congested with watery, blood-tinged fluid. There was little blood in the heart. The crop contained some flesh and feathers of a rock pigeon. The stomach contained more pigeon remains plus a pellet about 2 cm in diameter comprised mostly of unidentified mammal hair.

**TOXICOLOGY (Analyses by the NYSDEC Shared Laboratory Facility):** The anticoagulant rodenticide difethialone was detected at 0.607 ppm (wet basis) in the liver.

**DIAGNOSIS:** Fatal hemorrhage related to exposure to the anticoagulant rodenticide difethialone.

**COMMENTS:** The point of major blood loss in the present case was not determined. Close inspection of the blood-caked site on the left hallux did not reveal a mechanical injury. The level of difethialone recorded in this bird is highest recorded in a raptor so far in New York.

Joe Okoniewski  
March 27, 2012

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Joe Martens  
Commissioner

MEMORANDUM

TO: Joe Okoniewski, Wildlife Pathology Unit  
FROM: Peter Furdyna, EC II, BAQS Shared Laboratory Facility  
SUBJECT: Rodenticide Screening Results – WPU ID 120097  
Internal Laboratory ID 120025

*PAF*

DATE: 03/28/2011

The sample was received at the laboratory on 03/07/2012 via hand delivery by Robert Benson. At the time of receipt, the sample cooler was noted to be 9°C. The sample was identified as a red tailed hawk liver from a specimen collected at 101<sup>st</sup> Street and Central Park West in New York City. Following receipt of the sample, it was maintained in secure frozen storage until the time of analysis.

Results on the sample are as follows:

Rodenticide	Concentration found (ppb, or ng/g)
Warfarin	ND < 10
Diphacinone	ND < 10
Chlorophacinone	ND < 10
Bromadiolone	ND < 10
Difenacoum	ND < 10
Brodifacoum	ND < 10
<b>Difethialone</b>	<b>607</b>

“ND” = “Not Detected” at < the specified reporting limit

The sample was prepared for analysis by the method of Vandenbroucke, et. al<sup>1</sup>, modified by use of ascorbic acid<sup>2</sup> to aid in recovery of the indandione rodenticides diphacinone, and chlorophacinone. Briefly, the sample was thawed and homogenized with the addition of 100 mg of ascorbic acid. A portion of the homogenate was then extracted using acetone. Following clean-up procedures, the extract was diluted and analyzed by UPLC/MS-MS. To correct for matrix enhancing effects noted for the higher molecular weight compounds, matrix matched standards of the target chemicals were used for instrument calibration.

Quality control data associated with this analysis was reviewed and found to be acceptable, therefore this analysis is considered to be complete as of the date of this

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<sup>2</sup> Journal of Chromatography, 437 (1988) 301 - 305

-Okoniewski-

March 28, 2012

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## Wildlife Health Unit

New York State Department of Environmental Conservation  
108 Game Farm Road, Delmar NY 12054  
Phone: 518-478-3034/3038 Fax: 518-478-3035

### CASE REPORT

Species: Red-tailed Hawk  
County: New York Town: Manhattan  
Specific Location: 59<sup>th</sup> Street and Seventh Avenue  
Found: 3/4/12 Received: 3/6/12 Necropsy: 3/6/12 Prosector: Okoniewski  
Submitted by: [REDACTED] Urban Park Rangers

WHU No.: 120105

**HISTORY:** Found dead by the Park Conservancy.

**NECROPSY FINDINGS:** This adult (ASY) female red-tailed hawk was in very good flesh and had very large subcutaneous and visceral fat deposits: gross weight: 1,682 g; wing cord: 390 mm. The entire oviduct was turned inside-out (prolapsed) and extruded from the vent. The cranial portion of the oviduct was partly coated with clotted hemorrhage. The plumage behind the vent was stained with feces. Internally, there was a small amount of clotted hemorrhage in posterior abdomen. Pallor was limited to the spleen and, to a lesser extent, the kidneys. The heart contained little blood. Three enlarged ova (partly developed eggs) were present, the largest of which had ruptured and leaked a small amount of yolk into the body cavity. The crop contained bird tissue as did the stomach. The stomach contents included a few feathers of a rock pigeon.



**TOXICOLOGY** (Analyses by the NYSDEC BAQS Shared Laboratory Facility): Four anticoagulant rodenticides were detected in the liver: difethialone (0.127 ppm, wet basis), bromadiolone (0.068 ppm), diphacinone (0.059 ppm), and brodifacoum (0.046 ppm).

**DIAGNOSIS:** Shock secondary to a prolapsed oviduct, possibly facilitated by anticoagulant-mediated hemorrhage.

**COMMENTS:** A complex case. Oviduct prolapse are rarely seen in wild birds. It is more commonly seen in poultry and captive psittacines, and is usually associated with a problematic egg-laying event. An oviduct prolapse is more common in birds in poor

RTHA 120105 continued.

physical condition, or with an oviduct infection, neither of which were present in this hawk. It seems likely that the bird died shortly after the prolapse as the rather delicate tissue of the cranial end was still moist and viable-looking. Sudden death is not typical in oviduct prolapse, although neither is a prolapse to the extent observed here. It seems reasonable that the anticoagulant load, which was well within the range of levels found in raptors killed by anticoagulant-facilitated hemorrhage, could have permitted rapid hemorrhage from blood vessels damaged by the prolapse, leading to shock.

Joe Okoniewski  
March 27, 2012

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Joe Martens  
Commissioner

MEMORANDUM

TO: Joe Okoniewski, Wildlife Pathology Unit  
FROM: Peter Furdyna, EC II, BAQS Shared Laboratory Facility *PMF*  
SUBJECT: Rodenticide Screening Results – WPU ID 120105  
Internal Laboratory ID 120026

DATE: **03/28/2011**

The sample was received at the laboratory on 03/07/2012 via hand delivery by Robert Benson. At the time of receipt, the sample cooler was noted to be 9°C. The sample was identified as a red tailed hawk liver from a specimen collected at 59<sup>th</sup> Street and 7<sup>th</sup> Avenue near Central Park in New York City. Following receipt of the sample, it was maintained in secure frozen storage until the time of analysis.

Results on the sample are as follows:

Rodenticide	Concentration found (ppb, or ng/g)
Warfarin	ND < 10
<b>Diphacinone</b>	<b>59</b>
Chlorophacinone	ND < 10
<b>Bromadiolone</b>	<b>68</b>
Difenacoum	ND < 10
<b>Brodifacoum</b>	<b>46</b>
<b>Difethialone</b>	<b>127</b>

“ND” = “Not Detected” at < the specified reporting limit

The sample was prepared for analysis by the method of Vandebroucke, et. al<sup>1</sup>, modified by use of ascorbic acid<sup>2</sup> to aid in recovery of the indandione rodenticides diphacinone, and chlorophacinone. Briefly, the sample was thawed and homogenized with the addition of 100 mg of ascorbic acid. A portion of the homogenate was then extracted using acetone. Following clean-up procedures, the extract was diluted and analyzed by UPLC/MS-MS. To correct for matrix enhancing effects noted for the higher molecular weight compounds, matrix matched standards of the target chemicals were used for instrument calibration.

Quality control data associated with this analysis was reviewed and found to be acceptable, therefore this analysis is considered to be complete as of the date of this

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-Okoniewski-

March 28, 2012

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## Wildlife Health Unit

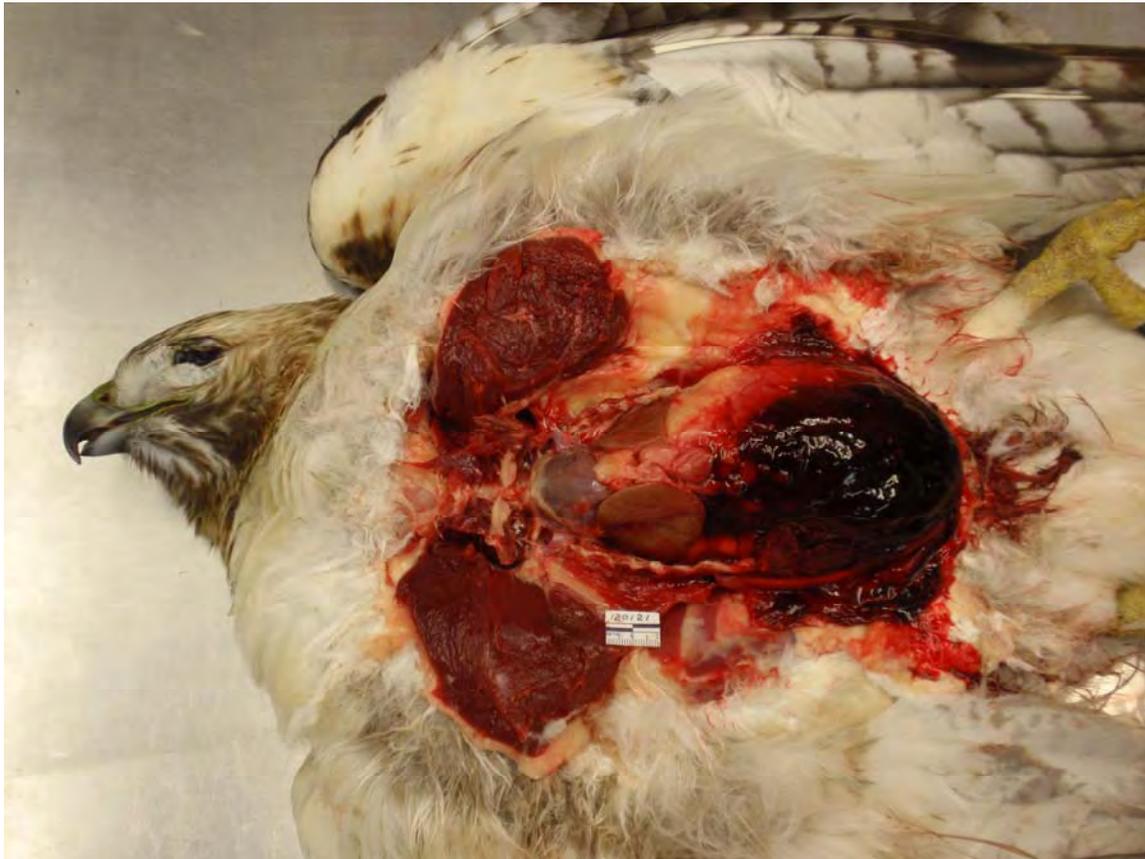
New York State Department of Environmental Conservation  
108 Game Farm Road, Delmar NY 12054  
Phone: 518-478-3034/3038 Fax: 518-478-3035

### CASE REPORT

Species: Red-tailed Hawk WHU No.: 120121  
County: New York Town: Manhattan Coordinates:  
Specific Location: Riverside Park (80<sup>th</sup> Street and Hudson River)  
Found: 3/9/12 Received: 3/14/12 Necropsy: 3/15/12 Prosector: Okoniewski  
Submitted by: [REDACTED] Urban Park Rangers

**HISTORY:** Found dead under nest; received at Delmar in a partly frozen condition.

**NECROPSY FINDINGS:** This adult (ASY) female red-tailed hawk was in robust flesh and had very large subcutaneous and visceral fat deposits; gross weight: 1980 g; wing cord: 415 mm. The plumage near the vent was matted with blood. Despite the lack of any discernible mechanical trauma, there was extensive hemorrhage around the visceral fat located between the alimentary canal and the ventral wall of the abdomen. The spleen, liver and kidneys were pale. The lungs were somewhat edematous. There was little blood in the heart. One partly developed egg was present in the cranial oviduct. Three other ova were also markedly enlarged. The crop was empty. The stomach contained the fur and bones of either a juvenile *Rattus sp.* or an adult house mouse.



RTHA 120121

TOXICOLOGY (analyses by the NYSDEC Shared Laboratory Facility): Three anticoagulant rodenticides were detected in the liver: bromadiolone (0.320 ppm, wet basis), brodifacoum (0.106 ppm) and difethialone (0.045 ppm).

DIAGNOSIS: Fatal hemorrhage related to exposure to anticoagulant rodenticides.

COMMENT: The massive hemorrhage in the visceral fat in the belly region is a common presentation in anticoagulant cases in raptors.

Joe Okoniewski  
March 27, 2012

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Joe Martens  
Commissioner

MEMORANDUM

TO: Joe Okoniewski, Wildlife Pathology Unit

FROM: Peter Furdyna, EC II, BAQS Shared Laboratory Facility *PMF*

SUBJECT: Rodenticide Screening Results – WPU ID 120121  
Internal Laboratory ID 120029

DATE: **03/28/2011**

The sample was received at the laboratory on 03/15/2012 via hand delivery by Robert Benson. At the time of receipt, the sample cooler was noted to be 4°C. The sample was identified as a red tailed hawk liver from a specimen collected at Riverside Park in New York City. Following receipt of the sample, it was maintained in secure frozen storage until the time of analysis.

Results on the sample are as follows:

Rodenticide	Concentration found (ppb, or ng/g)
Warfarin	ND < 10
Diphacinone	ND < 10
Chlorophacinone	ND < 10
<b>Bromadiolone</b>	<b>320</b>
Difenacoum	ND < 10
<b>Brodifacoum</b>	<b>106</b>
<b>Difethialone</b>	<b>45</b>

“ND” = “Not Detected” at < the specified reporting limit

The sample was prepared for analysis by the method of Vandebroucke, et. al<sup>1</sup>, modified by use of ascorbic acid<sup>2</sup> to aid in recovery of the indandione rodenticides diphacinone, and chlorophacinone. Briefly, the sample was thawed and homogenized with the addition of 100 mg of ascorbic acid. A portion of the homogenate was then extracted using acetone. Following clean-up procedures, the extract was diluted and analyzed by UPLC/MS-MS. To correct for matrix enhancing effects noted for the higher molecular weight compounds, matrix matched standards of the target chemicals were used for instrument calibration.

Quality control data associated with this analysis was reviewed and found to be acceptable, therefore this analysis is considered to be complete as of the date of this

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