

the Thalweg

Watershed Stewardship Program

Fall 2013

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Don't Be A Turkey!

Did you know that in Cobb County 85% of sewer blockages are grease-related and occur in residential areas? Fats, oils, and grease (FOG) are the natural by-products of food preparation, cooking, and baking processes. Some sources of FOG include ice cream, cheese, peanut butter, gravy, and salad dressing. When poured down the drain, FOG can cause blockages in the collection system, a network of pipes and pump stations that moves wastewater from homes and businesses to one of the County's water reclamation facilities. Wastewater comes from everyday activities we all do, such as washing dishes, using the garbage disposal, taking a shower, and of course, flushing the toilet. Anything that goes down a drain enters the collection system.

FOG may seem harmless. As a warm liquid, FOG goes down the drain easily. However, once in the pipes, it cools and clings to everything in the collection system. This restricts the flow of wastewater, eventually resulting in sewer backups that can overflow onto streets, homes, and creeks. If not addressed, overflows can lead to property damage, strong odors, and environmental, health and safety problems.

All households play an important role in preventing neighborhood sewer system blockages. If you are connected to a collection system, you have a vested interest in the reliability and life span of the system and treatment plants. Even if you've never experienced a FOG-related overflow, a portion of your monthly water bill payment funds the maintenance, repair, and replacement of the system. Plus, overflows can enter nearby waterways, impacting the health of the environment and the quality of life for local residents.

Do your part this Fall to help protect the environment and reduce sewer maintenance costs! Don't let your Thanksgiving clog the pipes and turn your holiday into a smelly mess. Keep your pipes and the festivities flowing by following these simple practices:

- NEVER pour fats, oils, and grease down the drain.
- Scrape leftover food on pans and plates into the trash (not the sink).
- Pour, wipe with a paper towel, and scrape oil and grease from pans into a container before washing. Dispose of these materials in the trash.
- Fryer grease should be cooled, placed in a sealed container, and disposed of in the trash.
- Use sink strainers to catch food, and then empty the strainer contents into the trash.

For more information about FOG, contact Cobb County's Grease Management Program, which coordinates FOG education and enforcement activities: fog@cobbcounty.org.



Feeding Behavior-Related Toxicity due to *Nandina domestica* in Cedar Waxwings (*Bombycilla cedrorum*)

By Moges Woldemeskel and Eloise L. Styer

Tifton Veterinary Diagnostic and Investigational Laboratory, Department of Pathology, College of Veterinary Medicine, The University of Georgia

This study first appeared in the publication "Veterinary Medicine International", December 2010

Abstract

Dozens of Cedar Waxwings were found dead in Thomas County, Georgia, USA, in April 2009. Five of these were examined grossly and microscopically. Grossly, all the examined birds had pulmonary, mediastinal, and tracheal hemorrhages. Microscopically, several tissues and organs were diffusely congested and hemorrhagic. Congestion and hemorrhage were marked in the lungs. Intact and partly digested berries of *Nandina domestica* Thunb. were the only ingesta found in the gastrointestinal tract of these birds. Due to their voracious feeding behavior, the birds had eaten toxic doses of *N. domestica* berries. *N. domestica* contains cyanide and is one of the few berries readily available at this time of the year in the region. The gross and microscopic findings are consistent with lesions associated with cyanide toxicity. This paper for the first time documents toxicity associated with *N. domestica* in Cedar Waxwings.



Cedar waxwing. Photo courtesy of John Harrison.
www.wikipedia.org.

1. Introduction

The Cedar Waxwing (*Bombycilla cedrorum*, formerly *Ampelis cedrorum*) is a member of the family Bombycillidae. It breeds in North America, principally southern half of Canada, and the northern half of the United States. Its winter range includes the United States, Mexico, and Central America as far south as Panama, and the Caribbean region. During winter and spring, when berry supplies are low or out of season, the Cedar Waxwings migrate in huge numbers out of the northern United States and southern Canada into most of the south western and south eastern United States. Cedar Waxwings are opportunistic feeders and move in a nomadic, unpredictable migration following the food supply. During winter they eat fruit almost exclusively and switch to eating mostly insects in summer. Diet analysis from eastern US over 65 years showed that fruit constituted 84% of their annual diet. *N. domestica* forms an excellent backdrop for perennials that disappear in winter. Clusters of the bright red berries of *N. domestica* last for months on each plant, attracting hungry birds whose food is in short supply during this time of the year and into late spring. Cedar Waxwings are voracious feeders, often eating until they can eat no more. They may become intoxicated and die from eating large quantities of overripe fruit. Toxicity associated with *N. domestica* is not previously reported in Cedar Waxwings.

2. Materials and Methods

Dozens of Cedar Waxwings were found dead in Thomas County, Georgia, USA, in April 2009. Five of these were necropsied at Tifton Veterinary Diagnostic and Investigational Laboratory of The University of Georgia, College of Veterinary Medicine. The birds were examined grossly and microscopically. For microscopic examination, tissue samples were collected at postmortem and fixed in 10% buffered formalin, processed for routine histopathology, sectioned at 5 µm, stained with hematoxylin-eosin (H&E), and examined by light microscopy.

3. Results

All the examined birds had similar findings on gross and microscopic examinations. Grossly, intact berries of *N. domestica* variably filled the crop. Ample amounts of partly digested berries also filled diffusely orange-stained ventricular lumens. A few intact berries were found in the proventriculus. There was hemorrhage in the lungs, heart, trachea, and thoraco-abdominal cavity.

Microscopically, the lungs, liver, kidney, proventriculus, ventriculus, uvea of the eye, heart, the meninges, and brain were diffusely congested. The hemorrhage and congestion were marked in the lungs. The tracheal lumen and pulmonary air capillaries were filled with hemorrhage. Multifocally, there was also hemorrhage within the skeletal muscles. The findings in the other examined tissues were unremarkable.



Cedar waxwing. Photo courtesy of Ken Thomas.
www.wikipedia.org.

4. Discussion

During winter, the Cedar Waxwings are concentrated in southeastern coastal plains of the USA. They are highly vagile, moving among crops of fruits, including those of ornamental trees and shrubs in suburban areas. Destruction of cultivated fruit is an index to the natural feeding habits of the bird, wild fruits being decidedly favored. In winter, their diets are almost exclusively fruits. At this time of the year, the birds have relied increasingly on crops of ornamental fruits planted in the urban areas in recent years. Ornamental fruiting plants and alien invasives may have shifted distributions of the birds and caused regional population increases. *Nandina domestica* is a native of China and Japan. The species and its dwarf varieties are popular landscape items. The plant has naturalized and invaded habitats in southeastern and other areas of the USA. The bright berries are beloved by birds and attract Cedar Waxwings, mockingbirds, and robins.

The appetite of the Cedarbird is of so extraordinary nature as to prompt it to devour every fruit or berry that comes in its way. Cedar Waxwings eat bulky fruits that contain easily assimilated simple sugars of glucose and fructose. They can store ingested fruits in a distensible portion of their esophagus, which is likely important in maximizing the amount of fruit ingested per foraging bout that their gizzards and intestines can process at any time. On occasion, they eat fruit that is overripe in such quantities that they become intoxicated. In this manner, they gorge themselves to such excess as sometimes to be unable to fly and suffer themselves to be taken by hand. Intact and partly digested berries of *N. domestica* were the sole contents of the gastrointestinal tract of the examined birds. This indicates that the birds had eaten toxic doses of *N. domestica* berries, one of the few fleshy fruits available in winter and spring in South Georgia.

Nandina domestica berries contain cyanide and other alkaloids. For most cultivars of *N. domestica*, cyanogenesis is the most important intoxication factor. Cyanide glycosides are substances present in many plants that can produce highly toxic hydrogen cyanide (HCN). At least 2000 plant species are known to contain cyanide glycosides with the potential to produce HCN poisoning. Generally, most parts of the plants contain cyanogenic glycosides, the young rapidly growing portion of the plant and the seeds containing the highest concentration. At least 55 cyanogenic glycosides are known to occur in plants, many being synthesized from aminoacids as part of normal plant metabolism. Frost and drought conditions may increase cyanogenesis in some plant species. Cool moist growing conditions enhance the conversion of nitrate to aminoacids and cyanogenic glycosides instead of plant protein. Presumably, similar weather conditions during late winter and early spring in the study area might have favored increased cyanogenesis in *N. domestica*.



Nandina domestica. Photo courtesy of Missouri Botanical Garden:
<http://www.missouribotanicalgarden.org>.

Cyanogenic plants represent a problem for various range of animals and wildlife, primarily among species that eat rapidly. The gastrointestinal tract of the examined birds solely contained berries of *N. domestica*. Because of their voracious feeding behavior, the birds have eaten toxic doses of *N. domestica* berries for which cyanogenesis is the most important intoxication facto. Tissue cyanide levels were not measured in these birds since cyanide is rapidly lost from animal tissues unless specimens are collected within a few hours of death and frozen for chemical analysis.

Hydrogen cyanide is highly poisonous to all animals. Sudden death is often the only presenting sign of acute cyanide poisoning. Although there are marked differences in toxicity of cyanide among species of birds, progression of signs of toxicity to death in birds is generally similar to those reported in mammals. A high rate of cyanide absorption is critical for acute toxicity. If a lethal dose is absorbed, death usually follows within minutes to one hour. Cyanide is a mitochondrial toxin that impairs cellular respiration causing morbidity or mortality within a short time. It is predominantly a neurotoxin, and its toxicity is mediated through inhibition of cytochrome oxidase, an end-chain enzyme of mitochondrial respiration. Cyanide's actions are complex and cannot be attributed solely to deprivation of cellular oxygen. Recent mechanistic studies show that cyanide inhibits multiple enzymes and alters several vital intracellular processes, which lead to a cascade of toxic events.

In cyanide poisoning, hemorrhages occur commonly in the heart, lungs, and various other organs of affected animals. The characteristic cherry red venous blood seen in acute cyanide poisoning results from the failure of the oxygen-saturated hemoglobin to release oxygen to the tissues because the enzyme cytochrome oxidase is inhibited by cyanide. The gross and microscopic findings in the examined birds are consistent with lesions associated with cyanide toxicity. In concurrence with the finding in the present report, birds that die from cyanide chemical toxicosis have bright red, oxygenated blood, and their tissues or organs, particularly the lungs, may appear congested with blood, hemorrhagic, and edematous. This paper for the first time documents toxicity associated with *N. domestica* in Cedar Waxwings. The berries of *N. domestica* are beloved by other birds such as robins and mockingbirdsm, indicating the potential toxicity to these birds if toxic doses are consumed during feed unavailability.

To read the full article, visit <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3005831/>.

Moges Woldemeskel and Eloise L. Styer, "Feeding Behavior-Related Toxicity due to *Nandina domestica* in Cedar Waxwings (*Bombycilla cedrorum*)," *Veterinary Medicine International*, vol. 2010, Article ID 818159, 4 pages, 2010. doi:10.4061/2010/818159



(a)



(b)

Toxicity of *Nandina domestica* in Cedar Waxwings. (a). Photograph showing berries of *N. domestica* in a crop of dead Cedar Waxwing. The arrows show congested and hemorrhagic trachea. (b). Photograph showing mediastinal and pulmonary hemorrhage.

Emerald Ash Borer Found with a Foothold in North Georgia

By Sandi Martin & Merritt Melancon

University of Georgia

Originally published on August 22, 2013



Emerald ash borer adult. Photo courtesy of Leah Bauer, USDA Forest Service Northern Research Station.

For years foresters and invasive insect experts have been on the lookout for the arrival of an unwelcome guest in Georgia. Now that it's here, they hope the public will help restrict its spread within Georgia.

The small, iridescent-green beetle has killed millions of ash trees across a wide swath of Canada and the upper Midwest since it was first detected in 2002. The emerald ash borer — *Agrilus planipennis*— has spread south and west from infested areas over the last decade.

In July, researchers found adult emerald ash borers in survey traps in DeKalb and Fulton counties. A follow-up ground survey found larvae in nearby ash trees, confirming an established emerald ash borer infestation.

Since 2005 University of Georgia invasive species experts have conducted an extensive trapping program in Georgia to screen for the emerald ash borer.

Georgia's five species of native ash trees usually grow along stream banks. While ash only makes up about 1 percent of Georgia forests, they play an integral role in preventing the erosion of stream banks and keeping silt out of natural waterways. Ash is also a popular landscape tree, with 2.9 million trees planted around Georgia homes, businesses, parks and greenways. The value of these city trees in Georgia is estimated to be around \$725 million.

Although the adult beetle is an active flyer, it is believed that the primary way the beetle spreads is by hitching a ride on infested ash firewood, logs and nursery stock. Emerald ash borer larvae kill ash trees by burrowing serpentine tunnels in the inner layers of bark, preventing the tree from transporting water and nutrients to and from the tree canopy.

The Georgia Invasive Species Task Force will launch a public outreach plan to try to curb the spread of this pest in the near future. This task force consists of the Georgia Department of Agriculture, the Georgia Forestry Commission, UGA, the Georgia Department of Natural Resources and the USDA Animal and Plant Health Inspection Service.

People can help slow the spread of this beetle through Georgia by not moving firewood and by helping others to understand how dangerous it can be to move firewood from one area to another.

"To prevent the spread of emerald ash borer, it is important not to move firewood in which the insect can hide," said Kamal Gandhi, associate professor in the UGA Warnell School of Forestry and Natural Resources. "Buy local firewood, whether camping or for your home."

To help reduce the spread of the emerald ash borer in Georgia, homeowners with ash trees should have a certified arborist check their trees for signs of emerald ash borer infestations.

Suspected infestations should be reported immediately so that foresters or arborists can understand how the infestation is spreading. This will aid in the development of effective methods to reduce its spread and impact.

"The faster (scientists) can track the spread of the insect, the faster they can work to stop it," said Joe LaForest, integrated pest management and forest health coordinator at the UGA Center for Invasive Species and Ecosystem Health.



Emerald ash borer larvae on ash. Photo courtesy of Kenneth R. Law, USDA APHIS PPQ.

The public can report suspected infestations by:

- Using the SEEDN (Southeastern Early Detection Network) website: www.eddmaps.org/southeast.
- Using the SEEDN Smartphone App [available for iPhone or Android devices]: <http://apps.bugwood.org/seedn.html>.
- Emailing one of the Experts listed below; or by contacting a representative of the Georgia Forestry Commission, Georgia Department of Agriculture, the Department of Natural Resources or their local, UGA Cooperative Extension agent.

For more information about the emerald ash borer and how to protect ash trees, visit: www.gainvasives.org/eab.

For more information about spotting signs of emerald ash borer infestations, view: www.youtube.com/watch?v=wXCynbv4Lc#at=24.

To read the full article, visit:

http://georgiafaces.caes.uga.edu/index.cfm?public=viewStory&pk_id=4855.

Martin, S., & Melancon, M. (2013, August 22). Emerald ash borer found with a foothold in north georgia. Retrieved from http://georgiafaces.caes.uga.edu/index.cfm?public=viewStory&pk_id=4855



Photo courtesy of Kenneth R. Law, USDA APHIS PPQ.



Emerald ash borer damage on ash. Photo courtesy of Leah Bauer, USDA Forest Service Northern Research Station.

VOLUNTEER OPPORTUNITY

Are you interested in participating at a volunteer service project? Look no further! The Cobb County Watershed Stewardship Program is excited to announce that the Watershed Stewardship Mob series is back for a second year. Each event will take place in the afternoon during the first Tuesday of every month and will take about two hours to complete.

We'll bring all of the supplies, and no experience is required! Just a willingness to help improve water and habitat quality, clothes you don't mind getting dirty, and a good pair of boots or tennis shoes.

Registration is required, so give us a call or send an email for more information and to sign up: 770-528-8214 or water_rsvp@cobbcounty.org. We hope you'll join us and spend an afternoon at a local creek, lending your hand to keep our waterways clean and healthy!

Be sure to check our next issue of "The Thalweg" and our calendar at www.CobbStreams.org for upcoming Winter and Spring 2014 events. Future service projects will include streambank stabilization and storm drain marking.

Mark your calendars for our Fall 2013 Mobs!

Watershed "Privet Pull" Mobs

11/5/13 – Rubes Creek at Sweat Mountain Park – 4pm-6pm

12/3/13 – Nickajack Creek at Heritage Park – 4pm-6pm

Chinese Privet is a non-native, invasive plant that out-competes native species. At the event, we'll be removing privet from the landscape around the creek.

RECOMMENDED RESOURCE

Illumination in the Flatwoods

By Joe Hutto

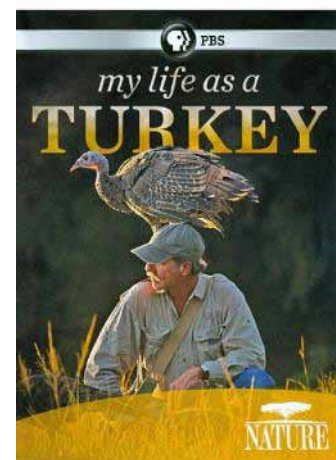
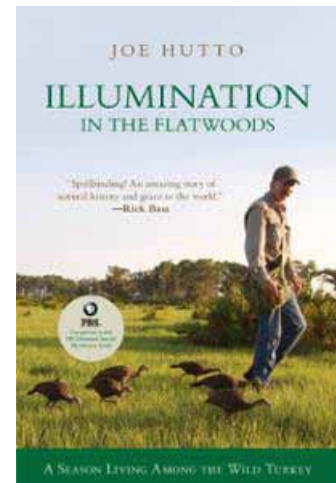
Nature: My Life as a Turkey

"Had I known what was in store—the difficult nature of the study and the time I was about to invest—I would have been hard pressed to justify such an intense involvement. But, fortunately, I naively allowed myself to blunder into a two-year commitment that was at once exhausting, often overwhelming, enlightening, and one of the most inspiring and satisfying experiences of my life."

Joe Hutto, Illumination in the Flatwoods

Based on a true story, this beautiful, charming, funny, sad, and thought-provoking book and film explore one of those rare moments when man and animal unwittingly become more closely linked than nature normally allows. Deep in the wilds of Florida, Joe Hutto, wildlife artist and naturalist, was presented with a rare opportunity. It had long been his hope to learn about the secret world of wild turkeys by having young turkey poults imprint on him, but obtaining wild turkey eggs, or young poults, had proven to be next to impossible; so when he arrived home one day to find a bowl filled with wild turkey eggs on his doorstep, he went out immediately to obtain an incubator, determined to become their mother. It was an experience that would change his life in ways he could never have imagined. He began speaking with them even before they hatched, and bonded with them in their first moments. Then, day after day, for over a year, he lived as a turkey mother, taking on the full-time job of raising 16 turkey chicks. It was a role he would learn from scratch and leave him caught up in wonder. The level of awareness and sensitivity of his young family to the world around them simply transcended anything he had experienced before. He learned their language and their ways, and in time, he became about as close to being a turkey in human skin as nature permits. Eventually, his children grew up, and Hutto had to let them go off on their own. It was harder than he ever imagined. The journal Hutto kept of his life as a turkey ultimately became a book, entitled Illumination in the Flatwoods. His story was then reenacted in the Nature documentary, "My Life as a Turkey."

Amazon.com



OBSERVATIONS

Most birds can fly because their bodies are adapted to be lightweight, not just because they have feathers. Except for penguins, ostriches, and other flightless species, birds have hollow bones with internal bracings rather than heavy, solid bones. You can see this characteristic for yourself after eating a chicken or turkey dinner, simply by snapping a bone in half. Other features that prevent birds from being weighed-down include lightweight beaks (rather than a mouth full of heavy teeth) and egg laying (rather than carrying several young in a womb). Good eyesight, balance, and muscle coordination also help birds take flight.



Photo courtesy of Yathin S Krishnappa. www.wikipedia.org.

Linda May
Environmental Outreach Coordinator
Georgia DNR, Wildlife Resources Division

ANNOUNCEMENTS

Cobb Libraries Offer Residents Battery Recycling Program

Residents of Cobb County can now recycle their old rechargeable and single use batteries at any Cobb County Library Branch. Keep Cobb Beautiful is partnering with the Library system to offer this free recycling program. Visit the Keep Cobb Beautiful website for a list of acceptable items and participating libraries:
<http://portal.cobbcountyga.gov/>.



We post twice weekly updates, workshop information, natural history tidbits, and more!

Deciduous

Annual or seasonal shedding of foliage from trees and shrubs. Conserves water by cutting down on transpiration and nutrients by reducing what the leaves require. Deciduous trees are useful in gardens because they give shade in summer, let in light in winter, and drop leaves that enrich the soil when decomposed.

Source: <http://www.terrapsych.com/ecology.html>

CONSERVATION TIP

Landscaping

Keep your grounds planted with what grows naturally in your area. Natural landscapes do not require mowing, whereas lawns must be mowed regularly. Gas-powered garden tools emit 5 percent of the nation's air pollution, as they use some six hundred million gallons of gasoline per year. One gas-powered lawn mower emits eleven times more air pollution than the average new car for each hour of operation.

From The Green Book

ANNOUNCEMENTS

Rivers Alive Stream Cleanup on Rottenwood Creek

Join Sierra Club, students from Southern Poly and Life University, Keep Cobb Beautiful, Cobb Parks, and Cobb Water on Saturday, October 26th from 9 AM to 1 PM as we remove litter from the headwaters of Rottenwood Creek. Free Rivers Alive t-shirts will be provided while supplies last! Please call or email for more information and to register: 770-528-8214 or water_rsvp@cobbcounty.org.

"Pick It Up Pal" Pledge

Welcome to "Jack" the dog and the Farace family who recently took the "Pick It Up Pal" pledge in an effort to keep our rivers, streams, and lakes healthy!

Although a small act, the impact of the "Pick It Up" program improves environmental conditions for the entire community, including those living downstream of Cobb County. To learn more about the program and to take the pledge, visit our website:

<http://watershed.cobbcountyga.gov/files/petWaste.htm>.



Stewardship Stars Excellence in Data Collection

The following volunteers have submitted data each month during the June, July, and August quarter:

Anne Ledbetter

Chemical Monitoring on Poplar Creek

David Zandstra

Chemical & Bacterial Monitoring on Rubes Creek

Keep Smyrna Beautiful Adopt-A-Stream

Chemical Monitoring in the Nickajack and Rottenwood Watersheds

Sally Brooking

Chemical Monitoring on Sope Creek

Sierra Club Centennial Group

Chemical, Biological, & Bacterial Monitoring on Rottenwood Creek

Thank you for your hard work and dedication!



welc  me

Georgia Lake Monitoring - Lake Acworth and Lake Allatoona

Holm Family and Homeschool Friends - Little Noonday Creek

Laurel Park - Ward Creek

Pope High School - Piney Grove Creek

Troop 772 - Rottenwood Watershed



Cobb County...Expect the Best!

This is an official publication of the Cobb County Water System, an agency of the Cobb County Board of Commissioners.

Calendar of Events

October

- 3 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 10 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 12 Adopt-A-Stream Visual Monitoring Workshop • 9:00am - 3:00pm • Cobb County Water Quality Laboratory
- 17 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 24 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 26 Rivers Alive Stream Cleanup • 8:30am - 1:00pm • Larry Bell Park
- 31 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory

November

- 5 Watershed "Privet Pull" Mob • 4:00pm - 6:00pm • Sweat Mountain Park
- 6 Adopt-A-Stream Bacteria Monitoring Workshop • 6:00pm - 8:30pm • Cobb County Water Quality Laboratory
- 7 Garden Work Day • 8:30am - 10:30am • Cobb County Water Quality Laboratory
- 12 Rain Barrel Make & Take Workshop Day • 10:00am - 11:00am • Cobb County Water Quality Laboratory
- 14 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 21 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory

December

- 3 Watershed "Privet Pull" Mob • 4:00pm - 6:00pm • Heritage Park
- 5 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 12 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory
- 19 Garden Work Day • 9:00am - 11:00am • Cobb County Water Quality Laboratory