



## ANIMAL AND ZONOTIC DISEASES OF CONCERN IN NORTH CAROLINA

Welcome to the inaugural issue of *The North Carolina One Health Bulletin* (NC OHB). The Bulletin is a quarterly publication distributed electronically that informs people of ongoing One Health challenges in our state that impact humans, animals and the environments they share. One Health, as defined by the One Health Commission, is “the collaborative effort of multiple health science professions, together with their related disciplines and institutions – working locally, nationally, and globally – to attain optimal health for people, domestic animals, wildlife, plants, and our environment.” All information in the *Bulletin* is in the public domain, but can be challenging to access and assimilate across multiple platforms and disciplines that span One Health. Reports are intentionally brief, with links and references to more detailed discussions for further information. Rabies case summaries will be presented each issue, as this disease remains a significant One Health challenge. Supplements will be sent when important disease events occur at the shared interfaces between people, animals, and the environment.

The *North Carolina One Health Bulletin* is coordinated through the **North Carolina One Health Collaborative (NC OHC)**: <http://nconehealthcollaborative.weebly.com>; **NC OHC on Facebook**: <https://www.facebook.com/pages/North-Carolina-One-Health-Collaborative/300163350109335>; **NC OHC on Twitter**: [https://twitter.com/NC\\_OneHealth](https://twitter.com/NC_OneHealth)). The *Bulletin* reflects the **NC OHC mission** to create a network of diverse health professionals, scientists, interested public, and students working to understand the interconnectedness of people, animals, and the environment in order to promote health and well-being of all species. Students from the area universities will contribute the articles with oversight by members of the NC OHC. We thank *The Maryland One Health Bulletin*, which began in 2011 to report zoonotic and animal diseases of concern, for sharing their template and format with us.

**Julie Casani, MD, MPH**

PH Preparedness Director

NC Division of Public Health

One Health Steering Committee Member

**Suzanne Kennedy-Stoskopf, DVM, PhD, DACZM**

Research Professor

North Carolina State University

College of Veterinary Medicine

Co-chair, NC One Health Collaborative

To report cases of disease in:	Contact Information:
<b>Domestic animals</b>	North Carolina Department of Agriculture & Consumer Services Veterinary Division, Animal Health Program  (919) 733-7601
<b>Humans</b>	Your Local Health Department: find it here <a href="http://www.ncalhd.org/county.htm">http://www.ncalhd.org/county.htm</a> or NCDHHS, NC Division of Public Health, Epidemiology Section, Communicable Disease Branch (919) 733-3419 <a href="http://epi.publichealth.nc.gov/cd/">http://epi.publichealth.nc.gov/cd/</a>



## ANIMAL AND ZONOTIC DISEASES OF CONCERN IN NORTH CAROLINA

Estimated first onset	Estimated end date	Jurisdiction affected	Species affected	Diagnosis	Estimated # of cases to date	Lead agency	Comment
2011	Ongoing	North Carolina, Florida, Illinois, Maryland, Georgia	Human	Rabies	2	CDC, MD DHMH	See Below
2013	Ongoing	Pender County, Cumberland Count, Brunswick Country	Horse	Eastern Equine Encephalitis	4	NC DA&CS	See Below

**Table 1. New or Ongoing Morbidity or Mortality Animal or Zoonotic Disease Events**

**For questions regarding specific disease events, please contact the lead agency noted. This contact information is for use by North Carolina veterinarians and health professionals:**

NCDACS - North Carolina Department of Agriculture & Consumer Services Veterinary Division, Animal Health Program: (919) 733-7601; North Carolina Veterinary Public Health Office: (919) 733-3410; NCDHHS– North Carolina Department of Health and Human Services, NC Division of Public Health, Epidemiology Section, Communicable Disease Branch: (919) 733-3419

### **Rabies Organ Transplant** (contributed by Chelsea Trull, Animal Sciences MS student, NC State University)

In the July 24, 2013 issue of The Journal of the American Medical Association, an original investigation uncovers events that led to rabies virus transmission by solid organ transplantation. In August 2011, a previously healthy man was admitted into a Florida healthcare facility after returning from a fishing trip. The man, originally diagnosed with ciguatera poisoning, presented with vomiting and upper extremity paresthesias that progressed into fever, dysphagia, seizures, autonomic dysfunction, and brain death. The man’s organs were recovered, including the heart, liver, and kidneys, and sent to recipients in Illinois, Florida, Georgia, and Maryland. Prior to moving to Florida, the organ donor lived in **North Carolina**. Interviews with family members revealed that the donor hunted and trapped raccoons in NC where rabies is endemic in the raccoon population and had two known raccoon bites about 7 and 18 months before the onset of symptoms. Rabies was not a suspected cause of death for the organ donor until the recipient of the left kidney died from rabies 18 months post-transplant. The CDC tested tissue samples from both the donor and the organ recipient and analysis indicated that both individuals had the raccoon type of rabies virus. The Maryland Department of Health and Mental Hygiene found that the organ recipient had no known animal exposure. The three other organ recipients received post-exposure prophylaxis (anti-rabies vaccinations and immune globulin) and remain asymptomatic. The investigation highlights the variable and sometimes prolonged incubation periods for rabies. This is the third known case of rabies transmission by means of organ transplant; however, this is the first case that all organ recipients did not develop rabies.

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### **Eastern Equine Encephalitis** (contributed by Danielle Lindquist, Class of 2016, NC State College of Veterinary Medicine)

Seven cases of eastern equine encephalitis (EEE), caused by a mosquito-transmitted *Alphavirus*, have been confirmed in six horses and one donkey in Pender, Cumberland, and Brunswick counties during the month of July. Passerine (i.e. perching) birds are the reservoir or maintenance hosts, and a species of mosquito that preferentially feeds on birds and favors freshwater hardwood swamps, *Culiseta melanura*, is the primary vector responsible for transmitting and maintaining the EEE virus in birds. Spillover of EEE into equine species indicates that other mosquito species that feed on mammals have previously fed on viremic birds and are now capable of transmitting the virus to equines that are not adequately protected by vaccination. The seven affected equines had an incomplete or no history of vaccination. Humans may also be infected by a mosquito bite although confirmed clinical cases of EEE in humans in North Carolina are relatively rare. The majority of human infections are either asymptomatic or present as a nonspecific febrile illness or aseptic meningitis. Frequent rainfalls this spring and summer have provided ample habitats for the mosquito species that act as bridging vectors for the transmission of EEE to horses and humans to breed. For more information, please visit the **NC Department of Agriculture** website at <http://www.ncagr.gov/vet/FactSheets/EEE.htm>, the **Center for Disease Control** at <http://www.cdc.gov/easternequineencephalitis/>, and **USGS Disease Maps** at [http://diseasemaps.usgs.gov/eee\\_nc\\_veterinary.html](http://diseasemaps.usgs.gov/eee_nc_veterinary.html).

### **State and Local Fairs** (contributed by Chelsea Trull)

September into early November marks “fair season” around the state of North Carolina. Heightened awareness of possible *E. coli* outbreaks that may occur in fairgoers from contaminated foods, water, or contact with animals or infected people is warranted. The most noticeable symptoms include diarrhea (may vary between mild to severe and bloody), abdominal cramping, and nausea and vomiting. Children and older adults are at risk of developing severe complications related to *E. coli* O157:H7 infection, especially hemolytic uremic syndrome (HUS). “Aiden’s Law” adopted in 2006 requires certain precautionary measures to be used for animal-contact exhibits. These include hand washing stations, educational signs for fair attendees to read about the risk of touching animals, and fencing requirements that stipulate height and boarding around the fence bottom to contain bedding and manure.

For more information: <http://epi.publichealth.nc.gov/cd/diseases/ecoli.html>

## NORTH CAROLINA ANIMAL RABIES CASES, 2013

**Table 2. Total Rabies Cases for 2013, Week Ending (As of August 21, 2013)**

Jurisdiction	Bat Total	Cat Total	Cow Total	Dog Total	Fox Total	Goat Total	Raccoon Total	Skunk Total	Other Total	Total
Alamance	1	0	0	0	0	0	4	1	0	6
Alexander	0	0	0	0	0	0	1	0	0	1
Alleghany	0	0	0	0	0	0	0	0	0	0
Anson	0	0	0	0	0	0	0	2	0	2
Ashe	0	0	0	0	0	0	1	0	0	1
Avery	0	0	0	0	0	0	0	0	0	0
Beaufort	0	0	0	0	0	0	2	0	0	2
Bertie	0	0	0	0	0	0	0	0	0	0
Bladen	0	0	0	0	0	0	4	0	0	4
Brunswick	0	0	0	0	1	0	3	0	0	4
Buncombe	0	0	0	0	1	0	2	0	0	3
Burke	0	1	0	0	0	0	0	0	0	1
Cabarrus	0	0	0	0	3	0	2	1	0	6
Caldwell	0	0	0	0	0	0	0	1	0	1
Camden	0	0	0	0	0	0	1	0	0	1
Carteret	0	0	0	0	0	0	0	0	0	0
Caswell	0	0	0	0	0	0	3	1	0	4
Catawba	0	0	0	0	0	0	1	1	0	2
Chatham	0	0	0	0	1	0	2	1	0	4
Cherokee	0	0	0	1	0	0	2	1	0	4
Chowan	0	0	0	0	0	0	0	0	0	0
Clay	0	0	0	0	0	0	0	0	0	0
Cleveland	0	0	0	0	1	0	3	1	0	5
Columbus	0	0	0	0	1	0	1	0	0	2
Craven	0	0	0	0	0	0	0	0	0	0
Cumberland	2	0	0	0	1	0	2	0	0	5
Currituck	0	0	0	0	1	0	0	0	0	1
Dare	0	0	0	0	0	0	0	0	0	0
Davidson	0	0	0	0	2	0	0	3	0	5
Davie	0	0	0	0	0	0	1	0	0	1
Duplin	0	0	0	1	1	0	3	0	0	5
Durham	0	0	0	0	1	0	8	1	0	10
Edgecombe	0	0	0	0	0	0	0	0	0	0
Forsyth	1	1	0	0	0	0	8	0	0	10
Franklin	0	0	0	0	0	0	0	1	0	1
Gaston	0	1	0	0	0	0	0	0	0	1
Gates	0	0	0	0	0	0	0	0	0	0

## NORTH CAROLINA ANIMAL RABIES CASES, 2013

**Table 2 (continued). Total Rabies Cases for 2013, Week Ending (As of August 21, 2013)**

Jurisdiction	Bat Total	Cat Total	Cow Total	Dog Total	Fox Total	Goat Total	Raccoon Total	Skunk Total	Other Total	Total
Graham	0	0	0	0	0	0	0	0	0	0
Granville	0	0	0	0	0	0	0	0	0	0
Greene	0	0	0	0	0	0	0	0	0	0
Guilford	1	2	0	0	5	0	7	0	0	15
Halifax	0	0	0	0	0	0	0	2	0	2
Harnett	1	0	0	0	1	0	0	0	0	2
Haywood	0	0	0	0	0	0	0	0	0	0
Henderson	0	0	0	0	1	0	0	0	0	1
Hertford	0	0	0	0	0	0	0	0	0	0
Hoke	0	0	0	0	0	0	0	0	0	0
Hyde	0	0	0	0	0	0	0	0	0	0
Iredell	0	0	2	0	0	0	0	1	0	3
Jackson	0	0	0	0	0	0	0	0	0	0
Johnston	0	0	0	0	0	0	2	0	0	2
Jones	0	0	0	0	0	0	0	0	0	0
Lee	0	0	0	0	0	0	0	0	0	0
Lenoir	0	0	0	0	0	0	1	0	0	1
Lincoln	0	0	0	0	1	0	3	0	0	4
Macon	0	0	0	0	0	0	0	0	0	0
Madison	0	0	0	0	0	0	0	0	0	0
Martin	0	0	0	0	0	0	0	0	0	0
McDowell	0	0	0	0	0	0	0	0	0	0
Mecklenburg	1	2	0	0	1	0	8	0	0	12
Mitchell	0	0	0	0	0	0	0	0	0	0
Montgomery	0	0	0	0	1	0	2	0	0	3
Moore	0	1	0	0	2	0	0	1	0	4
Nash	0	0	0	1	1	0	1	0	0	3
New Hanover	0	1	0	0	1	0	4	0	0	6
Northampton	0	0	0	0	1	0	0	0	0	1
Onslow	0	0	0	0	1	0	0	0	0	1
Orange	2	0	0	0	2	2	4	0	0	10
Pamlico	0	0	0	0	0	0	0	0	0	0
Pasquotank	0	0	0	0	0	0	0	0	0	0
Pender	0	0	0	0	1	0	3	0	0	4
Perquimans	0	0	0	0	0	0	0	0	0	0
Person	0	0	0	0	0	0	3	1	0	4
Pitt	0	0	0	0	0	0	0	1	0	1

## NORTH CAROLINA ANIMAL RABIES CASES, 2013

**Table 2 (continued). Total Rabies Cases for 2013, Week Ending (As of August 21, 2013)**

Jurisdiction	Bat Total	Cat Total	Cow Total	Dog Total	Fox Total	Goat Total	Raccoon Total	Skunk Total	Other Total	Total
Polk	0	0	0	0	0	0	0	0	0	0
Randolph	0	0	0	0	5	0	4	0	0	9
Richmond	0	0	0	0	0	0	1	0	0	1
Robeson	0	2	0	0	3	0	8	0	0	13
Rockingham	0	0	0	0	1	0	3	4	0	8
Rowan	0	0	0	0	2	0	5	1	0	8
Rutherford	0	0	0	0	0	0	2	1	0	3
Sampson	0	0	0	0	1	0	2	0	0	3
Scotland	0	0	0	0	1	0	0	0	0	1
Stanly	0	0	0	1	0	0	1	2	0	4
Stokes	0	1	0	0	0	0	1	0	0	2
Surry	0	0	0	1	0	0	1	1	0	3
Swain	0	0	0	0	0	0	0	0	0	0
Transylvania	1	0	0	0	0	0	0	0	0	1
Tyrrell	0	0	0	0	0	0	0	0	0	0
Union	0	0	0	0	1	0	2	2	0	5
Vance	0	0	0	0	0	0	3	0	0	3
Wake	4	0	0	0	5	0	2	0	0	11
Warren	0	0	1	0	0	0	0	1	0	2
Washington	0	0	0	0	0	0	0	0	0	0
Watauga	0	0	0	0	1	0	1	0	0	2
Wayne	0	1	0	0	0	0	3	0	0	4
Wilkes	0	0	0	0	3	0	3	4	0	10
Wilson	0	0	0	0	0	0	0	0	0	0
Yadkin	0	0	0	0	0	0	5	0	0	5
Yancey	0	0	0	0	0	0	3	0	0	3
<b>Total</b>	<b>14</b>	<b>13</b>	<b>3</b>	<b>5</b>	<b>56</b>	<b>2</b>	<b>142</b>	<b>37</b>	<b>0</b>	<b>272</b>

Source: North Carolina State Laboratory of Public Health

Rabies-positive mammals by species in North Carolina (2012):

<http://epi.publichealth.nc.gov/cd/rabies/figures/rabiesstats4.pdf>

Map of rabies in raccoons by county in North Carolina (1991-2012):

[http://epi.publichealth.nc.gov/cd/rabies/figures/map\\_raccoons\\_since91.pdf](http://epi.publichealth.nc.gov/cd/rabies/figures/map_raccoons_since91.pdf)

U.S. Livestock and Poultry Disease Events and Trends:

[http://www.aphis.usda.gov/animal\\_health](http://www.aphis.usda.gov/animal_health)

National Wildlife Health Center New and Ongoing Wildlife Mortality Events:

[http://www.nwhc.usgs.gov/mortality\\_events?ongoing.jsp](http://www.nwhc.usgs.gov/mortality_events?ongoing.jsp)