

Zoonotic Diseases of Wildlife

and

Emergency Preparedness and Response

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Zoonotic diseases

- Species → Potential diseases
- Transmission route
 - Environmental controls
 - Behavior modification
 - Personal Protective Equipment (PPE)



Zoonotic diseases

- ▶ Wild animals can carry diseases without appearing to be sick.
- ▶ Minimize contact – young children, elderly, pregnant, immune compromised.
- ▶ Quarantine new animals.
- ▶ Hot → warm → cold zones.
 - ▶ Think and plan – take everything in that you will need
 - ▶ Coming out – dispose or disinfect
- ▶ Separate clothing and footwear – easily done with scrubs.
- ▶ Handle young and healthy animals before sick and older animals.



Zoonotic diseases

- ▶ Do not eat or drink while working with animals.
- ▶ Disinfection – choose based on disease, read label, mix and handle properly
- ▶ Keep animal food storage and preparation areas separate from human food storage and preparation areas.
 - ▶ Ideal to keep dishes and utensils separate.
- ▶ Ideal to do handwashing and equipment and supplies cleaning separate from regular household washing spaces.
 - ▶ Utility sink, separate bathtub, outside.



Hand hygiene

- ▶ Wash hands with soap and water for at least 20 seconds.
 - ▶ Before working with the animals.
 - ▶ Between animals or animal groups.
 - ▶ After touching their food, environment, supplies.
 - ▶ After working with the animals.
- ▶ Dry with clean towel or paper towels.
- ▶ Wear gloves – but gloves are not a substitute for handwashing.
 - ▶ Clean hands before putting on gloves.
- ▶ Alcohol-based hand sanitizer is not a substitute for proper handwashing, especially when hands are visibly dirty.
- ▶ <https://www.cdc.gov/handwashing/when-how-handwashing.html>



Selected Zoonoses of Wildlife

- Avian Influenza
 - Canine distemper*
 - Hantavirus
 - Histoplasmosis
 - Monkeypox*
 - Plague
 - Rabies
 - Ringworm
 - Roundworms
 - Salmonella
 - Toxoplasmosis
 - Tularemia
- 



If you have any questions or concerns about your personal health – contact a physician!



If you have any questions about your pet's health or the health of an animal in your care – contact a veterinarian who treats that type of animal!



Avian Influenza

- ▶ Type A influenza virus
- ▶ Low pathogenic (LPAI) and highly pathogenic (HPAI)
- ▶ Wild waterfowl carriers – often asymptomatic
- ▶ LPAI – minimal symptoms
- ▶ HPAI – severe disease and death
- ▶ Transmission to humans is uncommon but does happen and has the potential to be deadly depending on the strain.
- ▶ HPAI will result in a response by state and federal authorities.

<https://www.cdc.gov/flu/avianflu/index.htm>

<https://www.usda.gov/topics/animals/one-health/avian-influenza>



Canine distemper*

- ▶ Virus
- ▶ Does not affect humans
- ▶ Raccoons, foxes, coyotes, skunks, ferrets*, dogs*
- ▶ Risk to pet dogs and ferrets – vaccinate appropriately through your veterinarian

<https://www.avma.org/resources/pet-owners/petcare/canine-distemper>



Hantavirus

- Spread by rodents
- Aerosolized virus from urine, feces, saliva
- Sin Nombre virus
 - Hantavirus pulmonary syndrome
 - Most common hantavirus in US, but still uncommon disease
- Mainly in the western US

<https://www.cdc.gov/hantavirus/index.html>



Histoplasmosis

- ▶ Fungal disease
- ▶ Inhaled spores from bird or bat droppings in soil
- ▶ Cats and dogs may become infected as well

<https://www.cdc.gov/fungal/diseases/histoplasmosis/index.html>



Monkeypox

- ▶ Virus – 2 clades, Central African and West African
- ▶ Same genus as smallpox
 - ▶ Similar but generally milder disease
- ▶ Transmitted through contact with infected bodily fluids through broken skin, respiratory tract, mucus membranes
- ▶ 2003 outbreak in the United States
 - ▶ West African clade
 - ▶ Human cases from contact with infected prairie dogs
 - ▶ Prairie dogs infected by contact with infected small mammals and rodents imported from Ghana

<https://www.cdc.gov/poxvirus/monkeypox/index.html>



Plague

- ▶ Bacteria – *Yersinia pestis*
- ▶ Transmitted through bite from rodent flea carrying the virus or contact with bodily fluids from infected animal
- ▶ Mainly in rural, western US
- ▶ Cats and dogs are susceptible too

<https://www.cdc.gov/plague/index.html>



Rabies

- ▶ Virus
- ▶ Transmitted by contact with saliva from an infected animal, usually through bites or scratches
- ▶ All mammals considered susceptible
- ▶ Almost 100% fatal neurological disease
- ▶ Preventable through vaccination – pre-exposure and post-exposure options

<https://epi.dph.ncdhhs.gov/cd/diseases/rabies.html>



Ringworm

- ▶ Fungal skin infection – common name, variety of fungi
- ▶ Hand washing
- ▶ Disinfection – diluted bleach

<https://www.cdc.gov/fungal/diseases/ringworm/index.html>



Salmonella

- Bacteria – variety of subspecies and serotypes
- GI symptoms
- Reptiles, amphibians, birds, rodents, small mammals
- Animals usually do not usually appear sick
- Fecal – oral transmission
- Raw meat, contaminated vegetables
- Cross-contamination risk
- Avoid hand-mouth contact
- Hand washing

<https://www.cdc.gov/salmonella/>



Toxoplasmosis

- Protozoan parasite *Toxoplasma gondii*
- Fecal-oral transmission – cat feces, contaminated food/cooking utensils/equipment
- Risks to unborn baby if mother is *newly* infected while pregnant
- Risks to immunocompromised people

<https://www.cdc.gov/parasites/toxoplasmosis/>



Tularemia

- ▶ Bacterial disease caused by *Francisella tularensis*
- ▶ Rodents, rabbits, and hares
- ▶ Transmitted by direct contact with bodily fluids from an infected animal
- ▶ Also inhalation
- ▶ Also tick and deer fly bites

<https://www.cdc.gov/tularemia/index.html>

Other vector borne diseases

Tick-transmitted diseases

- Spotted Fever Rickettsiosis – *Rickettsia* bacteria
- Ehrlichiosis – *Ehrlichia* bacteria
- Lyme Disease – *Borrelia burgdorferi* bacteria
- Southern Tick-Associated Rash Illness – cause unknown



Mosquito-transmitted diseases

- La Crosse encephalitis – virus, most common arbovirus in NC
- West Nile Virus
- Eastern Equine Encephalitis – virus, cannot catch from horses



<https://epi.dph.ncdhhs.gov/cd/diseases/vector.html>



References

- <https://www.cdc.gov>
- <https://www.cdc.gov/healthypets/pets/wildlife.html>
- <https://www.aza.org/policy-for-animal-contact-with-the-general-public>
- <https://www.ncwildlife.org/Have-A-Problem/Common-Wildlife-Diseases>
- <https://epi.dph.ncdhhs.gov/cd/index.html>



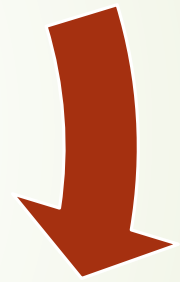
Emergency Preparedness and Response



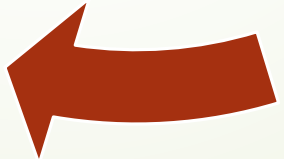
Mitigation



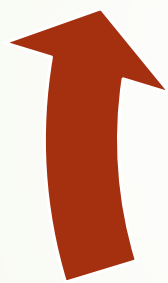
Preparedness



Response



Recovery





Preparedness

- Write a basic emergency plan to include evacuation
- Risk assessment of facility/collection
 - What are you at highest risk of?
 - What is the consequence of that risk?
 - What is the likelihood of the risk?
 - Natural disaster vs. disease vs. ?
- Education and training
- Accurate inventory of your animals

Preparedness

- Check generators regularly
- Obtain back-up generator
- Obtain fuel for 5-7 days
- Obtain feed/water for 5-7 days
- Gather all important contact numbers
- Secure facility
- Move animals if possible
- Buddy system with colleagues


The first 72 are on YOU!





Selected NCDA&CS Preparedness Activities

- ▶ Research, Trainings, Exercises, Meetings – attend, lead
- ▶ Plan review and development
- ▶ Incident Management Team development
- ▶ Communication – internal and external stakeholders
 - ▶ Local Emergency Planning Committees
 - ▶ Work Groups and Task Forces
 - ▶ Relationship building – county PH, EM, animal services, NCSU Cooperative Extension
- ▶ Mass Mortality Planning

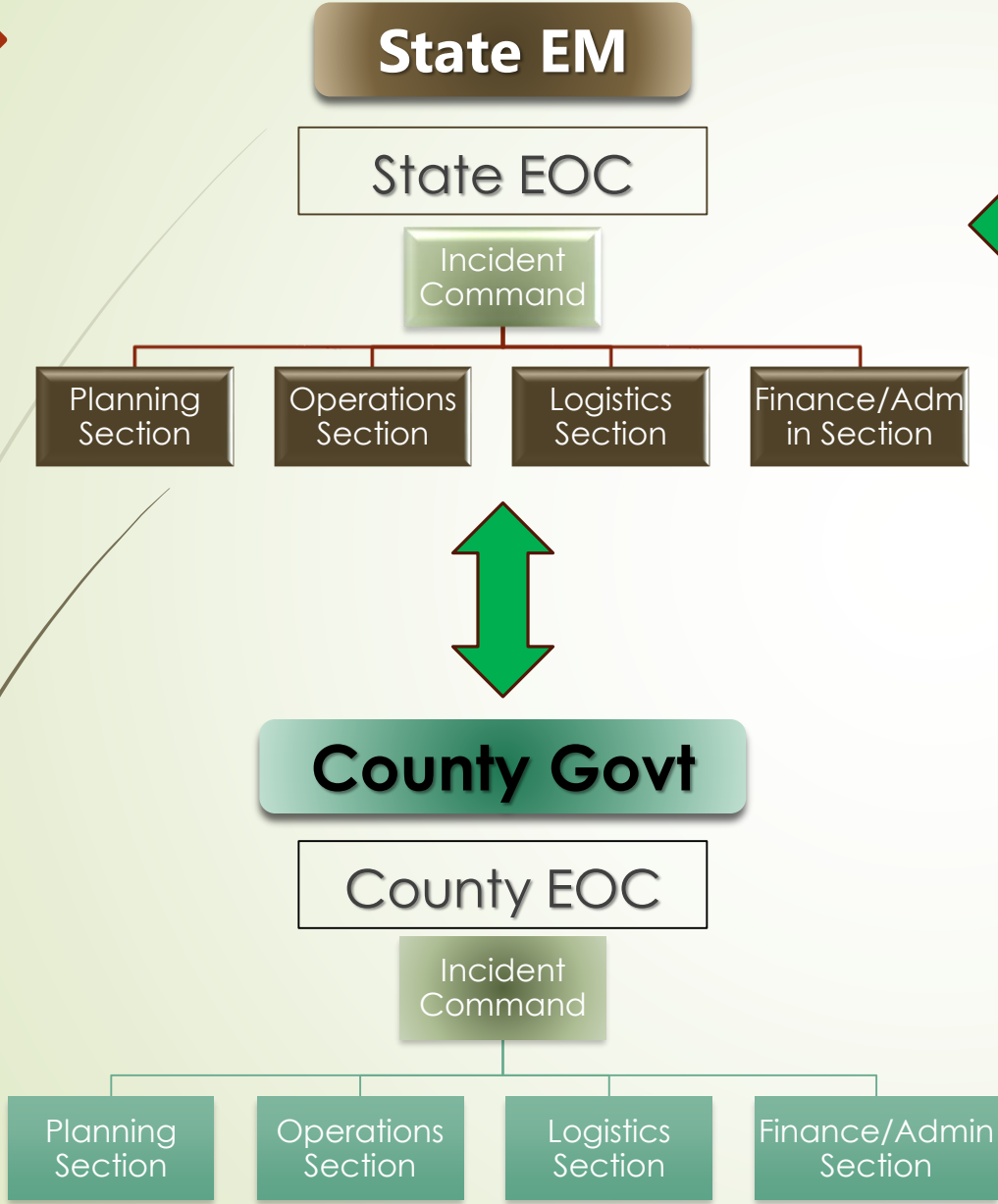


Response Structure and the Incident Command System

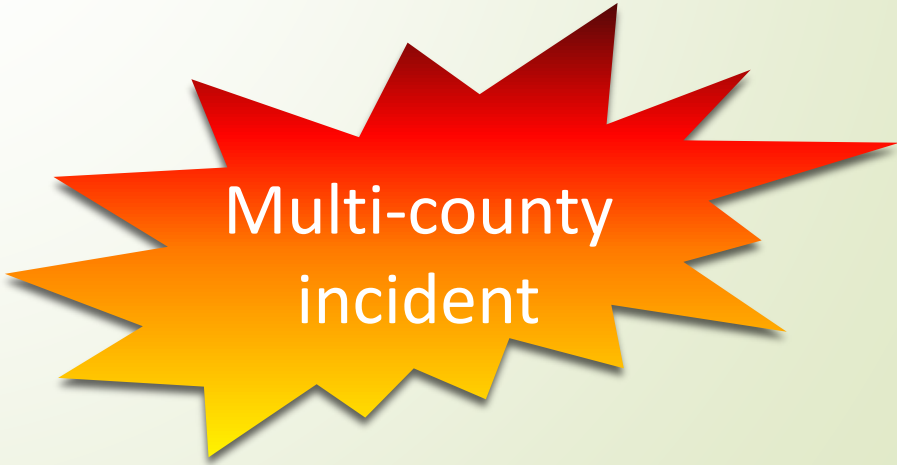
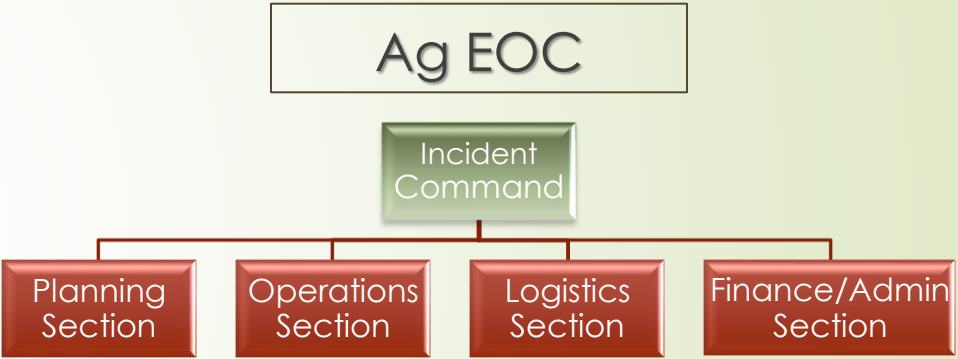
Command of an incident



Natural Disasters

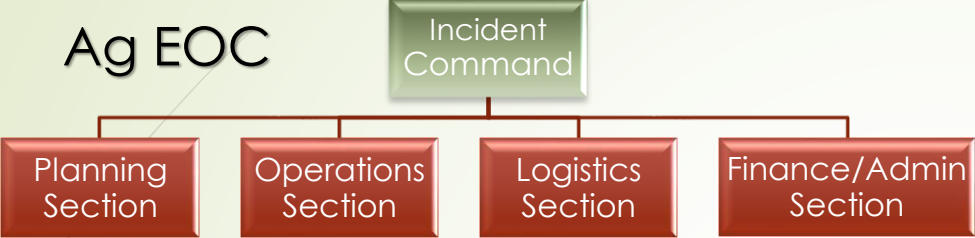


State Dept. of Ag

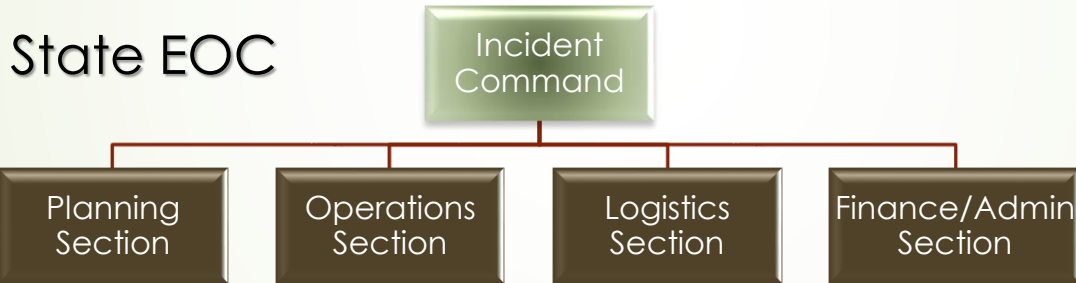


Foreign Animal Disease

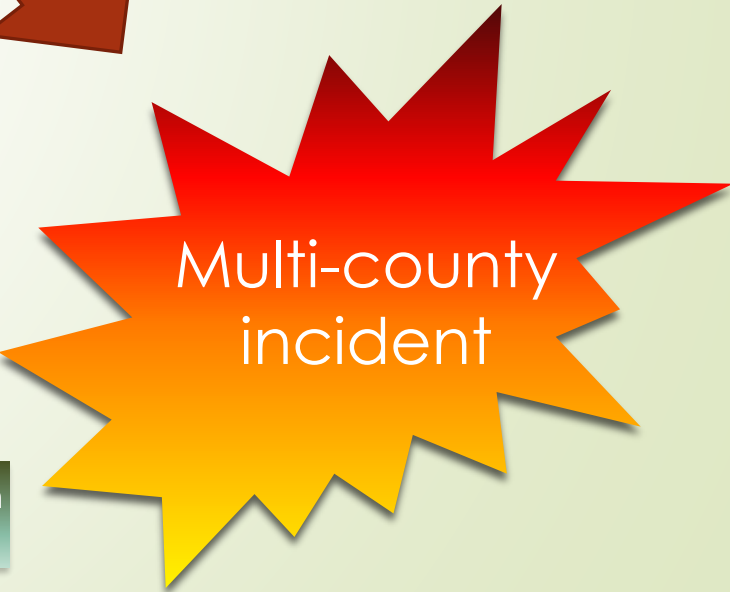
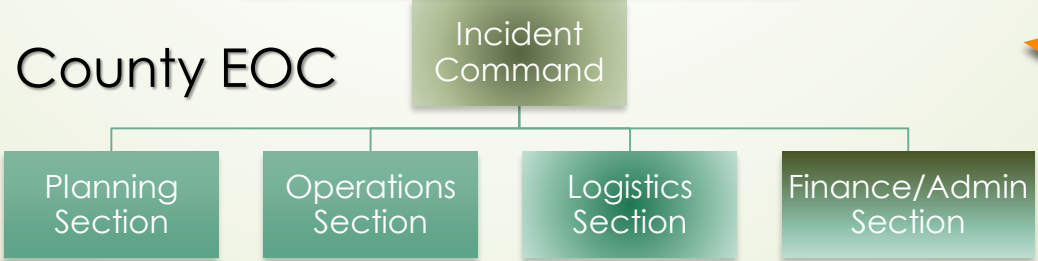
State Dept. of Ag/USDA



State Government

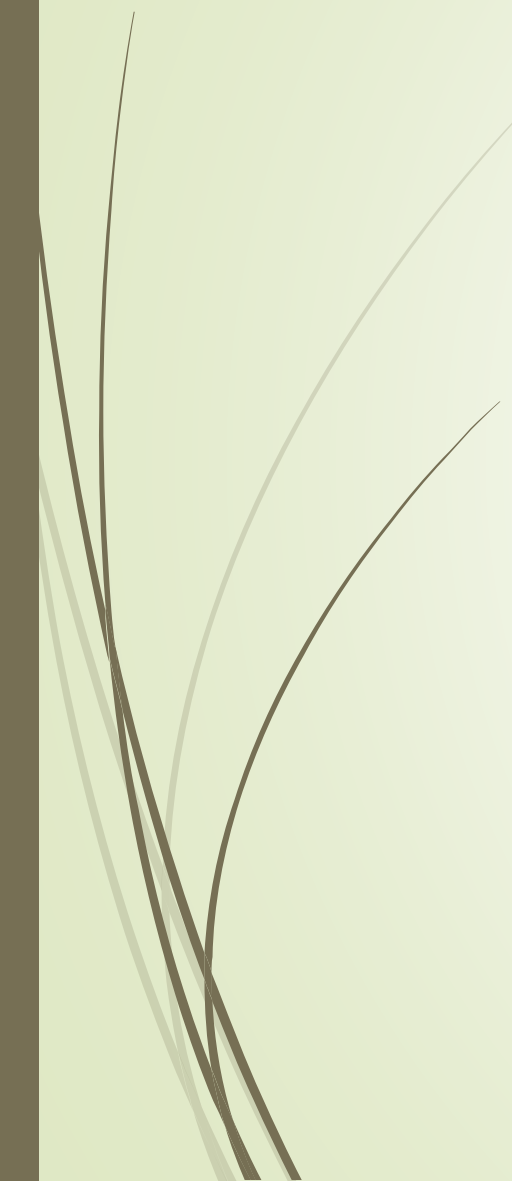


County Government





Response

- ▶ Know who to contact for help
 - ▶ County Emergency Management
 - ▶ Colleagues/Buddy system
 - ▶ Technical specialists/veterinarians
 - ▶ WRC, NCDA&CS
 - ▶ Protect yourself and your family
 - ▶ Protect your animals
- 



Reporting Issues and Requesting Assistance

- ▶ County Emergency Management
- ▶ Regulatory agency/organization
- ▶ Food-related
 - ▶ Local Health Department
 - ▶ NCDA&CS and NC DPH
- ▶ Human health emergency/disaster
 - ▶ Local Health Department
 - ▶ NC DPH
- ▶ Animal health emergency/disaster
 - ▶ NCDA&CS



Response

- ▶ State Emergency Response Team activation
- ▶ Agriculture Incident Management Team activation
- ▶ Surveillance/Assessments
- ▶ Rescue/Sheltering
- ▶ Depopulation
- ▶ Disposal
- ▶ Cleaning and Disinfection



Coordination with Partners

- USDA
 - NC Emergency Management – state and local
 - NC Dept. of Environmental Quality
 - Disposal
 - NC Division of Public Health and Local Public Health
 - NC Cooperative Extension – state and local
- 



Incident Command System Training

- ▶ FEMA Independent Study – online

<https://training.fema.gov/is/crslist.aspx>

- ▶ IS-10.a Animals in Disasters: Awareness and Preparedness
- ▶ IS-11.a Animals in Disasters: Community Planning
- ▶ IS-100.c Introduction to the Incident Command System, ICS 100
- ▶ IS-200.c Basic Incident Command System for Initial Response
- ▶ IS-700.b An Introduction to the National Incident Management System



NC Veterinary Response Corps

- ▶ <http://www.ncagr.gov/oep/veterinary/VetCorps.htm>
- ▶ ICS 100, 200, and 700 (online)
- ▶ Biosecurity/PPE Training - Provided by NCDA&CS or sufficient experience
- ▶ CAMET/Pet Sheltering Training - Provided by NCDA&CS or sufficient experience
- ▶ Knowledge of NC Emergency Management (<https://www.ncdps.gov/ncem>)
- ▶ Knowledge of NC Emergency Operations Plan
- ▶ Knowledge of Emergency Support Functions (<https://emilms.fema.gov/is230c/fem0104160text.htm>)
- ▶ Emergency Support Function #11
- ▶ Signing a Code of Conduct
- ▶ **Registration in NC TERMS – <https://terms.ncem.org>