Overview of FWC's Terrestrial Wildlife Disease Surveillance

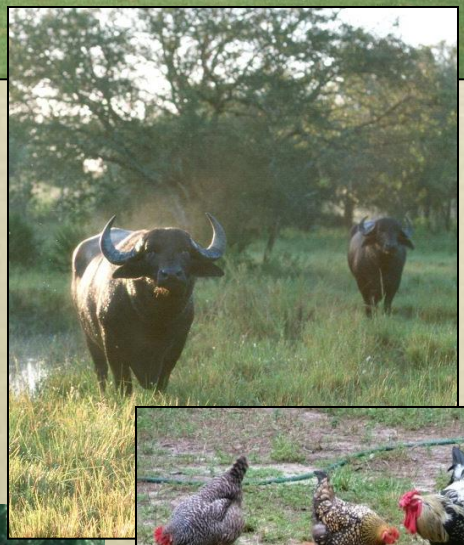
Mark Cunningham, DVM. MS
Florida Fish and Wildlife Conservation Commission

Fish and Wildlife Diseases

- Anthropogenic factors affecting all wildlife
  - Environmental contaminants
  - Climate change
  - Global travel
  - Habitat loss/fragmentation
- Florida is particularly at risk
  - Exotic/invasive spp.

NPS

Fish and Wildlife Diseases – Risk Factors



- Florida is particularly at risk
  - Large animal populations
    - Captive and feral/free-ranging exotic spp.
    - Livestock and aquaculture production
    - Wildlife
    - Two fly-ways
  - Large human population
  - Geography
    - Diverse habitat types, subtropical climate, proximity to Caribbean, SA

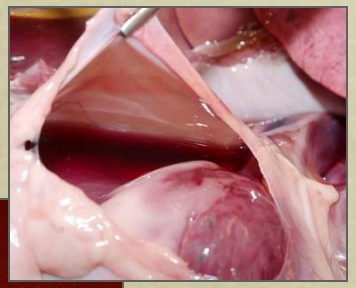
http://farm7.staticflickr.com/6003/6006388423_1d7240b1c3_z.jpg

FADs and EWDs

FDACS

- Many are zoonotic and/or a threat to domestic animals and wildlife populations
  - HW, CWD, HPAI, END, TB, FMD
  - DVE, vNDV (present in FL)
- Impacts to wildlife populations
  - WNS, FeLV

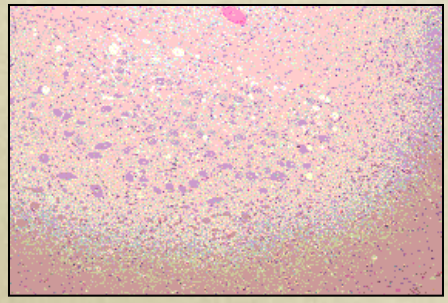
M. Miller



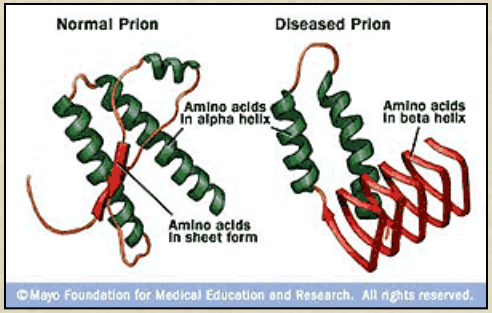
FADD 2009

FADD 2009

Chronic Wasting Disease



USDA



http://faculty.washington.edu/chudler/gif/prion.gif

http://www.gryphontor.com/showarticle.php?id=6

- TSE caused by an abnormally folded prion protein
- Similar to scrapie, BSE
- Infections documented in WTD, MD, Sika deer moose, elk, reindeer
  - Other cervids may be susceptible
  - No natural transmission to non-cervids

http://www.bbc.co.uk/news/science-environment-11263869

Chronic Wasting Disease

- Transmission
  - Direct
    - Shed in saliva, urine, feces, antler velvet
  - Indirect
    - Contaminated environment
    - Persists in soil for years

B. Williams

Chronic Wasting Disease

- Long incubation period
  - >16 mo (2-4 yr)
- Clinical signs
  - Duration
    - 4 mo to 1 yr
  - Weight loss
  - Behavior changes
  - Wide-based stance
  - Tremors
  - Ataxia
  - Death

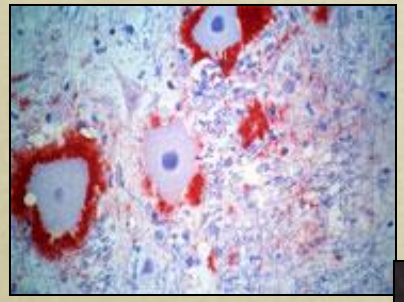
T. Kreeger

T. Kreeger

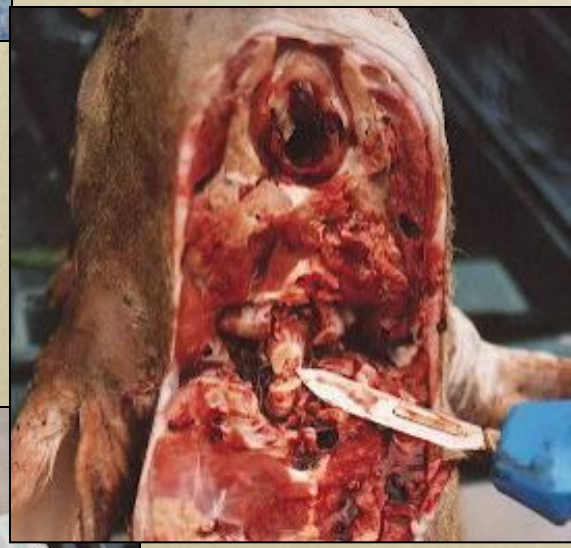
M. Miller

CWD - Diagnosis

- IHC of obex, RLNs
- ELISA in free-ranging deer
- Ante-mortem testing of limited value
  - Tonsil biopsy
  - Rectal mucosa biopsy

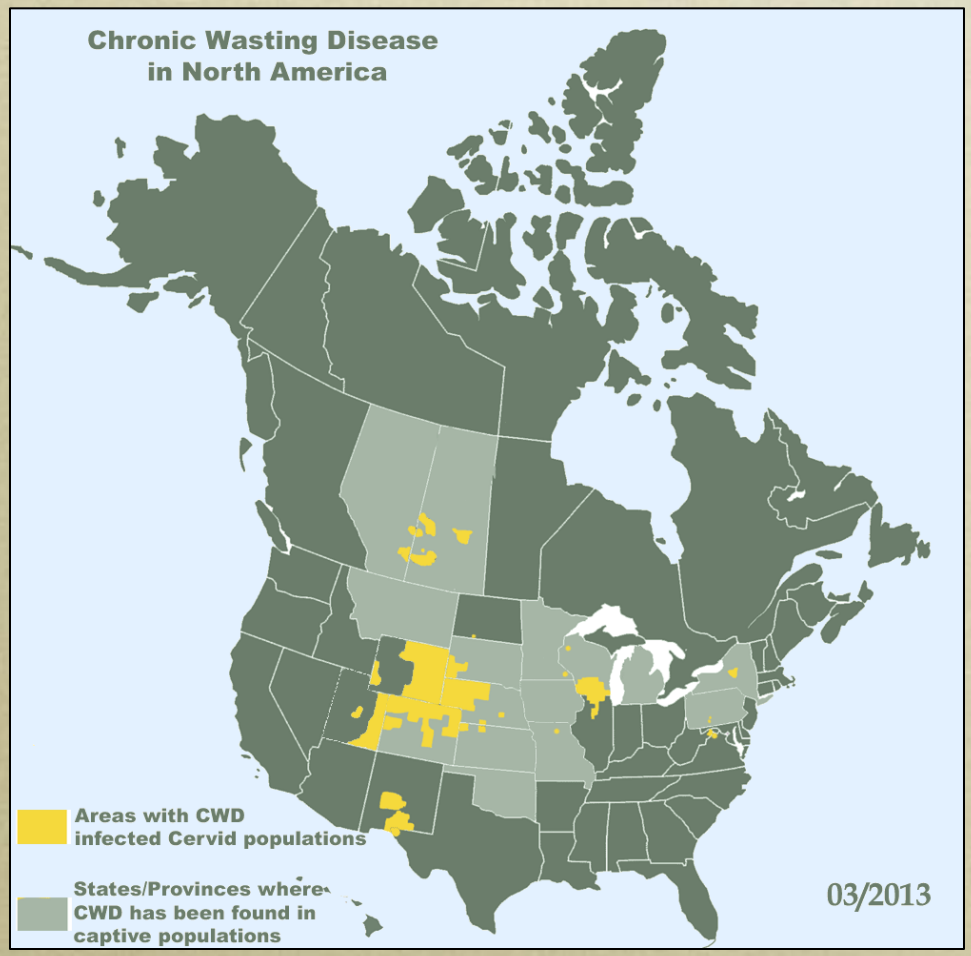


•WY DGF



CWD Distribution

- CWD may have originated from scrapie
- Endemic in WY, CO since 1960s
- Detected in WI in 2001
  - IL, MI, WV, NY, PA, MD, VA



CWD Alliance

CWD Distribution

- Prevalences and distribution are increasing
- Local spread
  - Deer movements and dispersal
  - Scavengers
- Long distance
  - Captive cervids
  - Infected carcasses

CWD – Impacts to Populations

- Long-term impacts to populations are unknown
- Models suggest long-term declines
  - Possibly occurring in WY and CO

CWD – Management

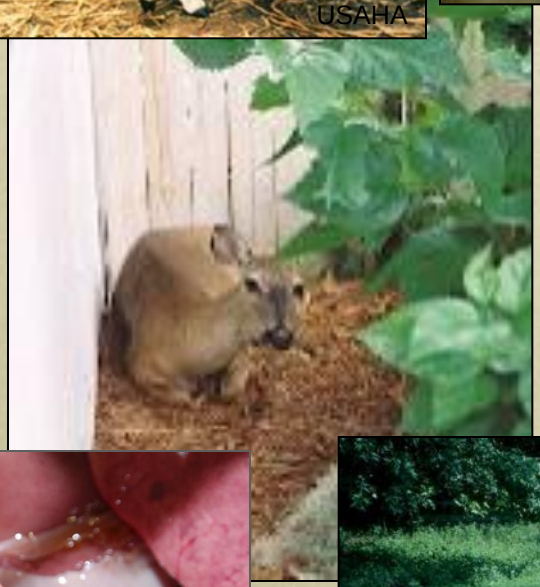
- Population reduction
  - So far has not been successful
  - Requires very early detection, rapid depopulation
    - Before environmental buildup
- Prevention

Active surveillance

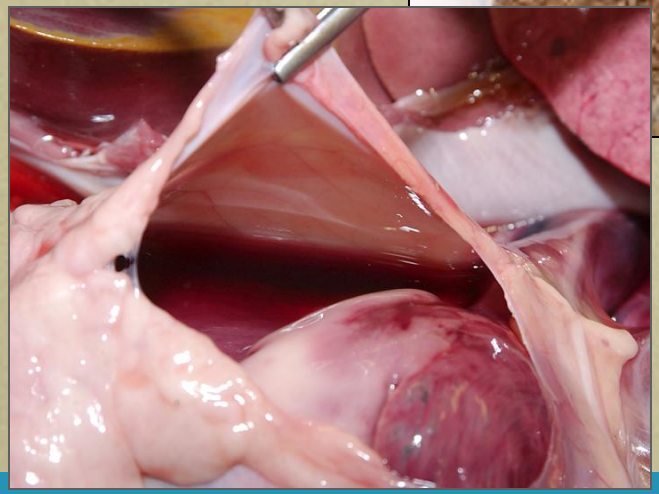
- “Random” sampling of hunter- and road-killed deer
  - Private and public lands near deer farms or game ranches
- 500 - 800 tested/yr
  - >7000 since 2002
  - No positives

Passive surveillance

- Collection and necropsy of sick or dead deer
  - 1-866-CWD-WATCH
- *Also surveying for other wildlife diseases – TB, HW, EHD/BT*
- ~ 50-100/yr



http://www.michigan.gov/images/deerribs_74486_7.jpg



Pseudorabies (Aujeszky's Disease)

- Suid herpesvirus 1 (Alphaherpesvirininae)
- Swine are the definitive host
- Most economically important disease of domestic swine
  - Abortion, neonatal mortality
  - Neurological signs juveniles
  - Respiratory signs in adults

Pseudorabies (Aujeszky's Disease)

- Latent infection in neuronal and lymphoid tissues
- Stress can cause recrudescence
- Virus shed in:
  - Nasal and oral secretions
  - Vaginal secretions and semen

Pseudorabies (Aujeszky's Disease)

- Wide range of 2° hosts
  - Carnivores, equines, ruminants, rodents
  - "Mad-itch" characterized by neurological disease, intense pruritis, death
- Transmission to 2° hosts
  - Ingestion (uncooked meat)
  - Possibly wounds
  - Aerosol

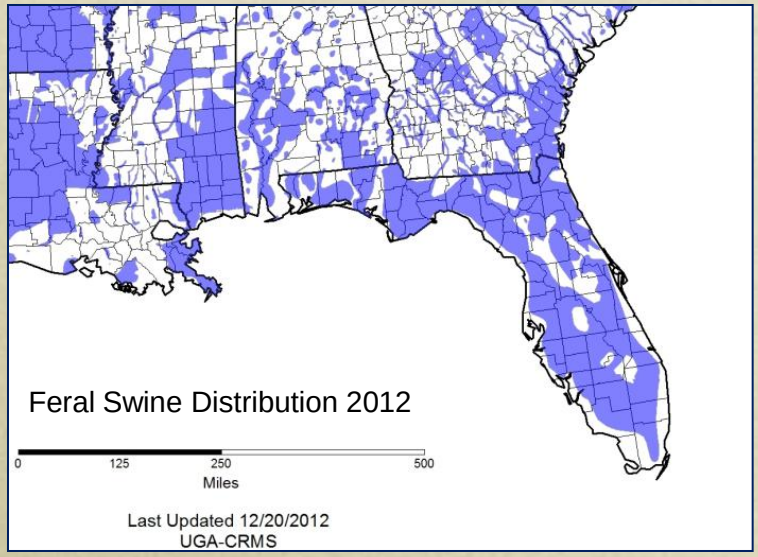
Cramer et al. (2012)

Pseudorabies (Aujeszky's Disease)

- United States obtained PRV-free status in domestic herds in 2004
  - Still present in feral swine

Pseudorabies and Florida Panthers

- Feral swine in FL
  - 35% have antibodies to PRV
  - Present in all counties
  - A primary prey item for FL panthers



SCWDS, 2012

S. Feltus

Pseudorabies and Florida Panthers

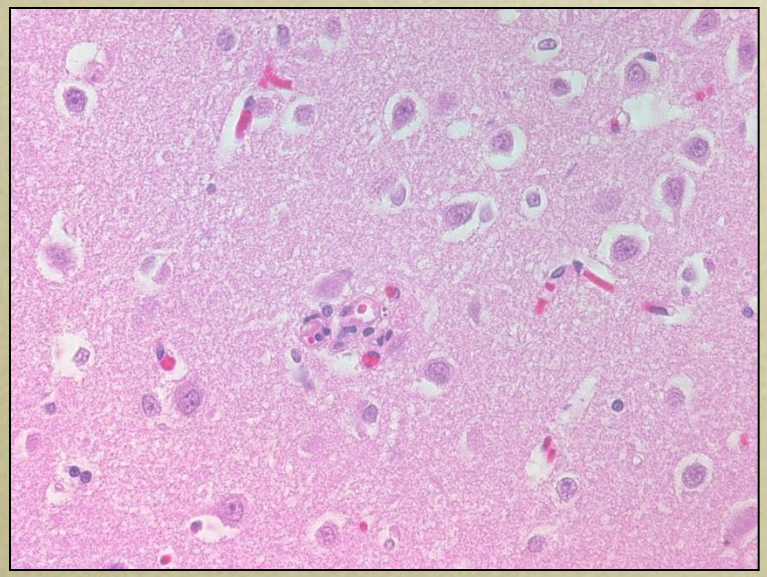
- Transmission
  - Ingestion
    - Likely most common route in panthers
    - Possibly infected rodents
  - Possibly wounds

M. Lotz

D. Shindle

Pseudorabies and Florida Panthers

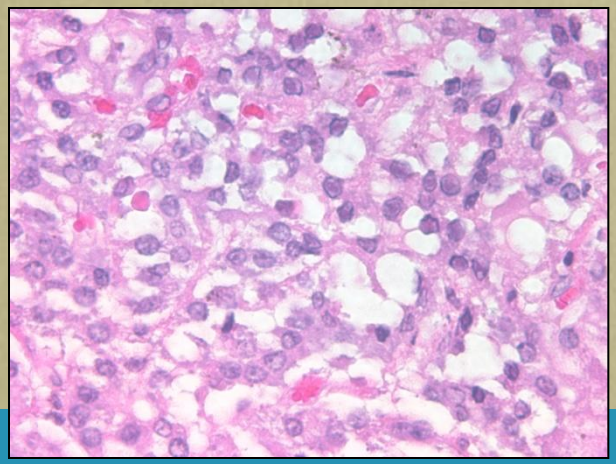
- 3 radio-collared panther mortalities due to PRV
  - 2 displayed classic CNS infection



Pseudorabies and Florida Panthers

- FP173 – Atypical infection
  - Stomach distended with water, aspiration
  - Inclusion bodies in the adrenals with no inflammation or necrosis

FWC



Pseudorabies and Florida Panthers

- Vaccination?
  - Captured panthers vax against rabies, FeLV
- Benefits as prey outweigh PRV risk?

D. Shindle