Florida’s Wetlands and Wildlife Health
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Aquatic birds
- Loons and grebes
- Tubenoses
- Pelecaniformes
- Anhingas and cormorants
- Wading birds
- Swans and geese
- Ducks
- Raptors
- Cranes
- Shorebirds
- Terns
- Alcids
- Kingfishers
- Dippers
Black Skimmer, Photo Image # BLSK 177

What a fascinating and graceful bird to watch, as this photo shows an adult Black Skimmer flying with its knife-edged lower mandible submerged in the water.

When this Black Skimmer feels something in the water when it's skimming, it will snap its head down and hopefully clamp onto a fish.

Return to Birds of the Wetlands
Florida’s Wetlands and Wildlife Health

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Protected Fish and Wildlife Conservation Commission
CHANGES IN ENVIRONMENT

• TOXIN CONTAMINATION - mercury, antibiotics, pesticides, immunosupression

• NUTRIENT CONTAMINATION - eustrongylidosis, AVM, Rodside?

• ATTRACTIVE NUSANCE – eustrongylidosis, spray fields, landfills,

• CHANGE FOOD RESOURCES – peanut toxicosis, Newcastle disease, avian cholera, immunosupression

• TRANSLOCATE ANIMALS and/or PATHOGENS – WNV, HPAI, SARS

• STRUCTURAL HAZARDS – powerlines, roads, boat use, vehicles, etc.

• LOSS OR ALTERATION OF WETLANDS- resulting in:
  - Crowding, Relocation, Diet change, nesting habitat loss, exposure to new species, habitats- HPAI, EEE, SARS

Contaminants in water

• Nutrients
• Methyl Mercury
• Chlorinated hydrocarbons, PCB,s, Dioxins,
• Sodium chloride
• Antibiotics
• Estrogen

Current Exposure in Everglades

• ↓ PCV
• ↓ Lymphoid tissue
• ↓ Appetite/Motivation to hunt
• ↓ Weight
• Changes in tissue enzymes
• Thermoregulation change
• Lethargy
• Decreased immune function
Nutrient contaminants

- Eustrongylidosis, and other parasites
- Botoxins? – red tide, botulism
- Attractive nuisance

Eustrongylidosis

- Nematode parasite of herons and cormorants
- Complex life cycle

Liver mercury mg/kg

Great White Heron fledglings cause of mortality

Spalding et al. 1994

Trauma Chronic disease
Infectious diseases

- Fecal contamination, *Escherichia coli*, *Campylobacter*, *Salmonella*, *Shigella*
- Avian cholera
- Salmonellosis
- Newcastle Disease – aquaculture/cormorants
- Avian influenza
  - Most benign, HPAI

Contaminant: nutrients (sewage)
Attractive nuisance

Eustrongylidosis

- Cycle driven by addition of nutrients to water
- Kills up to 80% of young birds in nest

Eustrongylides ignotus

- Nutrients
- Fish
- Oligochaete

Infected heron

Kills up to 80% of young birds in nest
Avian influenza A

- Waterbirds are natural reservoirs. Asymptomatic birds are frequently infected with multiple strains of virus.
- Transmission fecal oral/contamination of water

High pathogenic avian influenza

- High pathogenic avian influenza (rare) may be transmitted to wild birds by contact with domestic ducks and chickens and their waste and vice versa
- Spread by chicken products and/or wild bird migration
- Fatal disease in wild birds, chickens, waterbirds, mammals, and humans

Newcastle disease

- Highly contagious viral enteric or neurologic disease
- Transmission by aerosol or fecal ingestion
- Transported by carrier birds
- Causes reduced egg production to rapid death
Aquaculture - increased population density

- Increased colony size and exposure of nestlings to virus
- Mortality especially of young birds
- Adult carrier birds are threat to poultry industry

Newcastle disease virus

- Access to abundant food (catfish and crayfish aquaculture) in gulf states increases population size
- Increased colony size and exposure of nestlings to virus
- Mortality especially of young birds
- Adult carrier birds are threat to poultry industry

Biotoxins

- Avian vacuolar myelinopathy?
- Botulism
- Red tide
- Domoic acid
- Other harmful algal biotoxins (HAB’s)
- Mycotoxins

Avian vacuolar myelinopathy (AVM)

- Unidentified toxin biotoxin produces disorientation and brain lesions in coots and eagles at certain lakes in the southeast
- Recent “emerging” disease
Exotic weed, nutrient pollution, Toxin?

Avian vacuolar myelinopathy (AVM)

- Aquatic nutrient pollution increases mats of highly invasive exotic Hydrilla which harbors a toxin producing organism
- Coots ingesting Hydrilla become disoriented and are eaten by eagles

• Exotic weed, nutrient pollution, Toxin?
• Waterbird/eagle
• toxin
• algae

Translocation of pathogen/host

• West Nile Virus
• Malaria

West Nile Virus

• Example of translocation of a disease
• Common in Eurasia with occasional outbreaks, rare bird mortality
• Transmitted by mosquitoes
• Entered North America for first time in 1999 causing over 500 human deaths
• Extensive mortality in some bird species especially Corvids and hawks
• With time, immunity develops, similar to Europe
Wetland loss – crowding

- Increased exposure to sick birds
  - Ie avian cholera
- Exposure to novel species (and their diseases)
- Increase chance of dead bird starting botulism epizootic
- Decrease in water quality
  - Fecal contamination – clostridium, salmonella

Avian cholera

- Very rapidly reproducing bacterial Pasteurella multocida
- Fecal contamination of water which is aerosolized when birds take off from water

Avian cholera

- Access to waste grain increases population size
- Immune suppression may be associated with Vitamin A deficient corn diet
- Fewer wetlands available further increases density
- Fecal contamination of wetlands
- Rapid death of 10,000’s of birds every year
Water associated hazards
• Fish hooks, lead sinkers, monofilament
• Powerlines, towers, roads and bridges
• Trash
Wetland loss – impact on reproduction

- Increased predation – adult and chick mortality
- Decreased habitat quality – foraging and nesting
- Decreased pair experience

Florida 2060:
A Research Project of 1000 Friends of Florida

Developed Lands and Permanent Conservation Lands

Reproductive health
Wildlife health

- Wildlife health is closely tied to environmental changes
- Environmental changes are more often than not made by humans
- So animal health issues are of vital concern to us.
- And these issues need to be considered when planning changes or solutions
Emerging disease? or new opportunities?

- Crowding from wetland loss, development, drainage, drought
- Population expansion and inadequate nutrition from agriculture and aquaculture food availability
- Pathogen exposure and nutrient pollution from human and animal waste
- Movement of host and disease agents
- Toxins – physiologic change and immune suppression

Suggested action items

- Include wildlife health issues in the planning and regulatory stages of development
- Preserve wetlands to prevent crowding and increased disease transmission
- Separate human sewage and domestic animal waste from wildlife access
- Control access to aqua/agricultural food surplus
- Prevent aquatic nutrient and toxin contamination
- Limit wildlife access to physical hazards