

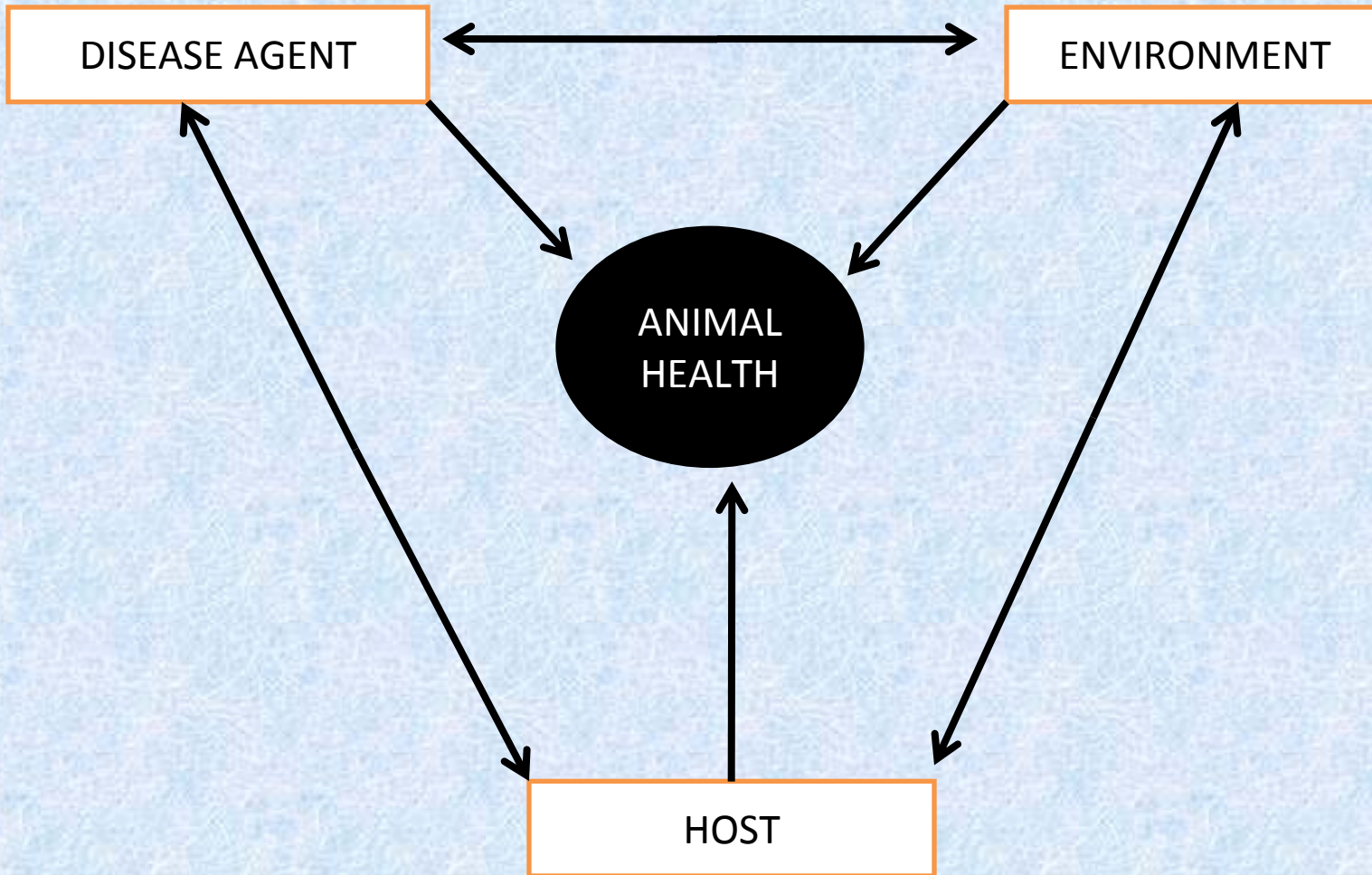
Florida's Wetlands and Wildlife Health

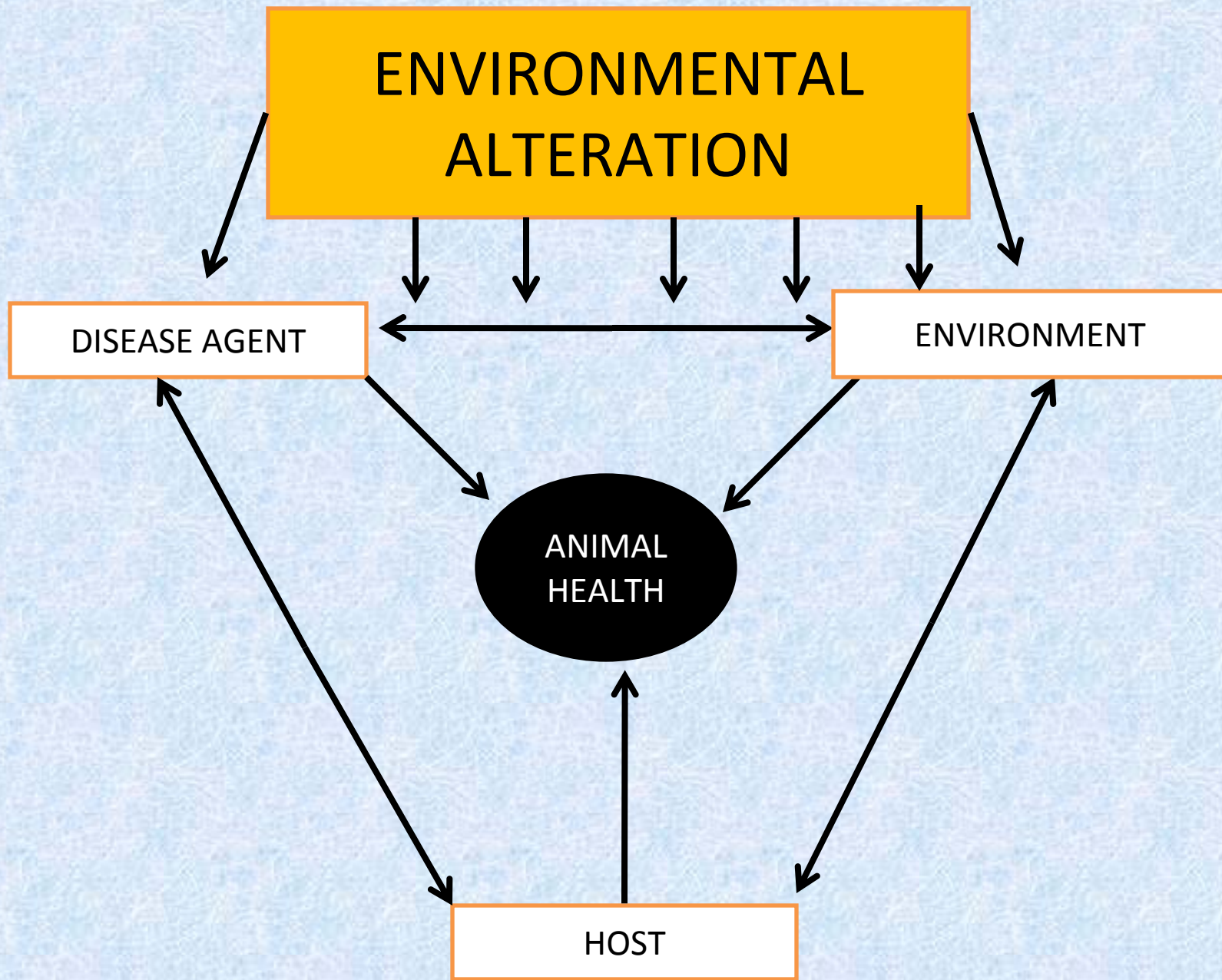
Marilyn G. Spalding, Department of Infectious Diseases and Pathology, College of Veterinary Medicine, University of Florida, Gainesville, Florida



Florida Fish and Wildlife Conservation Commission









- Contaminants

- Direct mortality
- Endocrine disruption
- Decreased immune function
- Disruption of food chain-loss of prey
- Development of antibiotic resistance
- difficult to document

Eustrongylidosis

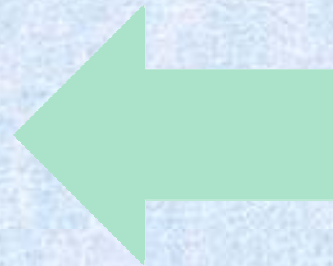
- Nematode parasite of herons and cormorants
- Complex life cycle

Infected heron

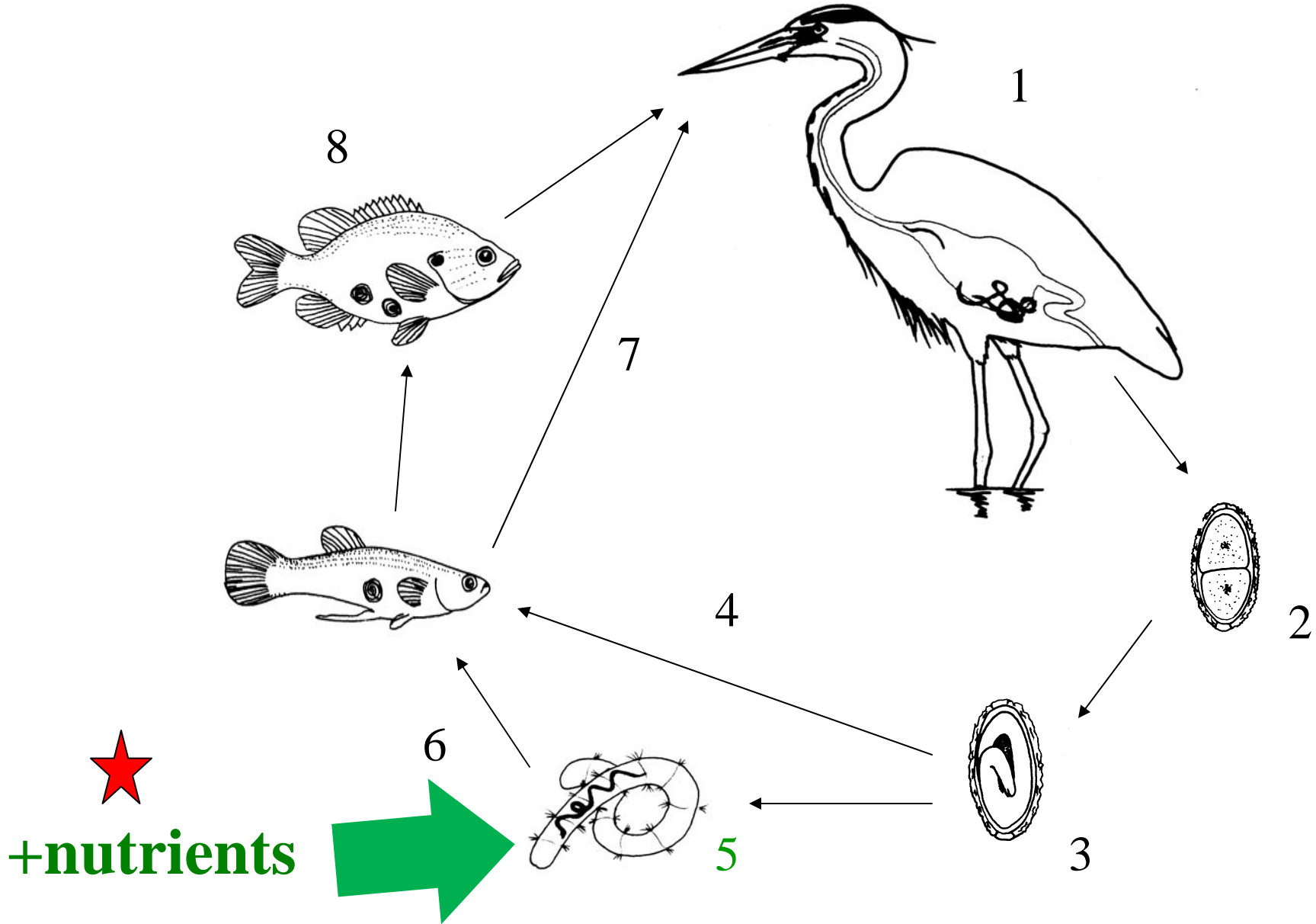


fish

Egg in feces
eaten by
earthworm

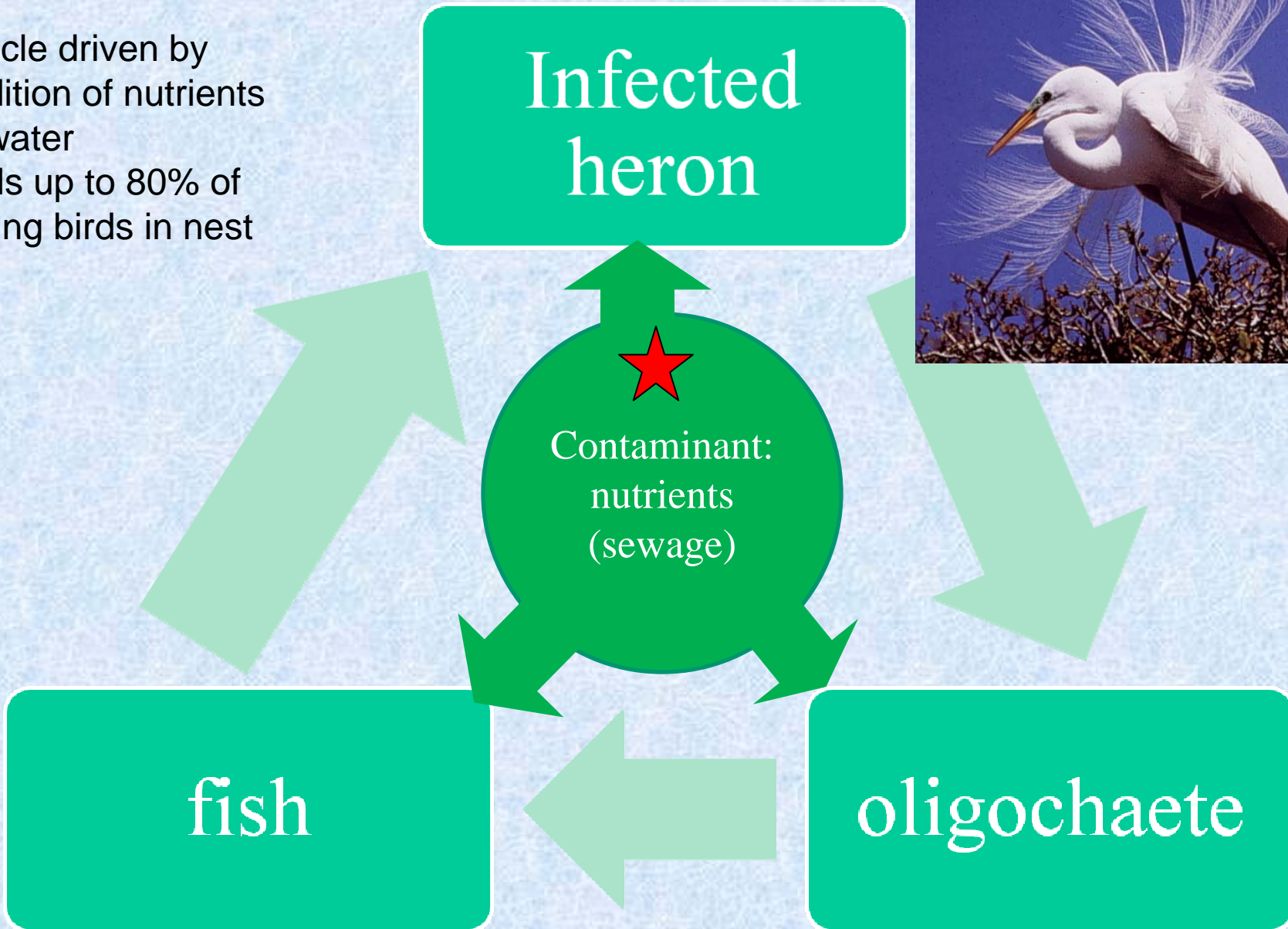


Eustrongylides ignotus



Eustrongylidosis

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



Avian influenza A

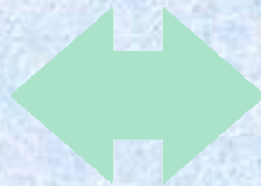
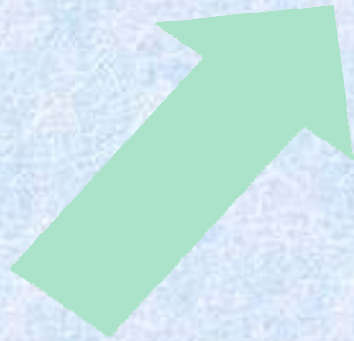
- Waterbirds are natural reservoirs. Asymptomatic birds are frequently infected with multiple strains of virus.
- Transmission fecal oral/contamination of water



Chickens/other
animals and
humans

Wild birds

Wild birds



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

Chickens/other animals and humans

Domestic-wild species contact

Migration and shipment

Wild birds

Wild birds



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

Cormorants

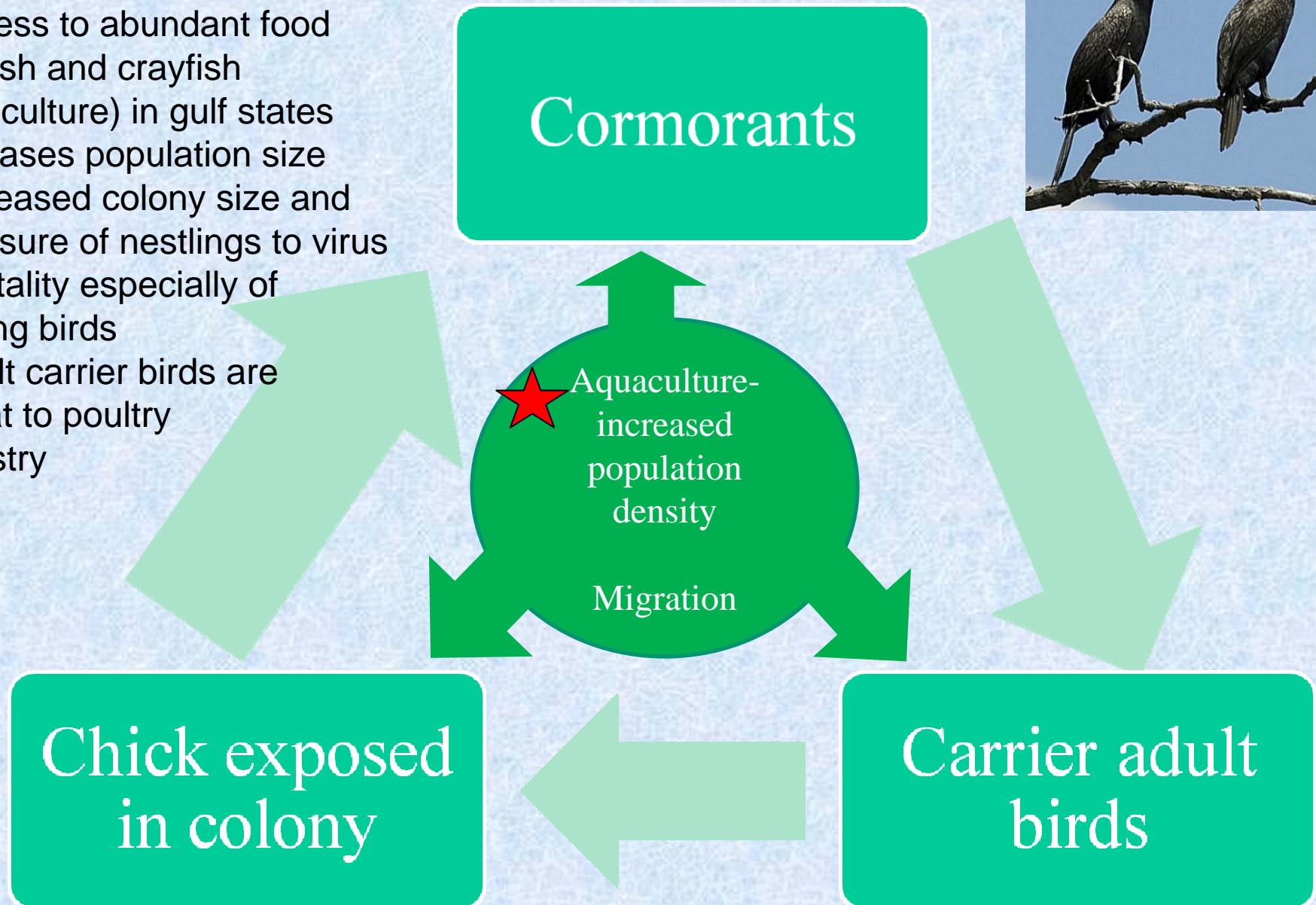
Chick exposed
in colony

Carrier adult
birds



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



Avian vacuolar myelinopathy (AVM)

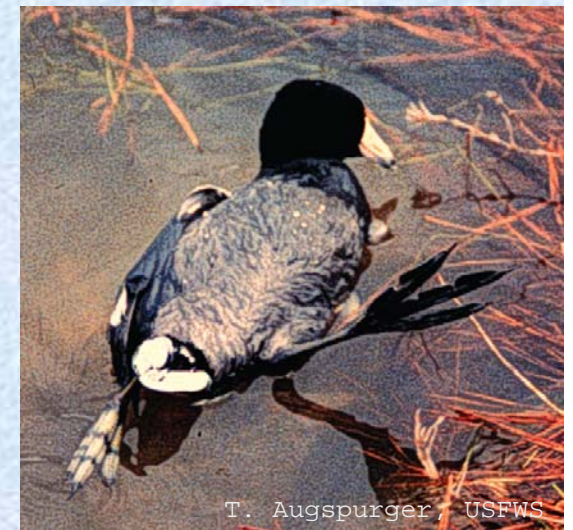
- Unidentified toxin biotoxin produces disorientation and brain lesions in coots and eagles at certain lakes in the southeast
- Recent “emerging” disease



Waterbird/eagle

toxin

algae



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

Waterbird/eagle

★ Exotic weed, ★ nutrient pollution, ★ Toxin?

toxin ?

algae



T. Augspurger, USFWS

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



Avian cholera

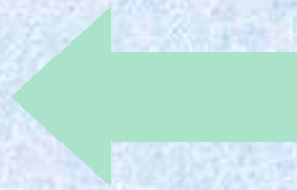
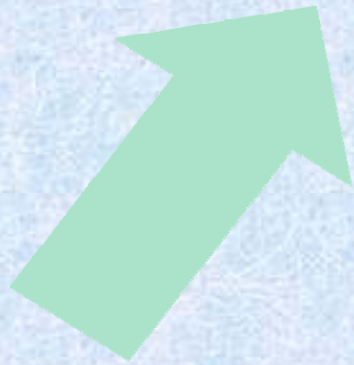
- Very rapidly reproducing bacteria: *Pasteurella multocida*
- Fecal contamination of water which is aerosolized when birds take off from water



waterfowl

Inhalation of
water droplets

Fecal
contamination of
water



Avian cholera

- Access to waste grain increases population size
- Immune suppression may be associated with Vit A deficient corn diet
- Fewer wetlands available further increases density
- Fecal contamination of wetlands
- Rapid death of 10,000's of birds every year



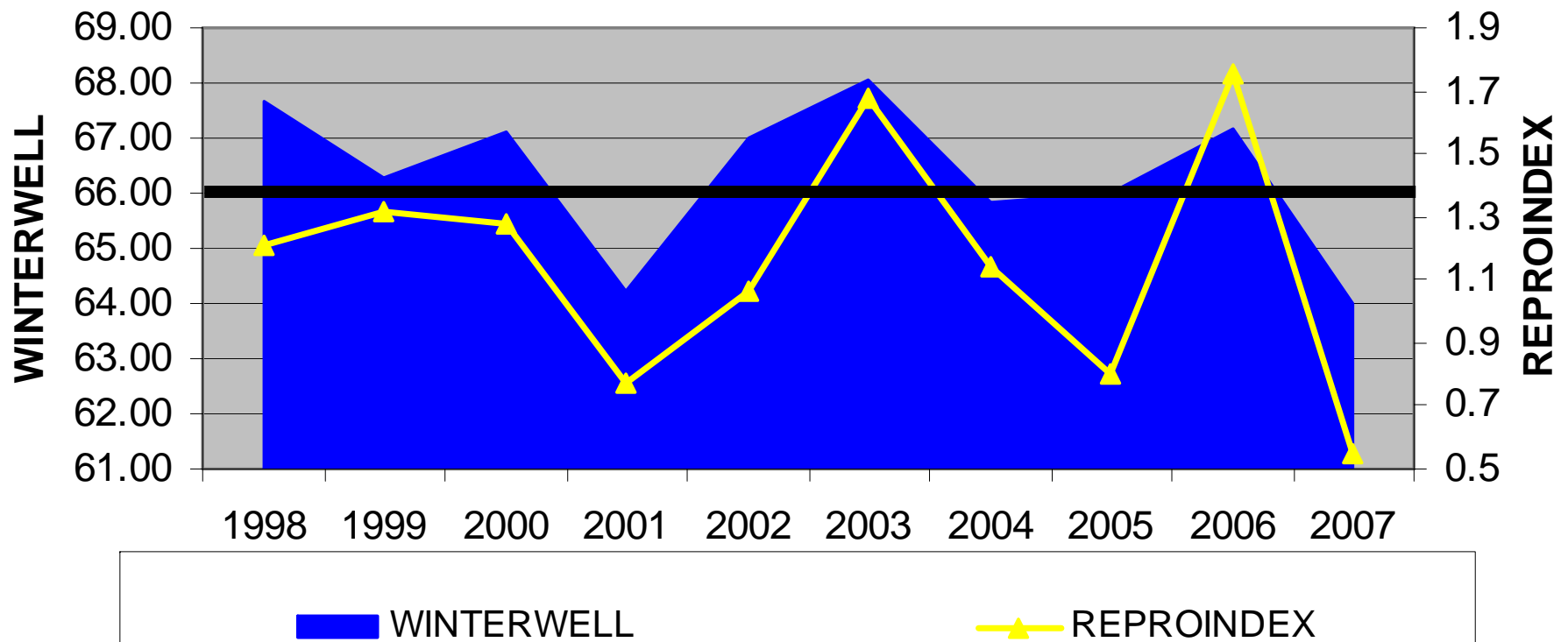
waterfowl



Inhalation of water droplets

Fecal contamination of water

Whooping crane reproduction in Florida





Wetland loss: development, drainage, drought

- Decreased quality habitat for foraging and nesting
- Forces use of marginal habitats with associated danger
 - increase hazards, especially boats
- Increases territorial competition
 - Increases adult and chick mortality
 - Increased exposure to terrestrial predators
 - Decreases pair “experience level”

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



