

Conceptual Model of Human and Natural Systems Interactions in the Agricultural and Ranching Areas in the Everglades and Pantanal

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About Conceptual Models

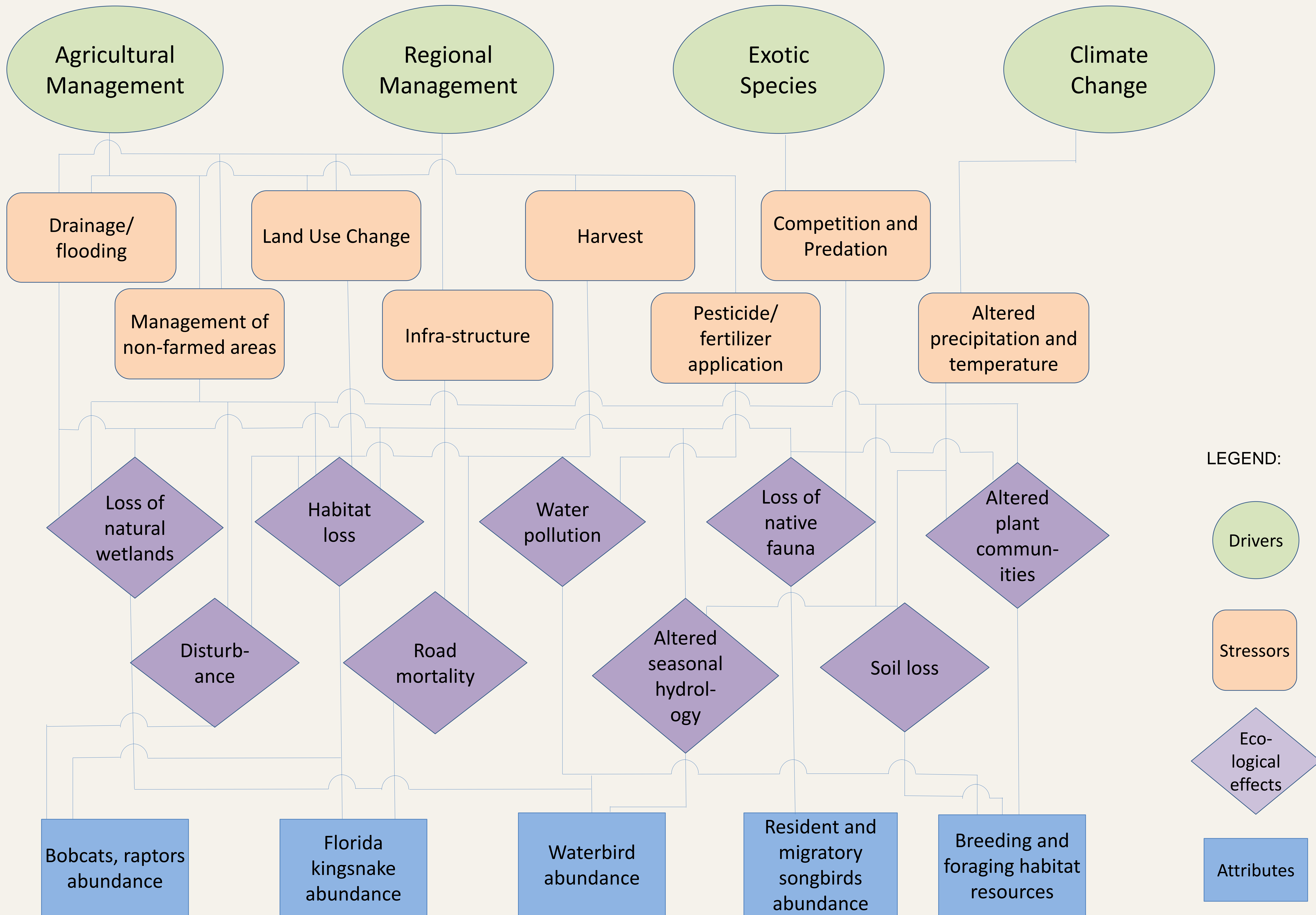
- They are non-quantitative planning tools
- They identify drivers and stressors on the natural system
- What are the ecological effects of the stressors?
- What attributes of the system are good indicators of the ecological effects of the stressors?
- Important for restoration and conservation programs

The Everglades Agricultural Area

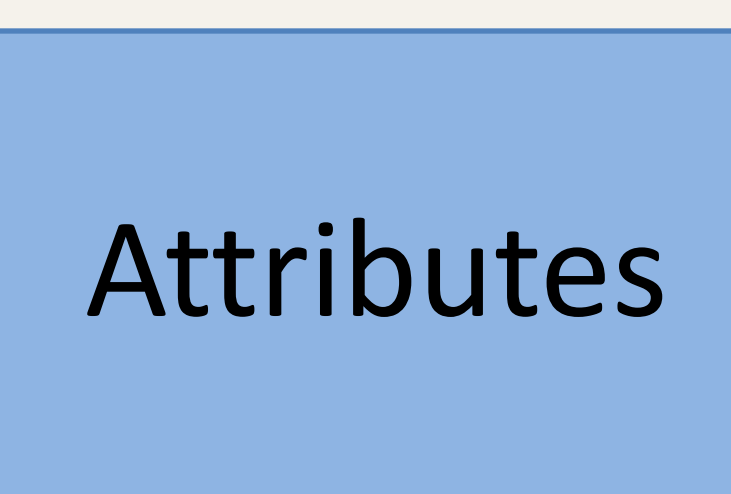
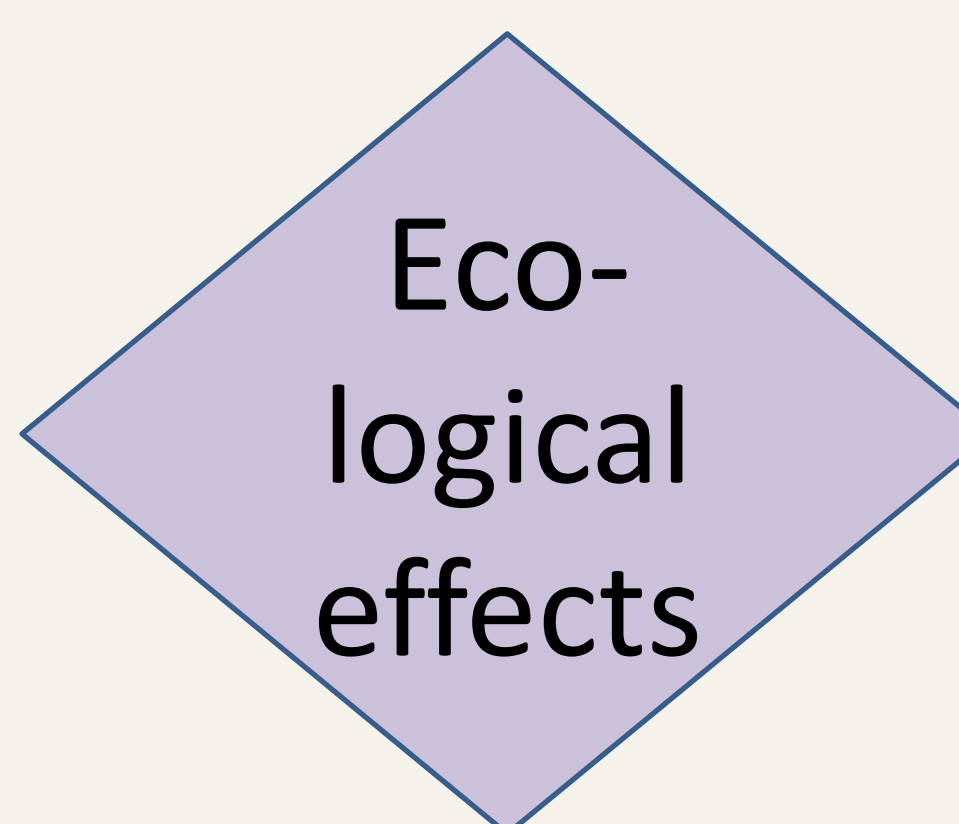
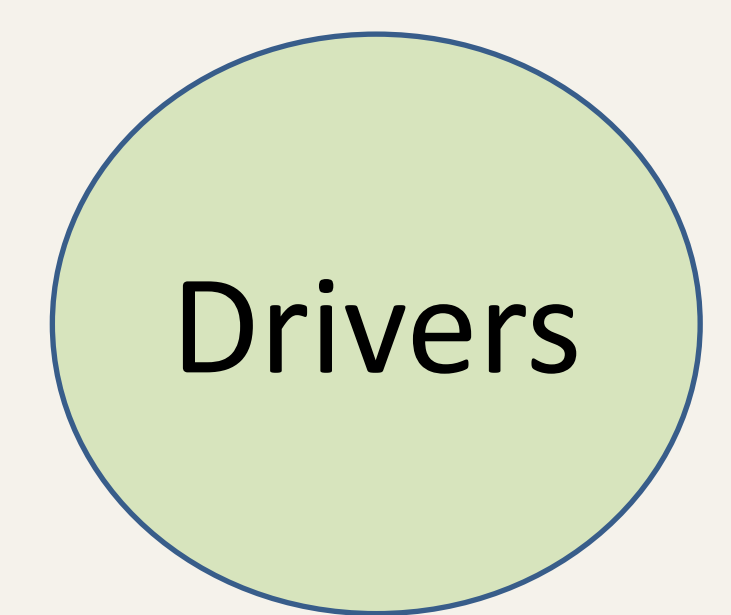


About the EAA

- Between Lake Okeechobee and natural/managed wetlands of the greater Everglades
- 280,000 ha or 2800 sq km
- Mainly sugarcane, also rice, vegetables and sod
- Highly managed, very little native vegetation
- Low road density



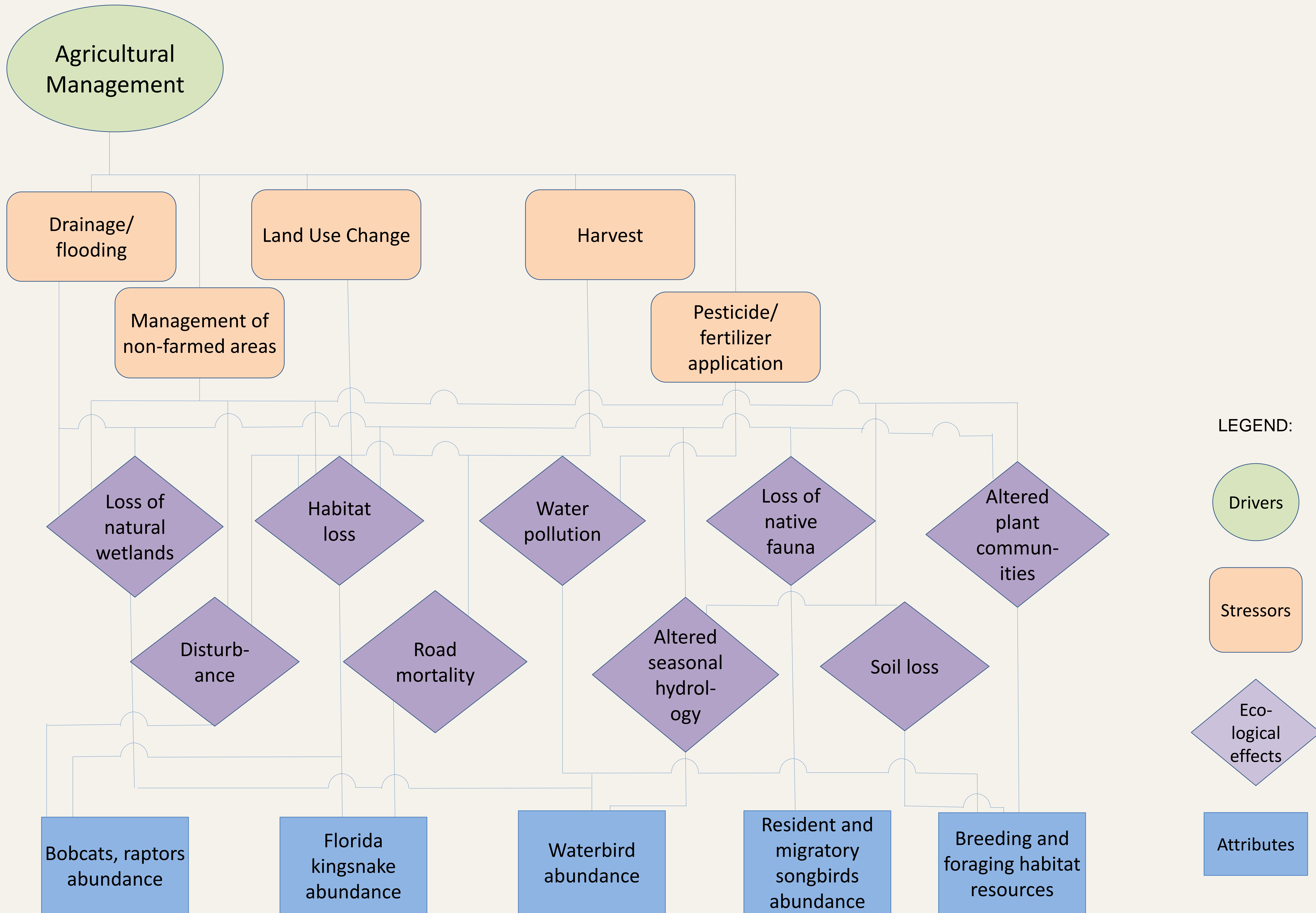
LEGEND:



Agricultural Management

- Alters hydrology
- Alters habitat
- Chemical input
- Access/infrastructure
- Disturbance/Harvest
- Vegetation type and structure





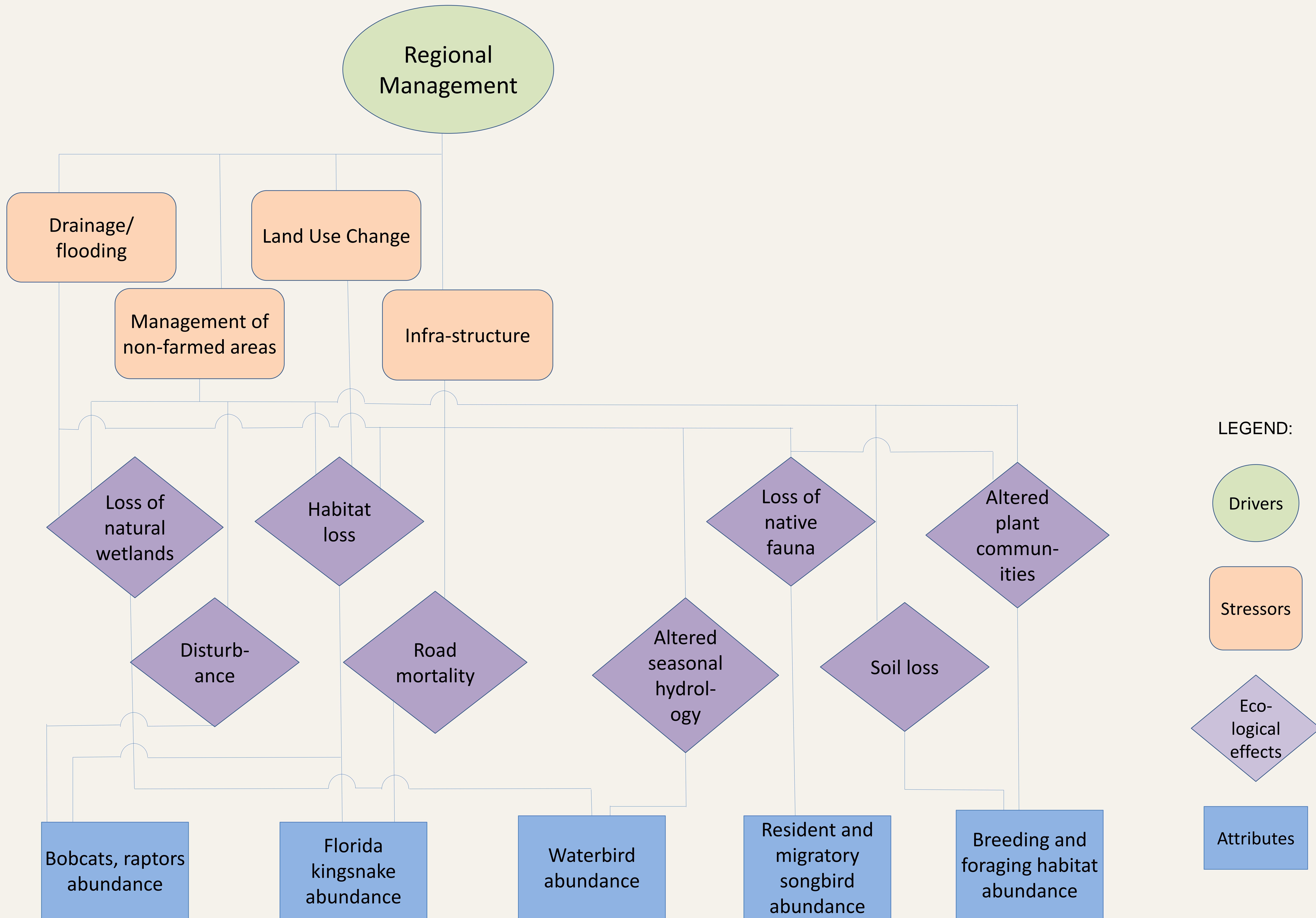
Agricultural Management Effects

- Flooded fields and seasonal hydrology– **wading birds, shorebirds, secretive marsh birds**
- Berm creation and maintenance (infrastructure) – **black-necked stilt, killdeer, common nighthawk**
- Burning at harvest/edges – **raptors, vultures, other predators benefit, loss of habitat for some migratory species and common yellowthroat**
- Infrastructure – **kingsnakes, sensitive species, feral cats and dogs are rare**
- Agricultural input – difficult to quantify for wildlife effects, impacts native vegetation

Regional Management

- Alteration of hydrological timing and amount
- Non-farmed areas converted to non-agricultural uses
- Infrastructure construction and intensification





Regional Management

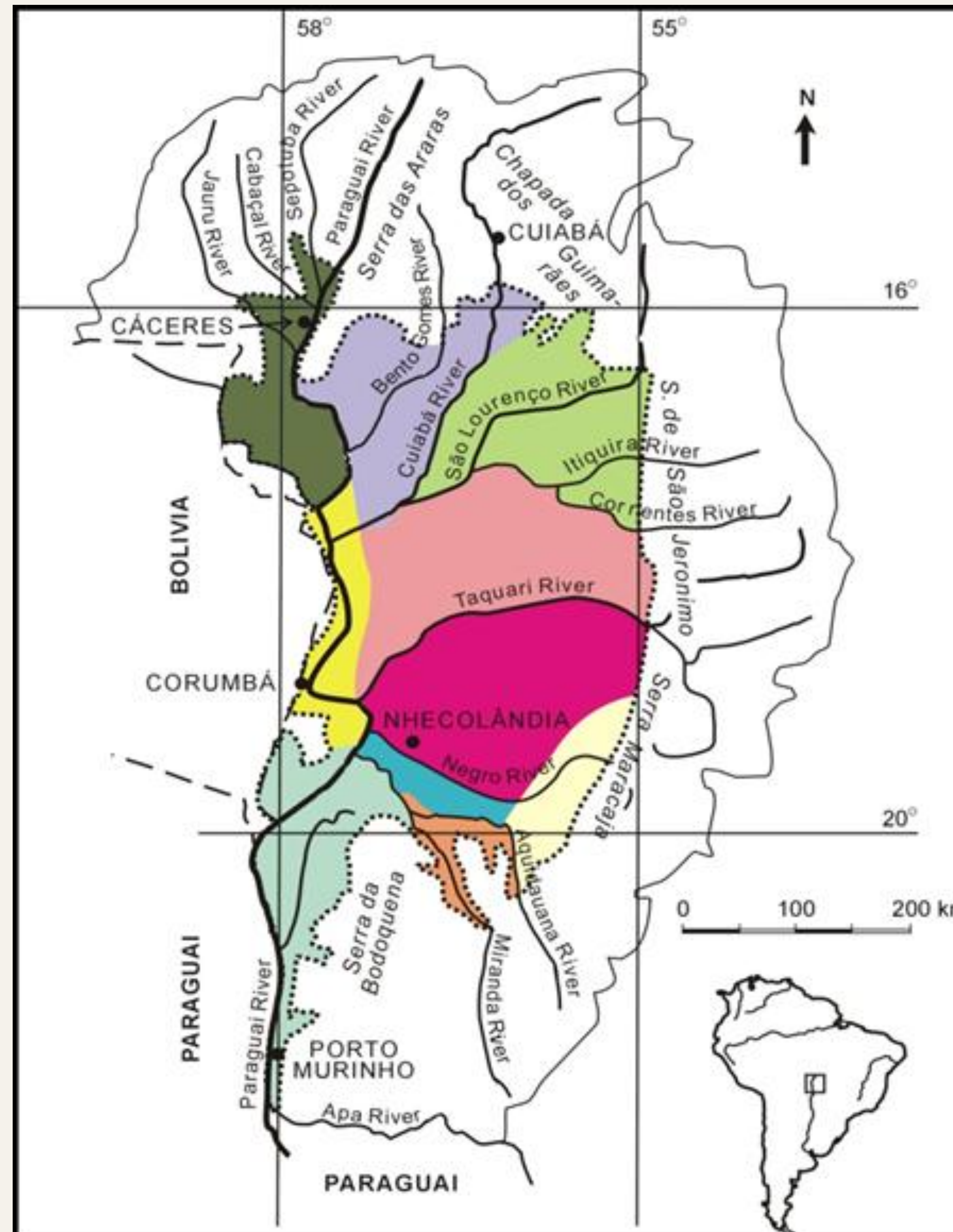
- Water management outside the area – **wading birds, breeding and foraging habitat**
- Non-farmed areas may include property boundaries, water retention, cleansing and storage, etc. - **waterbirds, kingsnakes and other reptiles, bobcats, resident and migratory birds**
- Infrastructure such as water control structures, increased development (including roads) – **kingsnakes, bobcats, breeding and foraging habitat**



Pantanal

- 140,000 km²
- Temporary wetland, monomodal flood pulse
- Low density cattle ranching
- Thousands of species of plants and animals but no endemics
- Highly influenced by hydroperiod and water depth

The Pantanal



Differences



- Vegetation Structure
- Ecotourism
- Size
- Diversity of the animal and plant communities
- Cattle/grazing vs. intensive agriculture
- Hydrologic management vs. minimal management in the Pantanal interior

Similarities

- Limited infrastructure compared with surrounding area
- Land conversion/burning
- Private ownership
- Non-native vegetation
- Agricultural input internal and external
- Soil erosion and loss



Management Stressors

- Burning and logging for increased pasture
- Clearing and disturbance for ecotourism
- Increased intensity of cattle ranching



Regional Management Stressors

- Conversion of uplands and wetlands
- Agricultural input from other areas
- Road-building and infrastructure
- Erosion and siltation



