KN-Wildlife: Exploiting Federal Data and Beyond: A Multi-modal Knowledge Network for Comprehensive Wildlife Management Under Climate Change
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Use case description and societal challenge being addressed
Our KN-Wildlife project aims to establish a comprehensive, integrative knowledge network designed for the management of wildlife in the context of climate change. It couples visualization tools and predictive models to distill complex multimodal data into an intuitive, unified representation of managed species, thus aiding decision-making processes and equipping stakeholders with actionable insights. The use cases include the collaboration with the Fish and Wildlife Commissions (FWC) and Departments of Health (DoH) in Indiana and Florida, for providing comprehensive knowledge and predictive models for their species of concern. Additional use cases will be developed for interdisciplinary training, education, and promoting public awareness about climate change and wildlife conservation. KN-Wildlife, with its interactive and intuitive visualization features, serves as an exceptional platform for supporting informed decision making, wildlife research, interdisciplinary training and education.

Knowledge graph source datasets
The knowledge network construction will be based on entities and relationships about targeted species extracted from the following sources: USGS Repository, the Catalog of U.S. Federal Early Detection/Rapid Response Invasive Species Databases and Tools, GBIF, WorldClim, the IUCN Red List, and the CABI Invasive Species Compendium. We will identify key concepts regarding our targeted species, habitats, environmental factors and more. We will also extend our network by connecting the entities with stakeholder provided data, e.g., the observation and field data of the targeted species. The number of species in KN-Wildlife will be around 1000 to 2000. The number of entities and relationships will be around 10K to 20K.

User queries / competency queries for the use case
The example questions can be:
- What is the distribution of white-footed mice in IN in the past 10 years and how is it related to the tick-borne disease cases?
- What will be the distribution of white-footed mice in IN in the event of an extremely hot summer?
- What will be the distribution of West Nile virus caused by mosquito bites in Florida during an extremely hot summer?
- What will be the distribution of West Nile virus caused by mosquito bite in IN after a mild winter?
- What invasive species are relevant to the transmission of West Nile virus?
- What species are relevant to the increase of tick-borne disease?