CANADIAN VERTEBRATE SPECIES AT RISK: INTEGRATING DATA FOR CONSERVATION IMPACT

How have population trends of Canadian vertebrate species correlated with their conservation status over time, and what visualization techniques can best communicate these relationships to conservation policymakers and wildlife managers?

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INTRODUCTION & PROJECT GOALS

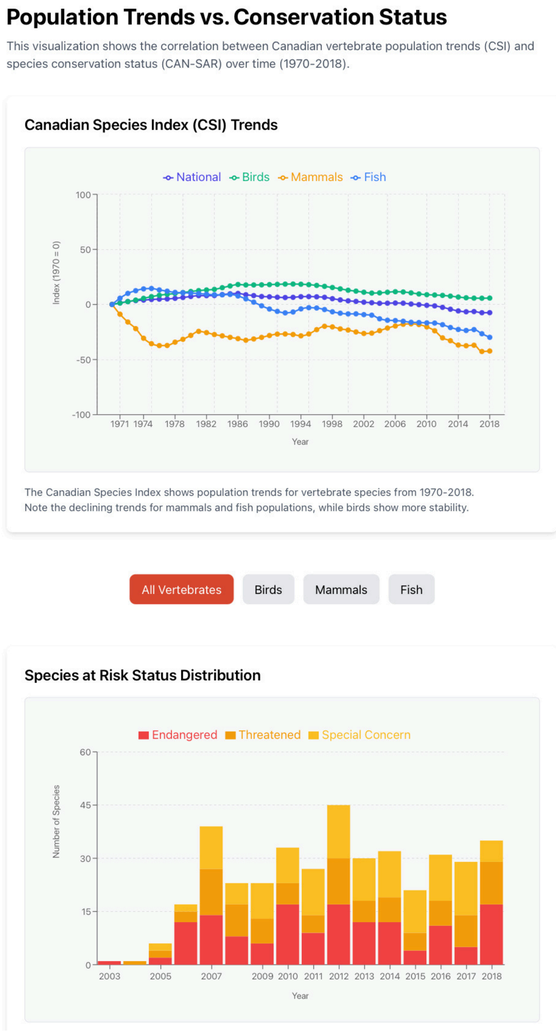
- **The Challenge**: Canada faces significant biodiversity loss (vertebrate populations ↓30%, mammals ↓42% since 1970). Traditional data displays often fail to connect conservation status with population outcomes effectively for decision-makers.
- **Our Goal:** To develop an interactive visualization platform by integrating the Canadian Species at Risk (CAN-SAR) database and the Canadian Species Index (CSI). This platform uses affective visualization techniques to clearly communicate the correlation between conservation status and population trends to inform conservation policy and wildlife management.
- **Inspiration**: Insights from the ZhouZhuang Life Mysterious Museum on tangible data presentation and narrative integration heavily influenced our design philosophy.

METHODOLOGY HIGHLIGHTS

- **Data Sources**: CAN-SAR (810 species, status, listing dates) & Canadian Species Index (900+ vertebrate population time-series).
- **Integration & Analysis**: Python (pandas) for data merging, ITIS for taxonomic resolution, time-lagged cross-correlation.
- **Visualization Design (React)**: Development of interactive visual tools applying principles of color theory. Multi-layered, affective visualizations (e.g., progressive color intensity, species silhouettes) to enhance engagement and understanding.

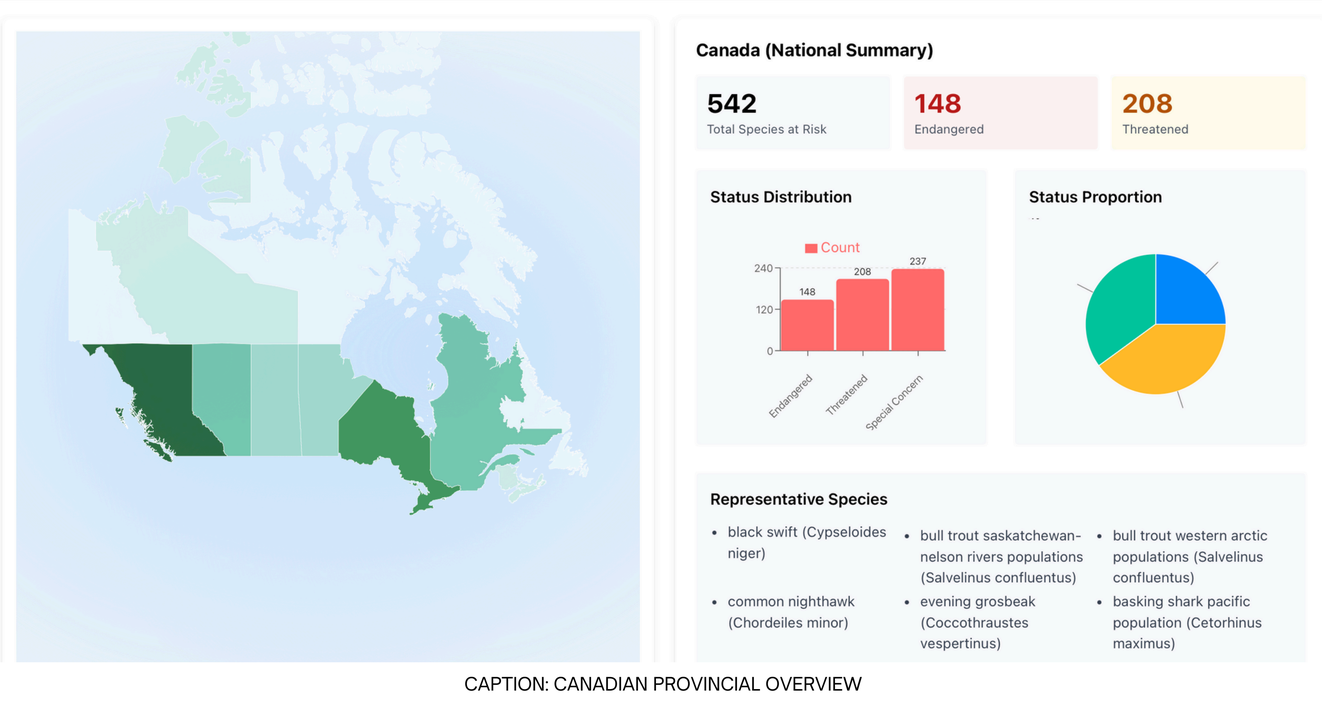
KEY FINDINGS

- **Positive Impact of Protection**: Elevated conservation status generally correlates with population stabilization or modest improvement.
- **Taxonomic Differences**: Mammals (despite -42% overall decline) show stronger positive recovery responses post-protection compared to fish (-30% overall decline), which exhibit more variable responses.
- **Response Lag**: Observable time lag between population declines and subsequent protection status changes.



CAPTION: DATA HOMEPAGE

CAPTION: KEY FINDINGS



CAPTION: CANADIAN PROVINCIAL OVERVIEW

CONTRIBUTION TO UN SUSTAINABLE DEVELOPMENT GOALS (SDGS)

Our project supports SDG 14 (Conserve & sustainably use marine resources) by visualizing marine species trends (e.g., -30% fish decline).

We advance SDG 15 (Protect terrestrial ecosystems & halt biodiversity loss) by visualizing status-population links for terrestrial species (e.g., -42% mammal decline).

EXPLORE OUR WORK

Full Code on GitHub

Interactive Website

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Disclaimer: This is the final project for INFOSCI 301 Data Visualization and Information Aesthetics, instructed by Prof. Luyao Zhang at Duke Kunshan University in Spring 2025.