# AMPHIBIANS AT RISK
## IN CALGARY

Three amphibian species currently make Calgary their home. However, wetland loss, wetland degradation, and barriers (e.g., roads and residential neighbourhoods) of the wetland network threaten their survival. To reduce these threats, it is necessary to understand where amphibian habitat (i.e., wetlands and surrounding terrestrial habitat) can be improved. To achieve this, our analysis included modelling to identify core wetlands and wetland corridors (movement pathways that support amphibian species) that play a significant role in the overall wetland network. As well, we documented barriers where restoration or mitigation could improve amphibian abundance to ultimately maintain amphibian biodiversity in Calgary.

**Calgary has over 2000 wetlands remaining but has experienced a 90% loss**

**Amphibians move between 600 to 1000m to access new wetlands**

**Citizen Scientist generated a 3-year dataset used to build models**

## Amphibian habitat preferences

Icons coloured in green indicate habitat features that increase population, those in red indicate a decrease in population.

### Wood Frog
Lithobates sylvaticus

Forest · Grassland · Road · Impervious surfaces

### Boreal Chorus Frog
Pseudacris maculata

Forest · Grassland · Road · Impervious surfaces · Slope

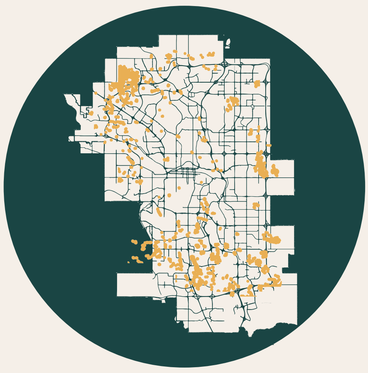
### Tiger Salamander
Ambystoma mavortium

Forest · Grassland · Road · Impervious surfaces · Slope

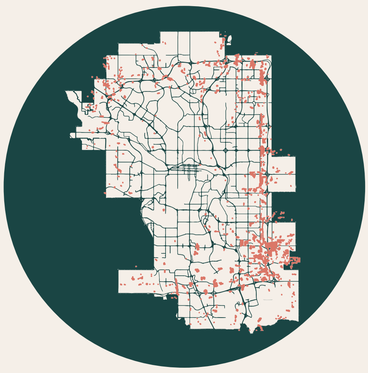
## Preferred habitat locations

Amphibian habitat for all three species occurs predominately outside the city Ring Road transportation system on the urban fringe or where urbanization has not occurred.

Wood frog



Boreal chorus frog



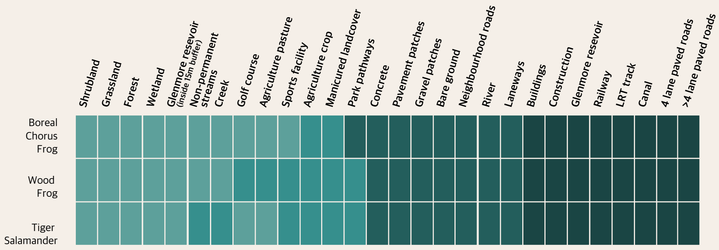
Tiger salamander

## Amphibians need to be able to move between wetlands

The relative effort of an amphibian to move across the landscape forms the basis of connectivity modeling. In Calgary, landscape features (e.g., grassland, concrete) were classified into categories from most likely to allow movement (habitat) to least likely (strong barrier). Restoration/mitigation efforts to remove barriers can improve amphibian movement.

Colour scale represents the resistance category.

Habitat · Favourable matrix · Less favourable matrix · Strong barrier




## Amphibian core wetlands and corridors

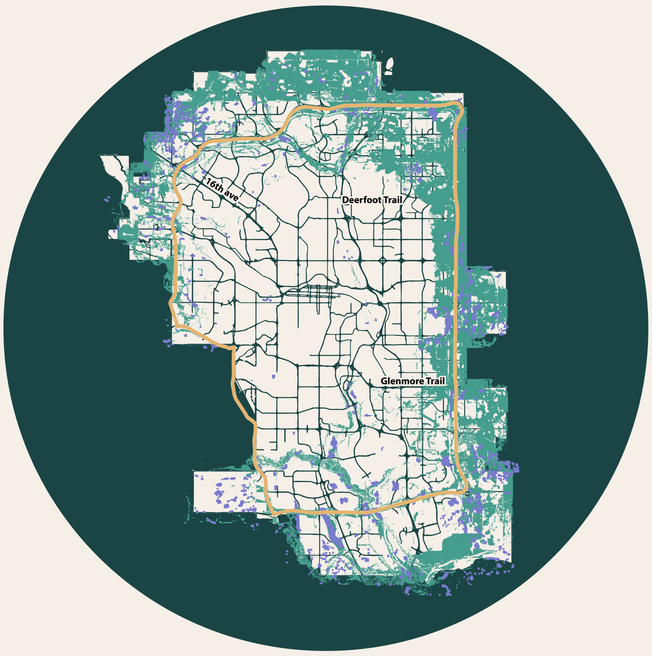
Calgary's major road network limits the ability of amphibians to disperse to new wetlands, reducing amphibian abundance.

Limited movement opportunities exist between wetlands occurring in inner city neighborhoods or in small natural areas within neighbourhoods.

Wetland corridors predominately occur where urbanization has not occurred on the edge of the city, in green spaces along major roads and along intact riparian systems, such as Nose Creek, Beddington Creek and Fish Creek.

Core wetlands along the urban fringe are still abundant, but most of these areas are earmarked for new residential neighbourhoods. Core wetlands in the inner city are limited in number, located primarily along river and creek systems with intact riparian corridors or in smaller natural areas.

Core Wetlands · Corridors · Ring Road (Stoney Trail/Tsuut'ina Trail)




## What we learned?

Opportunities to remove barriers, naturalize corridors and restore wetlands in movement paths are necessary for population resiliency, especially in isolated inner city wetlands.

The major road network in Calgary limits the ability of amphibians to disperse to new wetlands. Road mitigation (i.e., culvert crossing structures) is needed.

New developments that do not retain core wetlands and natural corridors between wetlands will compromise efforts to maintain or restore amphibian abundance in Calgary.

Although road side verges present concerns such as noise, pollution, and road mortality, in an urban environment, road side verges represent important opportunities for habitat and amphibian movement. Road side verges should be managed to support biodiversity.

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