



# Participant Update: Program Reporting

## What we learned from Call of the Wetland:

Three species of amphibian have been lost in Calgary, and three species remain.

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Most amphibians occur around the outskirts of the City, where we still have many wetlands.

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Wood frogs prefer wetlands nearby forests and natural grasslands, and that are away from roads and other paved areas.

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Boreal chorus frogs prefer wetlands away from rivers and streams, but with natural or even manicured grass areas nearby.

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Although we know tiger salamanders exist in Calgary, we don't have a full picture of where.

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If amphibians are to continue to make Calgary their home, we need to maintain natural habitat around wetlands and ensure amphibians are able to move between wetlands.

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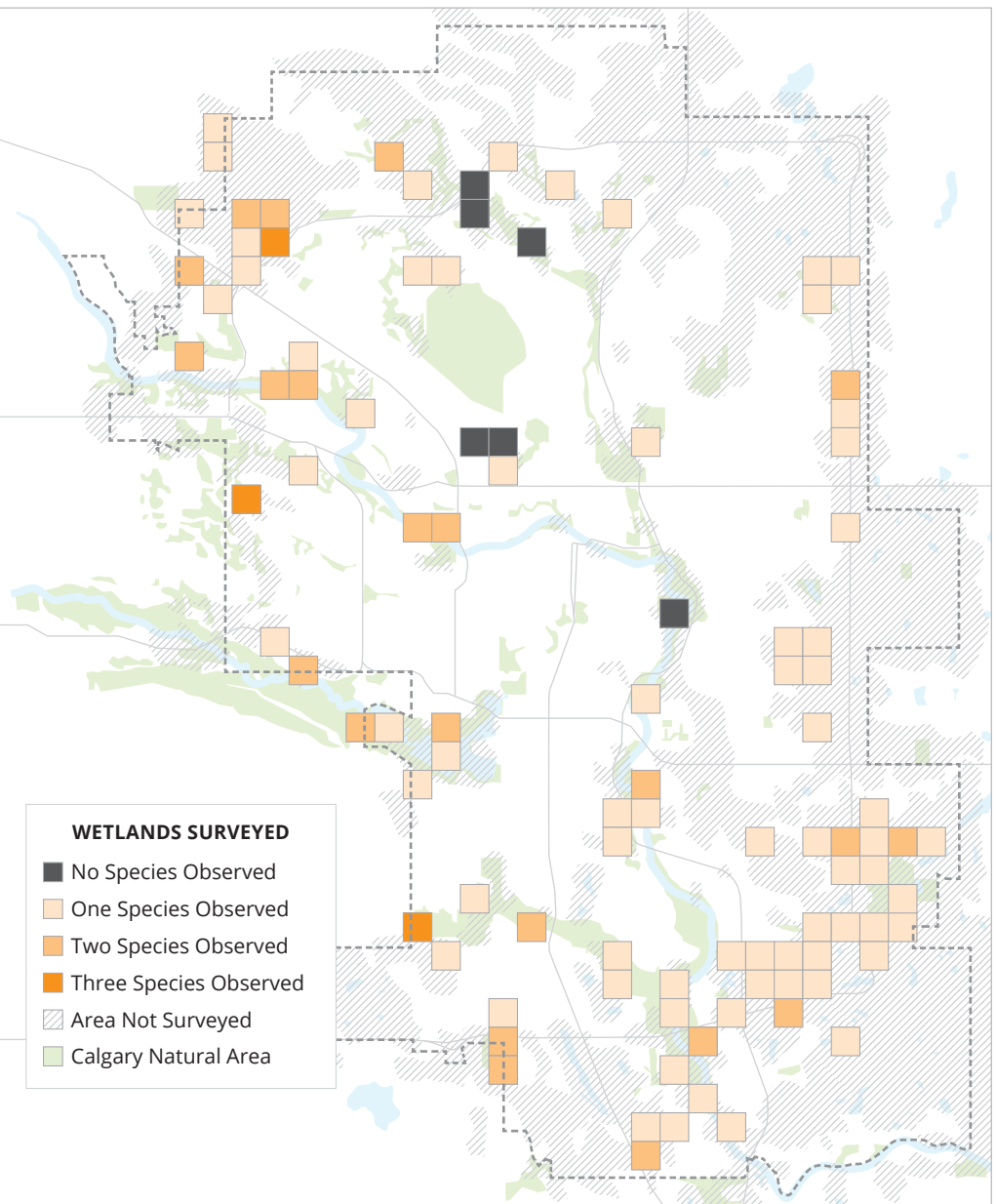
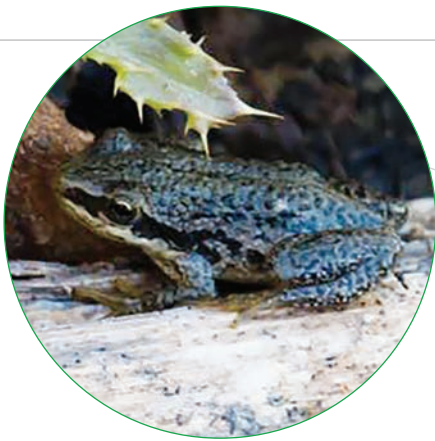


## Call of the Wetland citizen science program challenged participants to systematically survey 52 wetland sites in search of amphibians over three seasons (2017-2019).

Pictured below are the three amphibian species present in Calgary (from top): Boreal Chorus Frog, Wood Frog and Tiger Salamander.

Six species have historically been found in Calgary: boreal chorus frog, wood frog, northern leopard frog, tiger salamander, Canadian toad, and western toad. However, it was previously unknown which are still here and where. Because amphibians are important indicators of wetland health, knowledge on their occurrence is a step toward an understanding of how to better manage and protect Calgary's urban wetlands.

Thanks to 200 citizen scientists, who submitted over 1,000 amphibian observations, we are confident we now know which amphibian species are present in Calgary: Boreal Chorus Frog, Wood Frog and Tiger Salamander.



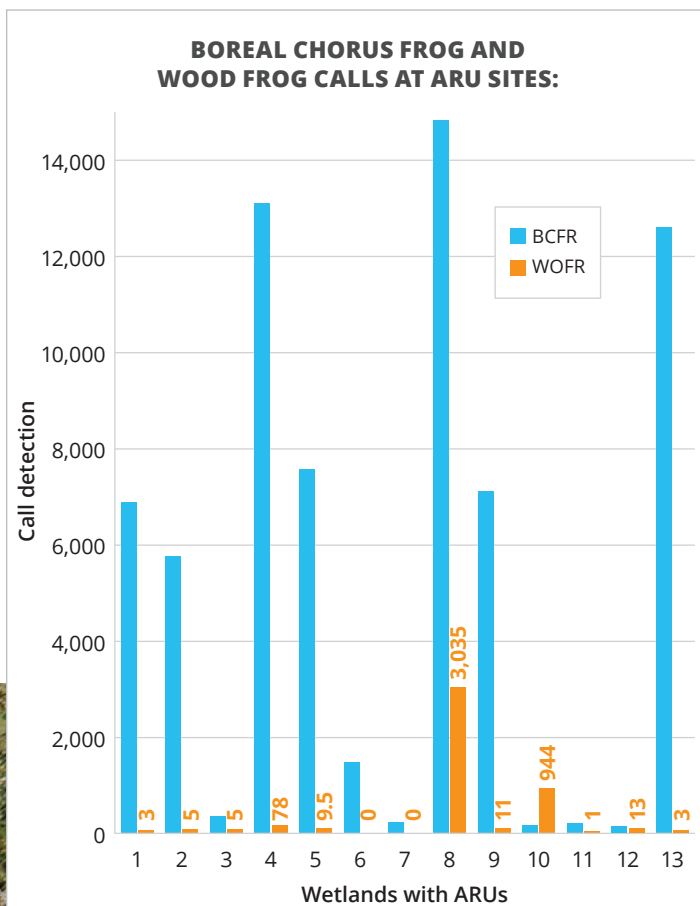
PHOTOS BY (FROM TOP) VANESSA CARNEY, DOROTHY HILL, KRIS KENDELL

## Quality control

A key component of any research project is to ensure quality control. To address this, acoustic recording units (ARU) were installed at 8 wetland sites in 2017 and 2018 to record amphibian calls. Data from the ARUs were compared to participant observations at the same sites to determine:

- Citizens correctly identified boreal chorus frog at a site 82% of the time – great job!
- Citizens correctly identified wood frog at a site 36% of the time\* – not great, but not as bad as it looks.
- Citizen scientists only reported species that the ARU also found – great job!

*\*The majority of ARUS recorded less than 10 calling detections of wood frog across 6-8 weeks (this is very low!). The chance of a participant being present during one of these calling events was low. We think these low calling rates might be lone individuals moving through the area and do not represent a local population of wood frog at that pond.*



ARUs recorded calls at 13 sites. This graph shows the number of times boreal chorus frog (blue) and wood frog (orange) were recorded calling. The number of wood frog calls are labeled to show the low detection. Citizen scientists did not report wood frog at sites where less than 10 calls were recorded.

## Occupancy modeling

Just because a species was not observed at a particular site, does not necessarily mean the species is not there! To account for this, we modeled the repeat citizen science observations to find the probability that any wetland is occupied by boreal chorus frog and wood frog. Occupancy modeling also can evaluate how important a landscape feature (ie. wetland size, habitat type) is to a particular species. Results allow us to better assess wetlands city-wide, rather than just at our subset of survey sites.

RESULTS:

- Wood frog
  - You have a 52% probability of finding a wood frog at a wetland in Calgary.
  - Wood frogs prefer wetlands nearby forests and natural grasslands, and that are away from roads and other paved areas.
- Boreal chorus frog
  - You have a 70% probability of finding a boreal chorus frog in a wetland in Calgary.
  - Boreal chorus frogs prefer wetlands away from rivers and streams, but with natural or even manicured grass areas nearby.

## Tiger salamander

Although tiger salamander was observed at 7 survey sites, we did not have enough data to model occupancy. Tiger salamanders don't produce a sound and are nocturnal, burrowing creatures. Our methodology of audible detection of calls and visual daytime surveys was not optimal for detecting this species. To better our understanding of tiger salamanders, report sightings with photos to 311!



## What's next?

### Sharing the data!

Call of the Wetland has already informed City of Calgary's decisions on wetland restoration locations, and the City will continue to use the data to inform development and management decisions, as well as to engage Calgarians on the importance of wetlands. The dataset is available upon request—email [info@rockies.ca](mailto:info@rockies.ca) if you are interested.

### Continued wetland research

Continued research is essential to understanding the implications of the urban environment on amphibian presence and wetland health. We initiated an "Urban Wetland Research" network in Calgary, so future research can collaborate and build off of our initial findings. Miistakis is using Call of the Wetland modeling to inform development of amphibian connectivity models to help us protect biodiversity in Calgary.

#### THANKS TO OUR PARTNERS



Miistakis  
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#### THANKS TO OUR FUNDERS



Call of the  
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#CallOfTheWetland

