2022 Rouge River Watershed Frog and Toad Survey

Friends of the Rouge
650 Church Street Suite 209, Plymouth, MI 48170

www.therouge.org

The Rouge River Watershed Frog and Toad Survey is a volunteer listening survey that has been coordinated by Friends of the Rouge since 1998. Volunteers are trained to recognize local frog and toad breeding calls and survey quarter-square-mile blocks within the Rouge River watershed from March through July. The purpose of the survey is to collect baseline data on the distribution of frogs and toads within the watershed as well as to give residents of an urbanizing area a positive experience with their local natural areas.

Funding for the 2022 survey was provided by Bosch, WM,
and the Fred A. and Barbara M. Erb Family Foundation

Summary of Volunteer Effort

The training for the 2022 Frog & Toad Survey was presented virtually in two separate sessions over two Saturdays. Part I, introduction, was held on Feb. 12, 2022 via Zoom with 48 attendees. Former surveyor Kathy Ableson presented the app she designed called Froggyvoice. Part II was held on Feb. 26, 2022 with 44 attendees. Four veteran surveyors provided their advice and experience: Marla Moiseev, Barbara Siepierski, Diane Rushlow and Bill Bialkowski. They shared their excitement about being outside at night and seeing fireflies, educating neighbors, and discussed what led them to sign up for the survey.

A total of 173 people signed up to survey: 125 veteran surveyors and 48 new surveyors. To support the surveyors, a group listen was held at West Bloomfield Woods Nature Preserve on April 29, 2022. It was co-sponsored by West Bloomfield Parks and Recreation and led by naturalist Lauren Azoury. Veteran volunteer Maggie Laster attended and provided information about the survey and shared anecdotes on her experience for the 17 attendees. Surveyors were offered a quiz was to test their skills at identifying calls. Twenty volunteers participated.

A total of 181 survey blocks were assigned. Of the 165 people who signed up to survey, 87(52%) followed through and submitted data covering 133 blocks. Surveyors contributed 429 hours of time.

Online Data Submission

Friends of the Rouge (FOTR) has been working to develop an effective and easy to use way for volunteers to submit their data through an online form. This would improve the quality of the data and save time for staff having to input data by hand. In 2018, with assistance from long-time volunteer Corrie Fochler, FOTR introduced an ArcGIS form-

based field data entering system called Geoform for volunteers to submit their data. Many volunteers successfully used it to track their data. In 2019, FOTR discovered that many of the submissions indicated the wrong survey block. While cell phones can locate where volunteers are, poor connections out in the field often led to submissions for the wrong location. The Geoform was put on pause.

In 2021, Schoolcraft College student Maddy Hanton, under the direction of professor Deirdre Devlin, spent a semester trying to develop a solution using another ArcGIS based app called Survey123. In early 2022, FOTR hired contractor Mike Dagle who tailored the application to require surveyors to confirm their survey block before they can submit their data. Surveyors were offered the opportunity to test out the app part way through the 2022 survey season. Twenty- four surveyors tested it out and provided feedback. Several changes were made based on their feedback. This Survey123 app will be introduced for all surveyors who want to use it in 2023.

Survey123 and similar apps are increasingly being used to collect field data due to their ease of use and real time tracking on data. The Michigan Department of Natural Resources and the Michigan Department of Environment, Great Lakes and Energy have begun using them. FOTR staff and interns used an app called Field Maps to collect data on European frogbit in 2021 and 2022 and FOTR worked with UM student Olivia Williams to use Survey123 to input water quality and habitat data at fish sampling locations.

2022 Data Collection

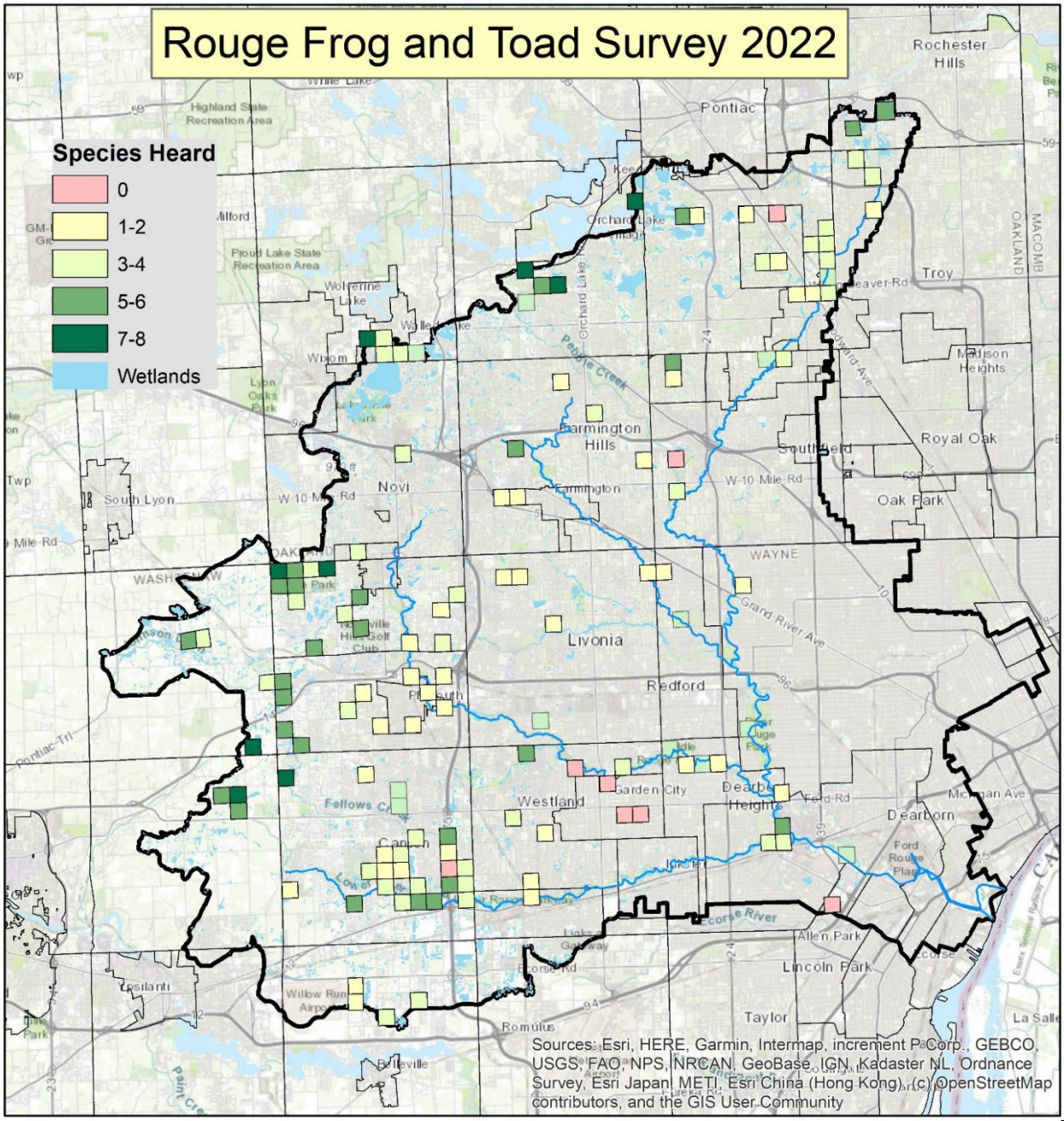
Data was received for 134 blocks. Of those 134, 120 or 90% were fully surveyed, while 14 blocks had a few casual observations. The casual observations are useful in confirming a species for a block. Frequent surveys throughout the season are needed to verify that the block has been fully surveyed and to confirm the number of species in a block.

2022 Survey Results

For the 120 blocks that were fully surveyed, an average of 2.8 species was heard per block (Table 1). This is down from 3.3 species per block heard in 2021. An average of 7 species were heard in each subwatershed. Eight blocks that were fully surveyed had no species calling (map p. 3).

Three of the seven subwatersheds had all eight species calling in at least one block. The Middle 1 and the Lower 1 had the highest species diversity at 3.9 and 3.8 species per block. The Middle 3 had the lowest percentage of species heard at 1.6 per block. Northern leopard frogs were missing from three subwatersheds.

Table 1: Blocks by Subwatershed					
subwatershed	# blocks surveyed	avg. # species heard per block	highest # species heard in one block	Total # species in Subwatershed	Species not heard
Lower 1	31	3.8	8	8	
Lower 2	5	2.4	4	5	Chorus frog, Spring peeper, Leopard frog
Main 1-2	26	3.3	7	8	
Main 3-4	4	2.5	6	6	Spring peeper, Gray treefrog
Middle 1	33	3.9	7	8	
Middle 3	9	1.6	5	7	Leopard frog
Upper	12	2.8	5	7	Leopard frog
Total	**120**	2.8		7	



American toads, gray treefrogs and green frogs were the most commonly heard species in 2022 (Table 2). Northern leopard frogs were the least commonly heard followed by bullfrogs and wood frogs. American toads and gray treefrogs were the only species that were heard in more blocks than average.

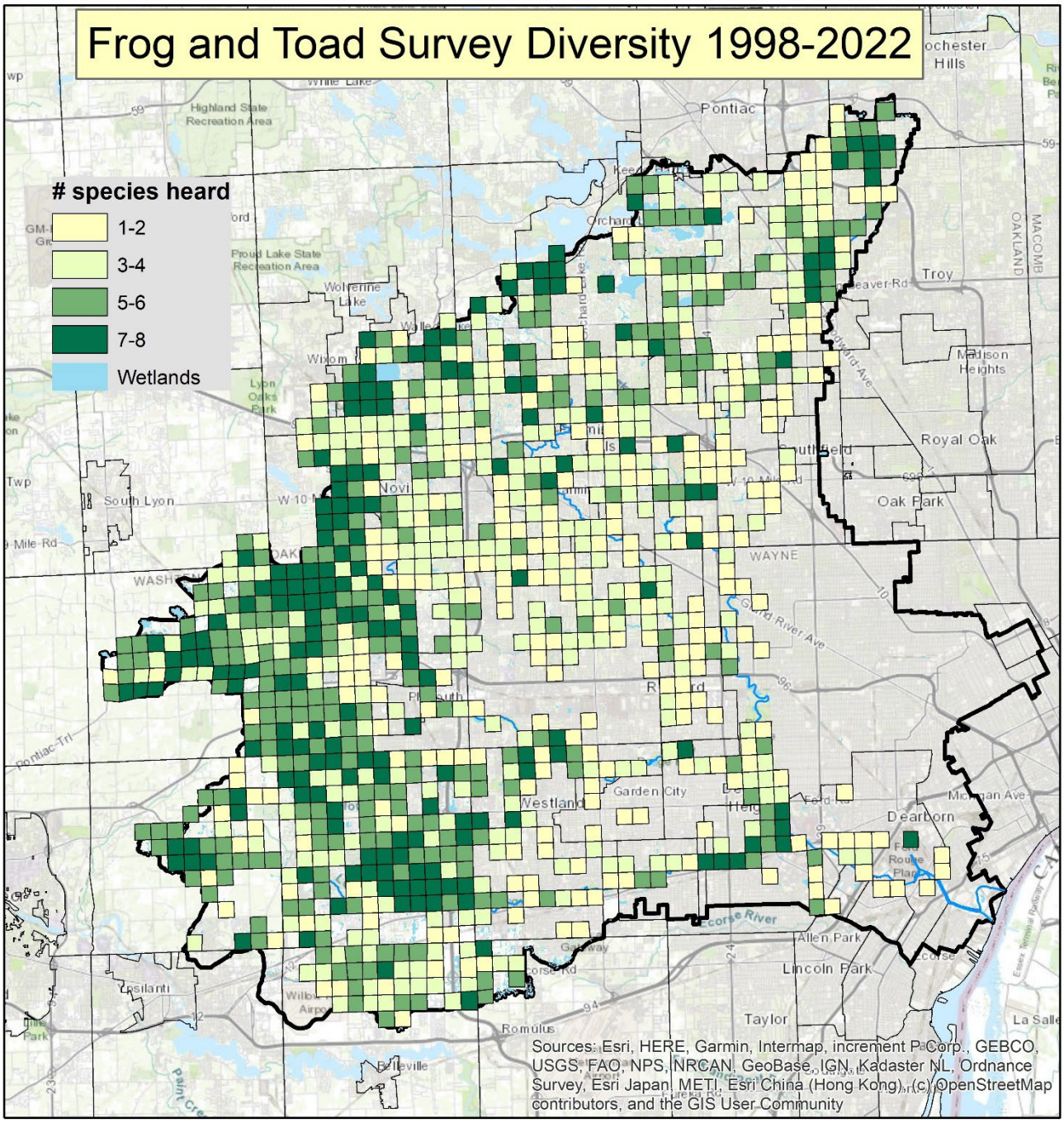
Table 2: Percent of blocks in which species was heard, five year spans

	2000-2005	2006-2010	2011-2015	2016-2020	2021	average	**2022**
Wood Frog	20	25	26	25	18	24	**20**
Midland Chorus Frog	50	50	46	53	42	49	**43**
Spring Peeper	48	54	48	50	41	49	**39**
American Toad	61	85	80	85	76	79	**82**
Northern Leopard Frog	12	17	17	18	15	16	**11**
Gray Treefrog	44	55	57	62	59	54	**65**
Green Frog	44	71	65	66	65	63	**62**
Bullfrog	10	16	20	21	18	17	**17**

The first frogs or toads any surveyors heard in 2022 were on March 6: wood frogs. This was followed by Midland chorus frogs on March 10. Green frogs were the last to start calling, on April 22 for Earth Day.

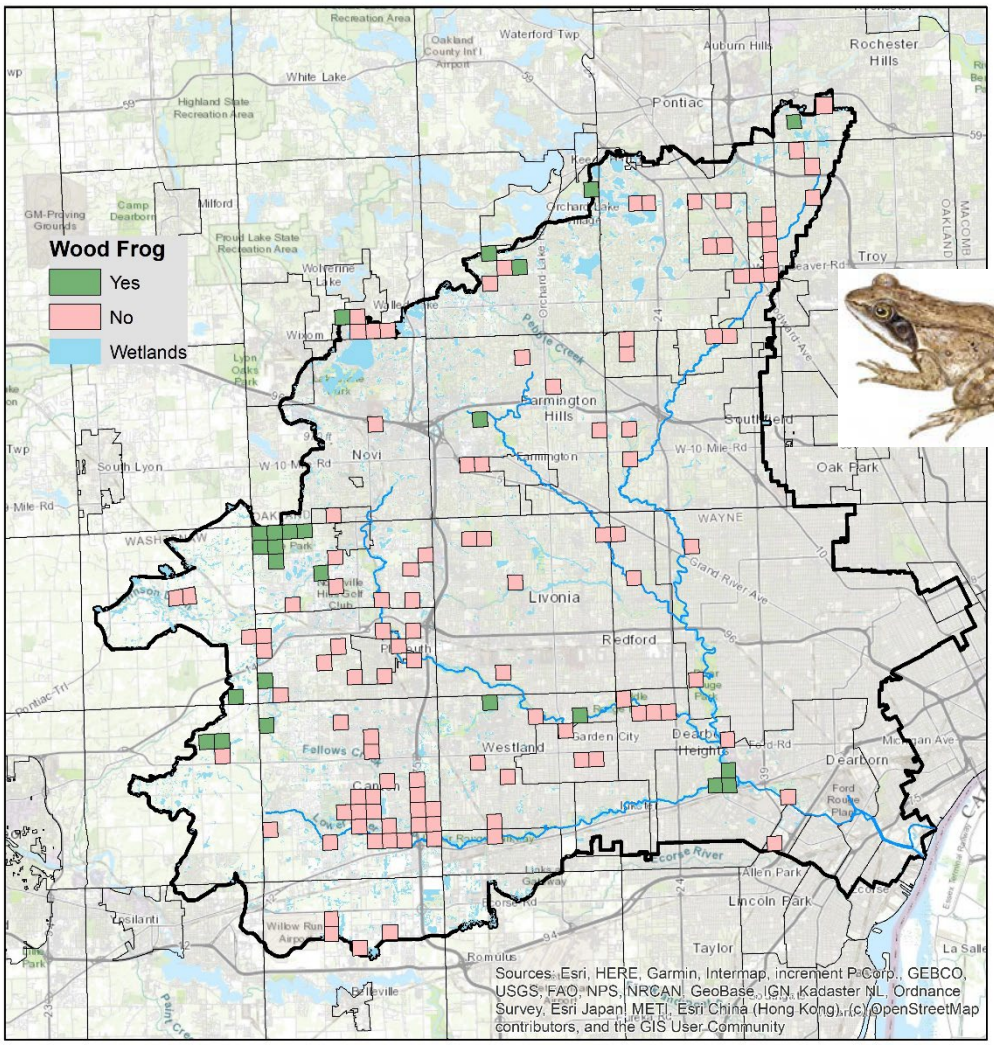
1998-2022 Diversity

The map on p. 5 shows the number of species heard for all blocks that were fully surveyed (had observations throughout the season) from 1998-2022. Almost all of the most diverse blocks (7-8 species heard) were on the outer edges of the watershed in the headwaters.

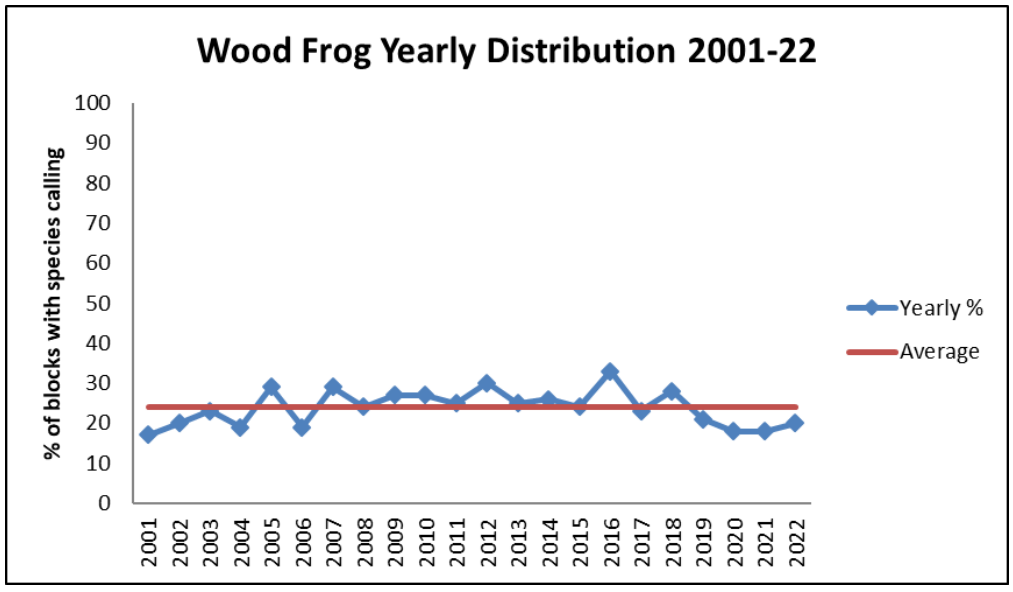

Frog and Toad Survey Diversity 1998-2022
species heard
1-2
3-4
5-6
7-8
Wetlands
Pontiac
Troy
Royal Oak
Oak Park
Madison Heights
Novi
South Lyon
Westland
Garden City
Dearborn
Lincoln Park
Allen Park
Taylor
Romulus
Ypsilanti
Belleville
Highland State Recreation Area
Proud Lake State Recreation Area
Wolverine Lake
Wixom
Lyon Oaks Park
WAYNE
Grand River Ave
Rouge River
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Species Maps

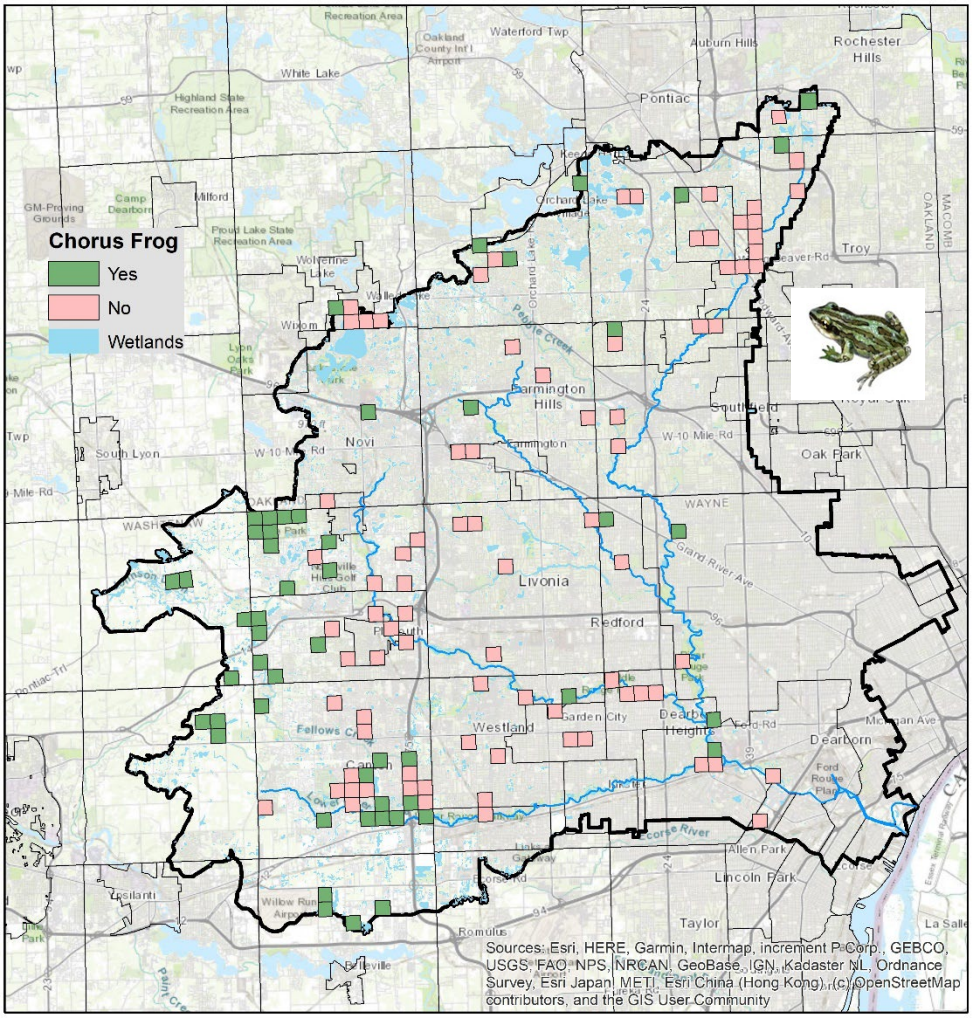
Wood frog (*Rana sylvatica*)



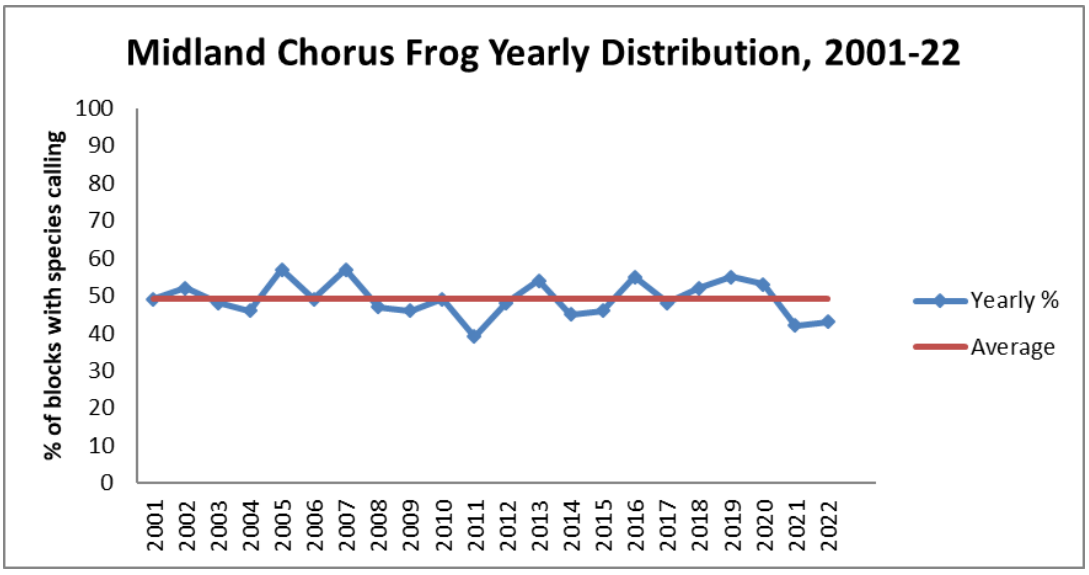
Wood frogs were heard in 20% of all survey blocks. This is below average (24%) for the species, which has been heard in fewer blocks since 2018. It is higher than last year (18%). Wood frogs were heard in all seven subwatersheds.



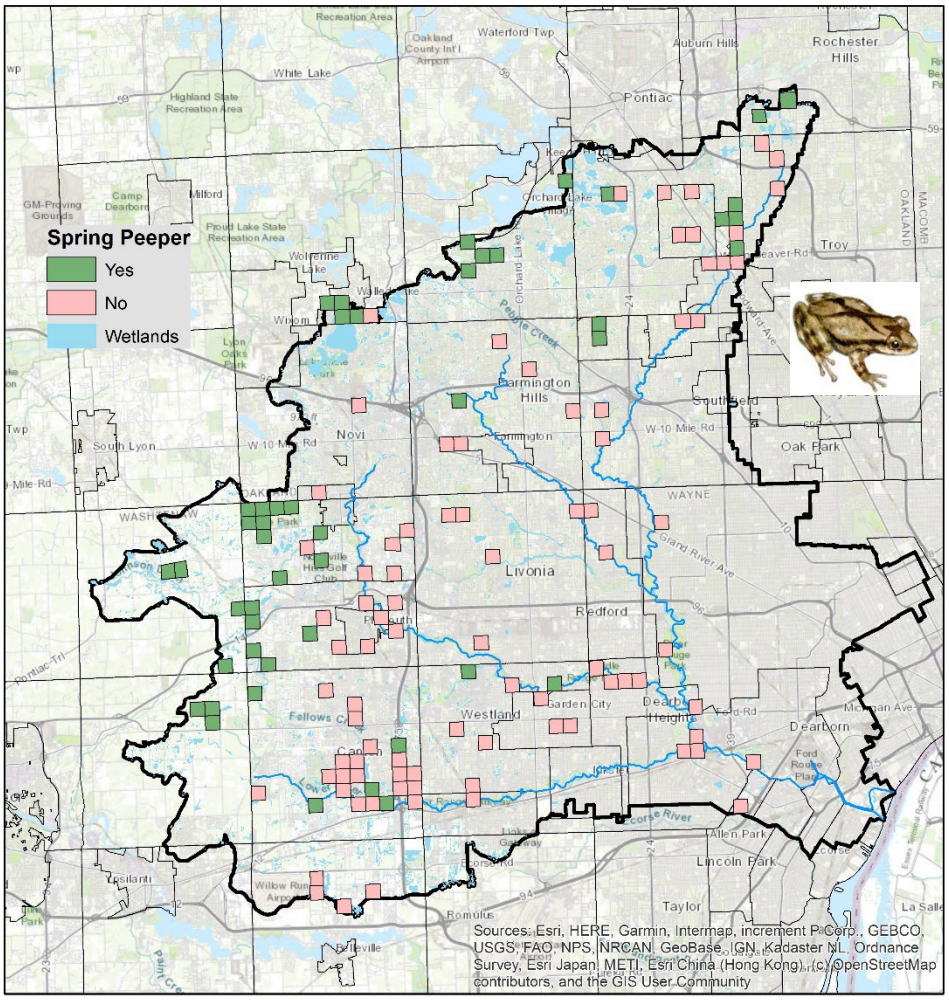
Midland Chorus frog (*Pseudacris triseriata*)



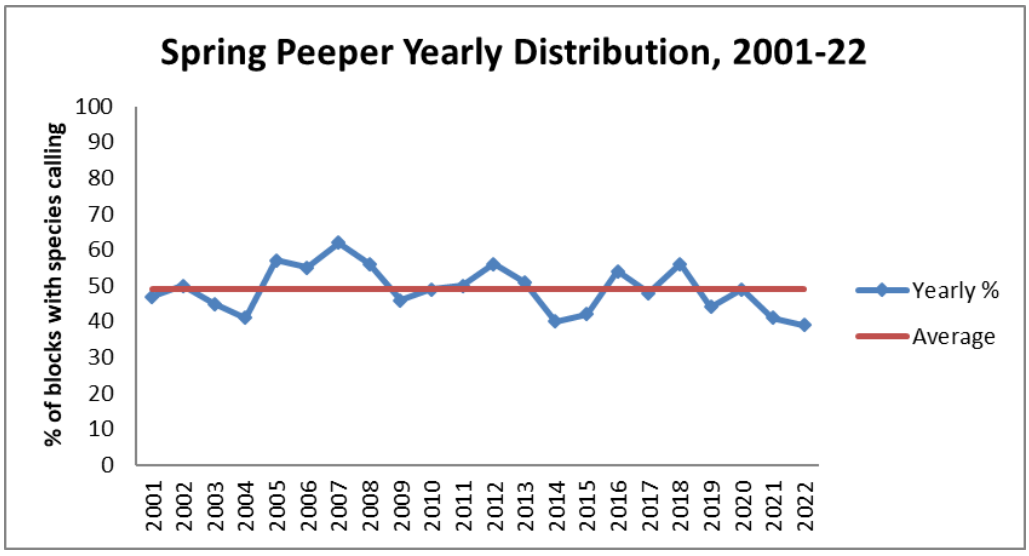
Midland chorus frogs were heard in 43% of all survey blocks. This is below average (49%) for the species which has been heard in fewer blocks since 2019. It is higher than last year (42%). They were heard in all seven subwatersheds.



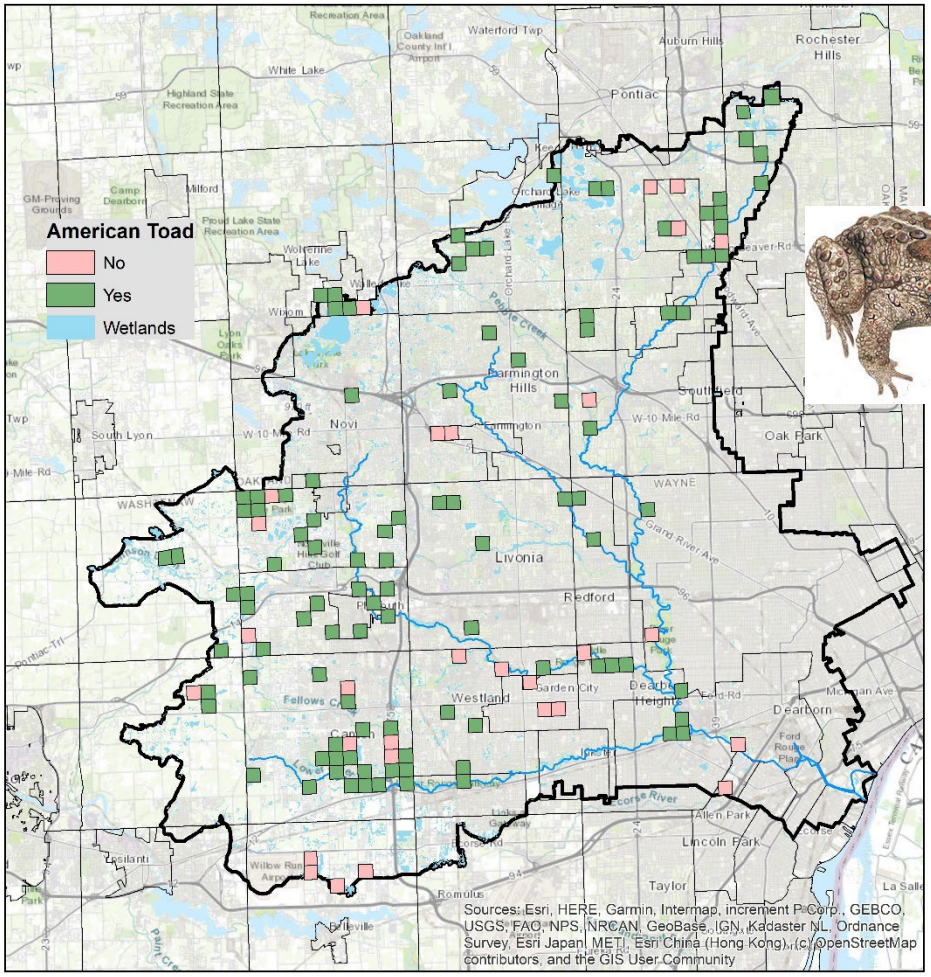
Spring peeper (*Pseudacris crucifer*)



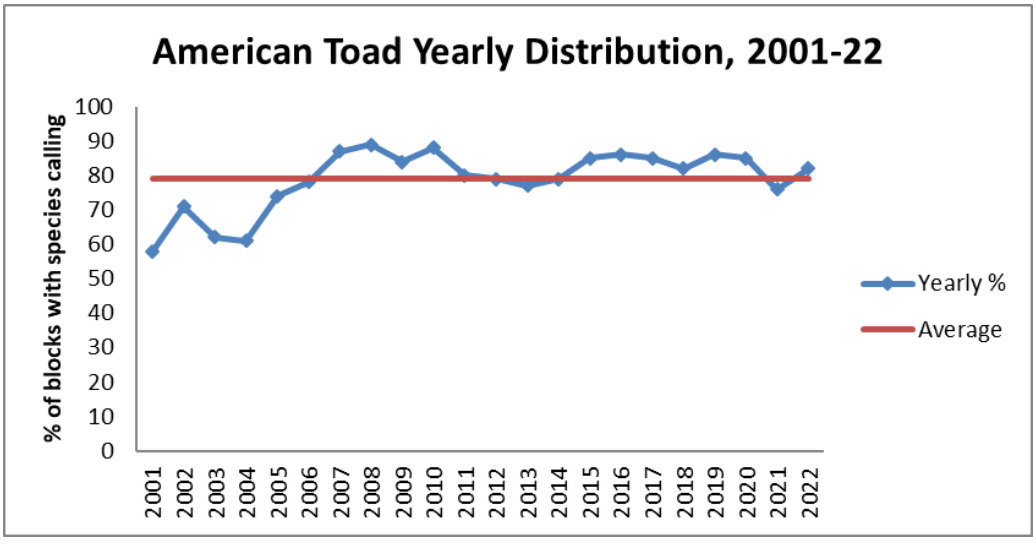
Spring peepers were heard in 39% of all survey blocks. This is below average (49%) for the species and continues a downward trend started in 2020. None were heard in the Lower 2 and Main 3/4 subwatersheds.



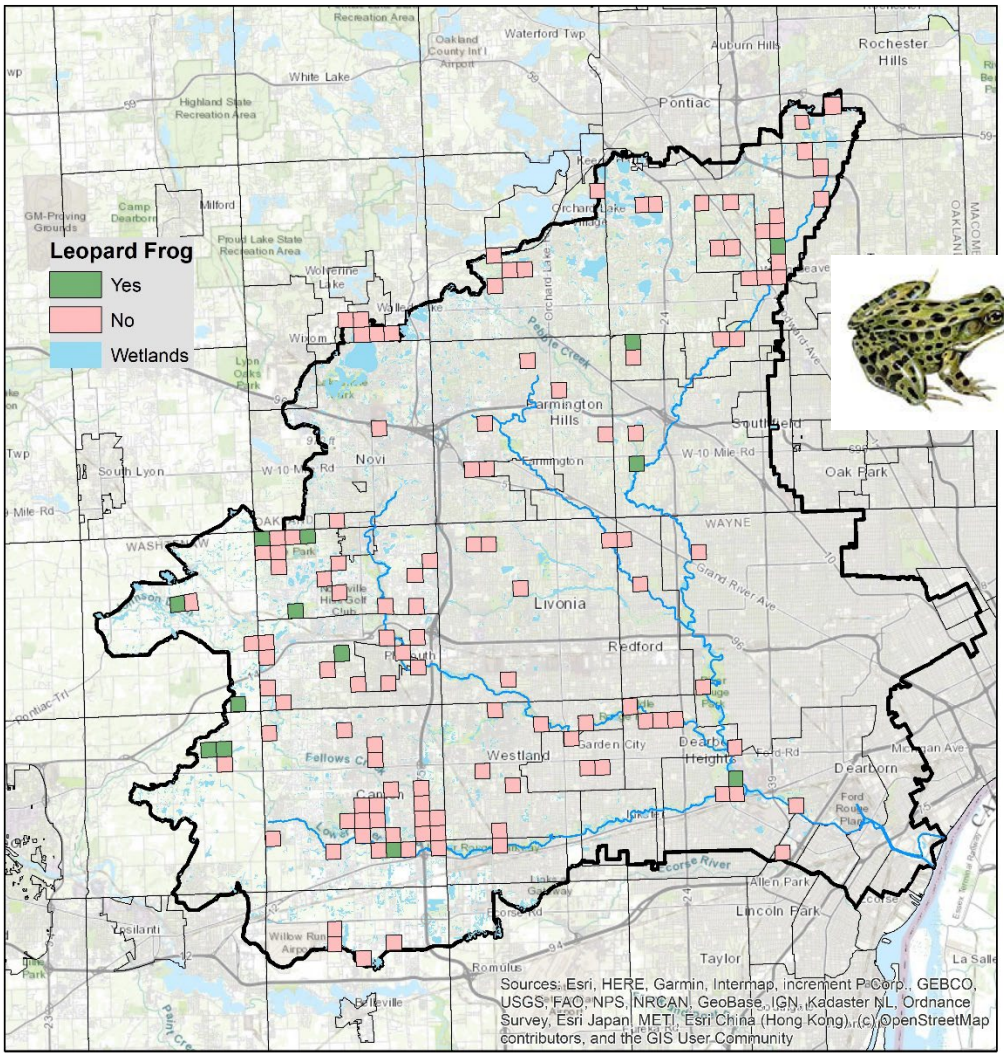
American toad (*Bufo americanus*)



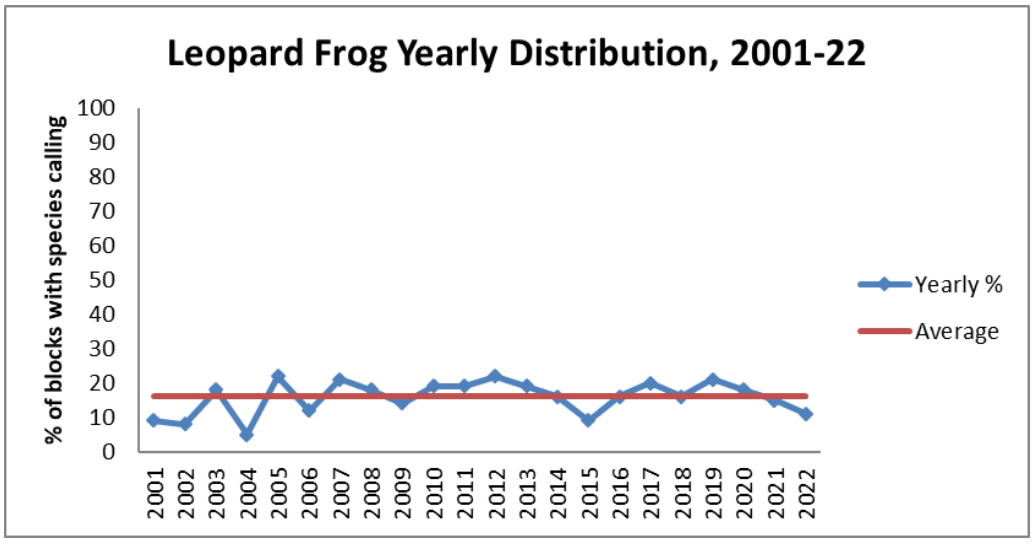
American toads were calling in 82% of all blocks which is above average (79%) and more than last year (76%). They were heard in all seven subwatersheds and continue to be the most commonly heard amphibian in the watershed.



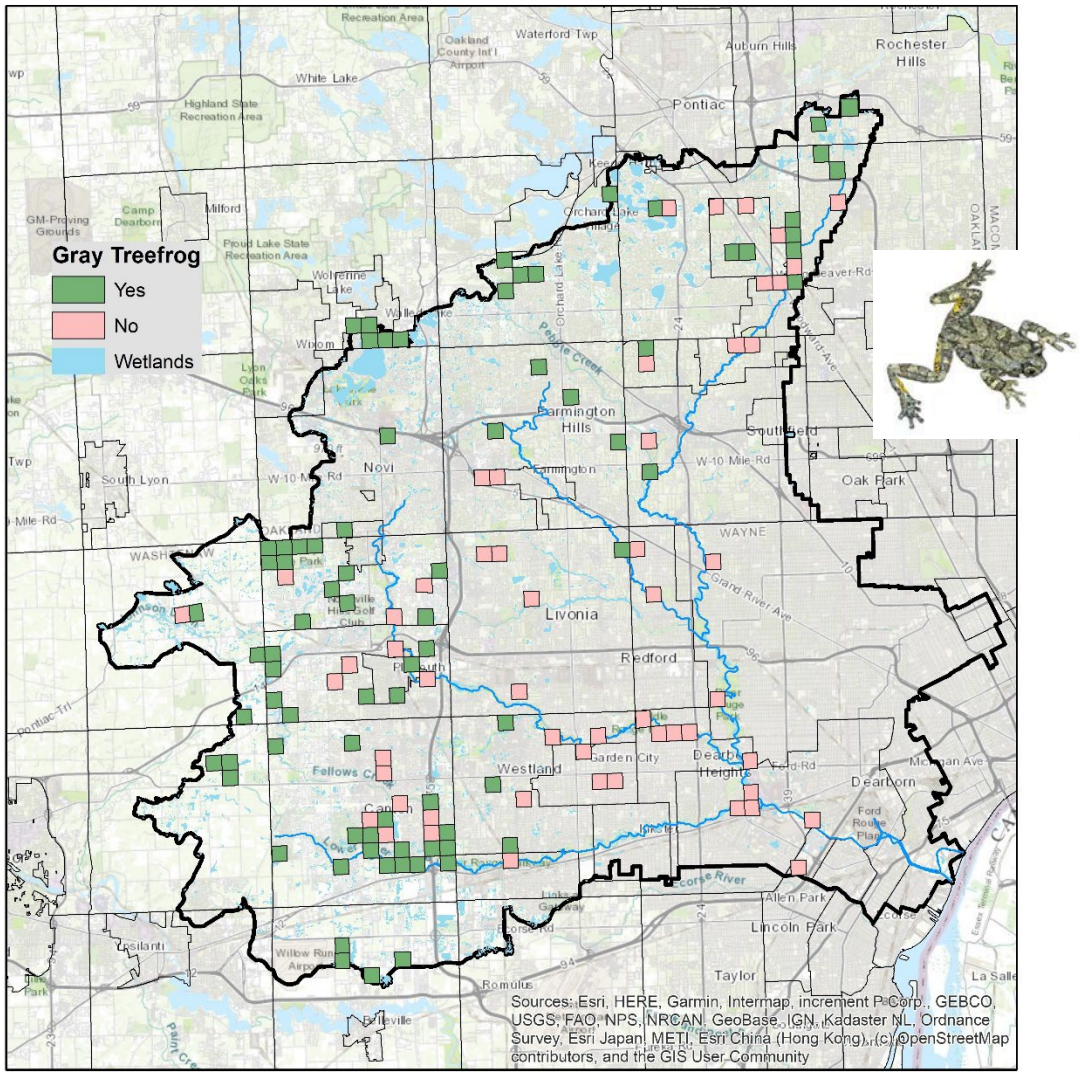
Northern leopard frog (*Rana pipiens)*



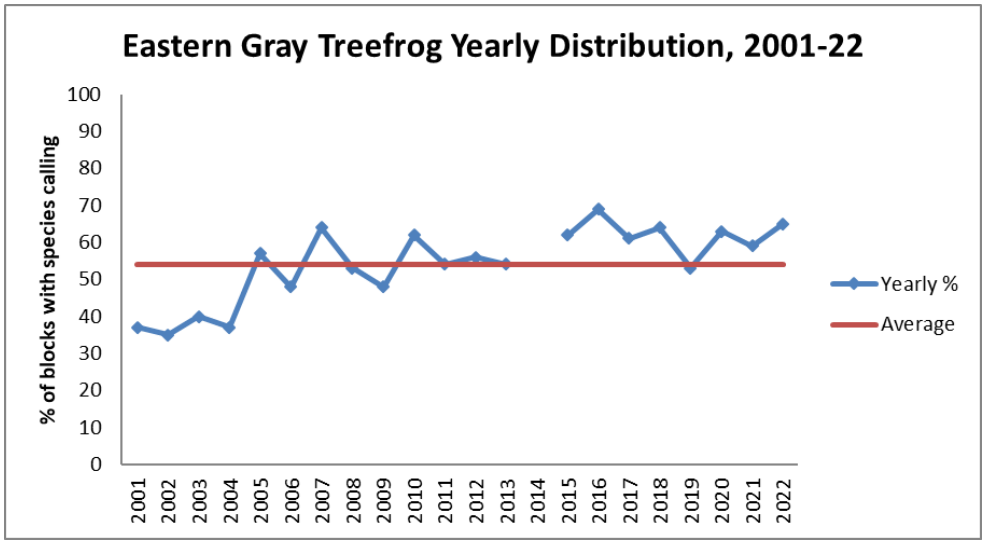
Northern Leopard Frogs, one of the most sensitive species in the watershed, were calling in 11% of all blocks. This is below average for this species (16%) and continues a decline started in 2020. They were missing from three subwatersheds: Lower2, Middle 3 and Upper.



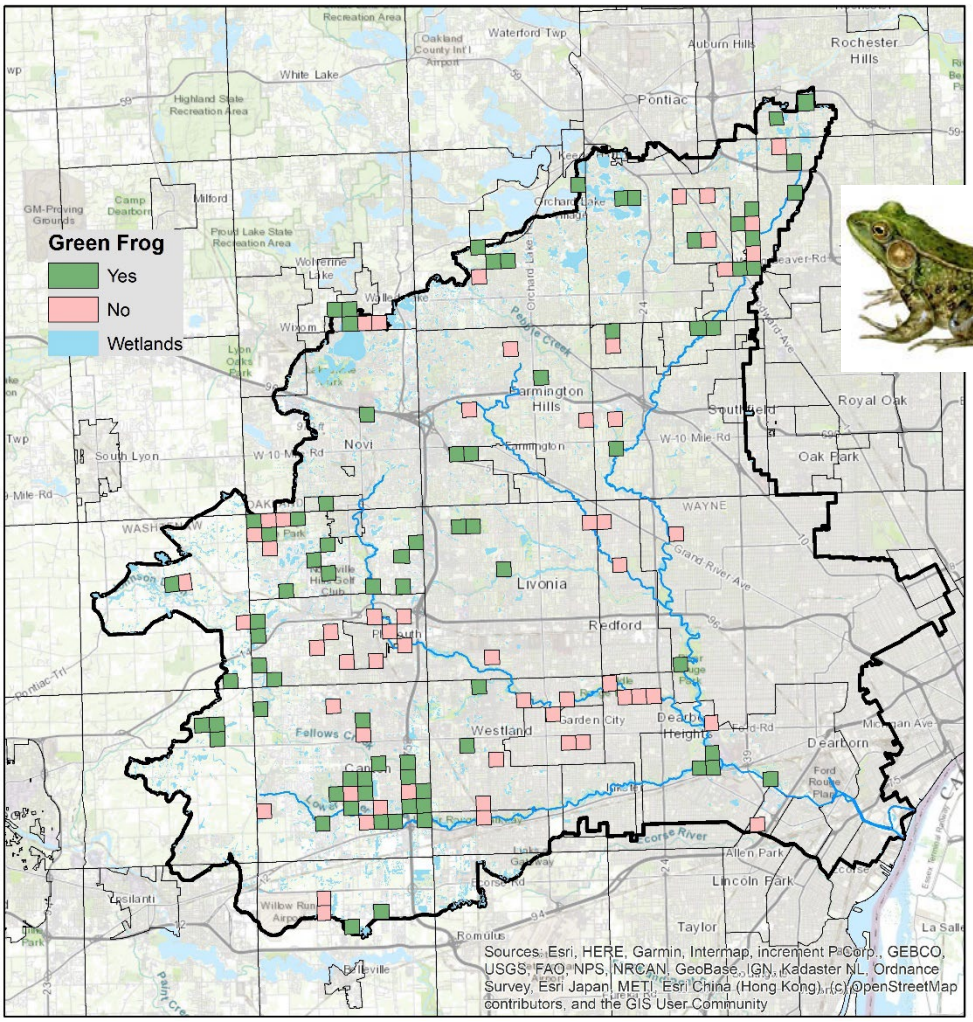
Gray treefrog (*Hyla versicolor*)



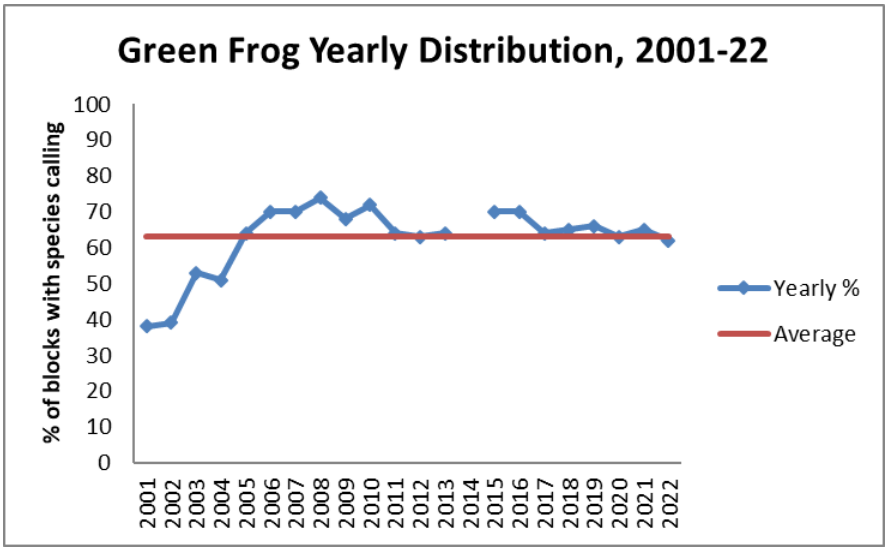
Eastern gray treefrogs were heard in 65% of all blocks, which is higher than average (54%) and higher than last year (59%). They were heard in all but the urbanized part of the watershed, the Main3/4.



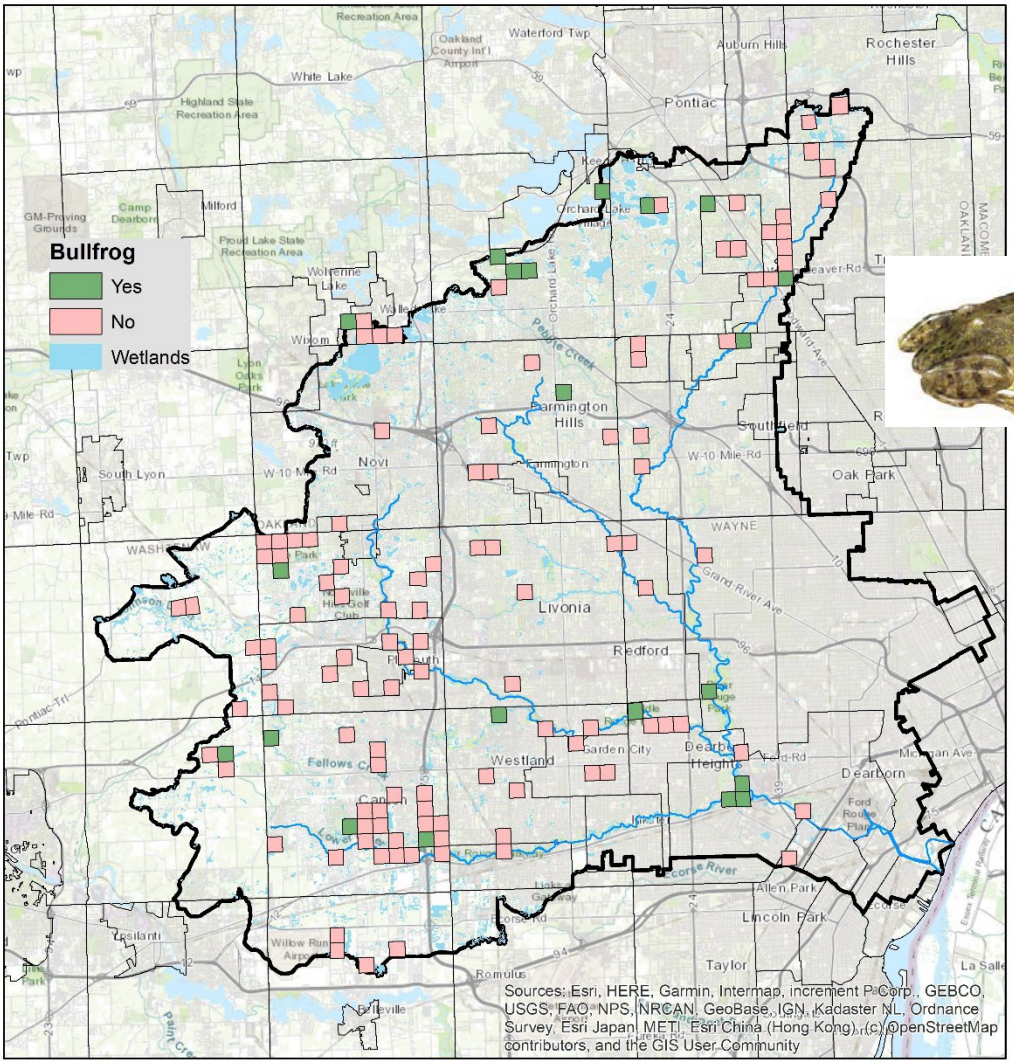
Green frog (*Rana clamitans*)



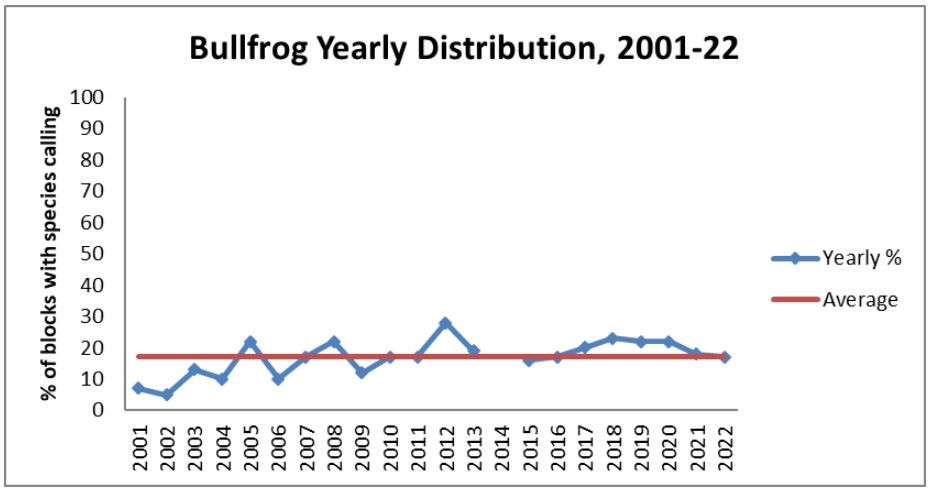
Green frogs were heard in 62% of blocks which is below average (63%) and fewer blocks than last year (65%). They were heard in all seven subwatersheds.



Bullfrog (*Rana catesbeiana*)



Bullfrogs were heard in 17% of blocks, which is average (17%) and less than last year (18%). They were heard in all subwatersheds.



Speaking up for Frogs and Toads

The data we collected is shared with surveyors and Rouge communities and has been used to guide restoration projects for the Rouge River Area of Concern. Eleven wetland restoration projects are in progress or have been completed that will provide increased quality habitat for amphibians. In addition, the data is being used to guide land use decisions. Much of this has come through surveyors who are some of the best advocates for protecting wetlands.

In February, Six Rivers Land Conservancy contacted FOTR to request data from FOTR for an area of land in the Village of Beverly Hills that was being considered for a nature preserve rather than being developed for homes. FOTR provided frog and toad, fish, and benthic macroinvertebrate data that showed the diversity of wildlife supported by this land. The Village is now working with the owners and Six Rivers to turn the land into a park and potentially repurpose a house there as a nature center.

In March, surveyor Beth Vaughn happened upon a sign for a rezoning an area in Canton near her survey areas. The rezoning would change Rural Residential to Single Family Residential, opening up the area for more intense development that could negatively affect amphibians. Beth sprang into action, attending hearings and speaking up for the value of the wetlands and the floodplain. FOTR member Al Vankerckhove also attended and spoke against the rezoning in favor of protecting the land. In September, the trustees voted against the rezoning.

Surveyor Sue Dorr was called into action this summer as one of her survey areas had been invaded by an invasive crayfish. Red swamp crayfish, native to the southern United States, are very aggressive, dig destabilizing burrows, outcompete the native crayfish and eat frogs, toads and their eggs and tadpoles. Sue volunteered to accompany FOTR and Michigan State University to collect and remove these animals. She has seen a decline in frog and toad species since the red swamp crayfish invaded. She will continue to monitor as the Michigan Department of Natural Resources works to eradicate them. Her many years of data collection provide a good baseline for the area prior to the invasion.

In October, surveyors Diane Rushlow and Linda Roman learned that one of their survey areas was slated for a development that could impact the frogs and toads they have been listening to for years. Diane reports: “I attended the Canton Board of Trustees meeting last night. I was given the opportunity to advocate on behalf of the Frogs and Toad. They were very supportive and shared the site plan with Linda and I. The area planned for the two buildings is on an elevated mowed grass area between the pond and wetland. They plan to fence off the construction site. Linda and I went to the area after the meeting; there is a bigger area than I remembered between the two areas. It would be great if they picked another site, but it looks like they plan minimally impact the frog and toad habitats. I plan to keep my four blocks for the 2023 survey; I will be keeping a close watch on this block.”

Thank you, surveyors, for speaking up for the frogs and toads!

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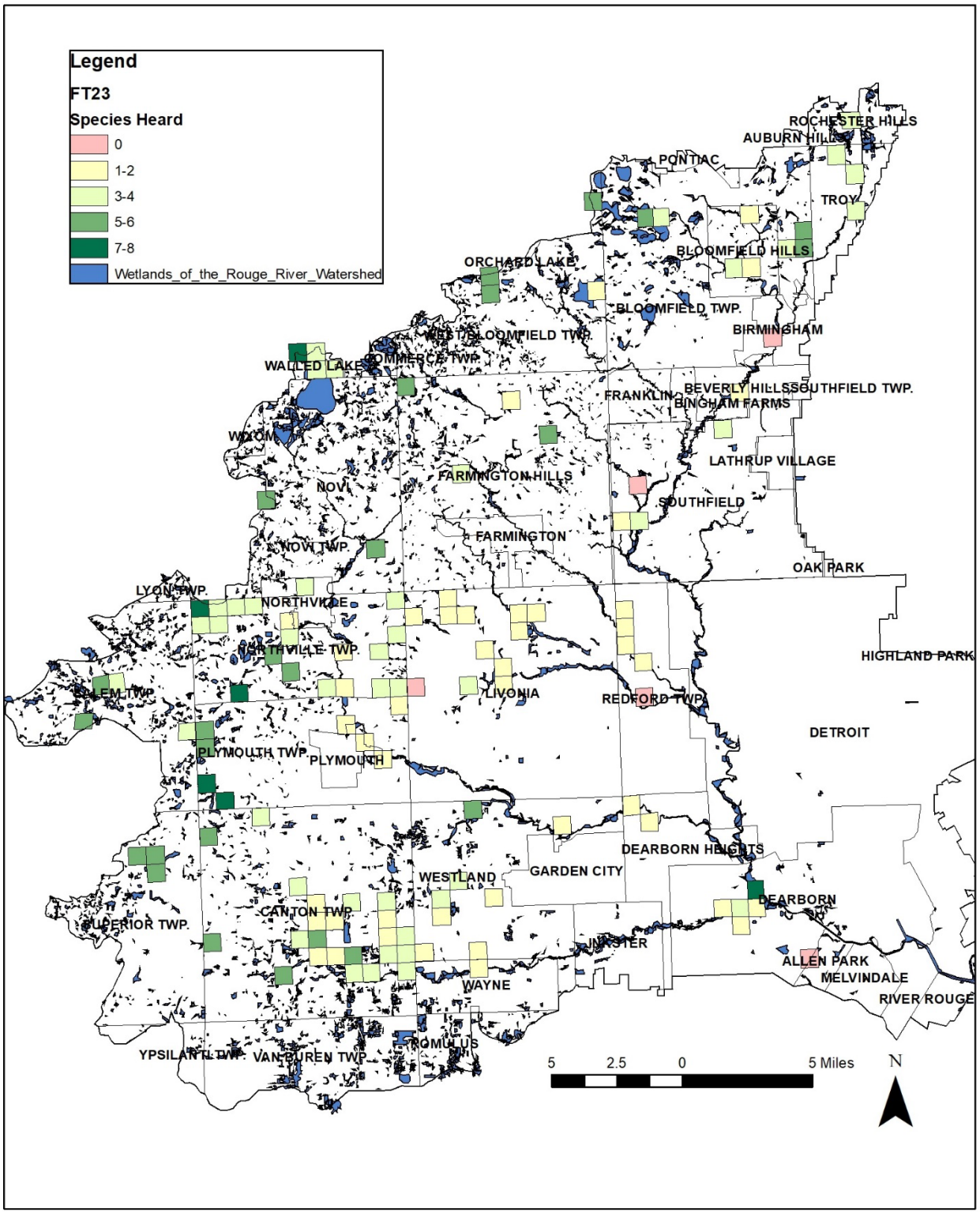
A total of 243 people signed up to survey an area for frogs and toads: 127 veteran surveyors and 116 new surveyors. To support the surveyors and to provide an opportunity to practice listening skills, a group listen was held at West Bloomfield Woods Nature Preserve on April 28, 2023. It was co-sponsored by West Bloomfield Parks and Recreation and led by naturalist Lauren Azoury. Veteran volunteer Maggie Laster attended and provided information about the survey and shared anecdotes on her experience for the 19 attendees.

A total of 224 survey blocks were assigned. Data was submitted for 149 blocks. A total of 469 of the observations for 64 blocks were received via the Survey123 app showing that not quite half of the blocks are being surveyed using the app.

Map 1: 2023 Survey Results

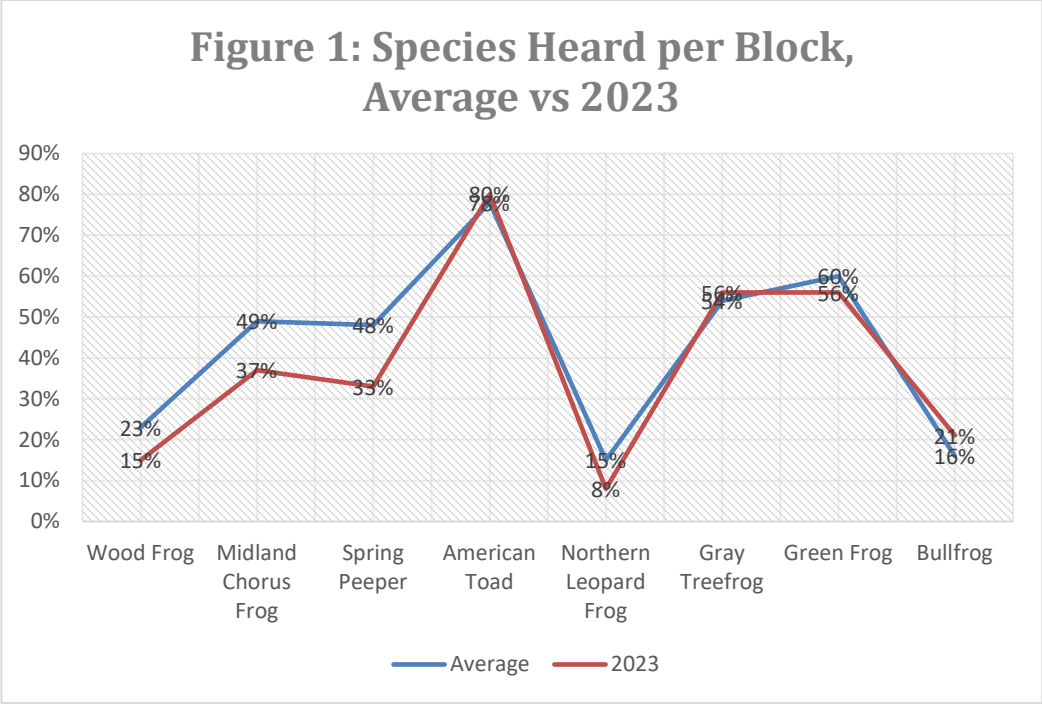


2023 Survey Results

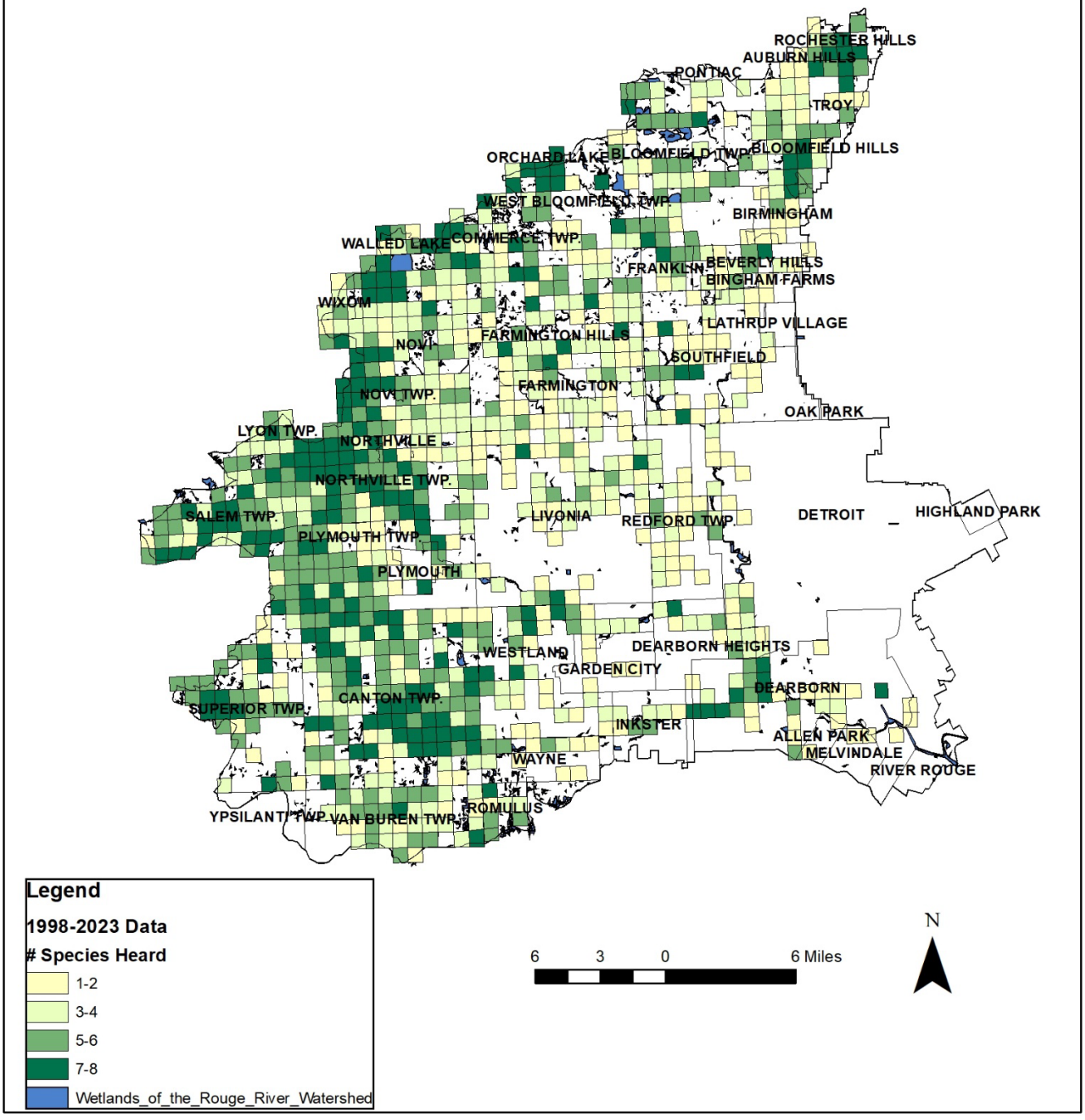
Surveyors submitted data observations for 149 blocks. Of those 149 blocks, 134 (90%) were fully surveyed. To be considered fully surveyed, the block must have at least four observation dates, spread between March and July. With consistent observations, we can generalize that the surveyor was able to document all of the species calling within the block. We also received partial data for 14 blocks. Occasional observations for a block are useful in documenting that a species was calling in that block in 2023, but it is not enough observations to say that other species were not also found there.

For the 134 blocks that were fully surveyed, an average of 3.1 species was heard per block. Five fully surveyed blocks had no species calling. American toads, green frogs and gray treefrogs were the most commonly heard species in 2023. Northern leopard frogs were the least commonly heard species, followed by wood frogs. Wood frogs, chorus frogs, spring peepers, and northern leopard frogs were all heard in fewer blocks than average for the species.

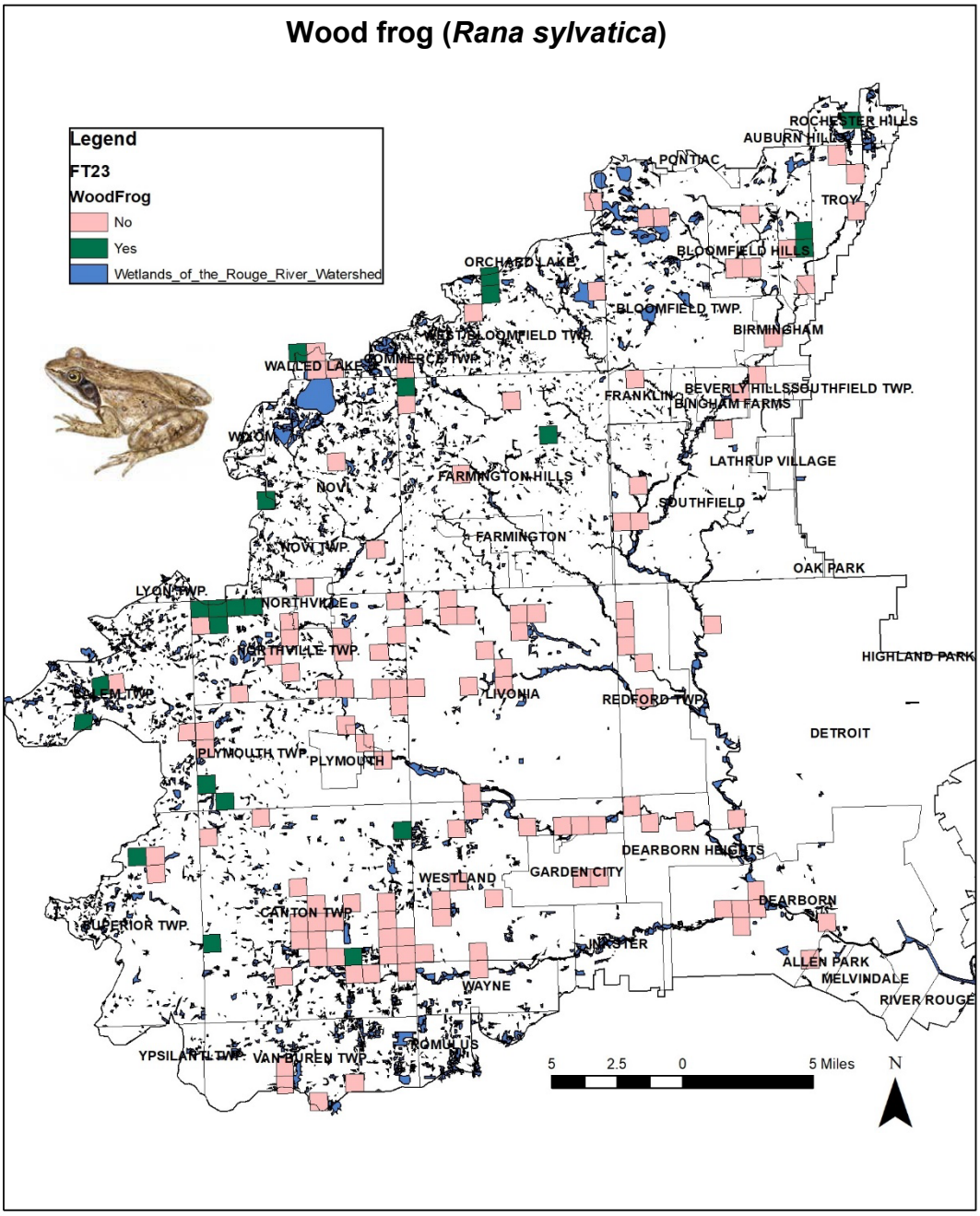
For each species, we looked at the trend over time in the percent of blocks in which they were heard (see Figure 1 and Species Maps and Graphs). Five of the species showed positive trends, especially gray treefrogs (slope +1.02), American toads (+.73), green frogs (+.55) and bullfrogs (+ .50). Spring peepers, chorus frogs and wood frogs were heard in fewer blocks but the slopes were far smaller. Since these three species are known to be more sensitive to environmental change, it will be important to keep a watch on them over time. The chaotic spring weather we have been experiencing due to climate change and ongoing development pressures in the watershed headwaters may be their largest challenge. Being sensitive to the needs of these fragile amphibians by protecting and improving wetlands will help them to survive.

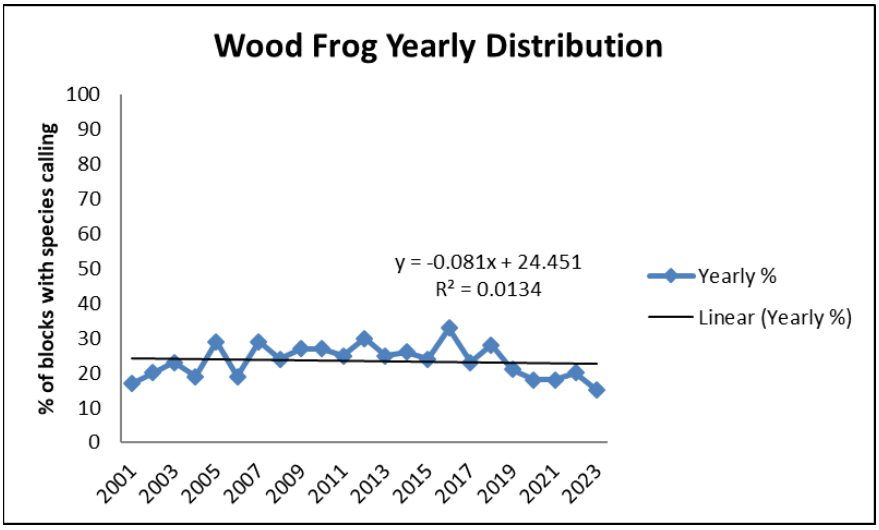


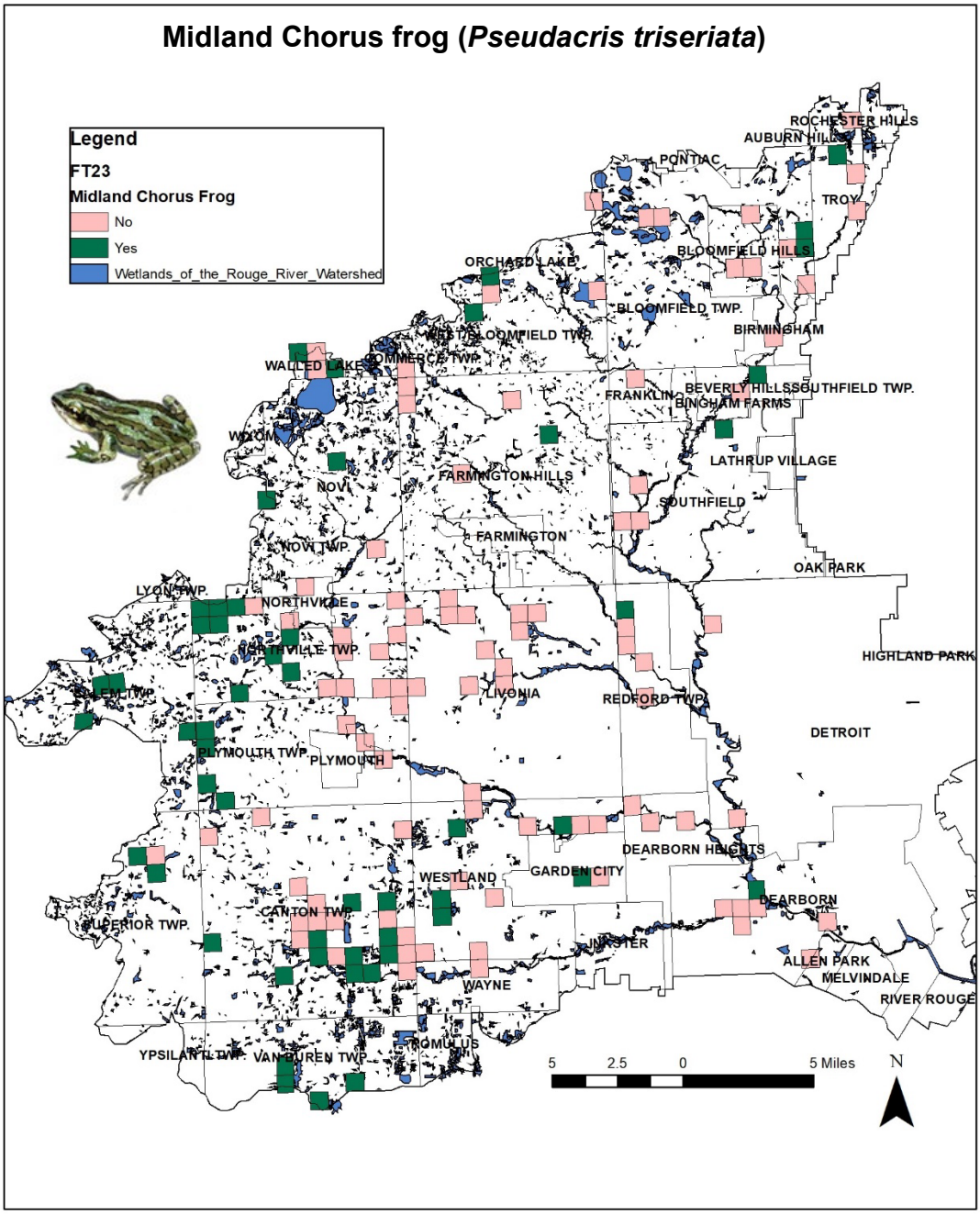
Rouge Frog & Toad Survey 1998-2023 Diversity

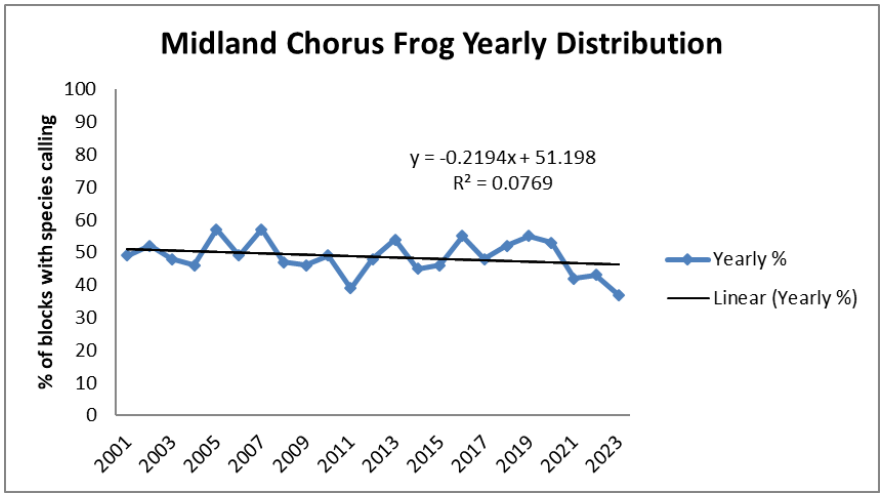


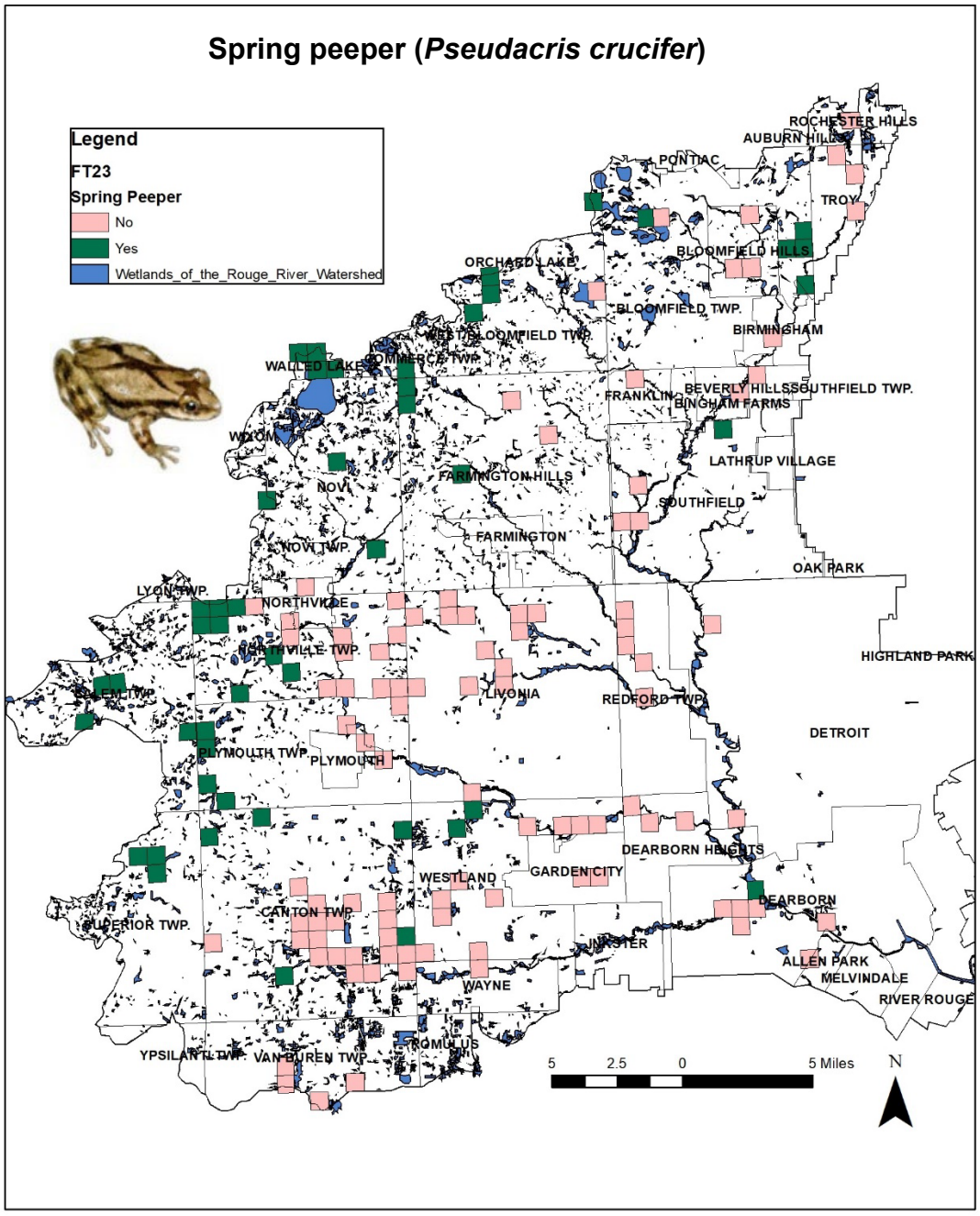
Species Maps & Graphs

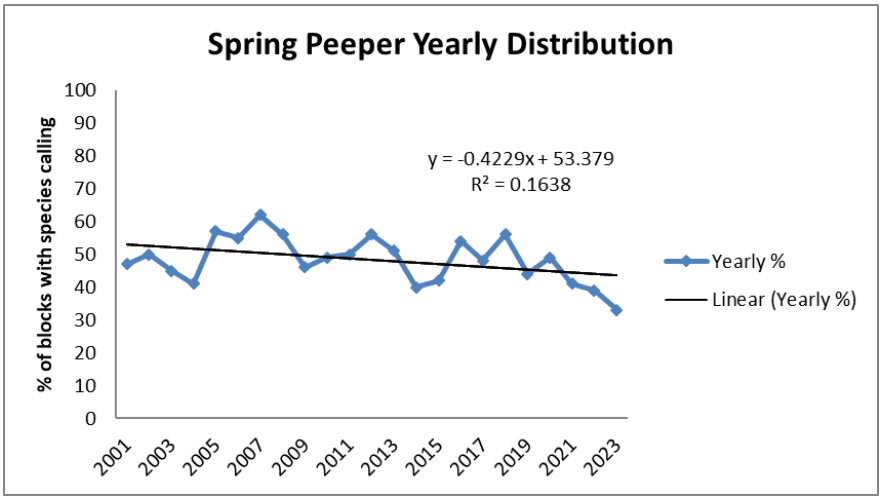

Wood frog (*Rana sylvatica*)
Legend
FT23
WoodFrog
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
BIRMINGHAM
WEST BLOOMFIELD TWP.
COMMERCE TWP.
WALLED LAKE
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
NORTHVILLE TWP.
HIGHLAND PARK
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
DEARBORN
CANTON TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N

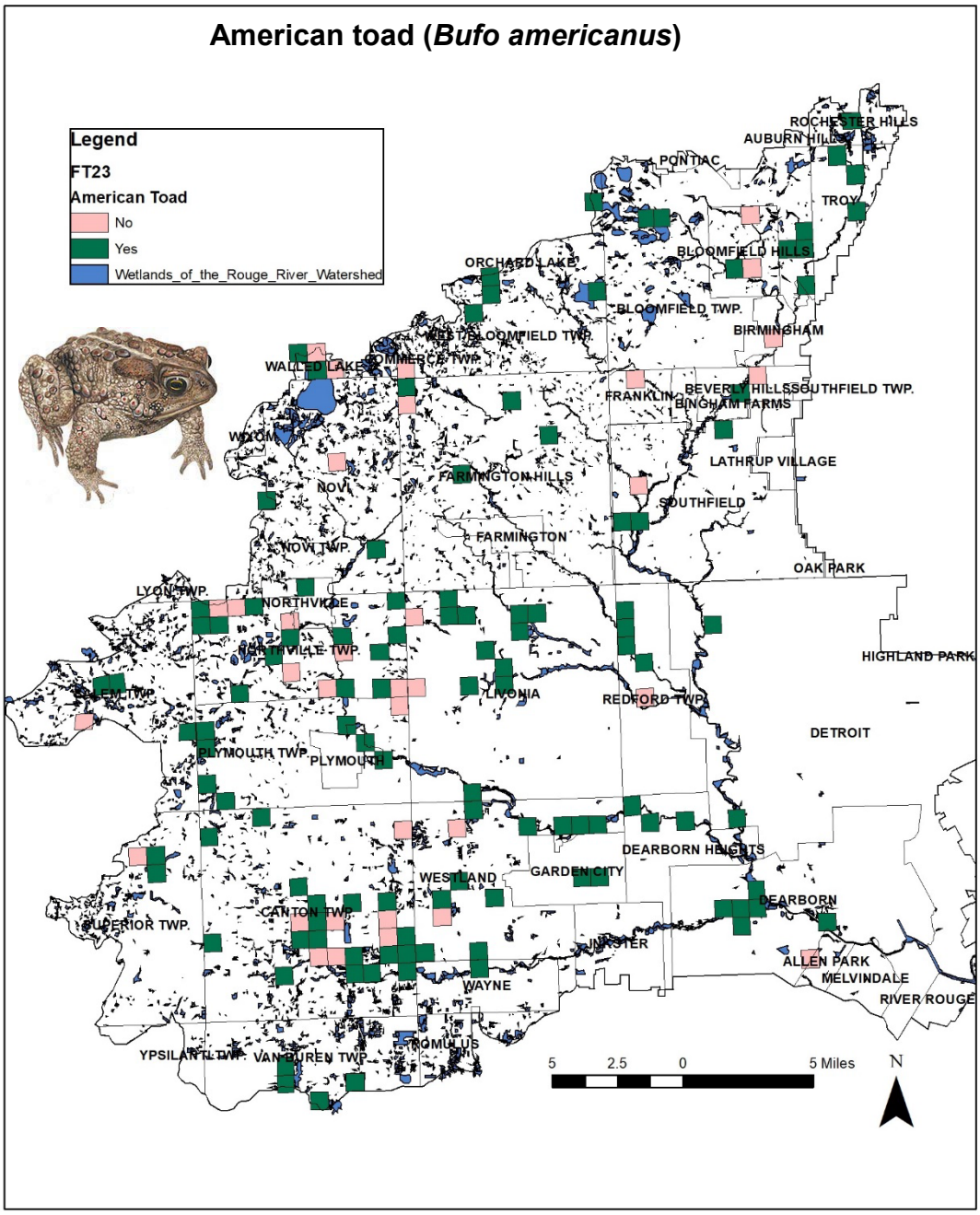

Wood Frog Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
y = -0.081x + 24.451
R² = 0.0134
Yearly %
Linear (Yearly %)
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023

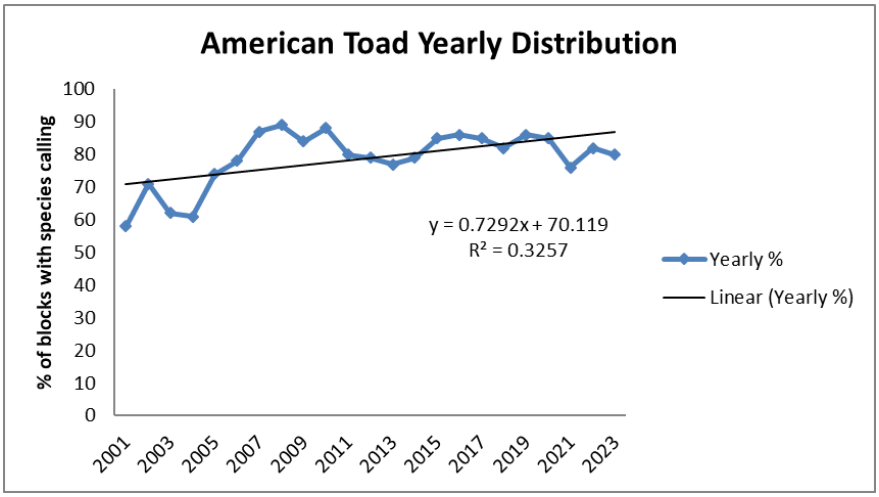

Midland Chorus frog (*Pseudacris triseriata*)
Legend
FT23
Midland Chorus Frog
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
WEST BLOOMFIELD TWP.
BIRMINGHAM
WALLED LAKE
COMMERCE TWP.
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
NORTHVILLE TWP.
HIGHLAND PARK
SALEM TWP.
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
DEARBORN
CANTON TWP.
SUPERIOR TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N

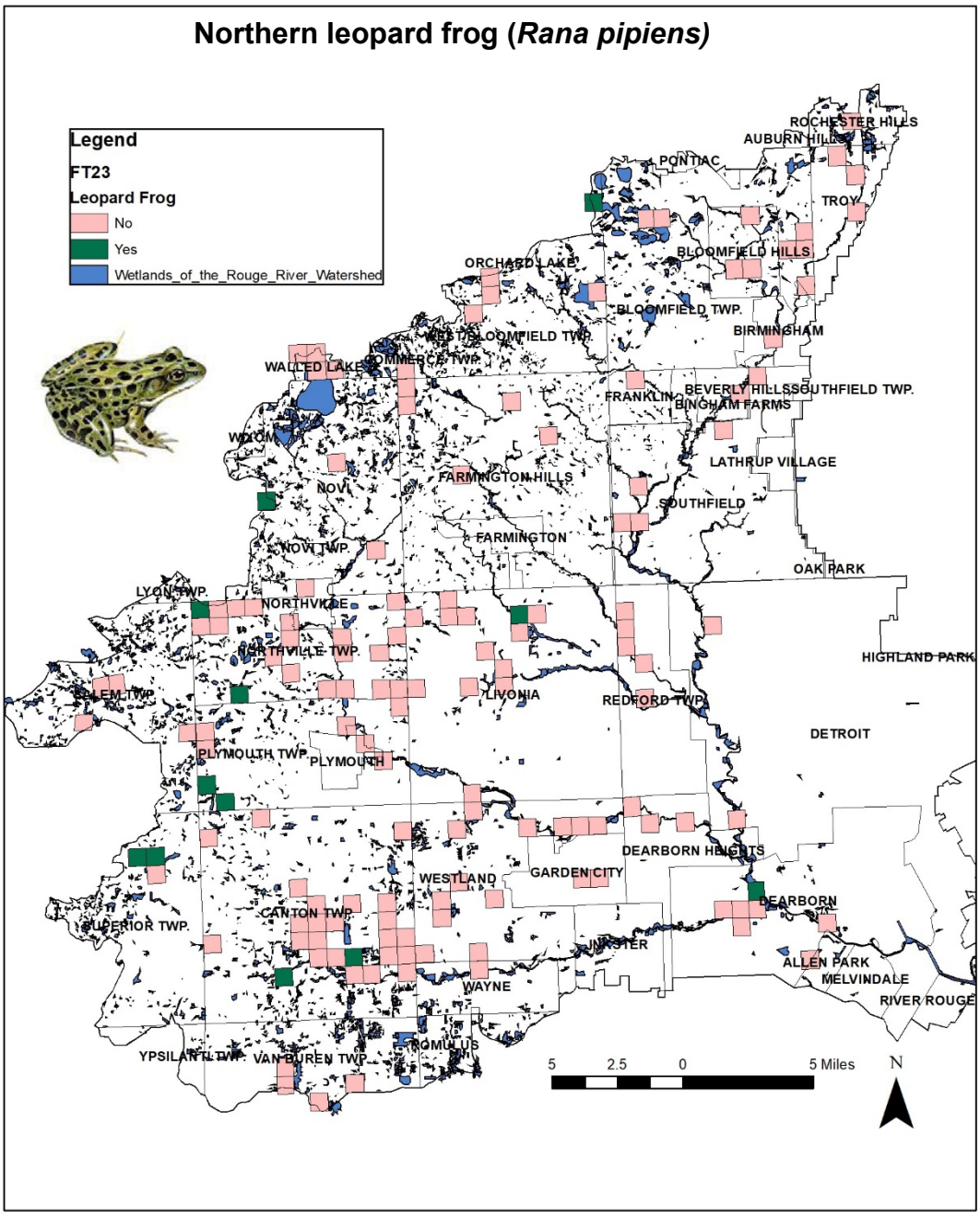

Midland Chorus Frog Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
y = -0.2194x + 51.198
R² = 0.0769
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Yearly %
Linear (Yearly %)

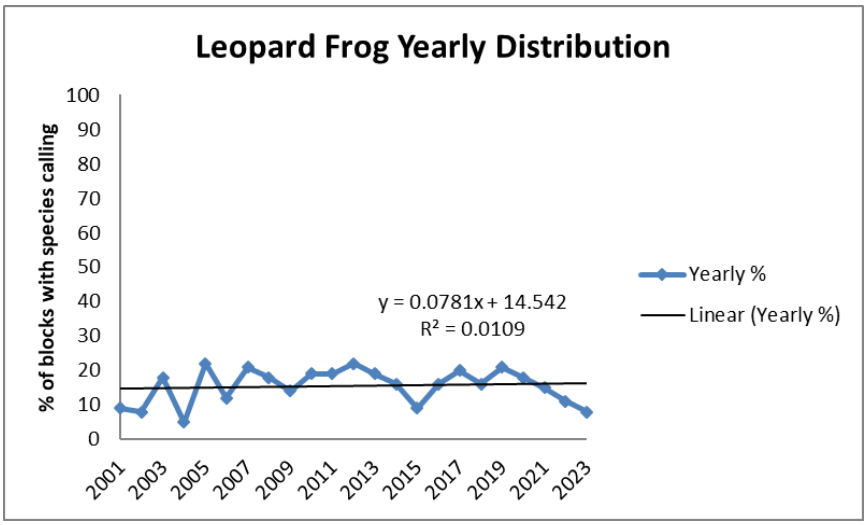

Spring peeper (*Pseudacris crucifer*)
Legend
FT23
Spring Peeper
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
BIRMINGHAM
WEST BLOOMFIELD TWP.
WALLED LAKE
COMMERCE TWP.
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
NORTHVILLE TWP.
HIGHLAND PARK
SALEM TWP.
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
DEARBORN
CANTON TWP.
SUPERIOR TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N

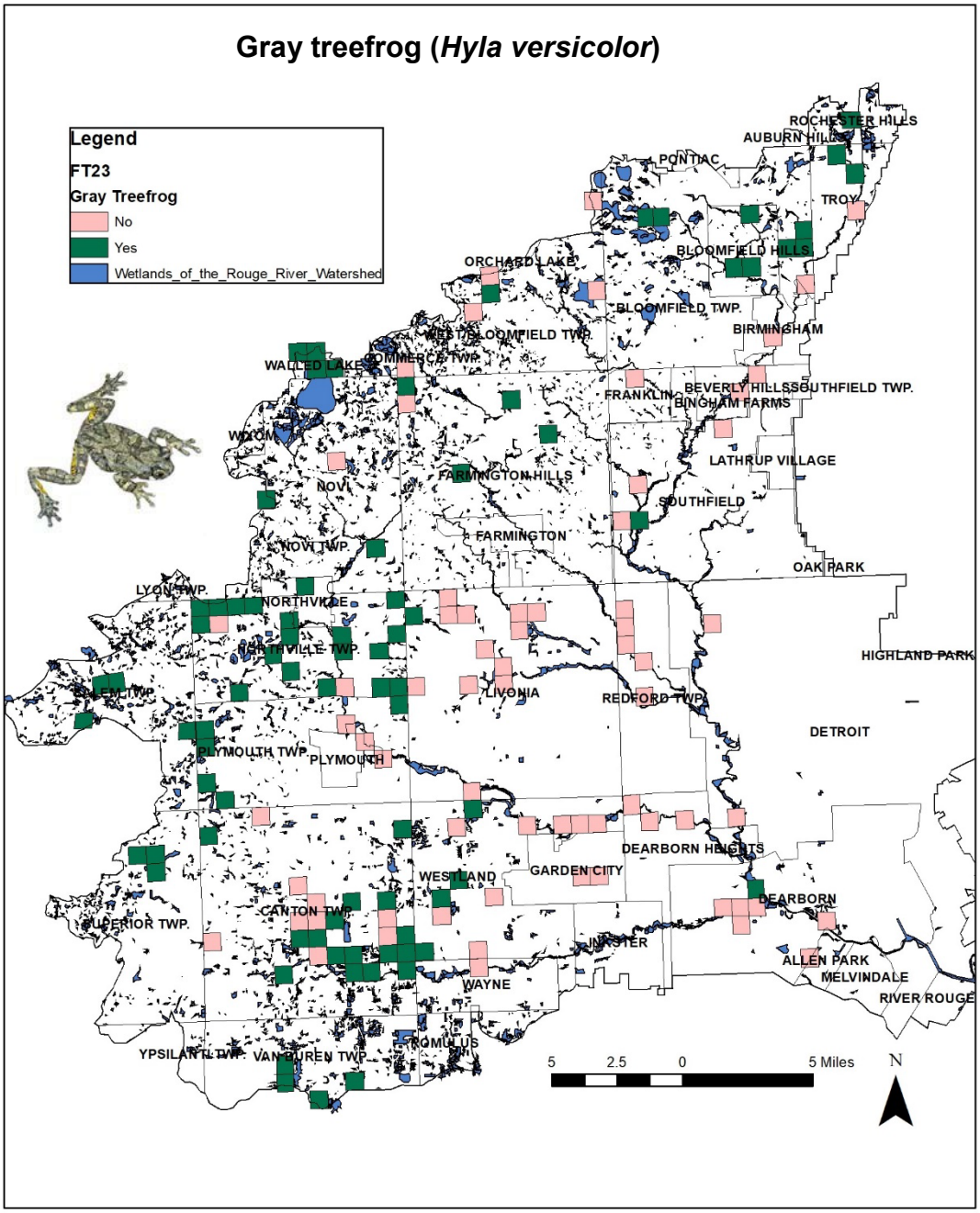

Spring Peeper Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
y = -0.4229x + 53.379
R² = 0.1638
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Yearly %
Linear (Yearly %)

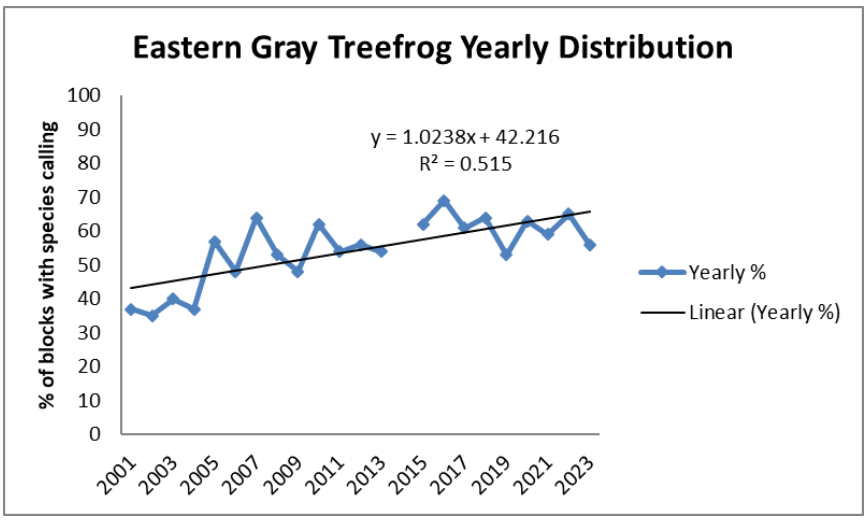

American toad (*Bufo americanus*)
Legend
FT23
American Toad
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
BIRMINGHAM
WEST BLOOMFIELD TWP.
WALLED LAKE
COMMERCE TWP.
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
HIGHLAND PARK
NORTHVILLE TWP.
SALEM TWP.
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
DEARBORN
CANTON TWP.
SUPERIOR TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N


American Toad Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
y = 0.7292x + 70.119
R² = 0.3257
Yearly %
Linear (Yearly %)

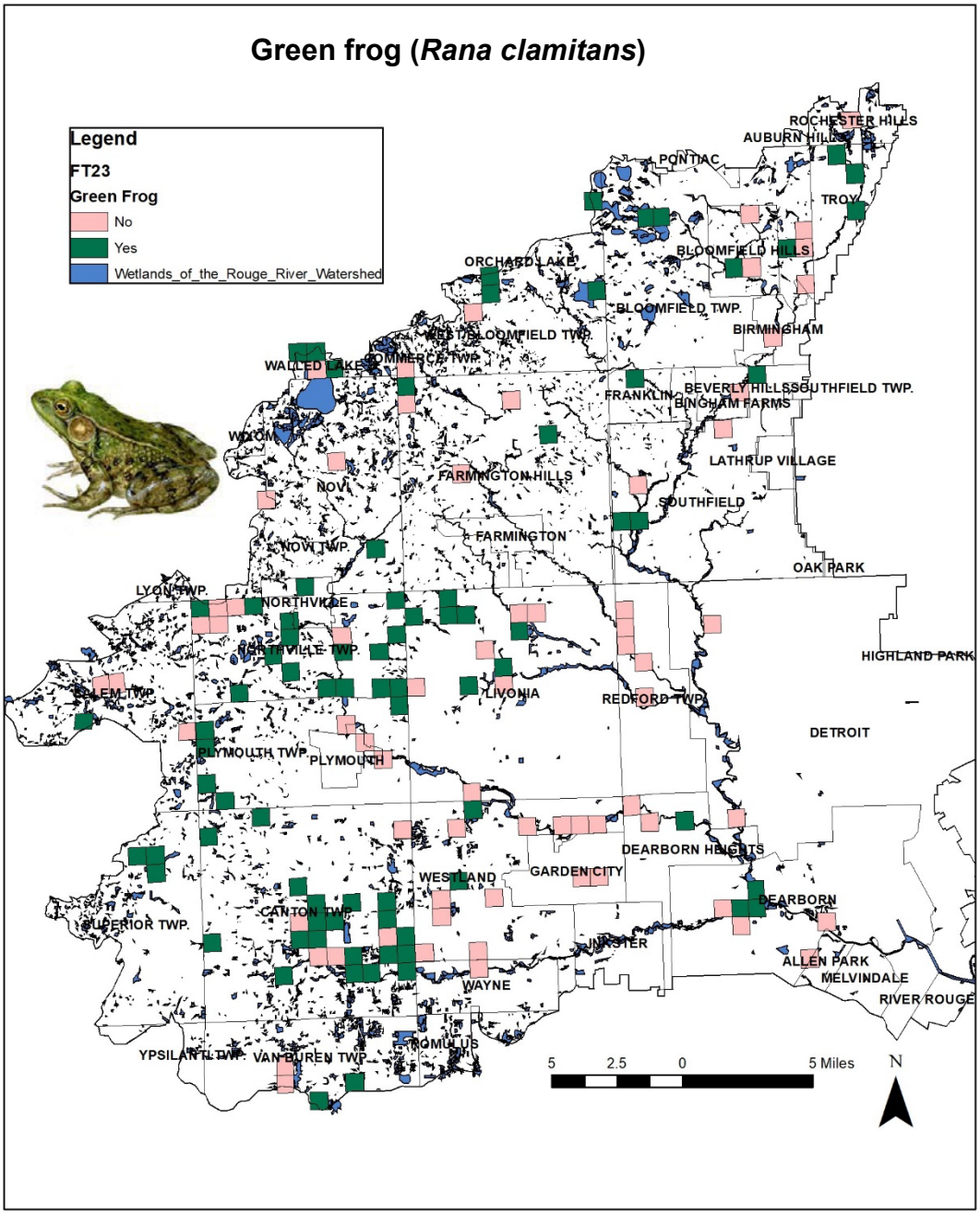

Northern leopard frog (*Rana pipiens*)
Legend
FT23
Leopard Frog
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
BIRMINGHAM
WEST BLOOMFIELD TWP.
WALLED LAKE
COMMERCE TWP.
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
NORTHVILLE TWP.
HIGHLAND PARK
SALEM TWP.
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
CANTON TWP.
DEARBORN
SUPERIOR TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N


Leopard Frog Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
y = 0.0781x + 14.542
R² = 0.0109
Yearly %
Linear (Yearly %)

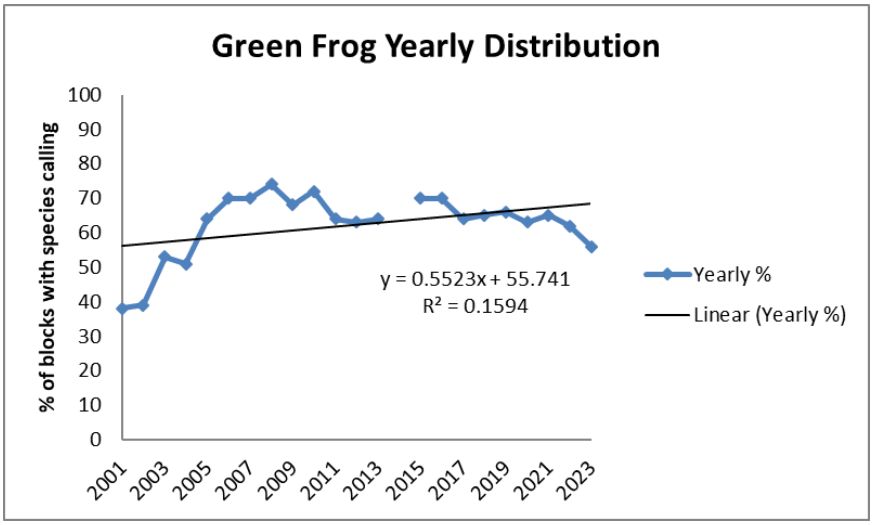

Gray treefrog (*Hyla versicolor*)
Legend
FT23
Gray Treefrog
No
Yes
Wetlands_of_the_Rouge_River_Watershed
ROCHESTER HILLS
AUBURN HILLS
PONTIAC
TROY
BLOOMFIELD HILLS
ORCHARD LAKE
BLOOMFIELD TWP.
BIRMINGHAM
WEST BLOOMFIELD TWP.
COMMERCE TWP.
WALLED LAKE
FRANKLIN
BEVERLY HILLS
SOUTHFIELD TWP.
BINGHAM FARMS
WIXOM
LATHRUP VILLAGE
FARMINGTON HILLS
NOVI
SOUTHFIELD
FARMINGTON
NOVI TWP.
OAK PARK
LYON TWP.
NORTHVILLE
NORTHVILLE TWP.
HIGHLAND PARK
SALEM TWP.
LIVONIA
REDFORD TWP.
DETROIT
PLYMOUTH TWP.
PLYMOUTH
DEARBORN HEIGHTS
GARDEN CITY
WESTLAND
DEARBORN
CANTON TWP.
SUPERIOR TWP.
INKSTER
ALLEN PARK
MELVINDALE
WAYNE
RIVER ROUGE
ROMULUS
YPSILANTI TWP.
VAN BUREN TWP.
5 2.5 0 5 Miles
N


Eastern Gray Treefrog Yearly Distribution
% of blocks with species calling
100
90
80
70
60
50
40
30
20
10
0
y = 1.0238x + 42.216
R² = 0.515
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Yearly %
Linear (Yearly %)

Green frog (*Rana clamitans*)



Green Frog Yearly Distribution



Bullfrog (*Rana catesbeiana*)