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Michigan Frog and Toad Survey 2015 Data Summary

20th Anniversary Edition

The Michigan Frog and Toad Survey has successfully completed 20 years of data collection. Give yourselves a big hand because it could not have been done without our dedicated volunteers! This is a significant achievement and a good step toward the understanding and conservation of Michigan's frog and toad populations.

There were 690 unique sites surveyed in Zone 1, 258 in Zone 2, 50 in Zone 3, and 90 in Zone 4, for a total of 1088 sites statewide, a 9% decrease from 2014 but still a 15% increase from 2013. Recruiting and encouragement of current volunteers to submit data will continue to be done to increase data flow. Three species, Fowler's toad, Blanchard's cricket frog, and mink frog, have ranges that include only a portion of the state. As was done in previous years, only data from those sites within the native range of those species were used in analyses.

A calling index of abundance of 0, 1, 2, or 3 (less abundant to more abundant) is assigned for each species at each site. Calling indices were averaged for a particular species for each zone (Tables 1-4). This will vary widely and cannot be considered a good estimate of abundance. Calling varies greatly with weather conditions. Calling indices will also vary between observers. Results from the evaluation of methods and data quality showed that volunteers were very reliable in their abilities to identify species by their calls, but there was variability in abundance estimation (Genet and Sargent 2003). Calling Indices of abundance will be reported as in past summaries but not used to actually estimate abundance of species.

Observations of Fowler's toads decreased this year with only one observation reported. They were reported at four sites in Zone 1 and four sites in Zone 2 in 2014. Twenty-six sites that had reported Fowler's toads in the past were surveyed in spring of 2013 and just one site in Kalamazoo County reported Fowler's toads. Mink frog observations continue to be low but were reported at 13 sites in Zone 3 and 12 sites in Zone 4, a significant increase from last year. There is a concern that data is not representative of the actual population due to the difficulty of surveying for this species. They tend to call at very early hours of the morning. There are still thoughts among the scientific community that mink frogs are actually declining in Michigan (J. Harding, pers. comm.). Pickerel frog occurrence remains low, possibly a result of confusion between this species' calls and that of the Northern leopard frog. Pickerel frog occurrences have been known to be lower than the leopard frog in other Great Lakes states; however efforts to investigate their rarity need to be undertaken soon. Northern leopard frog observations continue to increase. Occurrences of the Cope's gray treefrog continue to be low, relative to the

Eastern gray treefrog. There is speculation that the continued decline in observations of Cope's gray treefrogs may be due to the need to verify the observation. Surveyors may not be able to verify the call or may just not want to bother doing it.

Data on wood frog observations should be interpreted cautiously due to their brief calling periods and associated difficulty of conducting the first run when wood frogs are calling. Green frog observations are being to stabilize and show mild increases in observations. Using all the routes that submitted data in 2015 the percentage of sites at which a species was heard per route was calculated for each zone (Tables 1-4).

A statewide, 20-year analysis was done this year, along with a 10-year analysis and a one-year analysis (Table 5). The average number of sites per route at which a species was heard for all the routes was charted by year for each species. Percent change was calculated for each species using the number of sites per route. For most species the trends are similar between zones. Most species' trends appear to be stable or increasing. The 10-year analysis shows only two species declining. The 20-year analysis shows declines in eight species, which is up from six as calculated in 2014. Research projects focusing on frog and toad populations are welcome and necessary.

Table 5. Changes in Frog & Toad Observations, 1996-2015.

Species	No. Routes	2014-2015			2006-2015			1996-2015		
		2015 Mean	% change	95% CI	10-yr Mean	% change	95% CI	20-yr Mean	% change	95% CI
Fowler's Toad	378	0.03	-85	±0.17	0.1	-0.17	±0	0.2	-0.97	±0.11
Wood Frog	1088	3.7	2.8	±0.10	3.6	-0.09	±0.11	3.6	0.09	±0.22
Western Chorus Frog	1088	3.6	-20	±0.88	3.9	0	±0.13	4.2	-0.11	±0.26
Spring Peeper	1088	8.6	0	±0	8.2	0.13	±0.10	8.4	-0.00	±0.22
Northern Leopard Frog	1088	1.7	13.3	±0.20	1.6	0.10	±0.02	1.4	0.08	±0.11
Pickrel Frog	1088	0.1	-66.7	±0.20	0.1	0.10	±0	0.1	0.52	±0.02
American Toad	1088	4.2	10.5	±0.39	3.8	0.05	±0.06	3.9	-0.06	±0.18
Eastern Gray Treefrog	1088	6.9	3.0	±0.20	6.2	0.31	±0.15	6.6	-0.04	±0.10
Cope's Gray Treefrog	1088	0.1	0	±0	0.1	1.76	±0	0.1	-0.03	±0.10
Blanchard's Cricket Frog	590	2.4	700	±2.06	0.35	25.5	±0.32	0.23	10.58	±0.22
Mink Frog	140	1.9	217	±1.27	0.5	2.50	±0.20	0.3	99.90	±0.20
Green Frog	1088	5.4	-5.3	±0.29	5.3	0.15	±0.11	5.6	-0.06	±0.39
Bullfrog	1088	1.0	-28.6	±0.39	1.2	1.21	±0.05	1.2	-0.10	±0.13

Negative change

No. Routes=number of sites surveyed within range of species in 2015

Mean=Average number of sites per route at which species was heard

All updated data summaries, phenologies, range maps and other information on the Michigan Frog and Toad Survey are featured on the DNR web site: <http://www.michigan.gov/dnr/>. Click on “Wildlife and Habitat” then “Research Projects” then “Frog and Toad Survey”.

All questions concerning these data summaries and/or the Michigan Frog and Toad Survey should be directed to:

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Literature Cited

Genet, K and L.G. Sargent. 2003. Evaluation of methods and data quality from a volunteer-based amphibian call survey. Wildlife Society Bulletin 31 (3): 703-714

**Table 1. 2015 SUMMARY OF FROG AND TOAD SURVEY
Zone 1 - 690 sites**

	Fowler's Toad n=270 <i>f</i>	Wood Frog n=690	W. Chorus Frog n=690	Spring Peeper n=690	Northern Leopard Frog n=690	Pickereel Frog n=690	American Toad n=690	Gray Treefrog n=690	**Cope's Gray Treefrog n=690	**Blanchard's Cricket Frog n=590 <i>f</i>	Mink Frog n=0 <i>f</i>	Green Frog n=690	Bullfrog n=690
Mean*	0	1.89	1.61	2.33	1.25	1.00	1.77	2.08	1.67	2.5	--	1.28	1.25
No. Sites	0	237	322	571	132	6	267	522	6	14	--	388	108
% Sites	0	34.3	46.7	82.8	19.1	0.9	38.7	75.6	0.9	2.4	--	56.2	15.6

* Mean calling index of sites where species were heard

f n is the number of sites within that species range - calculations include sites in native range of species only

** Confirmed observations

**Table 2. 2015 SUMMARY OF FROG AND TOAD SURVEY
Zone 2 - 258 sites**

	Fowler's Toad n=108 <i>f</i>	Wood Frog n=258	W. Chorus Frog n=258	Spring Peeper n=258	Northern Leopard Frog n=258	Pickereel Frog n=258	American Toad n=258	Gray Treefrog n=258	**Cope's Gray Treefrog n=258	**Blanchard's Cricket Frog n=0 <i>f</i>	Mink Frog n=0 <i>f</i>	Green Frog n=258	Bullfrog n=258
Mean*	2.00	1.92	1.35	2.26	1.21	0	1.76	1.94	0	--	--	1.34	1.0
No. Sites	1	101	56	236	35	0	113	153	0	--	--	117	4
% Sites	0.9	39.1	22.6	91.5	13.6	0	43.8	59.3	0	--	--	47.2	1.6

* Mean calling index of sites where species were heard

f n is the number of sites within that species range - calculations include sites in native range of species only

** Confirmed observations

**Table 3. 2015 SUMMARY OF FROG AND TOAD SURVEY
Zone 3 - 50 sites**

	Fowler's Toad n=0f	Wood Frog n=50	W. Chorus Frog n=50	Spring Peeper n=50	Northern Leopard Frog n=50	Pickereel Frog n=50	American Toad n=50	Gray Treefrog n=50	**Cope's Gray Treefrog n=50	Blanchard's Cricket Frog n=0f	Mink Frog n=50f	Green Frog n=50	Bullfrog n=50
Mean*	--	2.00	1.50	2.37	1.22	0	2.04	1.58	0	--	1.41	1.65	0
No. Sites	--	27	6	48	9	0	20	20	0	--	13	27	0
% Sites	--	54.0	12.0	96.0	18.0	0	40.0	40.0	0	--	26.0	54.0	0

Mean calling index of sites where species were heard

f n is the number of sites within that species range - calculations include sites in native range of species only

** Confirmed observations

**Table 4. 2015 SUMMARY OF FROG AND TOAD SURVEY
Zone 4 - 90 sites**

	Fowler's Toad n=0f	Wood Frog n=90	W. Chorus Frog n=90	Spring Peeper n=90	Northern Leopard Frog n=90	Pickereel Frog n=90	American Toad n=90	Gray Treefrog n=90	**Cope's Gray Treefrog n=90	Blanchard's Cricket Frog n=0f	Mink Frog n=90f	Green Frog n=90	Bullfrog n=90
Mean*	----	1.78	1.12	2.46	1.20	0	1.93	2.02	0	---	1.14	1.41	0
No. Sites	----	42	12	86	10	0	53	58	0	---	13	57	0
% Sites	----	46.7	15.0	95.6	12.5	0	58.9	72.5	0	---	14.4	63.3	0

* Mean calling index of sites where species were heard

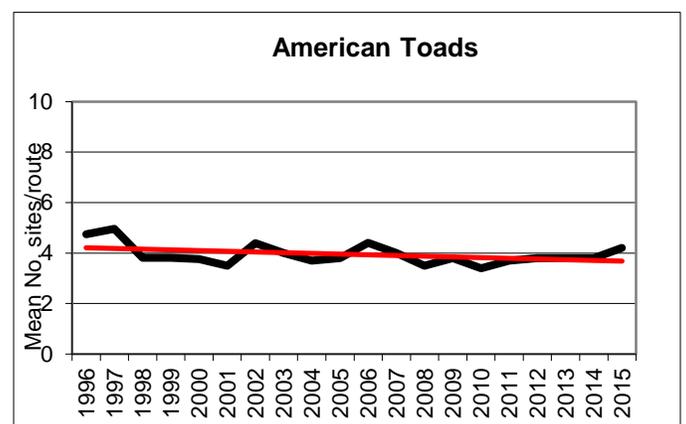
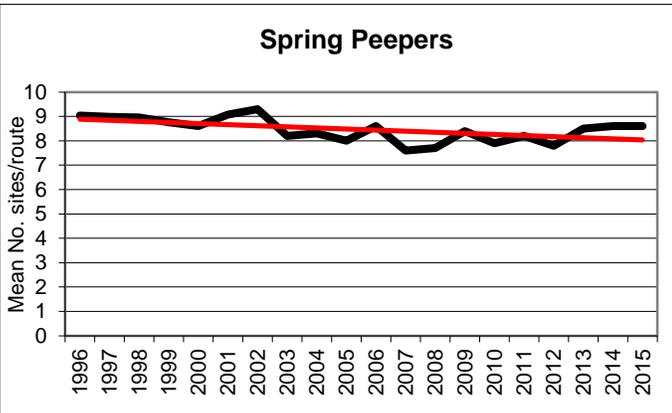
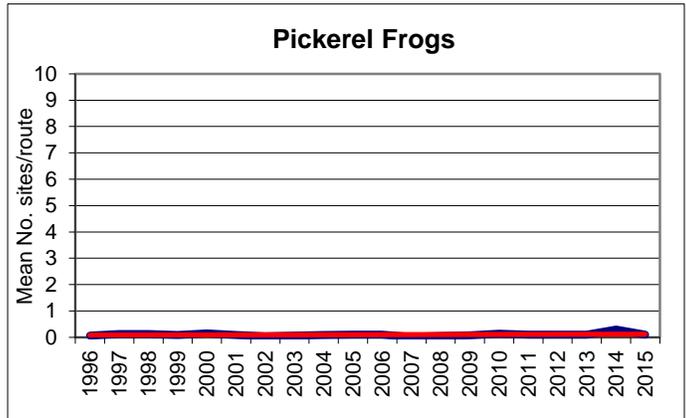
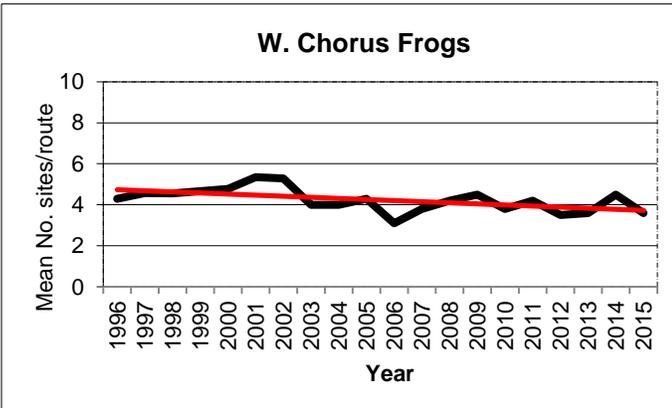
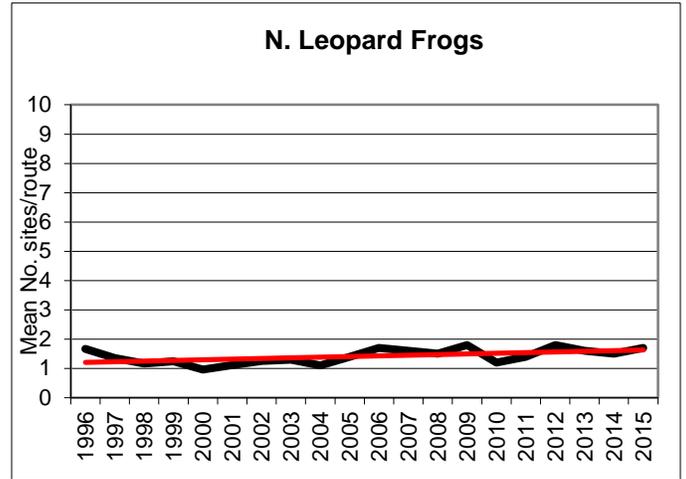
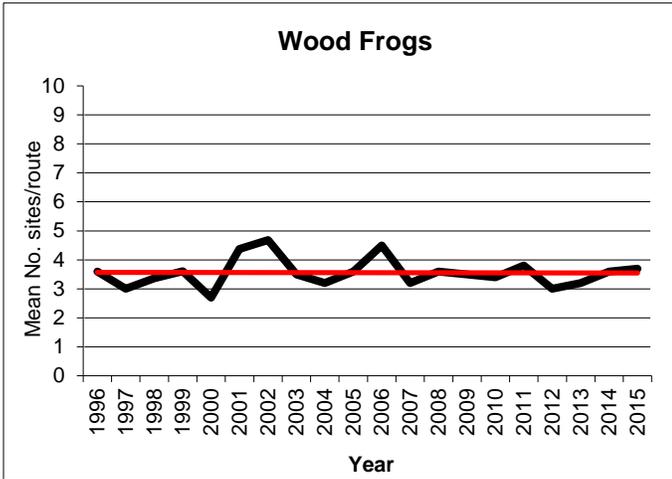
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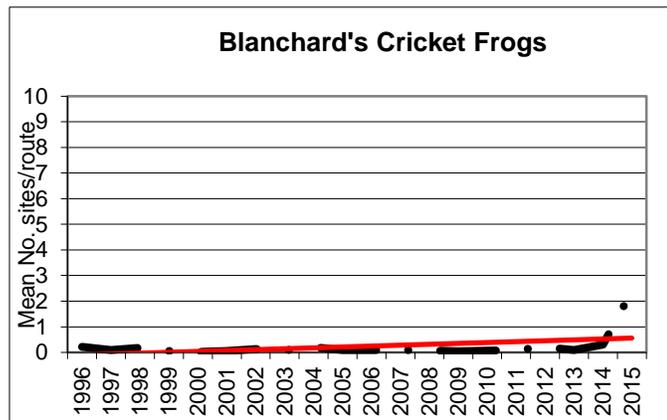
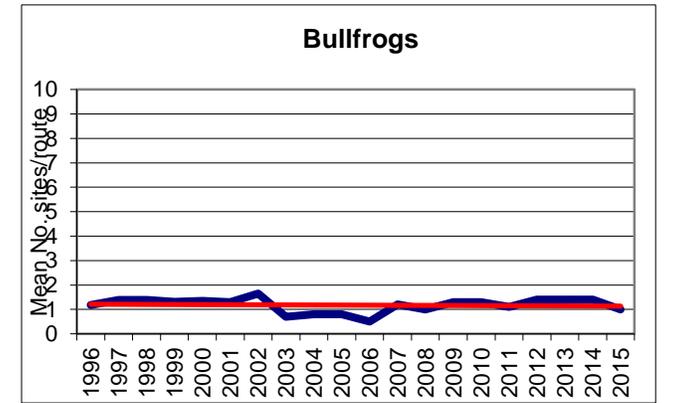
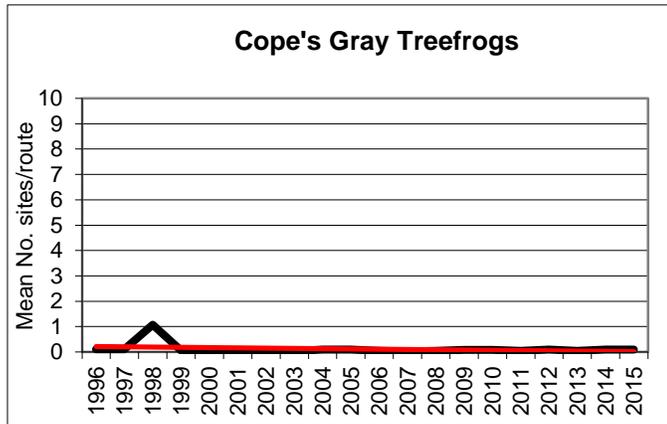
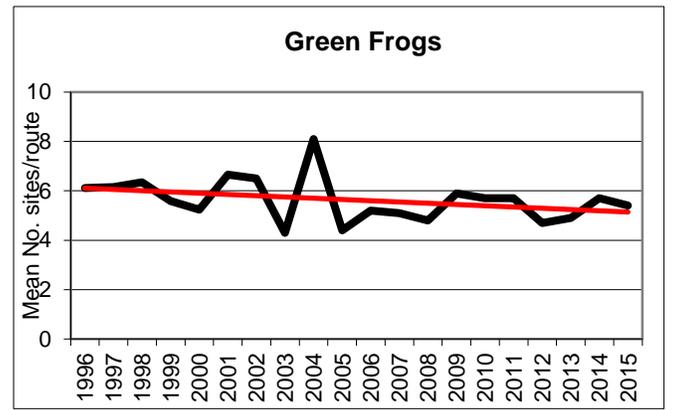
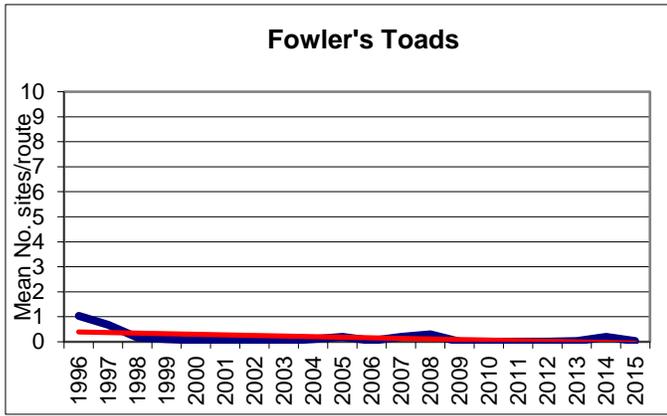
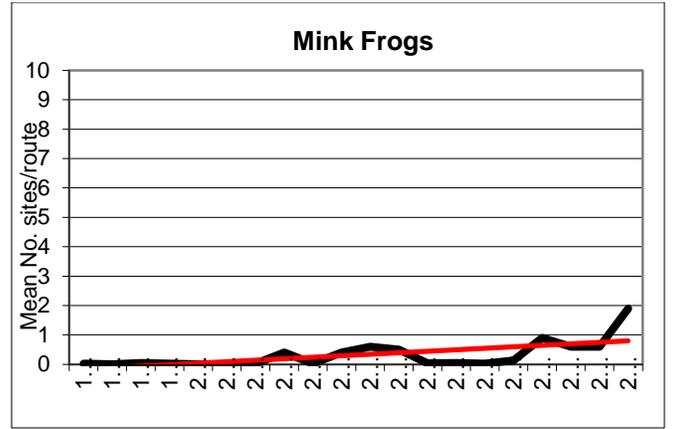
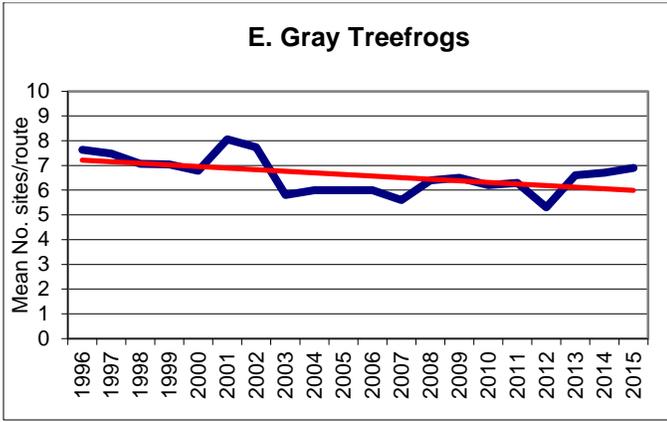
** Confirmed observations

Appendix A

Statewide species abundances and trends 1996-2015

— Trend line





Appendix B Statewide phenologies for 2015

