# *Iowa's Frog and Toad Call Survey*

2011

## *Introduction and Background*

The first volunteer based frog and toad call survey in Iowa took place in 1984 but it wasn't until seven years later in 1991 that the frog and toad call survey became a permanent yearly event in Iowa. Iowa was one of the earliest states to adopt this survey, developed in Wisconsin in response to alarm in the conservation community regarding amphibian declines. These alarm bells have only grown louder over the past 21 years of the survey and this long-term dataset is more important than ever.

From 1991-2009 Iowa's frog and toad survey followed a traditional model based on Wisconsin's survey. Volunteers chose 5-8 quality wetland sites and then visited each of these sites at night three times during the frog and toad breeding season. Volunteers listen and identify all the species by their unique call. Each species they hear is assigned an abundance index: 1 for a few individuals, 2 for a moderate number of individuals, some overlapping calls, and 3 for a full chorus. The listening time period was initially 10 minutes but in the last 4 years has been reduced to 5 minutes at each stop and environmental variables such as air and water temperature, cloud cover, wind and time since rain are also recorded.

Starting in 2010, Iowa adopted a second frog and toad survey protocol following guidelines from the North American Amphibian Monitoring Program (NAAMP) coordinated by the U.S. Geological Survey. NAAMP was initiated in the mid-1990's with a purpose of helping standardize frog and toad survey methodologies across state lines. The NAAMP protocol is based on the original survey developed in Wisconsin and the USGS Breeding Bird Survey. The main difference with the traditional model and NAAMP, is that NAAMP is run on already established 10 stop long randomly placed routes. The routes are run at the same time and in the same way with most of the information being collected overlapping with the traditional routes.

Both of these monitoring protocols are important to monitoring Iowa's anuran populations. Each provides complementary data, with the traditional survey likely biased towards higher quality sites while the NAAMP routes hit a mix. Currently we are focused on recruiting volunteers for the 84 NAAMP routes in Iowa but we definitely wish to continue the traditional survey and potentially add new routes in the future. Below, 2011 data are presented separately for each survey type.

## *Traditional Survey Results*

Data was reported for 68% (42) of the active routes in the traditional survey. This translated into 235 sites visited a total 621 times (# of sites X # of surveys) (Table 1). The average weather conditions were well within the parameters of the survey. The percentage of surveys done within 24 hours of a rain event remains at 43%.

The Boreal Chorus Frog was back on top as the most detected species on the surveys. It was recorded at 64% of sites and had an average abundance index over 2. It was also detected during all three runs but was as expected most abundant during run 1. Eastern gray tree frogs were the 2nd most reported species followed closely by American toads and cricket frogs which had the highest average abundance index at 2.3. There were six species not recorded on the traditional survey in 2011: Fowler's Toad, Plains Spadefoot, Pickeral Frog, Wood Frog, Crawfish frog, and Southern Leopard Frog (Table 2). These species are frequently not found as part of the survey because of several factors such as limited distribution, rarity and episodic breeding.

With really only two exceptions (Spring Peeper and Chorus Frog), all frog and toad species were recorded less frequently in 2011 than in 2010. Plains Leopard Frog also increased but was detected too few times to be meaningful. Examining the data for the last 10 years shows only the Spring Peeper with a marked negative trend across that time period (Figure 1). This is a little unusual as Spring Peepers have actually been expanding their range in the state and showing up in new sites further and further west. The number of surveyed sites classified as Timbered Riverine; the Spring Peeper's preferred habitat; have remained fairly constant over the ten year period. This is a species to watch.

### *NAAMP Survey Results*

Forty-four out of a total of 85 available Iowa routes were assigned to a volunteer. Only a little over half of these routes (24) were surveyed in 2011 and even fewer (15) were surveyed all three times during the breeding season. Despite holding two targeted training workshops in the spring, this level of participation is a decline from 2010 during which 29 routes were surveyed.

Fourteen out of Iowa's 18 species listed in NAAMP were heard by volunteers. It is worth noting that there are a few differences between the way NAAMP and the traditional survey track each species. The NAAMP survey combines Fowler's and Woodhouse's toad into one category, because these two species are hard to distinguish. There is a category added for unknown tree frogs, as Cope's and Eastern Grey Tree Frogs are difficult to tell apart. Southern Leopard frogs was the one species picked up on the NAAMP survey that was not heard on the traditional survey.

The three most commonly heard species across all sites and runs was the same for both surveys: the Boreal Chorus Frog, American Toad, and Eastern Grey Tree Frog (*Hyla versicolor*). The southern leopard frog shows up as occupying a high percentage of sites despite being heard at only three sites. This is because it has a very restricted range and the total number of sites surveyed on which it could have been heard was only ten (table 2a). No species occurred on all 24 routes surveyed though American Toad was heard on 23 routes. Cricket frogs were heard at 45% of sites and had the highest average abundance at those sites (2.43, Table 2a).

With the NAAMP data we only have two years of data so no trends can be inferred just yet. Looking at the 2010 to 2011 change in the percentage of potential sites on which each species was detected it shows a different trend from the traditional data. Unlike the traditional data all but five species increased in the percentage of sites occupied from 2010 to 2011. The biggest decreases were American toad and Plains leopard frog and the biggest increase was the Green frog (again excluding the Southern Leopard Frog for such a small # of records) (Table 2a).

### *In the Coming Year*

We will be holding three nighttime training workshops this spring in Lucas, Osceola and Black Hawk Counties. These workshops will hopefully help us recruit additional volunteers to adopt more of NAAMP routes. Our focus will continue to be to recruit folks to adopt NAAMP routes until we can have at least 90% of the 85 possible routes assigned. We will also need to continue to encourage follow through and participation in the survey. Initially it appears that volunteers running traditional surveys routes are more likely to participate than volunteers assigned a NAAMP route.

### *Acknowledgements*

As always we'd like to acknowledge the amazing volunteers who donate their time to this survey and to Iowa's wildlife as a whole. It is no easy task to find three nights during the summertime when the weather is just right to go listen to frogs. This is a truly amazing group of people! Thank you!

**Participation Data**

**Table 1 Traditional Survey: 2011**

| | |
|---|---|
| Num. of Active Routes | 62 |
| Num. of Routes Run in 2011 | 42 (67%) |
| Num. of Active Sites | 350 |
| Num. of Sites Run in 2011 | 235 (67%) |
| Total Num. of Visits Made in 2011 | 621 |
| Total Num. of Counties Surveyed | 29 |
| Num. of Empty Sites (no frogs heard all 3 runs) | 9 |

**Table 1a. NAAMP Survey 2011 Participation Data n = 85 total routes available in Iowa**

| | |
|---|---|
| Num. of Routes Assigned | 44 (52%) |
| Num. of Routes Run | 24 (28%) |
| Num. of Sites Run | 240 (28%) |
| Total Num. of Surveys conducted | 67 (26%) |
| Number of routes where all 3 runs conducted | 15 (18%) |

**Species Data**

**Table 2 Traditional Survey: 2011 Frog and Toad Survey species data**

**Number of records per run**
(count of the num. of surveys during which species was detected)

| *Species* | *Sites on which species detected* | *% of Total Possible Sites* | *1* | *2* | *3* | *Total Num. Visits* | *Average call index 1=Single to 3=Full Chorus?* |
|---|---|---|---|---|---|---|---|
| Chorus Frog | 151 | 64.3% | 136 | 74 | 15 | 225 | 2.07 |
| Eastern Gray Treefrog | 129 | 54.9% | 1 | 101 | 104 | 206 | 2.11 |
| American Toad | 124 | 52.8% | 14 | 92 | 50 | 156 | 1.79 |
| Cricket Frog | 106 | 45.1% | 2 | 74 | 91 | 167 | 2.30 |
| Bull Frog | 85 | 36.2% | 0 | 9 | 84 | 93 | 1.35 |
| Green Frog | 55 | 33.5% | 0 | 15 | 57 | 72 | 1.47 |
| Spring Peeper | 49 | 27.8% | 46 | 22 | 4 | 72 | 2.14 |
| Cope's Gray Treefrog | 60 | 25.5% | 0 | 53 | 48 | 101 | 1.91 |
| Northern Leopard Frog | 45 | 19.1% | 31 | 18 | 7 | 56 | 1.30 |
| Plains Leopard | 9 | 12.3% | 3 | 6 | 0 | 9 | 1.78 |
| Great Plains Toad | 1 | 6.3% | 0 | 1 | 0 | 1 | 1.00 |
| Woodhouse's Toad | 2 | 4.9% | 0 | 2 | 0 | 2 | 1.50 |
| Leopard Frog | 11 | 4.7% | 6 | 3 | 2 | 11 | 1.27 |
| Plains Spadefoot | 0 | 0.00% | 0 | 0 | 0 | 0 | NA |
| Pickeral Frog | 0 | 0.0% | 0 | 0 | 0 | 0 | NA |
| So. Leopard Frog | 0 | 0.0% | 0 | 0 | 0 | 0 | NA |
| Wood Frog | 0 | 0.0% | 0 | 0 | 0 | 0 | NA |
| Crawfish Frog | 0 | 0.0% | 0 | 0 | 0 | 0 | NA |
| Fowler's Toad | 0 | 0.0% | 0 | 0 | 0 | 0 | NA |

**Table 2a. NAAMP Survey: Species Detection for 2010 and 2011**

| *Species* | *# of Sites (%*)* | | *Change in % sites from 2010-2011* | *Total Num Visits* | *Average call index 1=Single to 3=Full Chorus* |
|---|---|---|---|---|---|
| | **2010** | **2011** | | | |
| Chorus Frog | 193(67) | 155(65) | -2 | 207 | 2.09 |
| American Toad | 182(63) | 132(55) | -8 | 155 | 1.62 |
| Eastern Gray Treefrog | 134(46) | 120(50) | +4 | 197 | 2.04 |
| Cricket Frog | 127(44) | 108(45) | +1 | 185 | 2.43 |
| So. Leopard Frog | 0(0) | 3(30) | +30 | 3 | 1.5 |
| Cope's Gray Tree frog | 59(20) | 66(28) | +8 | 105 | 1.7 |
| Spring Peeper | 34(19) | 39(26) | +7 | 52 | 1.63 |
| Green Frog | 21(12) | 32(25) | +13 | 40 | 1.23 |
| Bull Frog | 42(15) | 49(20) | +5 | 59 | 1.24 |
| Woodhouse/Fowlers | 5(13) | 6(15) | +2 | 7 | 2 |
| Great Plains Toad | 2(7) | 3(15) | +8 | 4 | 3 |
| Northern Leopard Frog | 34(12) | 33(14) | +2 | 37 | 1.14 |
| Plains Leopard | 18(13) | 5(4) | -9 | 6 | 2 |
| Unknown Tree frog | 21(7) | 11(5) | -2 | 17 | 1.59 |
| Plains Spadefoot | 1(3) | 0(0) | -3 | 0 | 0 |
| Pickeral Frog | 0(0) | 0(0) | 0 | 0 | 0 |
| Wood Frog | 0(0) | 0(0) | 0 | 0 | 0 |
| Crawfish Frog | 0(0) | 0(0) | 0 | 0 | 0 |

* Percent listed in percent of potential sites for each species. EX: For species with a statewide distribution the total number of potential sites in 2011 with 24 routes run = 240, For species with a limited distribution the number of total potential sites is limited by routes in counties where they occur so for Great Plains toad this = 30 sites.

Figure 1.Ten year trends for frog and toad data collected as part of Iowa's traditional call survey.