

Minnesota Frog & Toad Calling Survey



Calling Spring Peeper by Carol Hall

1996—2002

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INTRODUCTION

The Minnesota Frog and Toad Calling Survey (MFTCS) was developed in response to concern over the potential for population declines in Minnesota's fourteen frog and toad species. In 1993, a pilot project established 20 frog and toad survey routes under the coordination of herpetologist John Moriarty, and with funding from the Minnesota Herpetological Society and the Society for the Study of Amphibians and Reptiles. Building on this and similar efforts throughout the U.S., in 1996 the U.S. Geological Survey's Biological Resources Division initiated the North American Amphibian Monitoring Program (NAAMP). NAAMP methods, now used in the MFTCS, are designed to detect trends within the state's frog and toad populations over time. The results of this ongoing study will provide information on where species are located throughout the state, and how their populations change in abundance and distribution. Many frog and toad species are indicators of habitat quality. Their presence in, or disappearance from, an area may provide information on the condition of Minnesota's wetland habitats.

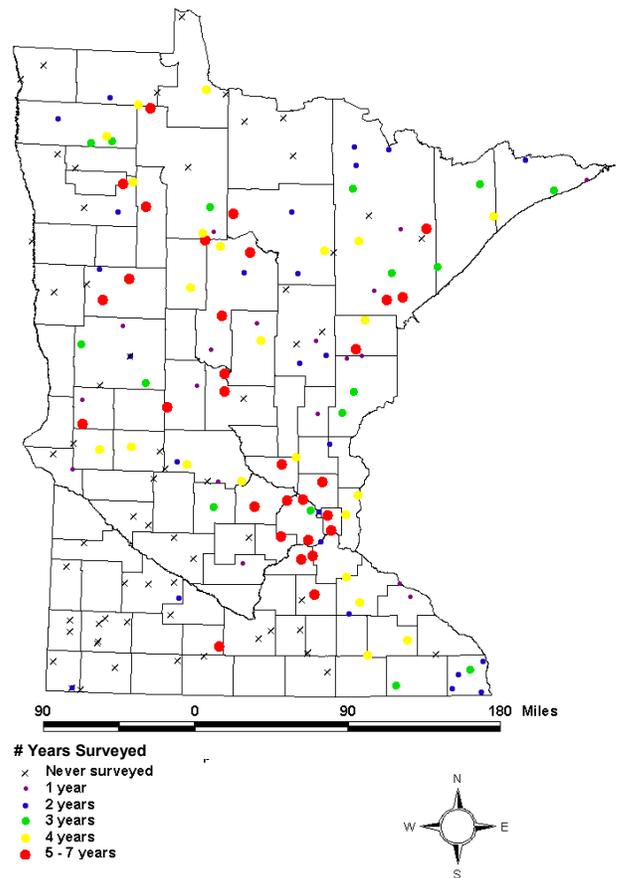
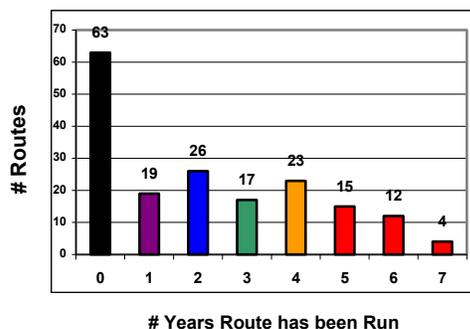
The MFTCS owes its ongoing growth and success to its large base of participants from throughout the state. Without the interest and dedication of these generous volunteers, this project would not be possible. We want to thank them, and provide this report to demonstrate how their efforts are contributing valuable information that will help manage Minnesota's natural resources.

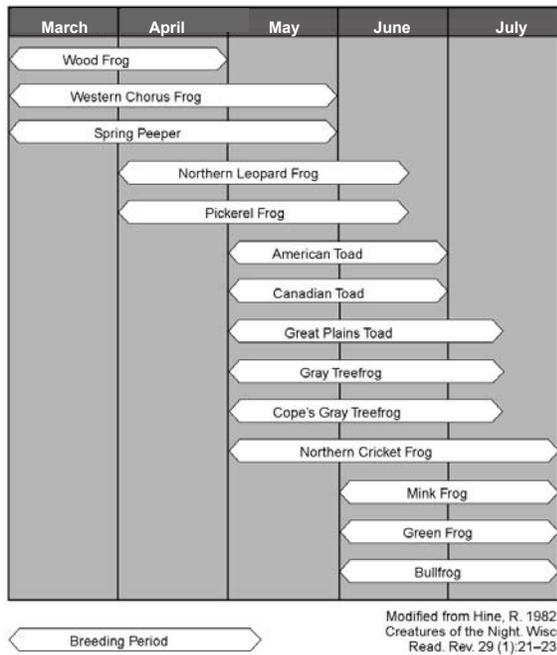
OVERVIEW & METHODS

A total of 116 MFTCS routes have been run in Minnesota, with additional routes being added annually. The routes vary by how many years each have been run (Fig. 1). The original 136 NAAMP routes are randomly distributed throughout Minnesota. Despite efforts to recruit volunteers for all routes, many routes have yet to be monitored ('x' in Fig. 1).

Thirteen of the fourteen species of frogs and toads were heard on at least one route in Minnesota between 1996 - 2002. The distribution maps in this report use data from routes that have been run for at least two years.

Figure 1. Location of MFTCS routes, and how many years each route has been run between 1996-2002.

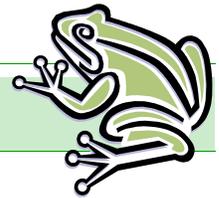




Before the annual survey season begins, every volunteer is assigned a route (or given directions to develop a new route) and is provided with instructions, route maps, survey route descriptions, and field datasheets. New volunteers are given the "Call of Minnesota's Frogs and Toads" cassette tape, the "Toads and Frogs of Minnesota and their Habitats" poster, and a generalized species distribution list.

Each route is run three times to encompass the variation in calling periods among frog and toad species (Fig. 2 and 3).

Figure 2. Typical calling periods for Minnesota Frog & Toad species.



Survey Protocol

- **Each Route is run 3 times, once during each designated period.**

Survey Period	Dates*	Preferred Minimum Water Temperature
Early Spring	April 15—30	50°F (10°C)
Late Spring	May 20—June 5	60°F (16°C)
Summer	June 25—July 10	70°F (21°C)

*Routes north of Highway 2 may add 1 week to survey dates

- **Surveys are run after dark, under favorable weather conditions.**
 - Water temperature is above preferred minimum
 - Wind is less than 8 mph
 - Warm, cloudy evenings with little or no wind and high humidity are ideal
- **Frog calls are noted at each stop (10 stops/route).**
 - Stops are a minimum distance of 0.5 miles apart
 - Volunteers listen at each stop for at least 5 minutes and count ALL frog and toad calls heard
 - The data are recorded on the field datasheet
 - **Call Index Values are recorded for each species heard at each stop:**
 - 1- Individuals can be counted with space between calls
 - 2- Individuals can be distinguished but there is some overlapping of calls
 - 3- Calls are constant, continuous, and overlapping
- **Rare or unusual records such as the Northern Cricket Frog or species outside of their distribution range should be verified by tape recording, testimony of 2 experienced observers, or a photo. Unusual calls that are not verified may not be counted.**
- **Once the route has been completed for all three runs, the datasheets and maps are sent to the Nongame Wildlife Program of the Minnesota Dept of Natural Resources (DNR) to be compiled and analyzed. Statistical analyses are completed, and distribution maps are created using ArcView 3.3©.**

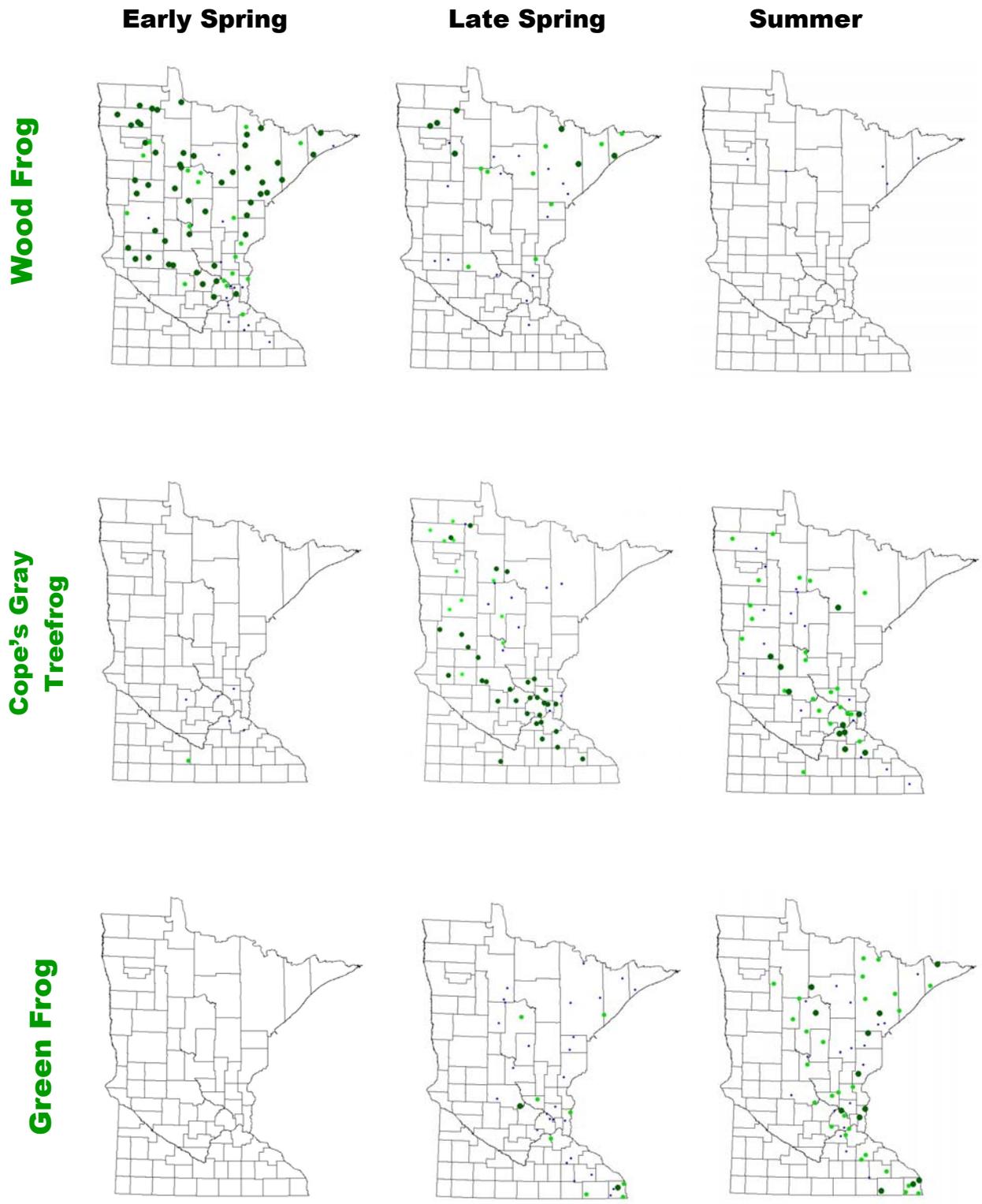


Figure 3. Examples of species calling in: early spring, late spring, and summer. Dots reflect greatest intensity of calls during each period (see **Survey Protocol**, page 2):

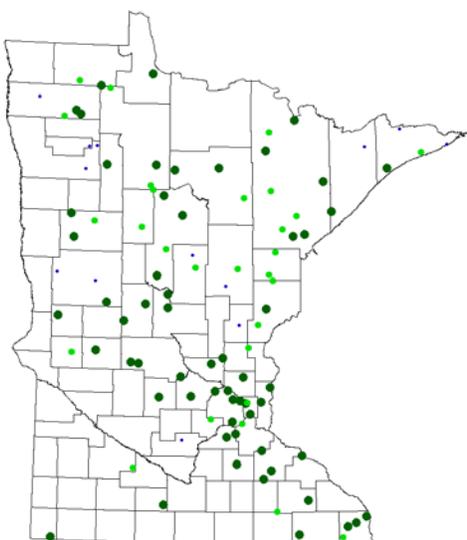
- Call index value 1,
- Call index value 2,
- Call index value 3.

RESULTS

The following maps show the results of the MFTCS between 1996 - 2002. Peak calling heard by route and by species is indicated. As a quality-control measure, only routes that have been run for 2 or more years are included. There are frog & toad species reported outside of their distribution range, and these are indicated by a different symbol (see below). Peak intensity heard on a route during any calling period between 1996 - 2002 is shown (see **Survey Protocol** for definitions, page 2):

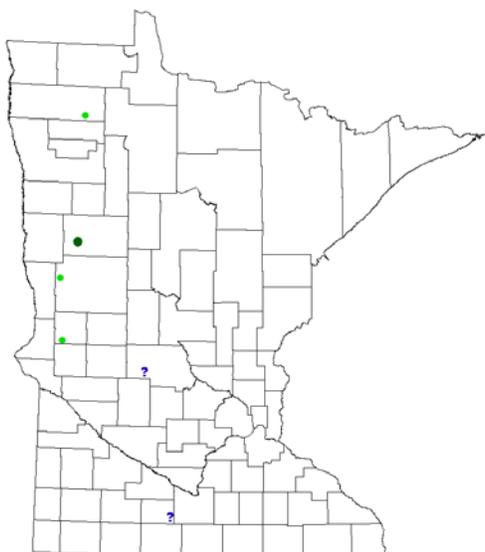
- Call index value 1, • Call index value 2, • Call index value 3, ? Call outside of known range (need verification)

AMERICAN TOAD *Bufo americanus*



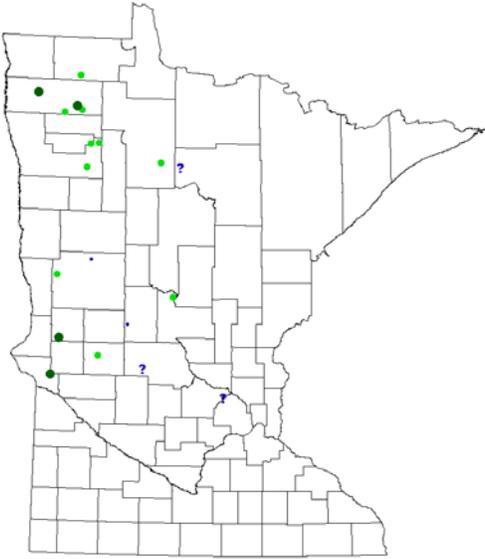
- Found in high numbers and widely-distributed
- Late Spring Caller
- **Distribution** - Within the U.S., found east of the great plains, and north of the Gulf of Mexico into Canada
- **Summer Habitat** - A variety of habitats, including bogs, coniferous forests, wooded areas, and prairies
- **Winter Habitat** - Burrows below the frost line

GREAT PLAINS TOAD *Bufo cognatus*



- Calls and breeds after heavy rains. Since rainfall varies annually (and survey periods are based on dates, not rainfall), this may be a difficult species to accurately document in the MFTCS
- Late Spring Caller
- **Distribution** - In North America, found in the Great Plains south to Mexico. In Minnesota, found in the western border of the state from Marshall County south to Rock County, with the eastern edge of its range in Nicollet County
- **Summer Habitat** - Tall-grass prairies and nonnative grasslands, burrows underground during heat and drought
- **Winter Habitat** - Burrows below the frost line

CANADIAN TOAD *Bufo hemiophrys*

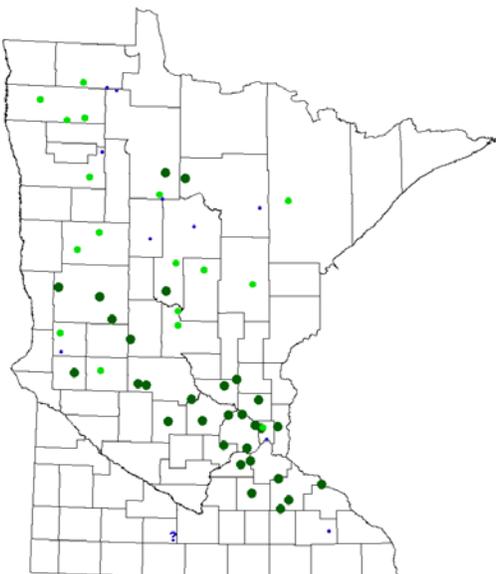


- Late Spring Caller
- **Distribution** - In the United States, found in northwest Minnesota and North Dakota. In Canada, found in Manitoba and Saskatchewan prairies. In Minnesota, found from the Minnesota River in Lac Qui Parle County north through the Red River Valley
- **Summer Habitat** - Same habitat as American Toads, ranging from woodlands to wetlands
- **Winter Habitat** - Burrows below the frost line, often in groups
- New routes in western counties would add valuable distribution information for this species

NORTHERN CRICKET FROG *Acris crepitans*

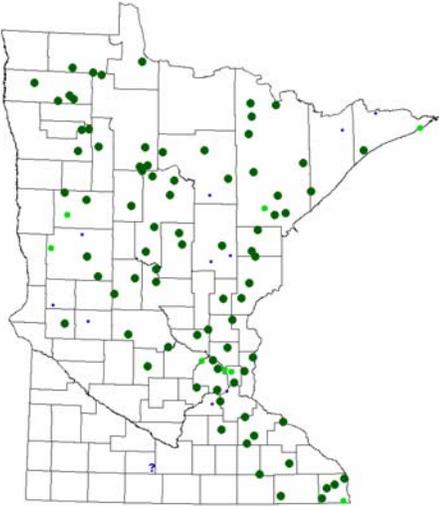
The Northern Cricket Frog is an endangered species in Minnesota. There is only one known population within the state, along the Minnesota River in Hennepin County. Although there have been reports in this study of possible calling, none have yet been verified. The Minnesota DNR is very interested in locating populations of this species, so if you believe you hear a Northern Cricket Frog, please try to document (e.g. tape-recording of call or photo) and contact your Nongame Wildlife Specialist (see back cover of this report for contact information).

COPE'S GRAY TREEFROG *Hyla chrysoscelis*



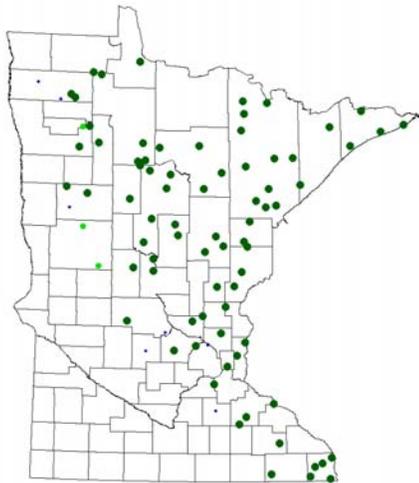
- Reports correspond to the deciduous transition zone between prairie and coniferous forests
- Overlaps the Gray Treefrog's range (for this study, it is very important to be able to distinguish between the two calls)
- Late Spring Caller
- **Distribution** - The same distribution as the Gray Treefrog, ranging from east of the Great Plains to Central Texas to the Atlantic
- **Summer Habitat** - Found in prairie edges, oak savannas, and woodland edges (where they overlap with Gray Treefrogs). Not found in forest interiors
- **Winter Habitat** - Under leaf litter, logs, rocks; partially frozen

GRAY TREEFROG *Hyla versicolor*



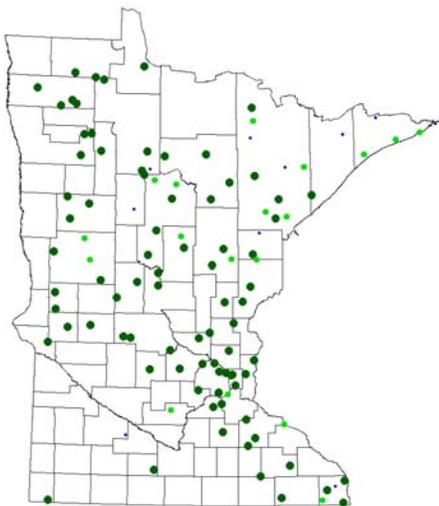
- Overlaps the Cope's Gray Treefrog's range (for this study, it is very important to be able to distinguish between the two calls)
- Late Spring Caller
- **Distribution** - In Minnesota, found statewide except for the southwest corner, in the U.S., found from the Great Plains to the Atlantic coast
- **Summer Habitat** - Wide range of woodland habitats, both deciduous and coniferous. Not associated with prairies, but use floodplain forest in the prairie region
- **Winter Habitat** - Under leaf litter, logs, rocks; partially frozen
- New routes in the Southwest would help delineate the edge of it's range

SPRING PEEPER *Pseudacris crucifer*



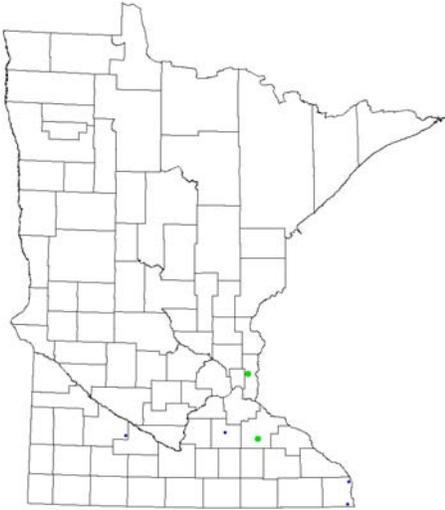
- The smallest frog in Minnesota, 2 - 3 cm long
- Early Spring Caller
- **Distribution** - Found throughout the eastern United States, east of the Great Plains. In Minnesota, found in the forested counties
- **Summer Habitat** - Breeds in wetlands without fish, and occupies woodlands, both deciduous and coniferous, near wetlands. Not found in prairies
- **Winter Habitat** - Under leaf litter, partially frozen
- Absence in urban areas may reflect the impact of development and habitat fragmentation

WESTERN CHORUS FROG *Pseudacris triseriata*



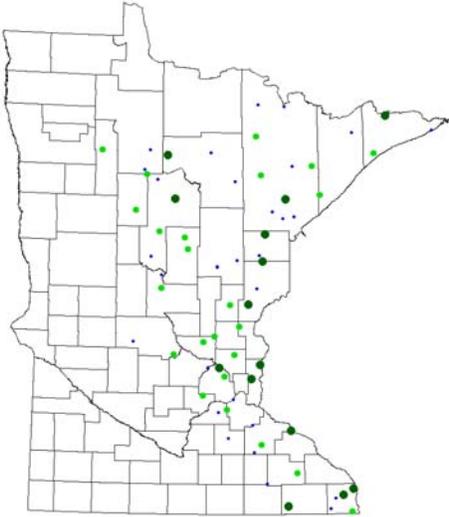
- Found throughout Minnesota
- 15-year study has indicated a 5% decline in Wisconsin populations of this species
- Early Spring Caller
- **Distribution** - Found in the central United States and Canada. Found statewide in Minnesota
- **Summer Habitat** - Breeds in temporary or permanent wetlands without fish, and occupies a variety of upland habitats
- **Winter Habitat** - Under leaf litter, logs, and rocks; partially frozen
- Generally tolerant of development and is found in wetlands near urban areas

BULLFROG *Rana catesbeiana*



- The largest frog in Minnesota, adults can be up to 8 inches from snout to vent
- Concern that where bullfrogs are introduced, other frog species may disappear, although more data are needed to test this theory
- Summer Caller
- **Distribution** - Native to the far southeastern corner of Minnesota, introduced elsewhere. In the U.S., native to east of the Rocky Mountains, except northern Plains, introduced to nearly every state.
- **Summer Habitat** - Permanent waters
- **Winter Habitat** - Aquatic areas that do not freeze solid

GREEN FROG *Rana clamitans*



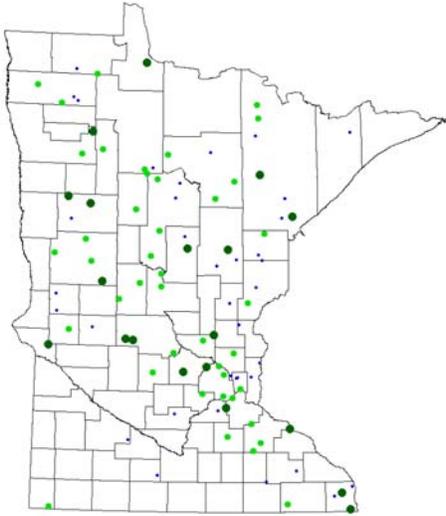
- Medium-sized frogs
- Considered sensitive to lakeshore development, the first species to disappear from lakes under development pressure.
- Summer Caller
- **Distribution** - Found east of the Great Plains, from the Gulf of Mexico to central Ontario and Quebec. They are found in the eastern half of Minnesota.
- **Summer Habitat** - Found in rivers, streams, lakes and ponds with permanent water and emergent vegetation
- **Winter Habitat** - Aquatic areas that do not freeze solid

PICKEREL FROG *Rana palustris*



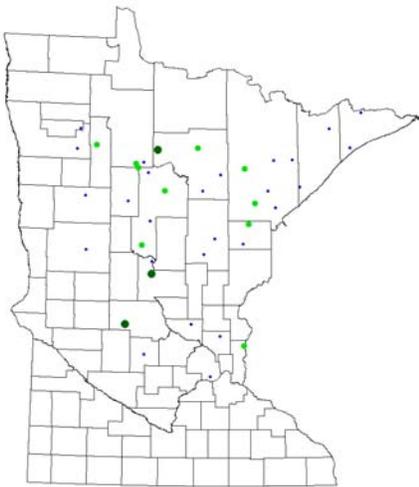
- Not effectively recorded in this study due to its limited range in Minnesota, usually found only in backwaters of rivers and streams
- Early Spring Caller
- **Distribution** - Found throughout the eastern United States, only found in the southeast corner of Minnesota
- **Summer Habitat** - Small ponds, spring-fed streams, and small rivers
- **Winter Habitat** - Aquatic areas such as rivers and streams

NORTHERN LEOPARD FROG *Rana pipiens*



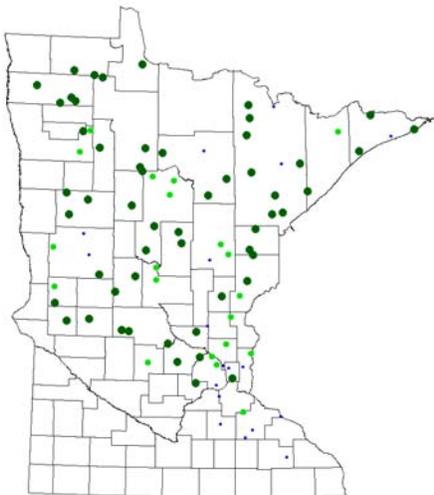
- Early Spring Caller
- **Distribution** - Only frog in Minnesota with records from every county. In the U.S., found in the north-central region from the Great Basin to New England and north into Canada.
- **Summer Habitat** - Most abundant in wet meadows and open fields near ponds or lakes. Considered a grassland frog.
- **Winter Habitat** - Aquatic, in ponds and streams
- New routes in the west, southwest, and south would complete the distributional information

MINK FROG *Rana septentrionalis*



- Minnesota, at the southern end of its continental range, probably has the largest distribution of Mink Frogs in the United States
- Summer Caller
- **Distribution** - In the U.S., found from Minnesota to northern New England and adjacent Canada. Found in the northern half of Minnesota.
- **Summer Habitat** - Prefers slow rivers, ponds, and lakes. Frequently observed sitting on lily pads or other emergent vegetation, requires permanent water
- **Winter Habitat** - Aquatic in ponds, streams, and bogs

WOOD FROG *Rana sylvatica*



- Most common frog in the acidic-water peatlands of northern Minnesota. May be tolerant of areas of high acid rain and runoff.
- Early Spring Caller
- **Distribution** - The northernmost frog in North America. Distribution ranges north of the Arctic Circle. In Minnesota, found state-wide except for the southwestern counties.
- **Summer Habitat** - Deciduous and coniferous moist forests, and in forests along rivers in prairies
- **Winter Habitat** - Under leaf litter, partially frozen

Minnesota's Frogs & Toads Need Your Help!

The MFTCS owes its success to its volunteers. As indicated in Figure 1, there are areas in the state that are lacking volunteers to run MFTCS routes, particularly in the Southwest Minnesota counties. We encourage anyone interested in learning frog and toad calls and conducting surveys to contact us. We will provide all of the required materials.

The majority of frog and toad species in Minnesota can be detected by the MFTCS methodology, but there are some species that only call after periods of rain (which can vary annually), or are not found in the wetlands targeted by our routes (e.g. Pickerel Frog). These frog species are still recorded when heard, but the results may not give a true indication of their distribution.

Volunteers do not capture or handle frogs, so deformities or unusual physical characteristics of frogs are not recorded in this study. If you are interested in learning more about deformed frogs in Minnesota, background information can be obtained from the Minnesota Pollution Control Agency (MPCA, <http://www.pca.state.mn.us/hot/frogs.html>).

Statistical analysis of MFTCS data is ongoing, and with additional years of data it will be possible to evaluate whether or not any species are declining or changing in distribution in Minnesota.

As the survey continues, it will provide valuable information about trends in Minnesota's frog and toad populations, as well as the status and health of wetlands and their adjacent habitats throughout Minnesota. Frogs and toads are not only affected by development and habitat fragmentation, but they are highly sensitive to pollutants and other environmental hazards, and are often the first natural indicators of toxins or contaminations in an ecosystem. Information from the MFTCS will be valuable in the development of future plans to protect and conserve Minnesota's natural resources.

Contact information

If you are interested in volunteering for the Minnesota Frog & Toad Calling Survey, please contact the program's volunteer coordinator at:

Minnesota Frog & Toad Calling Survey Volunteer Coordinator

A Thousand Friends of Frogs

Center for Global Environmental Education (CGEE)

Hamline University Graduate School of Education

1536 Hewitt Avenue, St. Paul, MN 55104-1284

Phone: 651-523-2945 Fax: 651-523-3041

If you have an unusual record of any frog or toad species (out of distribution range, or a Northern Cricket Frog), please try to document the record by 1) tape recording the call, or 2) taking a photo, and contact your Dept. of Natural Resources Regional Nongame Wildlife Specialist:

- **NW Minnesota:** Katie Haws, Bemidji, MN, Ph) 218/755-2976
- **NE Minnesota:** Pam Perry, Brainerd, MN, Ph) 218/828-2228
- **Central Minnesota:** Joan Galli, St. Paul, MN, Ph) 651/ 297-2277
- **Southwest Minnesota:** Lisa Gelvin-Innvaer, New Ulm, MN, Ph) 507/359-6033
- **Southeast Minnesota:** Jamie Edwards, Rochester, MN, Ph) 507/280-5070

Acknowledgements:

We would like to acknowledge not only our large base of dedicated volunteers, but also several key people who without their help, expertise, and enthusiasm, this program would not have been possible:

Program Start-up— John Moriarty

Report Review & Editing— John Moriarty, Tracey Fredin (Director of CGEE, Hamline University), and the MN DNR Nongame Wildlife Program Staff.

Volunteer Organization— Heather Schoonover and Erika Halvorsen, A Thousand Friends of Frogs, CGEE, Hamline University

Statistical analyses and interpretation - Douglas Hawkins, University of Minnesota.

References & Resources

Books

Oldfield, B. and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis. 237 pp.

Poster

Toads and frogs of Minnesota and their habitats. 1997. Poster produced by the Minnesota Department of Natural Resources.

Cassette Tape of Frog Calls

The Calls of Minnesota's Frogs and Toads: Reference and Training Tape. Produced by Frog Watch, Hamline University. St. Paul, Minnesota.

Websites

- **Minnesota Department of Natural Resources**— http://www.dnr.state.mn.us/reptiles_amphibians/frogs_toads/index.html
- **Minnesota Frog Watch/1000 Friends of Frogs**— <http://cgee.hamline.edu/frogs/>
- **North American Amphibian Monitoring Program**— <http://www.mp2-pwrc.usgs.gov/naamp/>
- **Minnesota Herpetological Society**- <http://www.bellmuseum.org/herpetology/main.html>
- **Society for the Study of Amphibians and Reptiles**- <http://www.ku.edu/~ssar/>

Video

J. J. Moriarty. 1999. The Amphibians of Minnesota. Minnesota Department of Natural Resources. Includes Frog & Toad Survey Protocol.