

Northeast State of the Frogs: Development of regional analysis for frog call survey data from the North American Amphibian Monitoring Program (NAAMP)

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Introduction

The North American Amphibian Monitoring Program (NAAMP) is a collaborative effort among USGS, State Agencies, and other partners, to monitor calling amphibians. NAAMP is active in over 20 states, including 11 northeastern states (Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, Hudson region of New York, Pennsylvania, Virginia, and West Virginia). Most Northeast states began data collection by 2001, though New York's Hudson region started in 2008.



Photo - NAAMP observer conducting survey

Need

In this RCN funded project we will develop the analytical methods to assess amphibian occupancy trends at the Northeast regional scale, using 11 years (2001-2011) of NAAMP survey data.

There are 30 species of frogs and toads in the Northeast. We anticipate being able to report occupancy trends for 18 of these species, with the majority of omitted species being restricted to southeastern Virginia (Table 1). Of the 18 species, 12 are considered Species of Greatest Conservation Need in one or more Northeast states (Table 1). In addition, Northeast Partners in Amphibian and Reptile Conservation (NEPARC) has proposed 7 of these species to be of 'high responsibility' for the Northeast (NEPARC 2010, see Table 1).

Methods

Survey protocol – NAAMP is a calling survey, where observers survey an assigned roadside route, with 10 listening locations. Route are surveyed 3 or more times per year to target early-, mid-, and late-season breeding amphibians. Observers report all amphibians heard during a 5-minute listening period, rating each species using a calling index scale (1-3 rating of calling activity as measure of abundance), along with some environmental data. Observers must pass an online frog call quiz to ensure they are skilled in frog call identification.



Species List	Species anticipated to have sufficient NAAMP data for analysis	Number of Northeast States species is considered SGCN	NEPARC's species of high Northeast responsibility
American toad	Yes	-	-
Fowler's toad	Yes	7	Yes
Oak toad	-	1	-
Southern toad	-	-	-
Northern cricket frog	Yes	3	Yes
Southern cricket frog	-	-	-
Pine Barrens treefrog	Yes	1	-
Cope's gray treefrog	Yes	2	-
Green treefrog	Yes	-	-
Pine Woods treefrog	-	-	-
Barking treefrog	-	3	-
Squirrel treefrog	-	-	-
Gray treefrog	Yes	1	-
Mountain chorus frog	Yes	3	Yes
Brimley's chorus frog	-	-	-
Spring peeper	Yes	-	-
Upland chorus frog	Yes	3	-
New Jersey chorus frog	Yes	2	Yes
Southern chorus frog	-	-	-
Little grass frog	-	1	-
Western chorus frog	-	3	-
E. narrow-mouthed toad	-	1	-
Eastern spadefoot toad	-	9	Yes
American bullfrog	Yes	-	-
Green frog	Yes	-	-
Pickereel frog	Yes	-	-
Northern leopard frog	-	6	Yes
Mink frog	Yes	1	Yes
Southern leopard frog	Yes	2	-
Wood frog	Yes	2	Yes
Carpenter frog	Yes	4	Yes

Table 1 - Frogs of the Northeast species list. In **bold font** are Species of Greatest Conservation Need (SGCN) and anticipated to have sufficient NAAMP data for analysis.

Methods (con't)

Statistical methods – We will expanding upon existing occupancy modeling approaches for NAAMP data (Royle 2004, Weir et al. 2009) in two important ways:

- 1) Develop regional model to look at species trends for the Northeast as a whole
- 2) Incorporate calling index data without truncation to presence-absence, for species with sufficient data, which will allow for greater sensitivity in detecting change

Status of Project

Currently the 2011 field season is underway. NAAMP observers are collecting data at their assigned survey routes. In addition, the summer season will include some GIS and database work in preparation for analyses. During the fall data entry and data review will be completed for the 2011 data. Also in the fall, a post-doc will be hired to help with the model development and analyses. In 2012 we will produce the following products:

- 1) Presentation at Northeast Fish & Wildlife Conference
- 2) Submit manuscript of regional trend analyses to scientific journal
- 3) Create regional trend results webpage on NAAMP website



Literature Cited

NEPARC. 2010. Northeast Amphibian and Reptile species of Regional Responsibility and Conservation Concern. Northeast Partners in Amphibian and Reptile Conservation (NEPARC) Publication 2010-1.

Royle, J.A. 2004. Modeling abundance index data from anuran calling surveys. *Conservation Biology* 18(5), 1378-1385.

Weir, L. A., I. J. Fiske, and J. A. Royle. 2009. Trends in Anuran Occupancy from Northeastern States of the North American Amphibian Monitoring Program. *Herpetological Conservation and Biology* 4:389-402.