

SPECIES PROFILE

Fowler's Toad

Bufo fowleri formerly *Bufo woodhousii fowleri*

Federal Listing: Not listed

State Listing: Special concern

Global Rank: G5T

State Rank: S3

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ELEMENT 1: DISTRIBUTION AND HABITAT

1.1 Habitat Description

Fowler's toad occurs mainly in habitats with loose, well-drained sandy or gravelly soils including riverbanks, lake margins, beach and coastal dune systems, and sandy or scrubby woodlands (Wright and Wright 1949, Smith 1961, Minton 1972, Green 1989, Breden 1987, Klemens 1993). Fowler's toads can be found along roadsides, near homes and gardens, and in fields and pastures (Wright and Wright 1949). Breeding habitat is generally the shallow margins of permanent water bodies, including lakes, farm ponds, rivers, and slow-moving streams (Wright and Wright 1949, Smith 1961, Breden 1988, Klemens 1993). Fowler's toads are facultative users of vernal pools (Wright and Wright 1949, Green 1989). Where the species co-occurs with the American toad (*Bufo americanus*), the Fowler's toad is often found in dryer areas than the American (Klemens 1993).

1.2 Justification

New Hampshire constitutes the northeastern limit of the range of the Fowler's toad. Little information on the Fowler's toad exists in New Hampshire and it is possible that the species occurs in low numbers. However, both historical and current written descriptions of the species distribution and numbers suggest that the species is abundant in some parts of New

England. Thus, the lack of evidence of a robust population in southern New Hampshire may be cause for concern. Lack of information on this species in the state is the most serious threat, as it currently cannot be assessed whether the species is locally abundant but not widespread, or is rare. This information is crucial for informing habitat protection and species management guidelines.

1.3 Protection and Regulatory Status

There is no special protection for Fowler's toad. See Marsh and Shrub Wetlands habitat profile and Vernal Pool habitat profile for protection and regulatory status of breeding habitats.

1.4 Population and Habitat Distribution

The Fowler's toad range is southern New England westward through southeast New York, New Jersey and northern parts of Pennsylvania, the Midwest (parts of Michigan, Illinois and Ohio), and southern Ontario, Canada. Throughout its range in New England and New York, the species has an irregular or spotty distribution, although it is often described as being "widespread". The species occurs throughout the south, with the exception of coastal plain areas of Georgia and South Carolina and peninsular Florida. Fowler's toads are limited to the southern portion of the states of Vermont and New Hampshire and may reach the Atlantic Coast almost into Maine (Stewart and Rossi 1981, Krauss and Schuett 1982, Shaffer 1991, Harding 1997, Klemens 1993). It is the only native *Bufo* on Long Island, New York. Limited records exist for the species in New Hampshire.

The distribution pattern of this species in the state is poorly documented. However, it is likely that the species occurred irregularly or patchily in areas with appropriate habitat upland and breeding

habitat. There are a limited number of Fowler's toad records in the state (see Town Distribution Map). The documented historic sitings (more than 20 years old) are from the towns of Boscawen, Canterbury, Amherst, Hanover, and Milford (Oliver and Bailey 1939). Observations considered verified within the last 20 years are from the towns of Grafton, Concord, and Pembroke. Overall, available data suggest that either the species suffers from poor monitoring and documentation or that it is rare and therefore constitutes a very small proportion of the regional Fowler's toad population.

1.5 Town Distribution Map

Not completed for this species.

1.6 Habitat Map

1.7 Sources of Information

Information was obtained from an extensive literature search and from Michael Marchand, Wetlands Biologist, Nongame and Endangered Wildlife Program, NHFG.

1.8 Extent and Quality of Data

The collective published works on Fowler's toad provide little insight into the species in New Hampshire. There have been no systematic surveys for Fowler's toads in the state. The quality of the existing data on Fowler's toad distribution in the state is extremely poor.

1.9 Distribution Research

As there have been no systematic surveys conducted in the state, the first priority is to conduct such a survey to document the location of breeding populations. There is no evidence that the species occurred historically in the northern portion of the state; thus, monitoring and survey efforts should focus on southern New Hampshire. Given that the species may not be widespread, it is important to determine sizes of any existing populations and to assess the threat (from development, pollution, or isolation) of continued persistence of the remaining populations. Although Fowler's toads breed in the shallow areas of permanent aquatic sites, they are facultative vernal pool breeders. Thus, it would also be important to

assess the location and type of breeding sites available in areas in which the species is documented. Because the species breeds later in the season than many other vernal pool breeding species, identification of appropriate vernal pool sites (e.g., long-hydroperiod vernal pools) is important.

ELEMENT 2: SPECIES/HABITAT CONDITION

2.1 Scale

2.2 Relative Health of Populations

There are not sufficient data available from which to make conclusions about population health or trends for this species.

2.3 Population Management Status

There are no population monitoring efforts for this species. The North American Amphibian Monitoring Program (NAAMP) is conducted annually in New Hampshire; however, no Fowler's toads have been reported.

2.4 Relative Quality of Habitat Patches

There are not sufficient data available to assess the quality of habitat patches for the Fowler's toads.

2.5 Habitat Patch Protection Status

There are insufficient data with which to assess protection status.

2.6 Habitat Management Status

There are no habitat management efforts being made for Fowler's toads. Because the distribution and abundance of the species is unknown, management efforts that might indirectly benefit this species cannot be assessed at this time.

2.7 Sources of Information

There are no sources of information beyond the RAARP and Natural Heritage databases.

2.8 Extent and Quality of Data

Although the literature can provide a general description of habitat associations for this species, distribution and population numbers are lacking for this species in New Hampshire. Because American toads are commonly misidentified as Fowler's toads, few records have been confirmed in New Hampshire (M. Marchand, NHFG, personal communication).

2.9 Condition Assessment Research

Basic distribution data for this species must be acquired. Understanding the location, size, and dispersal of existing populations will help protect the species. Areas for intensive, systematic surveys can be determined by an initial delineation of its potential habitat. Using remote sensing (e.g., aerial photography) and fieldwork, a GIS habitat layer could be created. Potential habitat could be determined by appropriate soil data layers with potential breeding site habitat. A list/formula should be developed that facilitates assessment of Fowler's toad population and habitat health. This list/formula could consider the following:

- Stability of the sub-population and/or metapopulation(s)
- Potential for genetic exchange between local populations
- Incidence of physical malformations or disease
- Water quality at breeding sites
- Proximity of the habitat patch to other potential habitat patches
- Proximity of the habitat to roads, development, and other disturbances
- Size and configuration of upland habitat

ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT

3.1.1 Development (Habitat Loss and Conversion)

(A) Exposure Pathway

Fowler's toads require sandy upland habitat near appropriate breeding sites. Many of these sites are along large river systems and lakes where development pres-

sure is high, thus Fowler's toads may suffer loss of habitat and fragmentation. Development could result in local extirpation if adjacent areas are unsuitable habitat and distances between suitable habitats are beyond dispersal capabilities of Fowler's toads.

(B) Evidence

Because we lack information on Fowler's toad distribution, there is no direct evidence that this threat is occurring. However, the most likely areas in which Fowler's toads may occur are in the southern part of the state and along riverine areas such as the Connecticut and Merrimack Rivers. Given current population growth and development trends (Sundquist and Stevens 1999), and the planned expansion of I-93, it is likely that there will be increasing development pressures in areas where Fowler's toads may occur.

3.1.2 Transportation Infrastructure (Mortality, Fragmentation, Dispersal Barriers)

(A) Exposure Pathway

Direct mortality of toads caused by vehicle traffic can be significant and may be particularly problematic for small populations. Roads fragment toad habitat and may act as partial barriers to migration. Thus, roads may decrease toad dispersal, resulting in decreased exchange of individuals among populations and consequently reduce colonization/recolonization and gene flow among local populations.

(B) Evidence

Although specific studies of road impacts on Fowler's toads are not available, there is substantial evidence in the literature that roads are a significant source of direct mortality for migrating amphibians (Fahrig et al. 1995, Ashley and Robinson 1996, Mazerolle 2004). Given current population growth and development trends (Sundquist and Stevens 1999), and the planned expansion of I-93, it is likely that there will be increasing developmental pressures in areas where Fowler's toads may occur.

3.2 Sources of Information

Because distribution and population size information on this species is not known, the threats to this species are hypothetical and are drawn largely from the general literature and knowledge rather than specific

evidence for this species in New Hampshire.

3.3 Extent and Quality of Data

No relevant data exist for this species in the state, and relatively poor data exist for this species in general.

3.4. Threat Assessment Research

A survey is needed to document the occurrence and abundance of the species, as well as to determine the number of remaining populations, the size of those populations and the degree of connectivity (i.e., likelihood of exchange among populations).

ELEMENT 4: CONSERVATION ACTIONS

4.1.1 Identify locations of Fowler's toad populations and protect their habitat; Habitat Protection

(A) Development (Habitat Loss and Conversion), Transportation Infrastructure (Mortality, Fragmentation, Dispersal Barriers)

(B) Justification

Given limited resources for habitat acquisition and protection, adequate data on population locations and status should be obtained so that the most appropriate parcels can be targeted for protection or management.

(C) Conservation Performance Objective

The initial performance objective is to survey all potential Fowler's toad habitats. If populations were found, the performance objective would be to protect the most significant (as measured through populations size, size or quality of the habitat patch, and other metrics) habitat parcels. Maintenance of extant Fowler's toad populations on those parcels would be the final performance objective.

(D) Performance Monitoring

Appropriate performance monitoring would be the number of parcels protected and the retention of extant Fowler's toad populations that are stable or increasing (however, see below).

4.2 Conservation Action Research

Existing knowledge of New Hampshire's Fowler's toad populations is poor and this precludes any attempt to assess the likely outcome of conservation actions. A systematic survey of potential Fowler's toad populations must be undertaken. This survey could most easily be accomplished during the breeding season through a combination of breeding call surveys (this species has a *very* distinctive call), egg mass counts, and larval surveys. Potential survey sites can be determined using GIS (see section 2.9). Once existence and location of populations have been established, the next step would be to determine the size of each population via a mark and recapture study. If potentially viable populations are identified, research should focus on the dispersal capabilities of the species, the degree to which populations are connected, and the areal extent of upland habitat that should be protected to ensure that habitat loss and fragmentation are minimized.

ELEMENT 5: REFERENCES

5.1 Literature

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Distribution of Fowler's Toad in New Hampshire

Distribution

■ Known

▨ Historic

N



0 10 20 40 Miles

Known - verified observations based on specimens, photos,
or expert observation [e.g., NHFG's Reptile & Amphibian
Reporting Program (RAARP), museum specimens, etc.]
Historic - observations greater than 20 years old.

