

## SPECIES PROFILE

# American Bittern

*Botaurus lentiginosus*

Federal Listing: Not listed

State Listing: Not listed

Global Rank: G4

State Rank: S3B

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### ELEMENT 1: DISTRIBUTION AND HABITAT

#### 1.1 Habitat Description

American bitterns occupy a range of freshwater wetlands that contain tall emergent vegetation. Suitable habitats thus include cattail (*Typha* sp.) marshes associated with lakeshores, beaver ponds, fens, and impoundments (Gibbs and Melvin 1992, Gibbs et al. 1992, Foss 1994), although nests are occasionally found in hayfields at some distance from water (Foss 1994, R. Andrews personal communication). Because of the species' diet and foraging behavior, it avoids the deeper parts of occupied wetlands (Gibbs et al. 1992). In many parts of the Northeast, bitterns also occur in wetlands dominated by ericaceous or other water-tolerant shrubs (e.g., *Alnus* spp., *Cephalanthus* spp., *Viburnum* spp.) (Gibbs et al. 1991).

Some evidence suggests that bitterns only breed in wetlands above a certain minimum size. In New York and Wisconsin, these minima were 4 and 10 ha (10 and 25 acres) respectively (*in* Gibbs et al. 1992). However, during the New Hampshire Breeding Bird Atlas (BBA) survey, workers reported territorial bitterns from wetlands as small as 1.2 ha (3 ac) (Foss 1994). Such smaller wetlands may serve primarily as alternate foraging sites rather than breeding areas (Gibbs and Melvin 1992).

Bitterns generally use similar freshwater habitats during migration in New Hampshire, although at this time they also occur in salt marshes along the coast (New Hampshire Bird Records). The species

has also been recorded in such habitats during the winter months, but is not known to breed in them anywhere in its range (Gibbs et al. 1992).

#### 1.2 Justification

Although bitterns are widespread across the state (see below), there is anecdotal evidence suggesting population decline. This decline is likely a result of wetland loss through draining, filling, and other means. The decline shown by bittern populations in New Hampshire has also been seen on the regional and continental scale, although the pattern of decline is unclear. Statewide atlas accounts in New York (Andrle and Carroll 1988), Vermont (Laughlin and Kibbe 1985), and Massachusetts (Petersen and Meservey 2003) all report on the species' decline since the mid 1990s. It disappeared from Long Island between 1985 and 2000 (New York State Department of Environmental Conservation) and has declined to the point of being listed as Endangered in Connecticut (Gibbs and Melvin 1992). Breeding Bird Survey (BBS) data show a mix of decreases and stable trends in the northeastern portion of the species' range. However, given the patchy nature of bittern habitat and the species' crepuscular behavior, the ability of the BBS to detect real population trends for bitterns is moderate at best, and any trends should be interpreted with caution.

In general, the species is far more common in the northern part of its range, including Canada and perhaps the northernmost portions of New England (Gibbs et al. 1992, Sauer et al. 2004). Data from the Christmas Bird Count (CBC) (National Audubon Society 2002) show a decline in bittern populations in the southeastern United States from the mid 1960s to the early 1990s, after which point numbers have been increasing. It should be noted that bitterns are rarely detected during the CBC, and that these trends in wintering populations may be biased by variation

in observer effort or other non-controllable factors.

### 1.3 Protection and Regulatory Status

*See pied-billed grebe.*

### 1.4 Population and Habitat Distribution

American bitterns have probably always been widely distributed throughout New Hampshire. During the BBA, they were reported from 60 blocks (43 priority blocks) (Foss 1994), and the species was present in most of the state except the seacoast and the higher elevations and extensive forests of the White Mountains (figure 1a). More recent data from the breeding season (late April through August, NHBR) indicate that this distribution remains largely unchanged (figure 1b).

### 1.5 Town Distribution Map

*Not completed for this species.*

### 1.6 HABITAT MAP

An American bittern habitat model for New Hampshire was modified from a model developed by the USFWS, Gulf of Maine Project (Banner and Schaller 2001). The base map for analysis was a composite wetland map developed at the NHNHBB, and NHFG, in which contiguous wetlands were grouped into complexes and given attributes related to wetland size, proportions of different wetland types, and a number of additional variables related to threat and condition (see Marsh and Shrub Wetland habitat profile). Potential bittern habitat was selected from the larger wetland data set using the following criteria (“wetlands” refers to “wetland complexes” as defined in the wetland habitat profile):

- Add +0.5 for wetlands between 1 and 10 hectares (2.5-25 acres)
- Add +1 for wetlands greater than 10 hectares (25 acres)
- Add +1 if emergent vegetation occupies greater than 30% of wetland
- Subtract -0.5 if open water constitutes greater than 50% of wetland (Gibbs et al. 1991)

This model was not tested against known bittern locations in the state, since it is known that the latter data

are not comprehensive. There are certainly bittern locations that might not be captured by this model, and many modeled wetlands may not be used by the species. However, the subset of wetlands selected by this model is probably a reasonable representation of the distribution of potential habitat across the state. Exceptions are most likely to occur in the White Mountains and Coastal Lowlands subsections, where bitterns are known to be rare or absent as breeders.

### 1.7 Sources of Information

Basic natural history information in this profile was largely gathered from the literature cited in element 6. Habitat modeling was informed by the Gulf of Maine Program (Banner and Schaller 2001) and wetland mapping conducted by the NHNHBB. Identification of threats, research needs, and conservation strategies was informed by the literature and by regional bird conservation planning (Bird Conservation Region (BCR) 14 and 30 step-downs).

### 1.8 Extent and Quality of Data

Although bitterns are secretive and thus not as frequently detected as other birds, evidence indicates that the available data do reflect their distribution across the state. However, data on population size and trend are largely non-existent, and the limited available data are acknowledged poor indicators of population status (Sauer et al. 2004).

### 1.9 Distribution Research

Although the need for distribution information is less critical than for some other wetland birds, accurate population trend data is needed. Given that American bitterns occur with many other wetland birds, any inventory or monitoring program for those species should include American bittern. Surveys should target known or high-potential sites as identified by habitat mapping and should use methods consistent with other efforts in the region. Marsh bird monitoring has been identified as a priority project in BCR 30, and a coordinated regional effort would be invaluable in understanding trends in demographics throughout the northeast.

**ELEMENT 2: SPECIES/HABITAT CONDITION****2.1 Scale**

Given the widespread distribution and varied habitats of the American bittern in New Hampshire, it is difficult to identify an appropriate conservation scale below that of the entire state. In addition, any smaller scale for planning specifically for this species will be severely compromised by a lack of data. It is likely that bitterns occur in numerous wetlands from which we lack verified reports, and as a result it is essentially impossible to accurately evaluate either population or habitat condition at smaller scales. Although the state could be broken into regions based on ecoregions, watersheds, or even counties, wetlands in any such subdivision would not be subject to the same threats or amenable to the same conservation actions. As a result, this profile will consider threats and actions relevant to the American bittern at a statewide scale. Note that individual wetland complexes are being treated by the wetland habitat profile, and much of the information therein will be relevant to bitterns.

**2.2 Relative Health of Populations**

At the statewide scale, this item has already been addressed in section 1.2 above. Available data do not indicate any local variation of population trends within the state.

**2.3 Population Management Status**

In the absence of detailed information on management activity at most places where bitterns occur, or on the local effects of management on bittern populations, it is impossible to evaluate management efforts for this species.

**2.4 Relative Quality of Habitat Patches**

There are no data available with which habitat quality could be evaluated for this species, though the habitat model, which generates scores from 0.5 to 2.0, could be used as a rough approximation of habitat quality on a statewide scale.

**2.5 Habitat Patch Protection Status**

American bitterns use a variety of wetlands. See Marsh and Shrub Wetland habitat profile for protection status of various wetlands.

**2.6 Habitat Management Status**

No management specific to American bitterns is in place anywhere in New Hampshire.

**2.7 Sources of Information**

Data on site occupancy were compiled from NHBR and the New Hampshire BBA (Foss 1994). Information pertaining to management at some bittern sites (state wildlife management areas) was obtained from the NHFG.

**2.8 Extent and Quality of Data**

In the absence of comprehensive statewide surveys of this species or its habitat, the available data should be viewed as little more than a snapshot of bittern distribution in the state. The available data probably accurately reflect the species range (element 1), but should not be used to evaluate habitat.

**2.9 Condition Assessment Research**

Little is known about how bittern productivity varies across habitat types, including the effects of patch size and extent of invasive species infestation. Such demographic studies, if conducted in conjunction with distribution and abundance assessments as discussed above, would be valuable in determining the types of wetlands that are most valuable to this species.

**ELEMENT 3: SPECIES AND HABITAT THREAT ASSESSMENT**

Key threats identified in form 2 are loss of wetlands to development and the potential for habitat alteration by invasive plants. To the extent that these threats are common to a number of wetland species, they will not be treated in detail here. See the Marsh and Shrub Wetlands habitat profile for more information.

#### ELEMENT 4: CONSERVATION ACTIONS

There are no specific actions for American bittern conservation beyond those identified in the Marsh and Shrub Wetlands profile.

#### ELEMENT 5: REFERENCES

##### 5.1 Literature

- Andrle, R.F., and J.R. Carroll. 1988. The atlas of breeding birds in New York State. Cornell University Press, Ithaca, New York, USA.
- Banner, A., and S. Schaller. 2001. U.S. Fish and Wildlife Service Gulf of Maine Watershed Habitat Analysis. USFWS Gulf of Maine Program, Falmouth, Maine, USA. [http://r5gomp.fws.gov/gom/habitatstudy/Gulf\\_of\\_Maine\\_Watershed\\_Habitat\\_Analysis.htm](http://r5gomp.fws.gov/gom/habitatstudy/Gulf_of_Maine_Watershed_Habitat_Analysis.htm) Accessed 14 January 2005.
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- Laughlin, S.B., and D.P. Kibbe. 1985. The atlas of breeding birds of Vermont. University Press of New England, Hanover, New Hampshire, USA.
- New York State Department of Environmental Conservation. 2004. New York State breeding bird atlas website. [www.dec.state.ny.us/apps/bba/results](http://www.dec.state.ny.us/apps/bba/results). Accessed 7 April 2005.
- Petersen, W.R., and W.R. Meservey. 2003. Massachusetts breeding bird atlas. Massachusetts Audubon Society, Lincoln, Massachusetts, USA.

Sauer, J.R., J.E. Hines, and J. Fallon. 2004. The North American Breeding Bird Survey, Results and Analysis 1966-2003. Version 2004.1, U.S. Geological Survey Patuxent Wildlife Research Center, Laurel, Maryland, USA.

##### 5.2 Data Sources

- National Audubon Society 2002. The Christmas Bird Count Historical Results [Online]. <http://www.audubon.org/bird/cbc>. Accessed 2005 February 8.
- New Hampshire Bird Records, New Hampshire Audubon, Concord, New Hampshire, USA.

#### ELEMENT 6: LIST OF FIGURES

Figure 1. Distribution of breeding season (mid-April through August) records of American bittern in New Hampshire during a) the Breeding Bird Atlas and b) a similar period 20 years later.

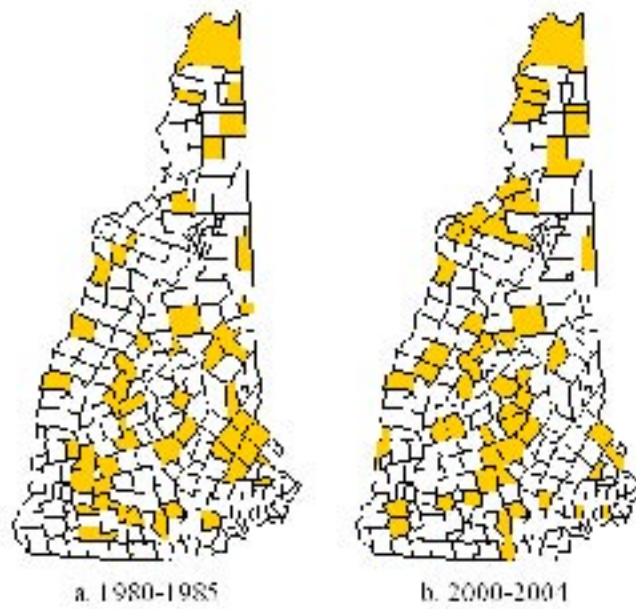
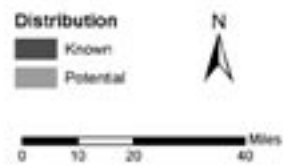


Figure 1. Distribution of breeding season (mid-April through August) records of American bittern in New Hampshire during a) the Breeding Bird Atlas and b) a similar period 20 years later.

## Distribution of American Bittern in New Hampshire



Known = confirmed breeding observations as reported in the NH Natural Heritage Bureau's Element Occurrence Database and obtained from NH Bird Records and the NH Breeding Bird Atlas, Audubon Society of New Hampshire.  
Potential = possible breeding and other observations from the same data sources.

