Species Status Assessment

Common Name: Least bittern **Date Updated:** March 12, 2025

Scientific Name: *Botaurus exilis* (formerly *Ixobrychus exilis)* **Updated By:** Heidi Kennedy

Class: Birds

Family: Ardeidae

Species Synopsis *(a short paragraph which describes species taxonomy, distribution, recent trends, and habitat in New York):*

The least bittern breeding range includes much of the United States east of the Great Plains, scattered locations in west-central and western United States, and areas south to Costa Rica. New York is near the northern periphery of the range, with populations extending northwards into southeastern Canada and Maine (Gibbs et al. 1992). Preferred breeding habitat in upstate New York is freshwater marsh with tall emergent vegetation, such as cattail (Typha spp.), interspersed with open water. On Long Island, brackish marshes and occasionally salt marshes may also be used. Trends are difficult to assess because the secretive nature of this species make them difficult to detect without targeted surveys. Where least bitterns do breed, they can occur in densities as high as 15 nests per hectare (Poole et al. 2009). Least bitterns are listed as Endangered, Threatened, or Special Concern in all states adjacent to New York except Vermont. The species has been included on the National Audubon Society Blue List since 1979 (Tate 1986) because birdwatchers reported the species as reduced over much of its range and extirpated in some areas.

In New York, the second Breeding Bird Atlas (2000-05) documented a 9% decline in occupancy since the first Atlas in (1980-85), but differences may in part be due to varying levels of survey effort.

I. Status

a. Current legal protected Status

i. **Federal:** Not Listed **Candidate:** No

ii. **New York:** Threatened

b. Natural Heritage Program

i. **Global:** G4

ii. **New York:** S3B, S1N **Tracked by NYNHP?:** Yes

Other Ranks:

-NYS 2025 SGCN Status: Species of Greatest Conservation Need
-IUCN Red List: LC – Least concern
-Northeast Regional SGCN: Watchlist

Status Discussion:

Least bittern is an uncommon breeder with a spotty distribution in New York. In winter it is very rare along the coast and unknown upstate (Stoner 1998). In large emergent marsh complexes in NY, such as the Iroquois wetland complex, it can be quite abundant.

II. Abundance and Distribution Trends

Note - Due to the secretive nature of this species, the North American Breeding Bird Survey (BBS) does not provide credible results for this species due to very low route abundance (birds per route). Therefore, trends from BBS were not presented.

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
North America	Yes	Unknown	Unknown			-
Northeastern US	Yes	Unknown	Unknown			-
New York	Yes	Unknown	Declining	-9% decrease in occupancy between 1st (1980-1985) and 2nd BBA (2000-2005)	Threatened	Yes
Connecticut	Yes	Unknown	Unknown		Threatened	Yes
Massachusetts	Yes	Increasing	Increasing	"Likely" increasing based on increase between 1974-1979 and 2007-2011 BBAs	Endangered	Yes
New Jersey	Yes	Unknown	Unknown		Special Concern	Yes
Pennsylvania	Yes	Declining	Declining	-10% decrease in occupancy between 1st (1982-1989) and 2nd (2004-2008) BBAs - Only 4 confirmed breeding locations in 2nd BBA. Abundance also seems to be declining where largest populations are found	Endangered	Yes
Vermont	Yes	Unknown	Stable	0% change in occupancy	Not listed	Yes

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
				between 1st BBA (1976-1981) and 2nd BBA (2003-2007)		
Ontario	Yes	Unknown	Declining	BBA from 1980-1988 and 2000-2005 show a decline in occupancy, however, many new observations have been reported to Ontario's Natural Heritage Information Centre (NHIC) in recent years, and see also southern Great Lakes Basin info below which includes Ontario.	Threatened	-
Quebec	Yes	Unknown	Increasing	Intensive surveys 2004-2007 revealed 48 new sites BBA from 1984- 1989 to 2010-2014 showed an increase in total squares with detections of 40 - 62	Vulnerable	-
Southern Great Lakes Basin	Yes	Increasing	Increasing	The Birds Canada Marsh Monitoring Program showed that least bittern		-

Region	Present?	Abundance	Distribution	Time Frame	Listing status	SGCN?
				populations decreased during the 1990s and early 2000s, but during the last 15 years populations have been increasing significantly		

Column options
Present?: Yes; No; Unknown; No data; (blank) or Choose an Item
Abundance and Distribution: Declining; Increasing; Stable; Unknown; Extirpated; N/A; (blank) or Choose an item
SGCN?: Yes; No; Unknown; (blank) or Choose an item

Monitoring in New York *(specify any monitoring activities or regular surveys that are conducted in New York):*

NYSDEC conducted a three-year pilot study of the National Marsh Bird Monitoring Program from 2009-2011 at selected wetlands across the state. Standardized surveys continued from 2012 through 2019 using both random and non-random points on public and private land in managed and non-managed marshes. Surveys were done at a significantly reduced level in 2020 -2022.

In addition, the Marsh Monitoring Program through Birds Canada has long term marsh bird monitoring routes in the Great Lakes Basin part of New York.

The least bittern is a target species in both of the above survey protocols.

Trends Discussion *(insert map of North American/regional distribution and status):*
The NYS Breeding Bird Atlas documented a 9% decline in occupancy from 1980-85 to 2000-05. Due to the secretive nature of this species, the BBS does not provide credible results for this species due to very low route abundance (birds per route). Targeted standardized marsh bird surveys using broadcast calls would be more effective to determine secretive marsh bird species trends.

The Birds Canada Marsh Monitoring Program uses standardized marsh bird surveys within the Great Lakes basin, and their data show that least bittern populations decreased during the 1990s and early 2000s (significant decline of 8.5% per year in the Great Lakes Basin between 1995 and 2003), but during the last approximately 15 years, populations have been increasing significantly (Tozer, 2020).

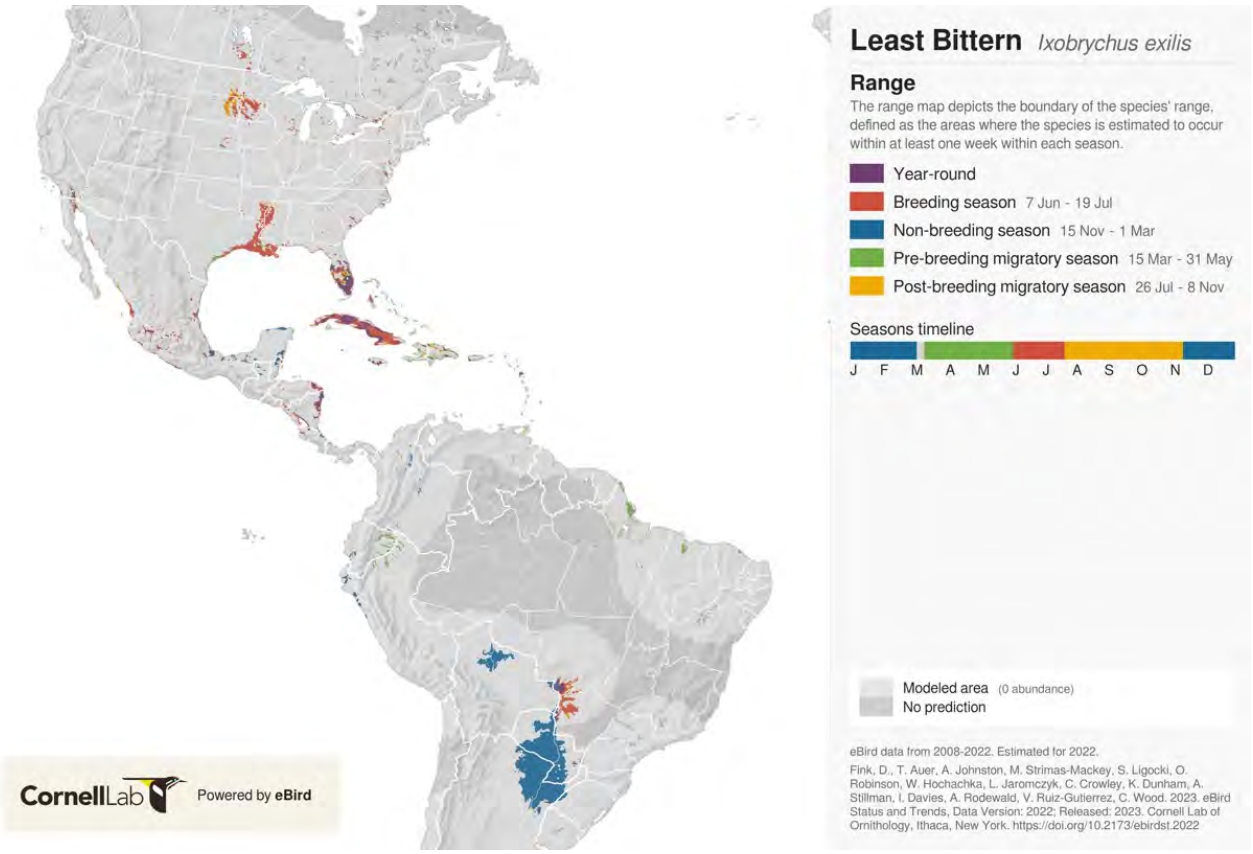

Figure 1. Least bittern distribution (eBird 2022)

Figure 2. Least bittern distribution (Birds of the World online)

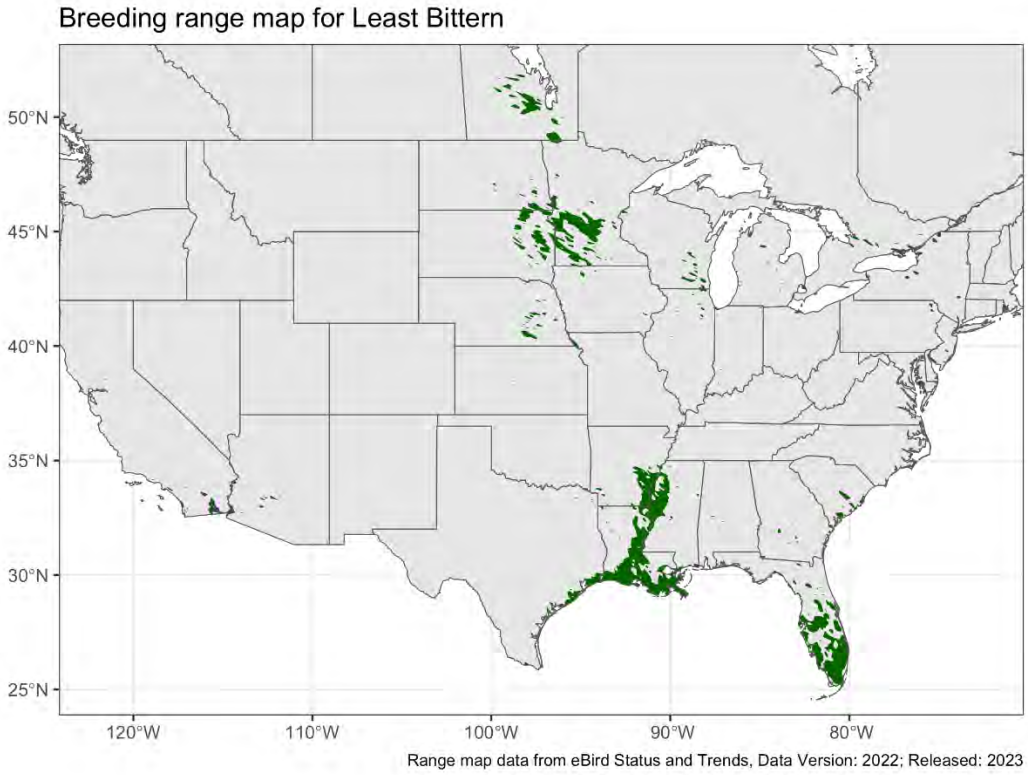

Figure 3. Breeding range of least bittern in North America (eBird).

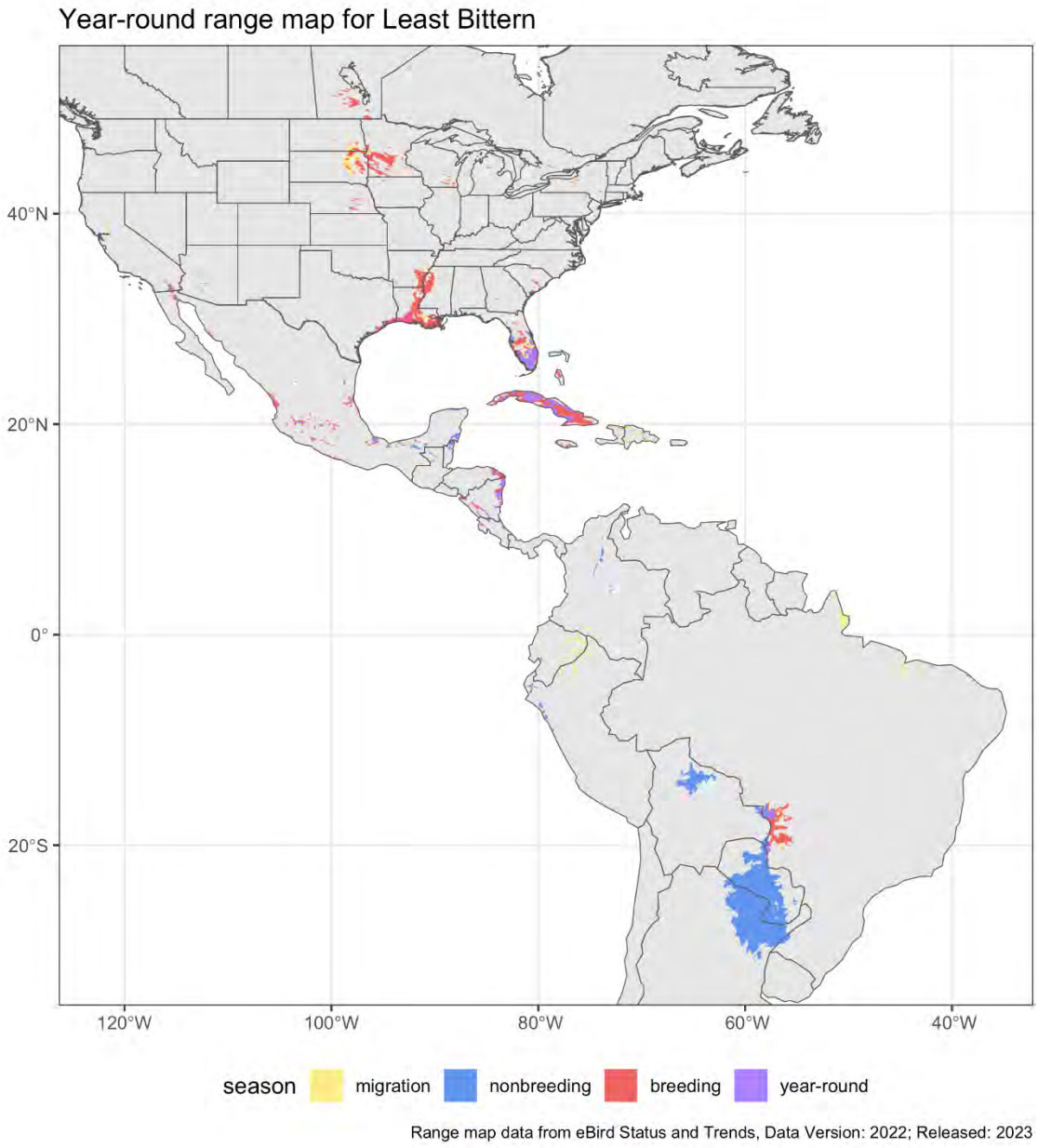

Figure 4. Year-round range of least bittern (eBird).

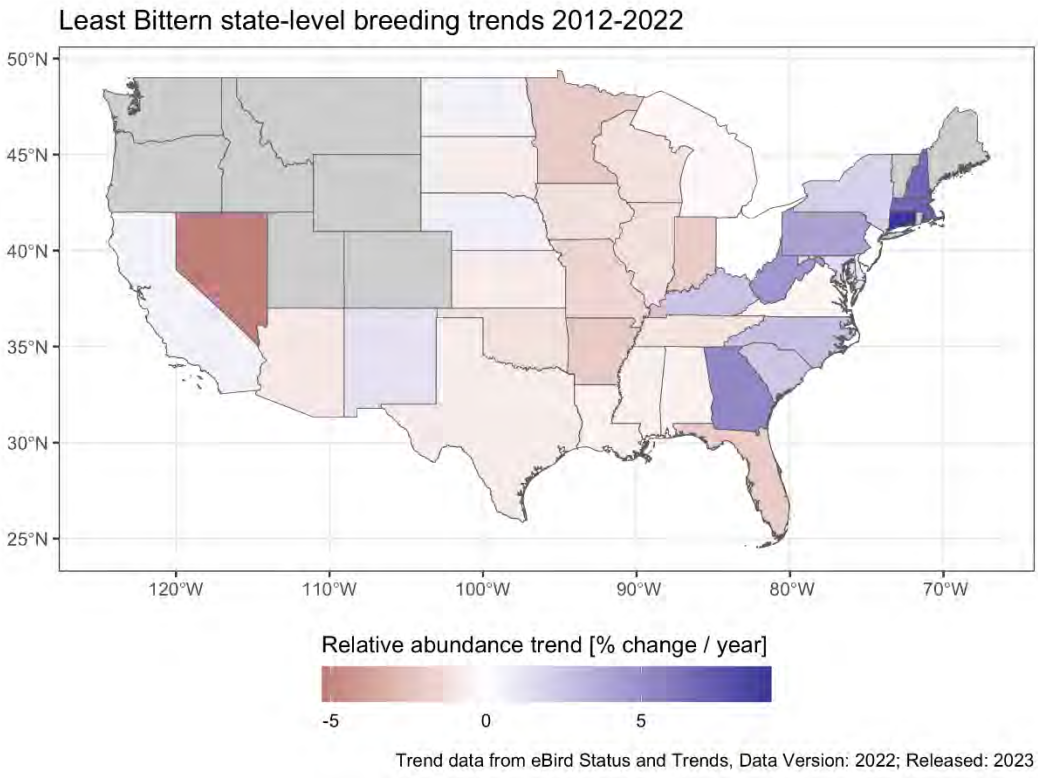

Figure 5. Breeding trends, by state, of least bittern (eBird).

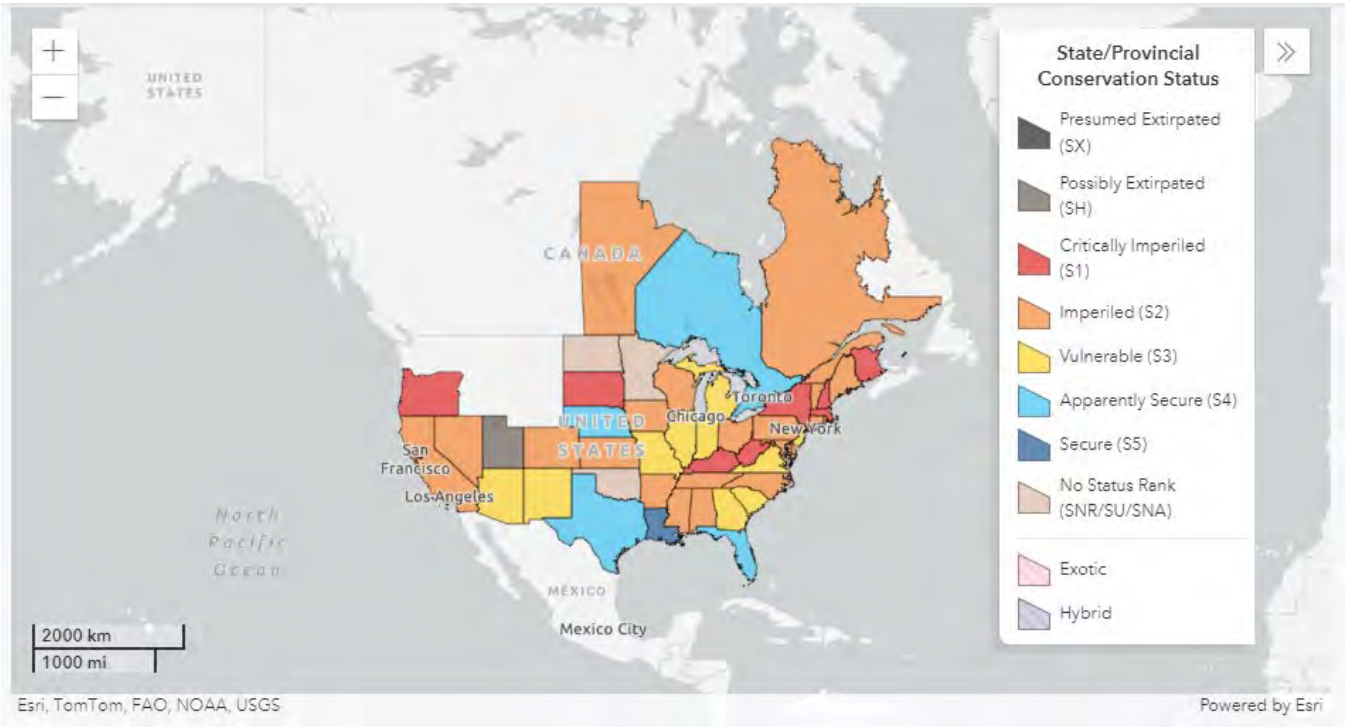

Figure 6. Conservation Status of least bittern in North America (NatureServe 2023)

III. New York Rarity *(provide map, numbers, and percent of state occupied)*

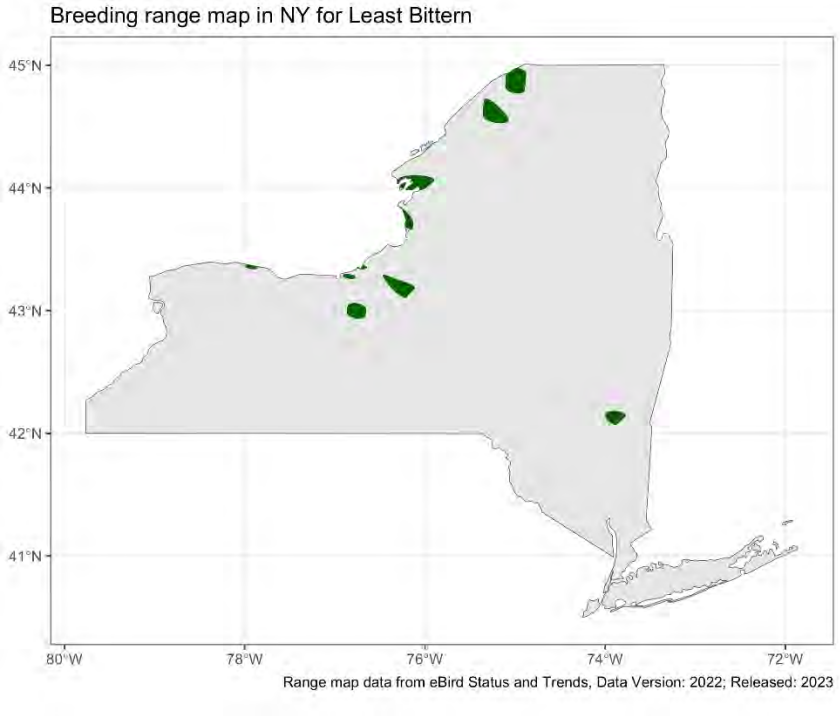

Figure 7. New York breeding range of least bittern (eBird).

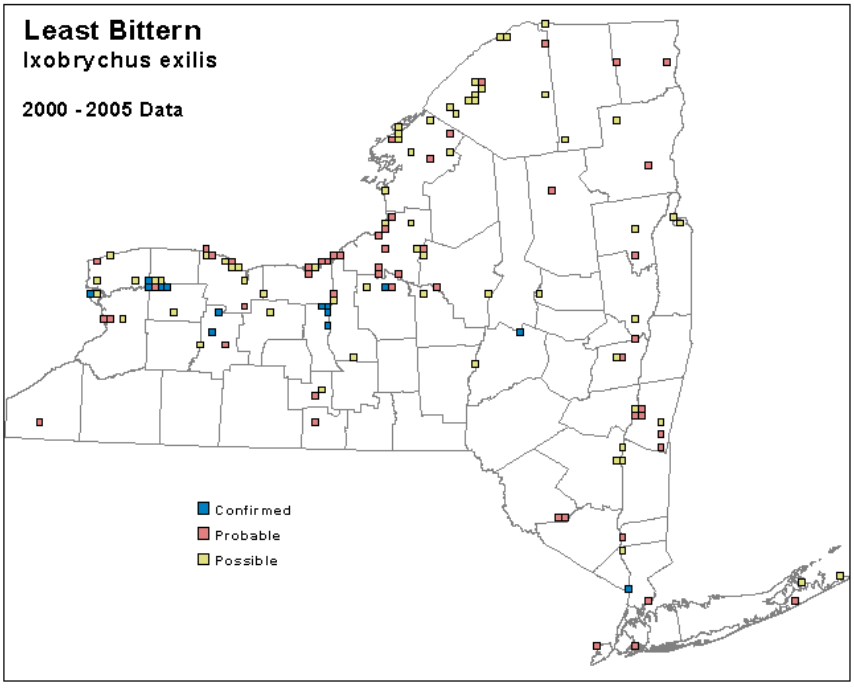

Figure 8. Occurrence Map from second NY Breeding Bird Atlas (NYSDEC)

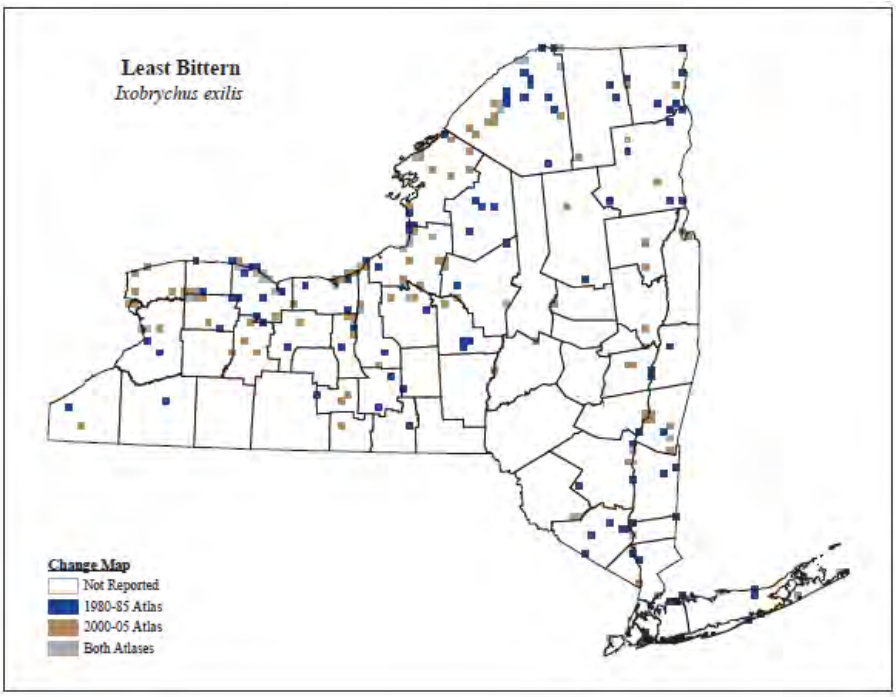

Figure 9. Change in occurrence between the first and second BBA (NYSDEC)

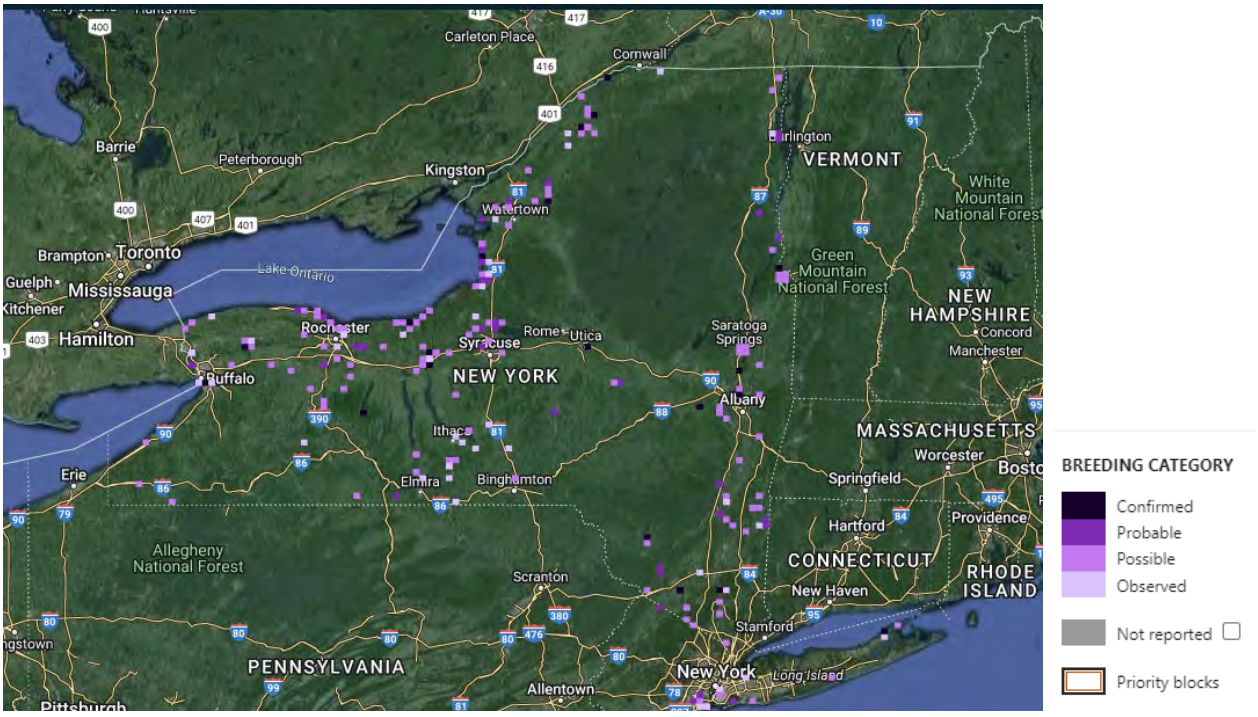

Figure 10. Records of least bittern in New York (NYS BBA III Map, 2023)

Details of historic and current occurrence:

The first Breeding Bird Atlas (BBA) (1980-85) documented occupancy in 142 blocks, 3% of the survey blocks statewide (Andrle and Carroll 1988). Breeding was concentrated on the Great Lakes Plain and Hudson Valley.

The second BBA (2000-05) documented occupancy in 129 blocks (out of 5,335), 2% of the survey blocks statewide (McGowan and Corwin 2008), a decline of 9% from the first atlas. Concentrations are apparent near the Iroquois and Montezuma wetland complexes, as well as at marsh complexes along Lake Ontario, most of which are at least partially contained in state Wildlife Management Areas.

The third BBA (2020-25) is complete, and data is currently being analyzed. This most recent BBA utilizes a different number and layout of survey blocks across New York, making direct comparison with the first two Atlases difficult. There were 5,333 blocks in the first and second BBAs, and there are 5,710 blocks in the current BBA, of which 1,815 are considered priority blocks. To date, least bittern has been documented in 84 priority blocks, 4.6% of all priority blocks statewide during the third BBA (NY BBA III Overview, 2024).

New York's Contribution to Species North American Range:

Percent of North American Range in NY	Classification of NY Range	Distance to core population, if not in NY
1-25%	Peripheral	

Column options
Percent of North American Range in NY: 100% (endemic); 76-99%; 51-75%; 26-50%; 1-25%; 0%; Choose an item
Classification of NY Range: Core; Peripheral; Disjunct; (blank) or Choose an item

IV. Primary Habitat or Community Type *(from NY crosswalk of NE Aquatic, Marine, or*

1. Freshwater Marsh
2. Great Lakes Freshwater Estuary Marsh
3. Estuarine, Brackish Intertidal, Tidal Wetland
4. Estuarine, Freshwater Intertidal, Tidal Wetland, Freshwater Tidal Marsh

Habitat or Community Type Trend in New York

Habitat Specialist?	Indicator Species?	Habitat/ Community Trend	Time frame of Decline/Increase
Yes	Yes	Declining	Since 1970s

Column options
Habitat Specialist and Indicator Species: Yes; No; Unknown; (blank) or Choose an item
Habitat/Community Trend: Declining; Stable; Increasing; Unknown; (blank) or Choose an item

Habitat Discussion:

In New York, least bitterns breed in freshwater marshes with tall emergent vegetation, such as cattail and burreed, interspersed with open water. Recent breeding reports on Long Island have been from

freshwater and brackish marshes, which appear to be favored over salt marsh habitat (Kennedy 2008). Least bitterns are thought to be area-dependent, preferring marshes of greater than 5 hectares (12.3 acres) (Brown and Dinsmore 1986). Mean home range of adults in a study at the Iroquois complex was 9.7 ha (n=33), but varied (1.8-35.7 ha) depending upon whether birds used one or two areas during the breeding season (Bonger and Baldassarre, 2002).
Least bitterns prefer stands of cattails, bulrush, or bur-reed. Stands of cattails are often interspersed with pools of open water or slow-moving channels and some woody vegetation. Large marshes are important breeding areas for this species. Open habitats such as mats of emergent vegetation are rarely used (Frederick et al. 1990).

V. Species Demographic, and Life History:

Breeder in NY?	Non-breeder in NY?	Migratory Only?	Summer Resident?	Winter Resident?	Anadromous/ Catadromous?
Yes	Choose an item.	Choose an item.	Yes	Choose an item.	Choose an item.

Column options
First 5 fields: Yes; No; Unknown; (blank) or Choose an item
Anadromous/Catadromous: Anadromous; Catadromous; (blank) or Choose an item

Species Demographics and Life History Discussion *(include information about species life span, reproductive longevity, reproductive capacity, age to maturity, and ability to disperse and colonize):*

No definite information is available on age at first breeding, which is presumably 1 year (Poole et al. 2009). Pairs will occasionally nest twice per breeding season (Weller 1961), both re-nesting after depredation and raising two broods (Bogner and Baldassarre 2002). In western New York, the mean time between failure or hatching of the first nest and initiation of a new nest was 5.3 d ±0.9 SE (n = 3) for re-nesting birds, and 21.7 d ±3.5 SE (n = 3) for double-brooded birds (Bogner and Baldassarre 2002). In western New York wetlands, 1999-2000, nest success (% nests hatching young) ranged from 58-68% in 2 years and fledging success (% young hatched that fledged) ranged from 76-78% (Bogner and Baldassarre 2002). Thus, overall success in this study (% eggs producing fledged young) was 44-52%.
No information is available on lifespan and survivorship, except 2540 individuals banded between 1914 and 2004 with only 8 subsequent encounters, none of which > 3 years after banding (Klimkiewicz 2008). Little information is available on the effects of disease and parasites or causes of death; the least bittern is known to host trematode worms (Font et al. 1984) and two species of lice and one species of mite (Peters 1936). Populations were thought to be reduced by an unknown disease during the nesting season at an Iowa wetland (Kent 1951).
Nest loss may be due to abandonment, predation, cannibalism, and disease (Kent 1951). High water also may destroy least bittern nests (McVaugh 1975). In S. Carolina, reproductive loss at nests was generally 1-2 eggs or young, rather than total loss (catastrophic mortality) owing to predation or weather (Post 1998).

VI. Threats *(from NY 2015 SWAP or newly described):*

New York has lost more than half of its wetlands since colonization (Tiner 1984 cited in NatureServe 2003). More recently, losses of wetlands in the Great Lakes Plains portion of the state have been offset as agricultural lands revert back to wetlands, although net losses of wetlands in the Hudson Valley

continue. Emergent marshes, which constitute only five percent of the state's 2.5 million acres, have declined overall. On a positive note, in addition to being protected by the State Freshwater Wetlands Act (Article 24), many of the larger emergent marshes and marsh complexes important to least bitterns in New York are publicly owned and managed for wildlife habitat (NatureServe 2013).

The habitat that remains may be degraded by fragmentation, exotic plants, and nutrient enrichment. Run-off from development and agricultural practices may also negatively impact prey. Water level management of Lake Ontario may also change the quality of habitat for least bitterns (King 2005). As a result of Lake Ontario water level management, many Lake Ontario wetlands are now dominated by thick cattail stands which lack the interspersion with open water that is important to least bittern nesting. Unnaturally high densities of predators may also pose a threat. In an assessment of vulnerability to predicted climate change conducted by the New York Natural Heritage Program, least bittern was identified as a second-priority species whose sensitivity should be assessed in the future (Schlesinger et al. 2011).

Wading birds tend to be susceptible to many diseases such as avian cholera, botulism, lice and mites, but little is known about the effects of disease and parasites on reproduction (NatureServe 2013). Because least bitterns fly low to the ground, collisions with motor vehicles, barbed-wire fences, and transmission lines can be a significant mortality factor (Forbush 1927, Guillory 1973).

Table 1. Threats to least bittern

Threat Level 1	Threat Level 2	Threat Level 3	Spatial Extent	Severity	Immediacy	Trend	Certainty
1. Residential and Commercial	1.1 Housing & Urban Areas	(wetland fragmentation)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
1. Residential and Commercial	1.3 Tourism & Recreation Areas	(shoreline development)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
6. Human Intrusions & Disturbance	6.1 Recreational Activities	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.2 Dams & Water Management/Use	(water level management)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
7. Natural System Modifications	7.3 Other Ecosystem Modifications	7.3.2 Vegetation succession	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	8.1.2 Terrestrial plants (loosestrife)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
8. Invasive & Other Problematic Species	8.1 Invasive Non-Native Plants & Animals	8.1.4 Aquatic plants (phragmites, purple loosestrife)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
9. Pollution	9.3 Agricultural & Forestry Effluents	(runoff, organochlorines)	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.1 Habitat Shifting & Alteration	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.4 Changes in Precipitation & Hydrological Regimes	11.4.2 Droughts	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.
11. Climate Change	11.5 Storms & Severe Weather	-	Choose an item.	Choose an item.	Choose an item.	Choose an item.	Choose an item.

Are there regulatory mechanisms that protect the species or its habitat in New York?

Yes: _X__ No: _____ Unknown: _____

If yes, describe mechanism and whether adequate to protect species/habitat:

The least bittern is listed as a threatened species in New York and is protected by Environmental Conservation Law (ECL) section 11-0535 and the New York Code of Rules and Regulations (6 NYCRR Part 182). A permit is required for any proposed project that may result in a take of a species listed as Threatened or Endangered, including, but not limited to, actions that may kill or harm individual animals or result in the adverse modification, degradation or destruction of habitat occupied by the listed species.
Least bitterns are protected under the Migratory Bird Treaty Act of 1918. Wetlands used for breeding are protected. The Freshwater Wetlands Act provides protection for wetlands greater than 12.4 acres (as of 2028 will be 7.4 acres) in size under Article 24 of the NYS Conservation Law. Smaller wetlands of unusual importance will also be protected. In addition, many of the larger wetlands and wetland complexes important to least bitterns are on public land.

Describe knowledge of management/conservation actions that are needed for recovery/conservation, or to eliminate, minimize, or compensate for the identified threats:

Wetlands with abundant emergent vegetation need preservation, protection, and improvement (Gibbs and Melvin 1992). It is important to prevent chemical contamination, siltation, eutrophication, and other forms of pollution in marsh habitats and to control invasive species (such as purple loosestrife and phragmites). When managing large wetland complexes, manage for the full suite of wetland species (waterfowl, marsh birds, furbearers etc.) by providing a range of habitat conditions, including areas with cattail, burreed, and bulrush and areas of hemi- marsh with a good mix of open water and emergent vegetation. A Lake Ontario water level management plan that would improve the health and diversity of Lake Ontario wetlands would benefit least bittern populations. Projects that create openings in thick cattail stands (channels and potholes) and encourage muskrat populations would also be beneficial. Some recent projects within Lake Ontario wetlands (mostly on WMA land) have involved the construction of channels and potholes to improve habitat conditions for species including least bittern.

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.0.0.0 Direct habitat management	Site/Area management – manage wetlands for hemi marsh conditions with tall emergent vegetation

Action Category	Action	Description
A.1 Direct Habitat Management	A.1.1.0.0 Manage plants, animals, fungi, or bacteria	Invasive/Problematic species control
B.3 Outreach	B.3.1.4.0 Public outreach and information	Awareness & Communications
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation planning	Site/Area Protection
C.6 Design and Plan Conservation	C.6.5.0.0 Conservation planning	Resource/Habitat Protection
C.6 Design and Plan Conservation	C.6.5.1.3 Develop a conservation, management, or restoration plan for protected private lands	Habitat/Natural process restoration

Table 2. Recommended conservation actions for least bittern

The Comprehensive Wildlife Conservation Strategy (NYSDEC 2005) includes recommendations for the following actions for freshwater marsh birds.

Curriculum development:

____ Utilize education as a tool for reducing wetland loss and the possible detrimental effects of human disturbance.

Fact sheet:

____ Promote the establishment of buffer areas around agricultural fields and developments.

Habitat management:

____ Restore wetland habitat and improve water level control.

____ Evaluate the extent to which management actions can reduce nest and chick losses via predator management and water level regulation.

____ Promote the use of Farm Bill and Landowner Incentive program funds to manage and restore appropriate habitat.

____ Adapt wetland management practices throughout the range of these species so they can simultaneously benefit waterfowl, marsh birds, and other water birds.

____ For endangered, threatened or rapidly declining marsh bird species/populations, protect all sites currently in use, and all historic sites of suitable habitat.

Habitat monitoring:

____ Identify and prepare a catalog of key migratory staging, molting areas, and wintering grounds.

____ Prepare a catalog, where possible, of breeding sites, identifying and mapping sites at a course .scale to select those worthy of monitoring.

____ Investigate diet and nutrition in relation to breeding habitat quality and prey populations.

Habitat research:

____ Evaluate habitats by a variety of techniques at multiple scales to better understand the micro- and macro- habitat features important to nest site selection.

____ Conduct controlled experiments to see which management actions are effective locally in producing habitat suitable for marsh birds.

Invasive species control:

____ Identify invasive species which have the potential to negatively impact marsh birds and quantify impact.

____ Reduce the spread and colonization of new sites by invasive exotic species.
___ Where feasible, control invasive species, which are known to have detrimental effects on marsh birds, to reduce negative impact (i.e. promote the implementation of biological controls to combat purple loosestrife).

Life history research:

____ Conduct demographic studies at selected sites across the species' breeding range to identify "source" and "sink" populations, thus the regions most important for maintaining a breeding population.
____ Conduct studies of habitat use, prey availability, and diet at migratory staging and molting areas and wintering grounds to assess possible threats and limiting factors.
____ Investigate aspects of behavioral ecology, such as mate selection, mate fidelity, spacing behavior, coloniality, dispersal, and post-fledging parental care.
____ Periodically monitor the levels of contaminants in marsh birds and their eggs to assess trends and determine effects on eggshell thinning, behavioral modification, chick development, nesting success, and juvenile survival.

Modify regulation:

____ Concurrently with management actions, efforts should be pursued vigorously to protect the quality and quantity of available wetland habitat and minimize wetland loss.

New legislation:

____ Develop and implement a noxious weed law to control the introduction and distribution of invasive exotic species.

New regulation:

____ Maintain water quality in nesting marshes and discourage use of pesticides on public lands to prevent reduction of insect populations and contamination of wetlands.

Population monitoring:

____ Refine monitoring techniques to better detect population trends and determine the cause of these changes.
____ Initiate baseline population surveys to determine abundance and distribution and periodically resurvey to detect trends
____ Study metapopulation dynamics and demography, focusing on such parameters as survival, age at first breeding, recruitment, dispersal, and the factors that affect them, using color-banded or radio-tagged birds.

Regional management plan:

____ Collaborate with existing planning initiative such as the North American Waterbird Plan, Bird Conservation Regional Plans and other regional efforts.

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