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New Distribution Records for Amphibians and Reptiles in Connecticut, with Notes on the Status of an Introduced Species

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New Distribution Records for Amphibians and Reptiles in Connecticut, with Notes on the Status of an Introduced Species

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ABSTRACT

Recent field work and a review of catalogued specimens in the herpetology collections at the Yale Peabody has yielded 170 new town records for amphibians and reptiles in Connecticut. These are reported here, along with observations on the status of the red-ear slider (*Trachemys scripta*) in Connecticut.

KEYWORDS

Trachemys scripta, red-eared slider, historical records, biodiversity surveys.

Introduction

The herpetofauna of Connecticut has been the subject of many natural history studies, beginning with Linsley (1844). During the 20th century works were published by Babbitt (1932, 1937), Lamson (1935), Petersen and Fritsch (1986) and Klemens (1993). In Klemens' landmark publication, all 22 species of amphibians and 23 species of reptiles (exclusive of marine turtles) naturally occurring in the state are treated, with the known distributions within the state presented by town, including both current and historic town records. Klemens' (1993) publication sparked considerable additional investigations, and here we present 170 new town records for 36 species of Connecticut reptiles and amphibians. These additions are derived from several principal sources. Notably, work on previously uncatalogued, historic herpetological specimens at the Peabody Museum of Natural History at Yale University (YPM) has re-

sulted in the discovery of Connecticut specimens that were not available to Klemens and were thus not included in his publication. This material, collected mostly by S. C. Ball and M. B. Bishop in the 1930s, but also with A. E. Verrill's specimens from the 1860s and 1870s, accounts for 29 of the new town records. In addition, specimens apparently overlooked by Klemens (1993) in the Yale Peabody Museum osteology collection are included. Of particular interest are specimens deposited by F. Wayne Van Devender and co-workers in the 1960s, which account for another 14 town records presented here.

Most new town records have been accumulated in recent years, mostly from an increase in herpetofaunal surveys conducted by Yale Peabody Museum staff. Areas surveyed include properties owned by the Connecticut Audubon Society and the Nature Conservancy, along with other Connecticut nature preserves used in biodiversity surveys. Other significant contributions to our

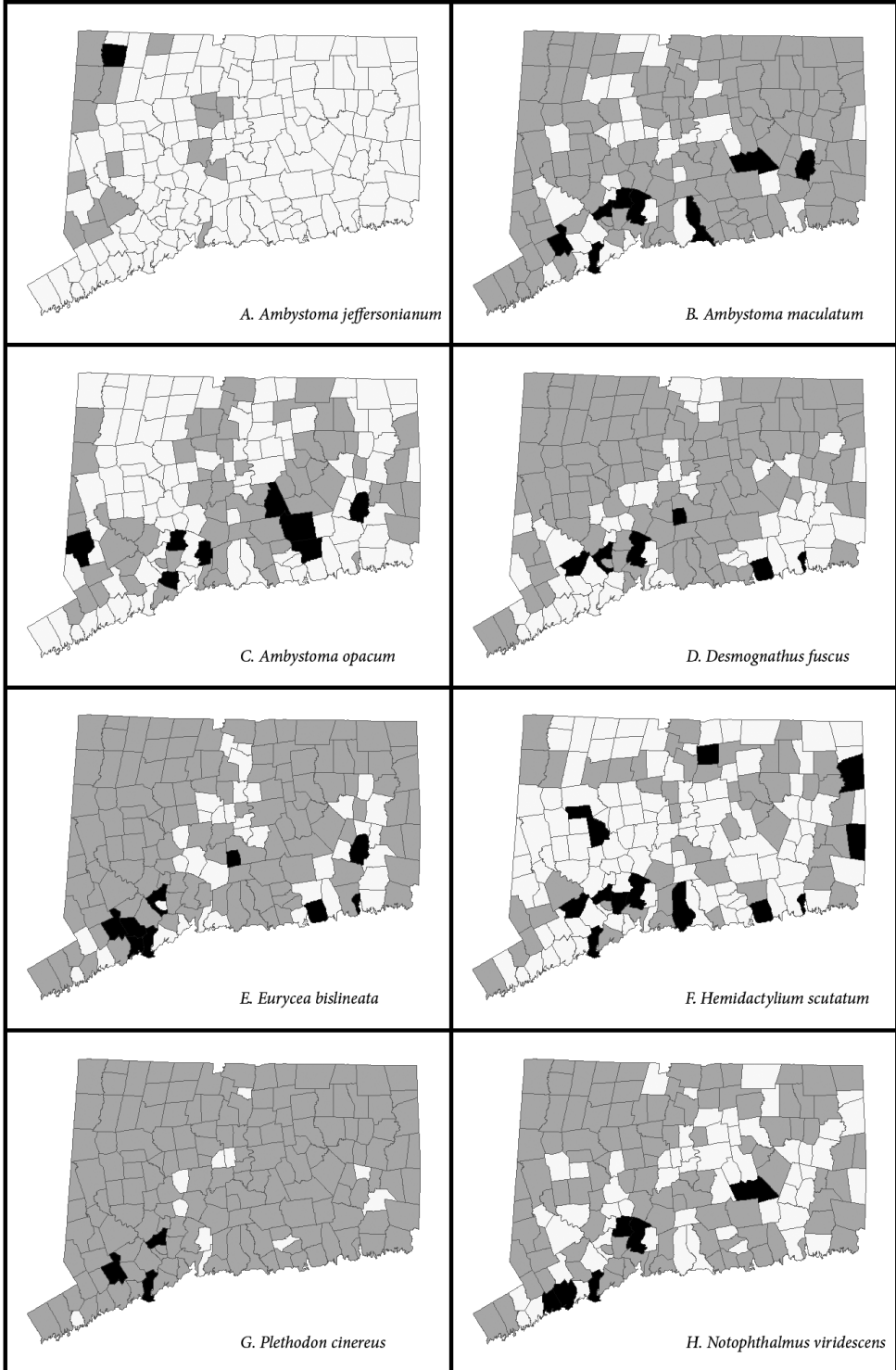


FIGURE 1. Distribution of amphibians and reptiles in Connecticut, by town. *Legend:* Light gray, no published records; dark gray, records published in Klemens (1993); black, new records published herein.

knowledge of the distribution patterns in the Connecticut herpetofauna have come from surveys conducted as part of the ongoing Connecticut Amphibian Monitoring Project (CAMP), which began in 1998. During the first five years of this proposed 15-year study, volunteers and professional staff surveyed the amphibian populations in wetlands of 13 randomly selected study sites located throughout the state. Voucher specimens from these study sites are deposited in the YPM herpetology collection. Lastly, there are noteworthy records from each of the recent annual “BioBlitz” events, 24-hour biodiversity surveys of Connecticut urban parks sponsored by the Connecticut State Museum of Natural History. These thorough surveys of often-neglected, semi-natural urban areas have occasionally revealed surprising discoveries.

Materials and Methods

All records presented here, whether contemporary or historic, are represented by voucher specimens in the YPM herpetology collection, except for recent records of *Terrapene carolina*, for which only photographic vouchers exist. Other photographs of Connecticut amphibians and reptiles mentioned here are incorporated in the Yale Peabody Museum slide and digital image collections. Photographs within the herpetology media collection are cited by their YPM.M number.

Voucher specimens were collected under Scientific Collection Permits 0104003 and 0106019 issued by the State of Connecticut Department of Environmental Protection and Yale University IACUC protocol 2002-10681. Full locality data for species considered to be threatened, endangered or of special concern by the Connecticut Department of Environmental Protection have been submitted to the State of Connecticut Environmental and Geographic Information Center for inclusion in their Natural Diversity Database.

Distribution Records

AMPHIBIA: CAUDATA

Ambystoma cf. jeffersonianum (Green)

Figure 1A

Town records. *Canaan* (Litchfield Co.): Sand Road Quarry, YPM 7832, collector Twan A. Leenders, 20 April 2003, eggs and

early embryos, identification based on egg mass (see Klemens 1993), egg mass maintained in 10% buffered formalin.

Ambystoma maculatum (Shaw)

Figure 1B

Town records. *Bethany* (New Haven Co.): Bethany Bog, YPM 6774, collector R. Wayne Van Devender, 1 October 1967, cleared and stained. *Colchester* (New London Co.): CAMP site, YPM 7188, collector Hank Gruner, 11 May 2002, larva. *Easton* (Fairfield Co.): CAMP site, YPM 10204, collectors Gregory J. Watkins-Colwell and Brian T. Roach, 28 March 2005, adult. *Hamden* (New Haven Co.): Brooksville Park, YPM 9156, collector Maxim Shpak, 18 March 2003; additional specimens from the same collecting event: YPM 9111 (adult) and YPM 9112–9113 (eggs). *Madison* (New Haven Co.): YPM 6209, collector Thomas M. Uzzell, 1968; also from Madison: YPM 6210–6212, 6215 (osteology specimens) and YPM 9979 (larva). *Norwich* (New London Co.): BioBlitz Site, Mohegan Park, YPM 6730, collector Gregory J. Watkins-Colwell, 31 May 2002, adult; also from Norwich: YPM 6718, 8902, 8903 (larvae). *Seymour* (New Haven Co.): CAMP site, YPM 9548, collector Donna Lindgren, 27 September 2003; also from Seymour: YPM 9866. *Stratford* (Fairfield Co.): YPM 9026, collector G. Watkins-Colwell, 23 July 2003; also from Stratford: YPM 9320, 9322, 9326–9330 (metamorphs) and 9662 (adult).

Ambystoma opacum (Gravenhorst)

Figure 1C

Town records. *Bethany* (New Haven Co.): Bethany Bog, YPM 5977, collector R. Wayne Van Devender, 1 October 1967, cleared and stained. *Danbury* (Fairfield Co.): YPM 8910, collector Victor O. DeMasi, 28 March 1999, larvae with four well-developed limbs (n=2). *East Haddam* (Middlesex Co.): North Plain, YPM 11, collector Stanley C. Ball, 1933; also from East Haddam: YPM 4523–4524 (juveniles) and YPM 8010–8029 (larvae), all collected in 1933. *East Hampton* (Middlesex Co.): CAMP site, YPM 8179, collector Bryan Goff, 11 May 2003; also from East Hampton: YPM 1050, lacks collection date but predates YPM 8179. *Lyme* (New London Co.): CAMP site, YPM 7214, collector Edward Natoli, 6 October 2002; also from Lyme: YPM 7215 (larva) and 7216 (adult), all collected in 2002. *North Haven* (New Haven Co.): YPM 6208, collectors R. Wayne Van Devender and Don Allen, 23 June 1968, osteology specimen. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6708, collector Gregory J. Watkins-Colwell, 1 June 2002, larva; additional specimens include: YPM 6709–6711 (larvae) and YPM 6723 (adult), all collected in 2002. *Orange* (New Haven Co.): YPM 25, collector H. B. Coffin.

Desmognathus fuscus (Rafinesque)

Figure 1D

Town records. *Derby* (New Haven Co.): CAMP site, YPM 10224, collector Gregory J. Watkins-Colwell, 10 April 2005. *Hamden* (New Haven Co.): Sleeping Giant State Park, YPM 7467, collector R. Wayne Van Devender, 21 January 1969; also from Hamden: YPM 7468, collected in 1969. *Middlefield*

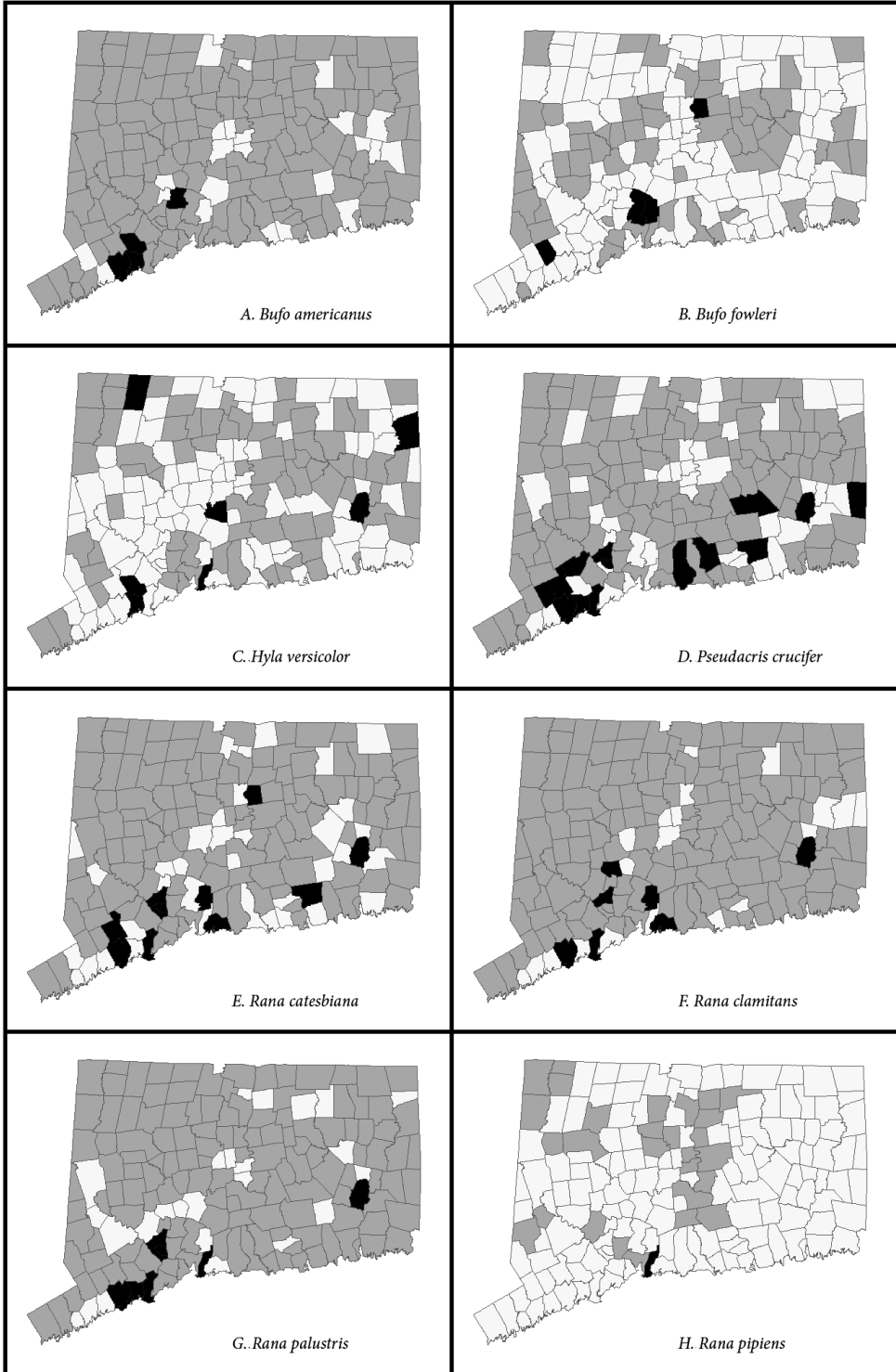


FIGURE 2. Distribution of amphibians and reptiles in Connecticut, by town. *Legend:* Light gray, no published records; dark gray, records published in Klemens (1993); black, new records published herein.

(Middlesex Co.): Wadsworth Falls State Park, YPM 6610, collector R. Wayne Van Devender, 21 June 1969; also from Middlefield: YPM 6611, collected in 1969. *Monroe* (Fairfield Co.): Means Brook, YPM 9479, collector Brian T. Roach, 1 October 2003. *New London* (New London Co.): BioBlitz site, Bates Woods Park, YPM 8881, collectors Gregory J. Watkins-Colwell and Brian T. Roach, 7 June 2003, adult; additional specimens from the same collecting event: YPM 8882 (adult), 8889 (eggs) and YPM.M 1039 (photograph of adult). *Old Lyme* (New London Co.): CAMP site, YPM 7220, collector Edward Natoli, 6 October 2002. *Seymour* (New Haven Co.): CAMP site, YPM 5792, collector Roger Lawson, 25 March 2000; also from Seymour: YPM 8193 and 9343, adults.

Eurycea bislineata (Green)

Figure 1E

Town records. *Bridgeport* (Fairfield Co.): Veterans Memorial Park, YPM 10090, collector Twan A. Leenders, 29 October 2004, larva; also from Bridgeport: YPM 10118, adult. *Derby* (New Haven Co.): CAMP site, YPM 7069, collector James Knox, 15 September 2002; also from Derby: YPM 7070, 9520 and 9896. *Easton* (Fairfield Co.): CAMP site, YPM 9777, collectors Gregory J. Watkins-Colwell and Brian T. Roach, 13 June 2004; also from Easton: YPM 9778 and 9877. *Middlefield* (Middlesex Co.): Wadsworth Falls State Park, YPM 6621, collector R. Wayne Van Devender, 21 June 1969; also from Middlefield: YPM 6622, collected in 1969. *New London* (New London Co.): BioBlitz site, Bates Woods Park, YPM 8862, collectors Gregory J. Watkins-Colwell, Twan A. Leenders, Hank Gruner, Richard Haley, Daniel J. Drew, Brian T. Roach, Bryan Goff and Caroline S. Redington, 7 June 2003; also from this site: YPM 8863–8934, 8879–8880, 8899 and 8934, series includes multiple life stages; additionally, photographic material (YPM.M 1047 and 1095) feature images of eggs in the field. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6712, collector Brian T. Roach, 31 May 2002, larva; also from Norwich: YPM 6713 (larva) and YPM 6719 (adult), both collected in 2002. *Old Lyme* (New London Co.): CAMP site, YPM 7217, collector Edward Natoli, 6 October 2002, adult; also from Old Lyme: YPM 7218 (adult) and 7219 (larva), both collected in 2002. *Seymour* (New Haven Co.): CAMP site, Great Hill Brook area, YPM 9342, collector Roger Lawson, 7 September 2002; also from Seymour: YPM 9511–9512 and 9899. *Stratford* (Fairfield Co.): Pumpkin Ground Brook, YPM 9890, collector Gregory J. Watkins-Colwell, 2 July 2004; also from Stratford: YPM 9891–9893. *Trumbull* (Fairfield Co.): near Old Mine Park, YPM 7169, collector Daniel J. Drew, 7 October 2002, adult; also from Trumbull: YPM 8646.

Hemidactylum scutatum

(Temminck and Schlegel)

Figure 1F

Town records. *East Windsor* (Hartford County): CAMP site, YPM 9708, collectors Gregory J. Watkins-Colwell, Brian T. Roach, Hank Gruner and Eric Davison, 25 April 2004. *Guilford* (New Haven Co.): North Guilford, YPM 5974, collectors R. Wayne Van Devender and R. Storez, 1968; also from North

Guilford: YPM 5975, cleared and stained, collected in 1968. *Hamden* (New Haven Co.): YPM 4850, collector Steve D. Garber, 9 April 1971. *Killingly* (Windham Co.): CAMP site, South Killingly, Tetrault Pond, YPM 9543, collector Richard Haley, 1 November 2003. *Monroe* (Fairfield Co.): CAMP site, YPM 9678, collectors Gregory J. Watkins-Colwell, Brian T. Roach and Daniel J. Drew, 31 March 2004. *Morris* (Litchfield Co.): CAMP site, YPM 6631, collector Gregory J. Watkins Colwell, 18 May 2002. *New London* (New London Co.): BioBlitz site, Bates Woods Park, YPM 8872, collectors Gregory J. Watkins-Colwell and Brian T. Roach, 7 June 2003, adult. *Old Lyme* (New London Co.): CAMP site, YPM 7221, collector Edward Natoli, 6 October 2002, adult. *Seymour* (New Haven Co.): CAMP site, YPM 6627, collector Chris Clark, 13 April 2002, adult. *Stratford* (Fairfield Co.): YPM 10081, collector Gregory J. Watkins-Colwell, 19 August 2004. *Voluntown* (New London Co.): CAMP site, YPM 10399, collectors Gregory J. Watkins-Colwell, Twan A. Leenders, Michael Mosher, Hank Gruner and Edward Natoli, 18 June 2005. *Watertown* (Litchfield Co.): CAMP site, YPM 9750, collectors Gregory J. Watkins-Colwell, Twan A. Leenders and Hank Gruner, 8 May 2004; also from Watertown: YPM 9753 and 9945. *Woodbridge* (New Haven Co.): YPM 5889, collected in 1930; also from Woodbridge: YPM 62, 269–270, collector Percy A. Morris, 20 June 1954.

Plethodon cinereus (Green)

Figure 1G

Town records. *Easton* (Fairfield Co.): CAMP site, YPM 8736, collector Daniel J. Drew, 27 May 2003. *Seymour* (New Haven Co.): CAMP site, YPM 8195, collector Donna Lindgren, 3 May 2003; also from Seymour: YPM 8196, 9514, 9897, 9900, 9898 and 9593. *Stratford* (Fairfield Co.): YPM 8926, collectors Gregory J. Watkins-Colwell, Alexander Colwell and Abigail Colwell, 18 June 2003, adult; also from Stratford: YPM 9498.

Notophthalmus viridescens (Rafinesque)

Figure 1H

Town records. *Bethany* (New Haven Co.): YPM 9715, collector Susan Hochgraf, 27 April 2004, eft. *Colchester* (New London Co.): CAMP site, YPM 9552, collector Edward Natoli, 17 May 2003, adult. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 6105, collector Gregory J. Watkins-Colwell, 13 August 2001, eft; also from Fairfield: YPM 7835 (adult) and YPM 9040 (larvae), collector Daniel J. Drew, 18 July 2003. *Hamden* (New Haven Co.): YPM 7603, collector Stanley C. Ball, 15 June 1935. *Stratford* (Fairfield Co.): YPM 9332, collector Gregory J. Watkins-Colwell, 15 September 2003, eft; also from Stratford: YPM 9400, eft. *Westport* (Fairfield Co.): YPM 59, collector Addison E. Verrill, 1865; also from Westport: YPM 282–284, all from same collecting event.

AMPHIBIA: ANURA

Bufo americanus Holbrook

Figure 2A

Town records. *Bethany* (New Haven Co.): YPM 9769, collector Susan B. Hochgraf, 2 May 2004, larvae (n=23); also from

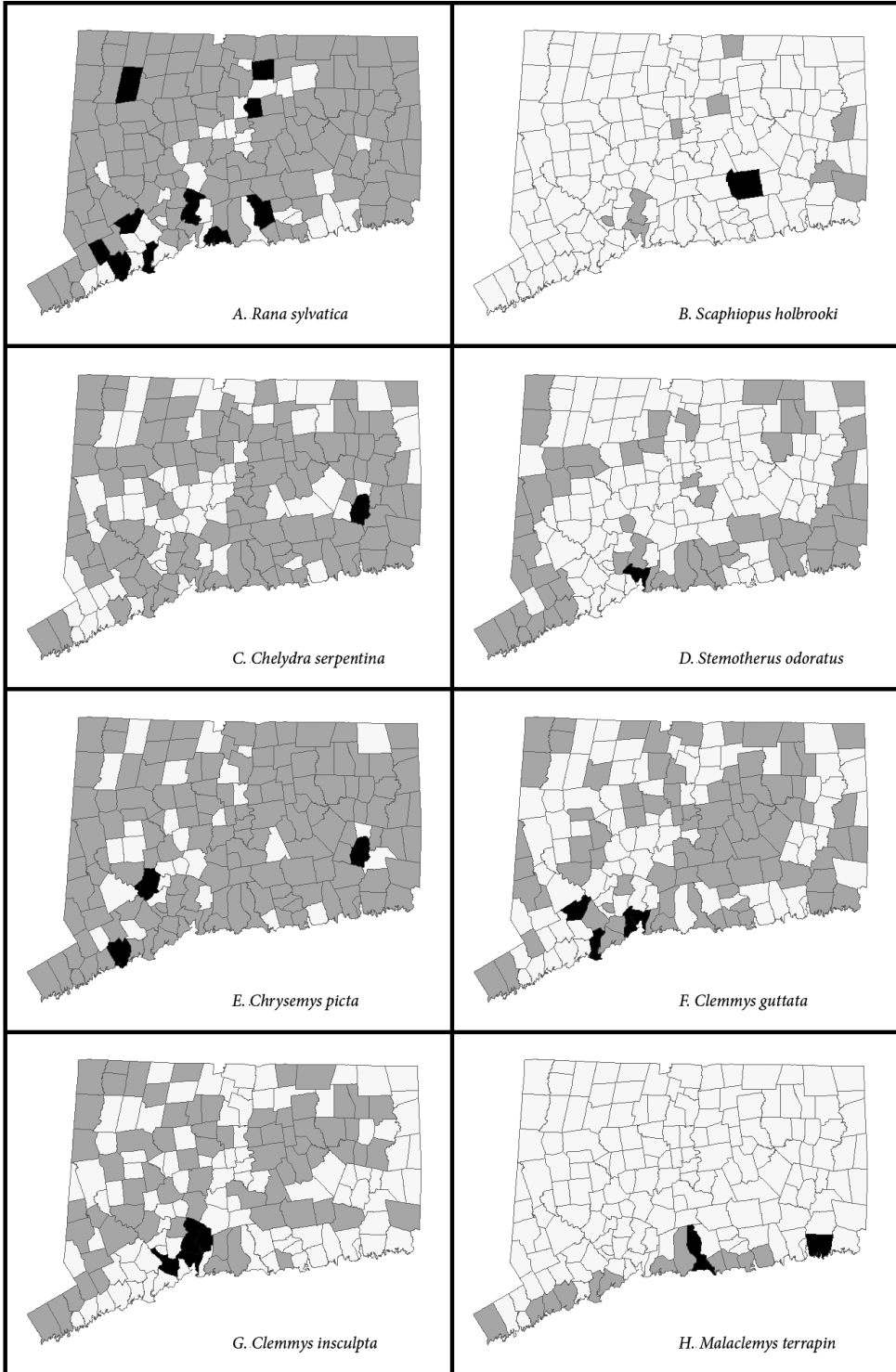


FIGURE 3. Distribution of amphibians and reptiles in Connecticut, by town. *Legend:* Light gray, no published records; dark gray, records published in Klemens (1993); black, new records published herein.

Bethany: YPM 9868–9873 (all larvae and juveniles). *Bridgeport* (Fairfield Co.): Beardsley Park, YPM 9478, collectors Twan A. Leenders and Gregory J. Watkins-Colwell, 2 October 2003, adult. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 6102, collector Gregory J. Watkins-Colwell, 13 August 2001, juvenile; also from Fairfield: YPM 5998, collector Gregory J. Watkins-Colwell, 14 August 2001. *Trumbull* (Fairfield Co.): near Old Mine Park, YPM 9150, collector Daniel J. Drew, 7 August 2003.

Bufo fowleri Garman
Figure 2B

Town records. *East Hartford* (Hartford Co.): near Rentschler Field, BioBlitz site, YPM 10300, collectors Gregory J. Watkins-Colwell, Brian T. Roach, Twan A. Leenders, Daniel J. Drew, Michael Mosher and Paul Goodel, 3 June 2005; also from East Hartford: YPM 10301, 10302, 10301–10315, 10369 and 10396. *Hamden* (New Haven Co.): YPM 7592, collector Stanley C. Ball, 21 June 1935, larva; additional specimens from the same collecting event: YPM 7593, 8724–8725, 8727–8729 (all larvae). *North Haven* (New Haven Co.): YPM 5962, collectors R. Wayne Van Devender and Don Allen, 23 June 1968, osteology specimen; also from North Haven: YPM 5963, 6833, 6844, 6881, 6883, collected in 1968. *Weston* (Fairfield Co.): Devil's Den Preserve, YPM 9162, collectors Twan A. Leenders and Caroline S. Redington, 13 August 2003, subadult.

Hyla versicolor LeConte
Figure 2C

Town records. *Bridgeport* (Fairfield Co.): Beardsley Zoo, YPM 10086, collectors Jeanne Yuckienutz and Gregg Dancho, 18 June 1998. This frog was captured as an adult in an ornamental fountain at the zoo and was kept in captivity until its death on 1 September 2004; specimen is a disarticulated skeleton. *East Haven* (New Haven Co.): YPM 4287, collector Marshall B. Bishop, 7 July 1938; also from East Haven: YPM 4289, collected in 1938. *Killingly* (Windham Co.): CAMP site, YPM 6693, collector Richard Haley, 31 May 2002, adult male. *Meriden* (New Haven Co.): BioBlitz Site, Hubbard Park, YPM 9390, collector Gregory J. Watkins-Colwell, 2 June 2000, adult male. *Norfolk* (Litchfield Co.): CAMP site, YPM 8203, collector Joseph Markow, 29 March 2003, adult. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6728, collector Gregory J. Watkins-Colwell, 31 May 2002, adult male. *Trumbull* (Fairfield Co.): Tungsten Circle, YPM 10085, collector Daniel J. Drew, 12 September 2004, metamorph.

Pseudacris crucifer
(Wied-Neuwied)
Figure 2D

Town records. *Ansonia* (New Haven Co.): YPM 7613, collector Stanley C. Ball, 18 April 1934, egg mass; also from Ansonia: YPM 6994 (adult), CAMP site, 13 July 2002. *Bridgeport* (Fairfield Co.): Beardsley Park, YPM 9477, collectors Gregory J. Watkins-Colwell and Twan A. Leenders, 2 October 2003, adult male. *Colchester* (New London Co.): CAMP site, YPM 7186, collector Hank Gruner, 11 May 2002, adult male; also

collected from Colchester: YPM 7197 (larvae), collected in 2002. *Easton* (Fairfield Co.): CAMP site, YPM 9878, collector Peter Jewusiak, 3 July 2004. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 6107, collector Gregory J. Watkins-Colwell, 13 August 2001; also from Fairfield: YPM 6118, 9021 and 9675. *Guilford* (New Haven Co.): North Guilford, YPM 5989, collector Robert Storez, 1968; also from Guilford: 5990; both specimens are cleared and stained. *Killingworth* (Middlesex Co.): Chatfield Hollow State Park, YPM 6764, collector Robert Storez, 1968, cleared and stained. *Lyme* (New London Co.): CAMP site, YPM 7180, collectors Hank Gruner and Edward Natoli, 11 May 2002; also from Lyme: YPM 7194, 9922 and 9920. *Monroe* (Fairfield Co.): CAMP site, YPM 9681, collectors Gregory J. Watkins-Colwell, Brian T. Roach and Daniel J. Drew, 31 March 2004; also from Monroe: YPM 9682 and 9875. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6729, collector Twan A. Leenders, 31 May 2002, adult; also from Norwich: YPM 6717 (larvae), collected in 2002. *Seymour* (New Haven Co.): YPM 7562, collector Marshall B. Bishop, 20 June 1933, metamorph; also collected from Seymour YPM 8240 (n=5 larvae). *Stratford* (Fairfield Co.): YPM 8929, collector Gregory J. Watkins-Colwell, 4 July 2003; also from Stratford: YPM 8930, 8933, 8959–8963, 9035–9037 and 9820–9823. *Voluntown* (New London Co.): CAMP site, YPM 10445, collectors Gregory J. Watkins-Colwell, Twan A. Leenders, Michael Mosher, Hank Gruner and Edward Natoli, 18 June 2005; also from Voluntown: 10450, 10455. *Weston* (Fairfield Co.): Devil's Den Preserve, YPM 7067, collector Gregory J. Watkins-Colwell, 1 September 2002, metamorph.

Rana catesbeiana Shaw
Figure 2E

Town records. *Ansonia* (New Haven Co.): CAMP site, YPM 6995, collector Donna Lindgren, 13 July 2002; also from Ansonia: YPM 6996–7004, collected in 2002; all specimens are larvae. *Branford* (New Haven Co.): YPM 6037, collector Hank Greene, 1 June 1965, osteology specimen. *Derby* (New Haven Co.): CAMP site, YPM 7075, collector James Knox, 15 September 2002. *East Hartford* (Hartford Co.): BioBlitz site, YPM 10299, collectors Gregory J. Watkins-Colwell, Brian T. Roach, Twan A. Leenders, Daniel J. Drew, Michael Mosher and Paul Goodel, 3 June 2005; also from East Hartford: YPM 10320 and 10321. *Easton* (Fairfield Co.): Banks Road at East Cricker Brook Swamp, YPM 9903, collectors Brian T. Roach and Gregory J. Watkins-Colwell, 12 July 2004. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 5999, collector Gregory J. Watkins-Colwell, 14 August 2001, adult male; also from Fairfield YPM 9157 (larva). *Lyme* (New London Co.): CAMP site, YPM 7201, collector Edward Natoli, 3 August 2002, larvae; also from Lyme: YPM 9929. *North Haven* (New Haven Co.): YPM 5961, collector R. W. Van Devender, 23 June 1968, osteology specimen; also from North Haven: YPM 6834 and 6877, cleared and stained. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6566, collectors Daniel J. Drew and Twan A. Leenders, 31 May 2002, osteology specimen; also from Norwich: YPM 6724 and 6687 (larvae). *Seymour* (New Haven Co.): CAMP site, YPM 9895, collector Peter Jewusiak, 8 July 2004. *Stratford* (Fairfield Co.): YPM



FIGURE 4. Distribution of amphibians and reptiles in Connecticut, by town. *Legend:* Light gray, no published records; dark gray, records published in Klemens (1993); black, new records published herein.

9029, collector Gregory J. Watkins-Colwell, 28 July 2003, metamorph; also from Stratford YPM 9121–9122, juveniles.

Rana clamitans Rafinesque

Figure 2F

Town records. *Branford* (New Haven Co.): YPM 6038, collector Hank Green, 1 June 1965, osteology specimen; also from Branford: YPM 9149. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 5924, collectors Audubon staff, 1 October 2000, amelanistic late-staged larva; also from Fairfield: YPM 6104, 9158 and 8231. *Naugatuck* (New Haven Co.): Naugatuck State Forest, YPM 9972, collector Twan A. Leenders, 4 August 2004; also from Naugatuck: YPM 9973–9974. *North Haven* (New Haven Co.): YPM 6835, collectors Robert Storez, Don Allen and R. Wayne Van Devender, 5 July 1968, cleared and stained, adult female; additional specimens from North Haven: YPM 6836–6839 (cleared and stained, collected in 1968), YPM 5800 (collected in 2000), and YPM 5959 (osteology specimen, collected in 1969). *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6672, collector Gregory J. Watkins-Colwell, 22 May 2002; additional specimens from the same locality: YPM 6720 (adult), 6714 (larva). *Seymour* (New Haven Co.): CAMP site, YPM 9894, Peter Jewusiak, 8 July 2004. *Stratford* (Fairfield County): YPM 8964, collector Gregory J. Watkins-Colwell, 15 July 2003, juvenile; additional specimens from Stratford: YPM 9024–9025, 9160–9161, 9117–9120 and 9316; all metamorphs or young juveniles.

Rana palustris LeConte

Figure 2G

Town records. *Ansonia* (New Haven Co.): CAMP site, YPM 8194, collector Chris Clark, 4 May 2003, adult. *Bridgeport* (Fairfield Co.): Veterans Memorial Park, YPM 10119, collector Twan A. Leenders, 29 October 2004. *Derby* (New Haven Co.): YPM 1070, collected 29 April 1936 (presumed collected by S. C. Ball or one of his associates); also from Derby: YPM 7072, collector James Knox, 15 Sept 2002. *East Haven* (New Haven Co.): YPM 6880, collector R. Wayne Van Devender, 1968, cleared and stained. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 6103, collector Gregory J. Watkins-Colwell, 15 August 2001, juvenile; also from Fairfield: YPM 6119–6120 (juveniles collected in 2001) and YPM 9022 (larvae collected in 2003). *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 6673, collector Gregory J. Watkins-Colwell, 22 May 2002; also collected from Norwich: YPM 6722; both specimens adult. *Seymour* (New Haven Co.): CAMP site, YPM 10225, collector Gregory J. Watkins-Colwell, 10 April 2005, adult. *Stratford* (Fairfield Co.): YPM 9027, collector Gregory J. Watkins-Colwell, 23 July 2003; additional specimen from same locality: YPM 9389; both juveniles.

Rana pipiens Schreber

Figure 2H

Town records. *East Haven* (New Haven Co.): YPM 4284, collector Marshall B. Bishop, 7 July 1938.

Rana sylvatica LeConte

Figure 3A

Town records. *Branford* (New Haven Co.): Peabody Field Station, YPM 9148, collector Gregory J. Watkins-Colwell, 6 August 2003; also from Branford: YPM 9722 and 9813; both are larval lots. *East Hartford* (Hartford Co.): near Rentschler Field, BioBlitz site, YPM 10319, collectors Gregory J. Watkins-Colwell, Brian T. Roach, Twan A. Leenders, Daniel J. Drew, Michael Mosher and Paul Goodel, 3 June 2005; also from East Hartford: YPM 10322, larvae. *East Windsor* (Hartford Co.): CAMP site, YPM 6706, collector Eric Davison, 2002; also from East Windsor: YPM 9698 and 9700; all are larvae. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 6106, collector Gregory J. Watkins-Colwell, 13 August 2001, adult; also from Fairfield: YPM.M 1079 (photograph). *Goshen* (Litchfield Co.): YPM 9763, collectors Twan A. Leenders and Caroline S. Redington, 18 May 2004. *Hamden* (New Haven Co.): Mount Carmel, YPM 3246, collector D. C. Eaton, 7 June 1867; also from Hamden: YPM 3274. *Killingworth* (Middlesex Co.): Chatfield Hollow State Park, YPM 6761, collectors R. Wayne Van Devender, Robert Storez and Don Allen, 1968; also from Killingworth: YPM 6762. *Monroe* (Fairfield Co.): CAMP site, YPM 6669, collector Brian T. Roach, 19 May 2002; also from Monroe: YPM 9680, 9824 and 9825–9827. *Stratford* (Fairfield Co.): YPM 8927, collector Gregory J. Watkins-Colwell, 7 July 2003; additional specimens from same locality: YPM 8928, 8931, 9023, 9031–9032, 9039, 9115–9116, 9159, 9164, 9319, 9323, 9819, 9317–9318 and 9837–9849. *Weston* (Fairfield Co.): Devil's Den Preserve, YPM 6677, collectors Gregory J. Watkins-Colwell and Frank Gallo, 26 May 2002, adult; also from Weston: YPM 7068 and 9331.

Scaphiopus holbrookii (Harlan)

Figure 3B

Town records. *East Haddam* (Middlesex Co.): North Plain, YPM 7926, collector Stanley C. Ball, 1 May 1934; additional specimens from North Plain: YPM 7632–7636, 7725, 7880–7889, 7910 –7918, 7920–7921, 7923–7925, 8304, 8445–8455; all larvae or metamorphs. Ball (1936) described his work with this species, including the release of thousands of larvae into a pond on his property in North Plain. Klemens (1993) discussed Ball's various localities, but did not mention the North Plain site. Additional surveys have not yet been done on this site, though its location has been confirmed. Future surveys of this area are necessary to determine whether or not this introduction was successful.

REPTILIA: TESTUDINATA

Chelydra serpentina (Linnaeus)

Figure 3C

Town records. *Norwich* (New London Co.): Mohegan Park, YPM 12584, collectors Richard Haley and Eileen Fielding, 1 June 2002, adult female.



FIGURE 5. Distribution of amphibians and reptiles in Connecticut, by town. *Legend:* Light gray, no published records; dark gray, records published in Klemens (1993); black, new records published herein.

Sternotherus odoratus (Latreille)
Figure 3D

Town records. *New Haven* (New Haven Co.): YPM 10887, collector Georg Baur, osteological specimen in the Yale Peabody Museum collection by 1890, based on accession records.

Chrysemys picta (Schneider)
Figure 3E

Town records. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 11452, collector Gregory J. Watkins-Colwell, 14 August 2001, juvenile. *Norwich* (New London Co.): BioBlitz

site, Mohegan Park, YPM 12554, collectors Gregory J. Watkins-Colwell and Daniel J. Drew, 22 May 2002; also collected from *Norwich*: YPM 12555, collected in 2002. *Oxford* (New Haven Co.): YPM 10546, collector Oscar Harger; no date, but Harger collected herpetological specimens for the Yale Peabody Museum mainly in the 1870s; additional specimens from *Oxford*: YPM 10553–10554, all osteology specimens.

Clemmys guttata (Schneider)
Figure 3F

Town records. *Monroe* (Fairfield Co.): YPM 13873, collector Kim Redmond, 8 September 2003, specimen kept alive at

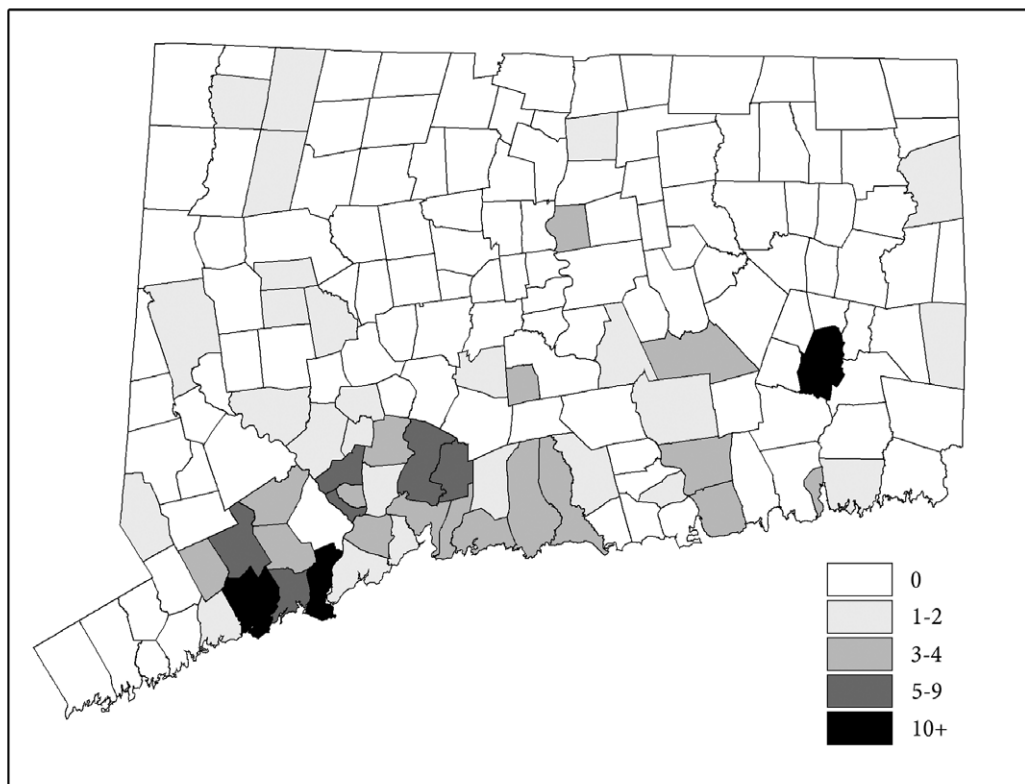


FIGURE 6. Increase in the number of amphibian and reptile species reported in Connecticut, by town, between Klemens' (1993) monograph and the present study.

Beardsley Zoo until 9 December 2004. *New Haven* (New Haven Co.): YPM 10924, collector J. W. Scollick; also from New Haven: YPM 10934 (Scollick supplied the Yale Peabody Museum with 15 turtle skeletons, which arrived on 7 August 1889). *Stratford* (Fairfield Co.): YPM 13642, collector Gregory J. Watkins-Colwell, 29 July 2004; also from Stratford: YPM 13643; specimens are eggshells from field-collected eggs hatched in captivity; photographs of hatchlings are deposited in the herpetology media collection as YPM.M 1104–1113, 1116–1133 (hatchlings were released at collection site). *West Haven* (New Haven Co.): YPM 10908, collectors Georg Baur and Charles E. Beecher, osteology specimen; no date, but Beecher and Baur were both on staff at the Yale Peabody Museum for only a short time together, during 1888–1889 (Baur left the Peabody Museum in 1890).

Clemmys insculpta (LeConte)

Figure 3G

Town records. *Derby* (New Haven Co.): YPM 2937, 29 May 1936; also from Derby: YPM 2938–2939, collected 1936. *Hamden* (New Haven Co.): YPM 2904, collector Henry Moski, 28 April 1957. *New Haven* (New Haven Co.): YPM 14415, collector Stanley C. Ball, 20 July 1932, embryo; also from New Haven: YPM 10909, 10925 and 10933, osteology specimens. *North*

Haven (New Haven Co.): YPM 12510, collector Katie Manende, 2001, osteological specimen. *Orange* (New Haven Co.): Race Brook, YPM 5946, collector Marshall B. Bishop, 1930; also from Race Brook: YPM 5947–5954, collected 1930; survey work is needed to determine whether the area is still suitable for this species.

Malaclemys terrapin (Latreille)

Figure 3H

Town records. *Groton* (New London Co.): Noank, YPM 10610, collector Addison E. Verrill, August 1874, osteology specimen. *Madison* (New Haven Co.): YPM 2914, collector Percy A. Morris, 1 August 1957.

Terrapene carolina (Linnaeus)

Figure 4A

Town records. *Beacon Falls* (New Haven Co.): YPM.M 1114, photograph by Susan Hochgraf, 30 August 2004; additional photograph in same series: YPM.M 1115. *Stratford* (Fairfield Co.): YPM.M 1086, photograph by Gregory J. Watkins-Colwell, 19 June 2003; additional photographs in same series: YPM.M 1087–1089.

Trachemys scripta (Schoepf)
Figure 4B

Town records. *Bridgeport* (Fairfield Co.): Beardsley Park, YPM 15053, collector Gregg Dancho, 12 October 2005, hatchling. *Woodbridge* (New Haven Co.): YPM 2921, collector Marshall B. Bishop, 24 June 1930, juvenile.

REPTILIA: SQUAMATA

Carphophis amoenus (Say)
Figure 4C

Town records. *Fairfield* (Fairfield Co.): YPM 12718, collector Shane M. Scholtz, 1 August 2002, osteology specimen and tissues.

Diadophis punctatus (Merrem)
Figure 4D

Town records. *Madison* (Middlesex Co.): CAMP site, YPM 13599, collectors Peter Jewusiak and John Picard, 4 August 2004. *New London* (New London Co.): BioBlitz site, Bates Woods Park, YPM 14425, collector Gregory J. Watkins-Colwell, 7 June 2003, adult. *North Haven* (New Haven Co.): YPM 12202, collectors R. Wayne Van Devender and Don Allen, 23 June 1968, adult female, cleared and stained. *Norwich* (New London Co.): BioBlitz site, Mohegan Park, YPM 12573, collector Hank Gruner, 1 June 2002, adult male. *Stratford* (Fairfield Co.): YPM 14562, collector Gregory J. Watkins-Colwell, 5 July 2003, adult female; additional Stratford specimens collected in 2003: YPM 14657–14658.

Elaphe obsoleta (Say)
Figure 4E

Town records. *Middlefield* (Middlesex Co.): YPM 165, collector Wesley R. Coe, 7 August 1931; also from Middlefield: YPM 164, collected in 1936. *New Haven* (New Haven Co.): YPM 10605; also from New Haven: YPM 10606; both are osteology specimens and were received at Yale University on 10 June 1874 from T. G. Evans. *Southbury* (New Haven Co.): YPM 163, collector Craig La Vin, 14 September 1932.

Heterodon platirhinos Latreille
Figure 4F.

Town records. *Milford* (New Haven Co.): YPM 361, collector John Eggloski, 1 August 1937. *Orange* (New Haven Co.): Maltby Lane, YPM 86, collector C. T. Netteville, 14 April 1968. *Trumbull* (Fairfield Co.): Park Street, brought to the Beardsley Zoological Garden alive on 15 August 2003 and donated to the zoo by Steven Werner; photographed by Twan A. Leenders on 2 October 2003 (YPM.M 1101); specimen kept live at Beardsley Zoological Garden for several months, and on death was deposited at the Yale Peabody Museum as YPM 13421.

Lampropeltis triangulum (Lacepede)
Figure 4G

Town records. *Fairfield* (Fairfield Co.): YPM 12884, collector Shane M. Sholtz, 27 May 1998. *Stratford* (Fairfield Co.): YPM 13969, at intersection of James Farm Road and North Pasture Lane, collector Gregory J. Watkins-Colwell, 6 June 2005, adult.

Nerodia sipedon (Linnaeus)
Figure 4H

Town records. *Easton* (Fairfield Co.): YPM 13522, collectors Gregory J. Watkins-Colwell and Brian T. Roach, 13 June 2004. *Essex* (Middlesex Co.): Hamburg, YPM 221, collector Bertram Bruestle, 19 July 1936; also from Essex: YPM 224, collected in 1936. *Fairfield* (Fairfield Co.): Connecticut Audubon Center, YPM 12526, collector Gregory J. Watkins-Colwell, 4 April 2002. *Stratford* (Fairfield Co.): YPM 14672, collectors Gregory J. Watkins-Colwell and Abigail Colwell, 18 October 2003, neonate.

Opheodrys vernalis (Harlan)
Figure 5A

Town records. *New Milford* (Litchfield Co.): YPM.M.1138, Gaylordsville, private property on Kent Road, photographed by George Sterry, 9 August 2005; series of four photographs.

Storeria dekayi (Holbrook)
Figure 5B.

Town records. *Hamden* (New Haven Co.): YPM 14639, collector Jacques A. Gauthier, 13 August 2003, adult. *North Branford* (New Haven Co.): Northford, YPM 303, collector A. L. Rogers, 1923; also from North Branford: YPM 365, 5994–5996 and 14423.

Thamnophis sauritus (Linnaeus)
Figure 5C.

Town records. *Derby* (New Haven Co.): YPM 516, collector unknown, but likely Stanley C. Ball or one of his assistants, 29 April 1936. *Guilford* (New Haven Co.): YPM 11526, collector R. Wayne Van Devender, 18 June 1968, osteology specimen of an adult male. *Meriden* (New Haven Co.): YPM 547, collector George H. Powell, 23 August 1943.

Thamnophis sirtalis (Linnaeus)
Figure 5D.

Town records. *Bethlehem* (Litchfield Co.): YPM 13526, collector Twan A. Leenders, 9 June 2004. *Goshen* (Litchfield Co.): Route 4 near Tyler Lake, YPM 13041, collector Twan A. Leenders, 21 September 2003. *Old Lyme* (New London Co.): Rogers Lake, YPM 523, collector Marshall B. Bishop, 1 July 1934; additional specimen from same collecting event: YPM 6407.

Agkistrodon contortrix (Linnaeus)

Figure 5E

Town records. *West Haven* (New Haven Co.): YPM 453, collected in 1932.

Discussion

The fact that even after the year 2000 more than 100 new town records could be added to the geographic distribution records of Connecticut amphibians and reptiles, the majority from the southwestern part of the state alone, is indicative of our incomplete knowledge of the local herpetofauna.

Recent collection efforts have focused on coastal areas, leaving much of rural Connecticut to be surveyed (see Figure 5E). Many of the new town records reported here are of common, widespread species that are to be expected in most, if not all, Connecticut towns, and undoubtedly many more town records for these species will be added in the future. Many of the historic town records reported in this paper also concern these widespread species and, even though no recent records from these towns exist, the historic records most likely reflect their current presence as well. The absence of recent records more often reflects the absence of recent survey data than the absence of species. However, in a few cases the historic records are likely to represent extinct populations. For example, specimens of *Clemmys guttata* and *Clemmys insculptata* from New Haven, collected in the 1870s, probably represent populations that have succumbed to habitat loss and habitat alteration. However, several of the new town records are from recent surveys in some of the most urbanized or otherwise heavily developed areas in Connecticut, indicating that the need for updated surveys is real.

Another issue we wish to highlight is the introduction of an exotic species in Connecticut. The sliders (*Trachemys scripta scripta*, *Trachemys scripta elegans* and *Trachemys scripta troostii*) comprise a group of turtles, native to the southeastern and southern United States, that together range from southeastern Virginia to northern Florida, westward through Texas and north through the Mississippi watershed to northern Illinois and Indiana (Conant and Collins 1998). Sliders have been introduced to areas outside their natural distribution within North America, including New England (Christiansen 2001;

Townsend et al. 2002; Emer 2004). Sliders are also established in many countries (Franz et al. 1993; Thirakhupt and Van Dijk 1994; Haffner 1997; Jooris et al. 1998; Ota 1999; Agosta and Parolini 2000; Piovano and Giacomina 2000; Powell et al. 2000; Najbar 2001; Petterino et al. 2001; Arnold and Ovenden 2002; Nunez et al. 2002; Cadi et al. 2004; Iriarte et al. 2005; Lee 2005). Sliders are, in fact, essentially cosmopolitan now (Ter-Borg 2000), but have only been reported to occur in nonbreeding groups in Connecticut (Klemens 1993). Klemens (1993) suggests that the species cannot establish in the state because the summer season is too short for successful egg incubation.

We here report on reproductive behavior, and evidence of wild nesting success, of *T. scripta* in Connecticut. Because the source of introduced sliders is nearly always captive material, and the original geographic origin generally unknown, the use of subspecific nomenclature for introduced populations is problematic. Additionally, the likelihood of hybridization at commercial turtle farms and at release sites adds further confusion. For this reason, we adopt just the species level terminology for the introduced populations of slider turtles.

The earliest documented *T. scripta* found in Connecticut is YPM 2921, collected 24 June 1930 by Marshal B. Bishop in Woodbridge, Connecticut. This specimen was not cited in Lamson (1935), who made no mention of the species. DeGraaf and Rudis (1983) state that the species is introduced and established in parts of Massachusetts and Connecticut, but provide no additional data and none of their cited sources indicates an established population. Klemens (1993) states that the species occurs in Connecticut, but is not known to reproduce in the state, thus contradicting DeGraaf and Rudis (1983).

Beardsley Park in Bridgeport includes one man-made pond set aside for amphibian conservation efforts (lat 41.2136N, long 73.1820W), one dammed river (the Pequonnock River forming Bunnell's Pond), and a zoo with artificial wetlands and ornamental ponds. *T. scripta* has often been seen in all three areas of the park. While adults are most frequently encountered (consistent with Klemens 1993), on at least three occasions juveniles or eggs have been found. In addition, subadults and adults have been seen within the park boundary along the Pequonnock River and Bunnell's Pond,

and basking on the dam (lat 41.2066N, long 73.1870W).

In the spring of 2002, Dancho found a female digging a nest near the entrance to the zoo parking lot (approximately lat 41.2094N, long 73.1839W). The female was removed to the clinic and allowed to complete oviposition. The eggs were incubated, but none hatched. A juvenile was found on park grounds along the Pequonnock River near where the river feeds into Bunnell's Pond (approximately lat 41.2169N, long 73.1808W) in the spring of 2004. Based on its size, the animal was estimated to be more than a year old. A second juvenile was found in April 2005 at the Amphibian Conservation pond. This individual was smaller, though not a hatchling. Both the 2004 and the 2005 animals were captured and retained. On 12 October 2005, Dancho found a freshly killed *T. scripta* in the zoo parking lot (lat 41.2090N, long 73.18W). The specimen (YPM 15053) is 30.8 mm in carapace length, with an umbilical mark and an egg tooth consistent with a recently hatched turtle. YPM 15053 could be the first specimen that documents breeding in the state for this introduced species. It is also likely to be the first documented breeding of the species in New England (see Klemens 1993). It is important to note that the Beardsley Zoo does maintain a group of *T. scripta* in an outdoor, screened enclosure. However, no animals are known to have escaped from the enclosure. Additionally, all of the *Trachemys* on exhibit were brought to the zoo by members of the public. Several of these were collected from within the city of Bridgeport and even a few from within the park itself. To date, the turtles on exhibit have not reproduced.

Thus, while evidence is lacking to suggest that *T. scripta* breeds in rural Connecticut or in more pristine habitats, it does indeed seem to be established as a breeding population in Bridgeport. Sliders are known to negatively impact native turtle species (Luiselli et al. 1997; Servan and Arvy 1997; Gianaroli et al. 1999; Cadi 2000; McKenna and Tramer 2001; Cadi and Joly 2003, 2004; Spinks et al. 2003; Mosimann and Cadi 2004). However, the species is still released intentionally throughout the world as discarded pets, by-products of the food industry, or as part of religious celebrations (see Cen 1998; Hennig 2004). Recently, studies have shown that juvenile sliders are a good biological control agent for mosquito lar-

vae in water storage tanks (Borjas et al. 1993). While such biological control in a controlled setting is intriguing and could have advantages over repeated pesticide use, in the wild this would likely only increase the negative ecological impact of the species. In light of recent concerns over mosquito-borne pathogens in the United States, we consider that the potential value of juvenile sliders as mosquito control must be weighed carefully against the risks of establishing a nonnative species that can adversely affect native turtle populations.

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