



First record of Japanese Mystery Snail *Cipangopaludina japonica* (von Martens, 1861) in Texas

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Abstract: Two *Cipangopaludina* snails were discovered in Harris County, Texas, USA, during routine fieldwork in October 2015. Dissection yielded one male and one female containing 52 offspring in her brood pouch. Phylogenetic analysis of the cytochrome *c* oxidase subunit I (COI) gene confirmed both individuals to be *Cipangopaludina japonica* (von Martens, 1861). This is the first distribution record of *C. japonica* in Texas. Non-native invasive snails, such as *C. japonica*, compete with native species and may serve as reservoirs for parasites, prompting the need for increased diligence in monitoring public waterways.

Key words: aquarium trade; *Bellamya*; Gastropoda; globalization; invasive; non-native

The Japanese Mystery Snail, *Cipangopaludina japonica* (von Martens, 1861) (Gastropoda: Viviparidae), is a freshwater snail native to eastern Asia (Clench and Fuller 1965; Jokinen 1992) that was first recorded in the United States in the late nineteenth century in California (Wood 1892; Hannibal 1911). The United States Geological Survey's Nonindigenous Aquatic Species Database (USGS 2016; Appendix, Table A1) only contains records of *C. japonica* populations for 15 states, but several other state natural resource agencies (DNRs) report populations of *C. japonica* (Figure 1) that do not appear in the national database (Appendix, Table A2). *Cipangopaludina japonica* is closely related to, and often confused with or misidentified as, the more widespread and invasive Chinese Mystery Snail, *C. chinensis* (Gray, 1834), another species that the Asian food markets also brought into the United States in the early 1890s (Jokinen 1982). *Cipangopaludina chinensis* occurs extensively across the United States with the highest densities found in the Great Lakes and the northeastern United States (Figure 2; Appendix, Table A1).

Accidental or deliberate introductions (Kipp et al.

2016) of these mystery snails into new habitats pose ecological concerns as both species have the ability to reach high population densities (Chaine et al. 2012), compete with native species (Solomon et al. 2010) and alter aquatic ecosystems (Johnson et al. 2009). Like many other freshwater snails, these viviparids also act as intermediate hosts for parasites that pose serious health risks, including the nematode *Angiostrongylus cantonensis* (Lin and Chen 1980) and *Echinostoma cinetorchis*, a species of human intestinal fluke (Park et al. 1997; Chung and Jung 1999). The combined threats mystery snails pose to human and environmental health coupled with their invasive history (Wolfert and Hiltunen 1968; Soes et al. 2011) often land both *C. chinensis* and *C. japonica* on invasive species watch lists (Kipp et al. 2016).

Both species are also frequently placed in the genus *Bellamya* versus *Cipangopaludina* based on morphological features (Smith 2000; Bury et al. 2007), but debate exists on whether this represents a true synonymy (Van Bocxlaer and Strong 2016). The Integrated Taxonomic Information System does not recognize the nomenclature of *Bellamya* (Havel et al. 2014), but several recent studies chose to use this name for the genus over *Cipangopaludina* (Smith 2000; Solomon et al. 2010; Soes et al. 2011). Consequently, the taxonomy of both *C. chinensis* and *C. japonica* remains unclear as many scientific names are improperly synonymized or used inconsistently (Global Invasive Species Database 2016). Based on an extensive comparative study of internal morphology, Van Bocxlaer and Strong (2016) argued for the validity of the genus *Cipangopaludina* to better reflect evolutionary relationships and further called for rigorous molecular studies to resolve the relationships of *C. chinensis*, *C. malleata* and *C. japonica*. Given the similarity of *C. japonica* to *C. chinensis*, along with the comparative limited information on *C. japonica*, we provide background for both species.

Cipangopaludina japonica and *C. chinensis* exhibit

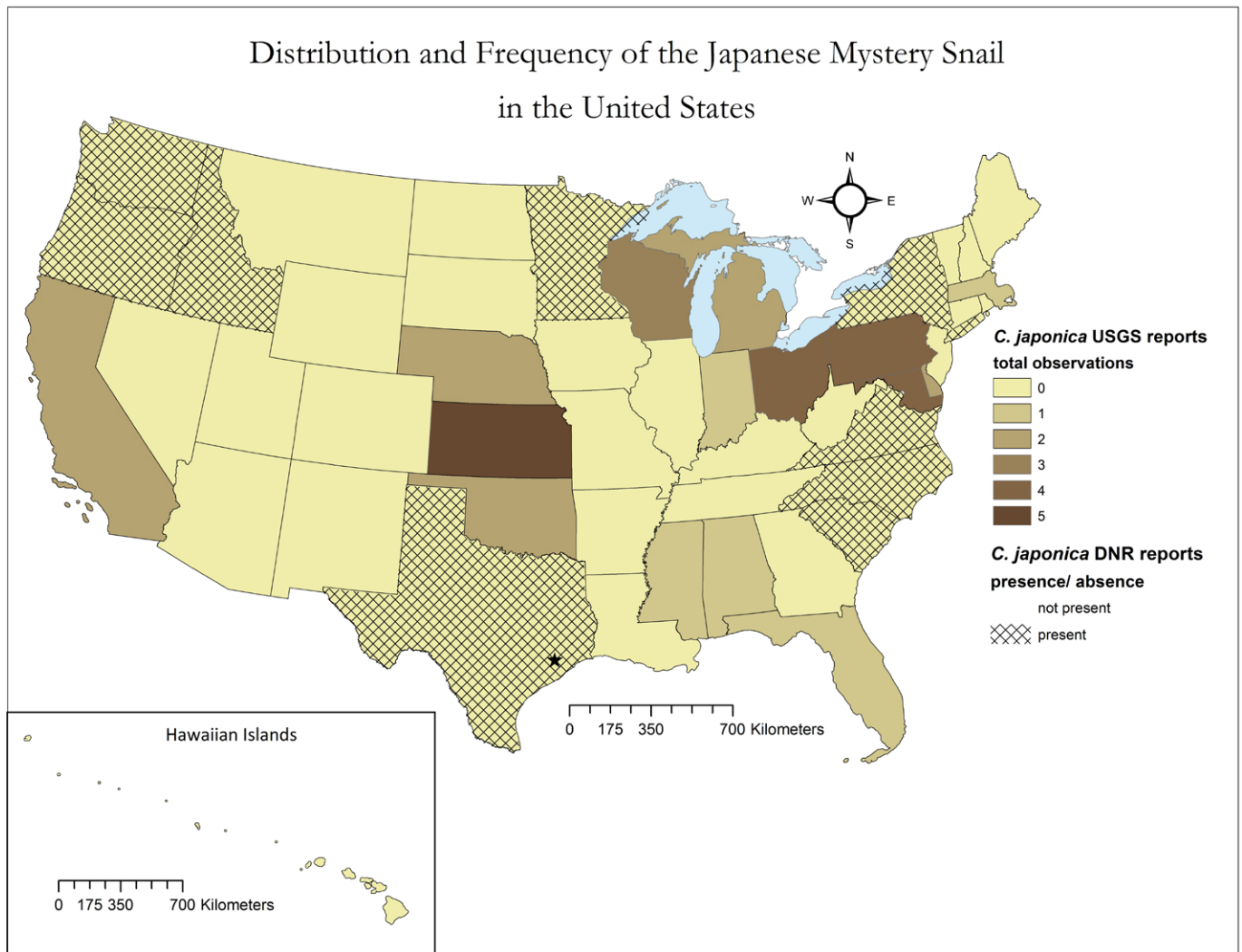


Figure 1. Distribution of *Cipangopaludina japonica* collections reported in the United States (USGS 2016). Records of *C. japonica* exist for fifteen states on the USGS Nonindigenous Aquatic Species Database (AL, CA, DE, FL, IN, KS, MA, MD, MI, MS, NE, OH, OK, PA, WI) although several other state departments of natural resources (ID, MN, NY, NC, OR, PA, SC, VA, WA, WI) include information about introductions on their websites (hatched states). A black star represents our collection of *C. japonica* in Harris County, Texas. The closest occurrence of *C. japonica* to our present collection occurs approximately 518 km away in Lake Ardmore, OK (USGS 2016).

similar life histories and occupy equivalent ecological niches (Jokinen 1982). Both taxa commonly occur in lentic ponds and lakes that have sandy to muddy substrates. Both species feed non-specifically on benthic organic matter (Jokinen 1982). In a study that altered water levels in rice paddy soils, Kurihara and Kadowaki (1988) found that submerged soils provided a suitable habitat in which *C. japonica* consumed primarily detritus and successfully reproduced. With a generalist diet, long life spans and high fecundity, populations of mystery snails may grow quickly (Stephen et al. 2013).

Based on estimates, female mystery snails may live for approximately five years, with a shorter life expectancy for males of three to four years (Jokinen 1982; Van Bocxlaer and Strong 2016). After their first year, females become reproductively active and release live offspring. Reproduction occurs continuously throughout spring to early summer when females carry embryos that they

later release June through October (Jokinen 1982). Mature females release an average of 25 offspring per year and 130 offspring during their lifetime, although as many as 133 offspring have been documented in a single individual of *C. chinensis* (Stephen et al. 2013) and 178 offspring from one *C. japonica* specimen (Van Bocxlaer and Strong 2016). Offspring measure approximately 5 mm in size at birth. Juveniles can reach 35 mm in size after their first year and adults can measure up to 65 mm in size (Clench and Fuller 1965; Jokinen 1982).

Based on morphometric analysis, *Cipangopaludina japonica* lacks external morphological characters that provide consistent reliable field identifications of sex (Van Bocxlaer and Strong 2016). Field identification of *C. japonica* and *C. chinensis* may also prove difficult, as Smith (2000) suggested that *C. japonica* differs the most from *C. chinensis* with respect to the embryonic shell. Shells with more acute spires and finer carinae

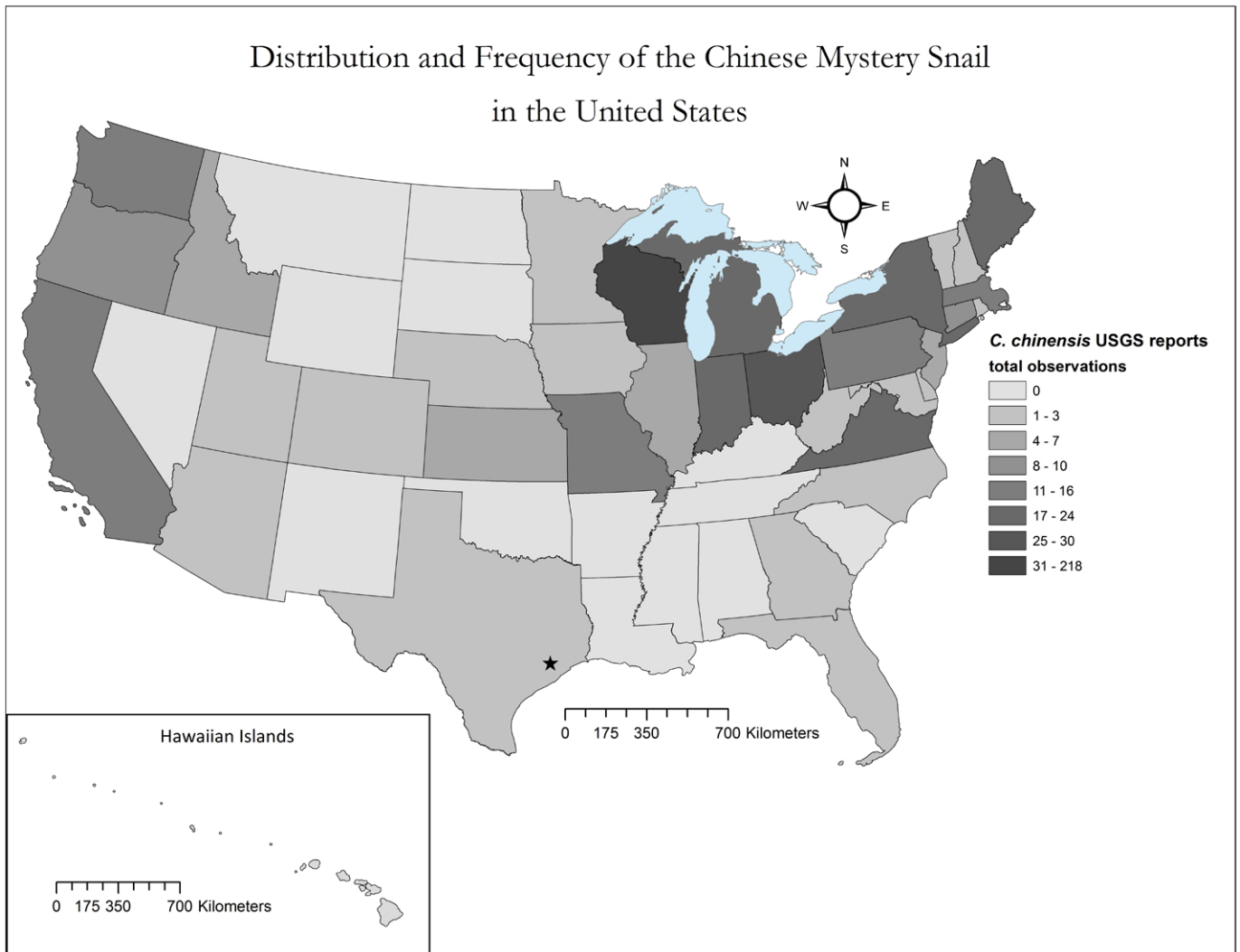


Figure 2. Distribution map of *Cipangopaludina chinensis* collections reported in the United States (USGS 2016). *Cipangopaludina chinensis* occurs extensively across the United States with the highest densities found in the Great Lakes and the northeastern United States. A black star represents our collection of *C. japonica* in Harris County, Texas.

suggest *C. japonica* over *C. chinensis* (Clench and Fuller 1965; Jokinen 1982; Park et al. 1997; Smith 2000). However, those traits only have utility within a small size range (35–45 mm) in both species (Smith 2000). Smith (2000) also noted that the vas deferens in *C. japonica* is branched compared to *C. chinensis*, and that juvenile *C. chinensis* show depressed embryonic whorls. Although shell morphology may fail to distinguish the two *Cipangopaludina* species, molecular data consistently separates them. For example, Hirano et al. (2015) employed two mitochondrial genes, cytochrome *c* oxidase subunit I (COI) and 16s rRNA to show clear distinctions between *C. japonica* and *C. chinensis*. In this paper, we provide morphological information along with genetic confirmation of *C. japonica* from a population in Harris County, Texas.

Using field nets, two individual mystery snails (Figures 3 and 4) were discovered in October 2015 while collecting the invasive gastropod *Pomacea maculata* Perry, 1810 (Texas Parks and Wildlife Department permit no.

RES0301.74) in the Missouri City Community Pond in Harris County, Texas (29°34'04.4"N, 095°31'36.2"W). We collected both mystery snails for subsequent



Figures 3 and 4. *Cipangopaludina japonica* collected at the Missouri City Community Pond in Harris County, Texas. **3:** Male (53.1 mm length, 38.0 mm width). **4:** Female (62.8 mm length, 43.9 mm width).

identification and initially froze them at -20°C before dissection to determine sex and whether the female carried any offspring. We preserved foot tissue and offspring found in the brood pouch in 70% ETOH. The shells and offspring are stored as voucher material at the North Carolina Museum of Natural Sciences in Raleigh, North Carolina (NCSM 101740 for the male and NCSM 101741 for the female and brood).

To confirm our morphological identification of the two snails, we sequenced the mitochondrial COI gene to ascertain species identity (Hebert et al. 2003). We extracted total genomic DNA from a small piece ($\sim 1\text{ mm}^2$) of unpigmented foot tissue using a NucleoSpin[®] extraction kit (Macherey-Nagel, Pennsylvania, USA). Following the conditions used in Hayes et al. (2009), we amplified a 709 bp fragment of the COI gene by polymerase chain reaction (PCR) using the standard invertebrate primer pair LCO1490 (5'-GGTCAACAAATCATAAAGATATTGG) and HCO2198 (5'-TAAACTTCAGGGTGACCAAAAATCA) (Folmer et al. 1994). The Institute for Cellular and Molecular Biology at the University of Texas at Austin performed Sanger sequencing in both directions using an ABI BigDye Terminator v.3.1 Cycle Sequencing Kit (Perkin-Elmer Applied Biosystems, Inc.) on an ABI 3730 XL capillary sequencer following the manufacturer's instructions.

Using MUSCLE ver. 3.6 (Edgar 2004), we aligned our sequences with Genbank sequences from 47 other *Cipangopaludina* spp. (Appendix, Table A3) and three *Viviparus* spp. as outgroups ($n = 51$ total sequences). We used jModelTest ver. 2.1.7 (Darriba et al. 2012) to determine the best fit model based on Akaike Information Criterion (AIC) and estimated phylogenetic relationships under maximum likelihood using the TrN+G model in PhyML ver. 3.0 (Guindon et al. 2010). Node support was estimated with 1000 bootstrap replicates (Felsenstein 1985). We edited and visualized the consensus tree in FigTree 1.3.1 (Rambaut 2009).

We identified the two snails as a species of non-native *Cipangopaludina* based on shell shape and size. All native viviparids in the U.S. are smaller and possess different shell forms than *C. japonica* and *C. chinensis* (Burch 1982). Based on the acute spires and more ovate apertures (Lu et al. 2014; Hirano et al. 2015), we assigned both specimens putatively to *C. japonica*. Dissection revealed one male (Figure 3) and one female (Figure 4) with 52 offspring in her brood pouch. Offspring showed slightly depressed embryonic whorls but not enough to be indicative of *C. chinensis*. The female shell (62.8 mm length and 43.9 mm width) was larger than the male (53.1 mm length and 38.0 mm width) and both were larger and had thinner shells than most native viviparids (Burch 1982).

For genetic analysis, we edited and assembled our COI sequences in Geneious 7.1 (Biomatters Ltd.). Sequences from the male and female were 658 bp in length and

100% identical (GenBank accession KX259343). Phylogenetic analysis yielded a single tree (log likelihood = -2106.8749 , model = TrN + G) clustering both snails in a clade with other *C. japonica* specimens (Figure 5), confirming our field identification. The *C. japonica* clade was well supported ($> 50\%$) and clearly separate from specimens of *C. chinensis*.

Our collection of two individual *Cipangopaludina japonica* represents the first record of this species in Texas (USGS 2016). To our knowledge, this work presents the first published sequence of the COI gene for *C. japonica* obtained from a United States population.

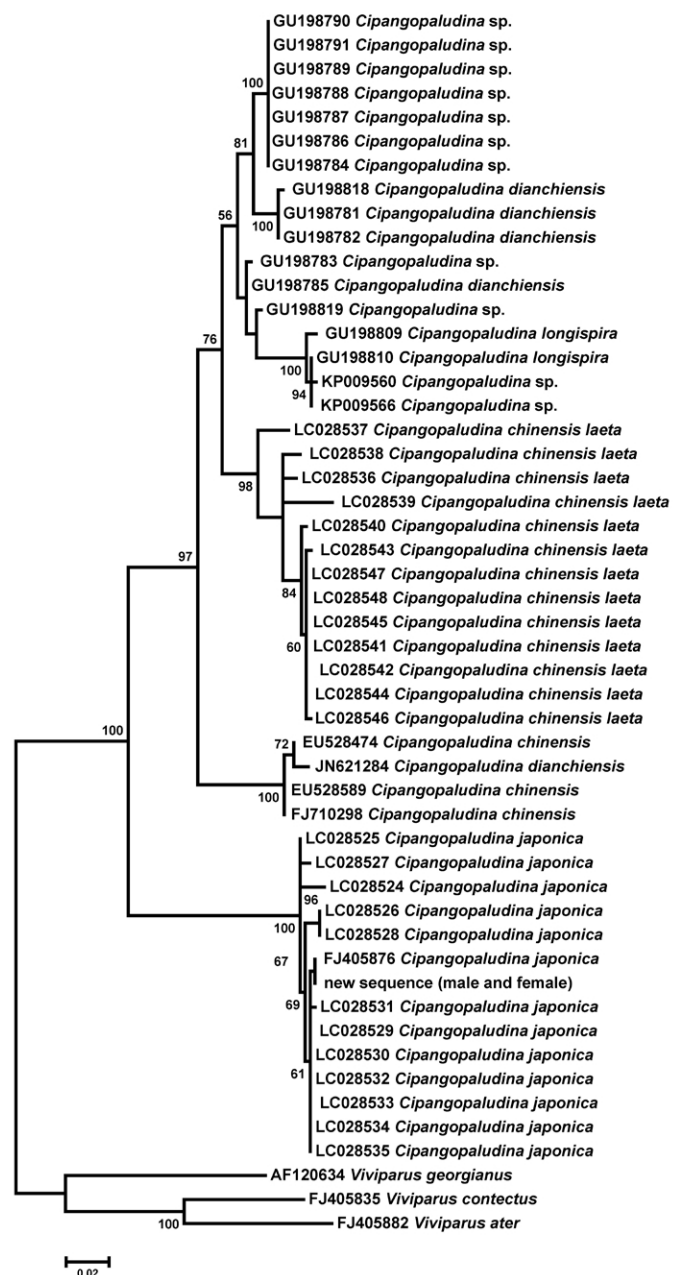


Figure 5. Maximum likelihood phylogeny (-log likelihood = -2106.8749 , model = TrN + G) including 47 *Cipangopaludina* spp., three *Viviparus* outgroups, and our new sequence ($n = 51$). Nodes with greater than 50% bootstrap support are indicated by node values.

The USGS Nonindigenous Aquatic Species Database lists collections in 15 states but our state-by-state examination of DNR websites also discovered a number of states that reported introductions of *C. japonica* not present in the national database. Lack of centralized reporting raises questions as to the closest source populations for introductions. *Cipangopaludina chinensis* introductions appear better documented, including a widespread distribution within the Saint John River in New Brunswick, Canada (McAlpine et al. 2016).

The closest known collection of *C. japonica* to our field site occurs approximately 518 km away in Lake Ardmore, Oklahoma (USGS 2016). Overall, our discovery of large, reproducing adults in a degraded urban pond raises serious ecological concerns about the potential of *C. japonica* to survive overland exposure (Havel et al. 2014), and even perhaps overwinter. Wide environmental tolerances would enable the species to establish new populations more easily, particularly in areas already invaded by other, non-native invasive mollusks such as *P. maculata* (Karatayev et al. 2009). Non-native invasive snails, such as *C. japonica*, compete with native species (Johnson et al. 2009) and may serve as reservoirs for parasites (Lin and Chen 1980; Chung and Jung 1999), prompting the need for increased diligence in monitoring public waterways.

Although we identified our specimens as *C. japonica*, the majority of published research includes individuals morphologically identified as *C. chinensis*. We therefore used these studies for comparison purposes when addressing issues of spread and ecological impact. In terms of their potential to spread, both *C. japonica* and *C. chinensis* can likely survive long periods of overland exposure. Both *C. japonica* and *C. chinensis* possess an operculum that partially functions in preventing water loss. In one experiment, large *C. chinensis* juveniles (greater than 25 mm) survived up to four weeks of air exposure while smaller juveniles (less than 10 mm) showed greater sensitivity to air exposure and low humidity (Havel 2011). In another experiment, adult *C. chinensis* survived an average of 44.6 days (\pm 4.9 as 1 SD) when left vulnerable to air exposure (Havel et al. 2014). Due to anatomical similarities between the two species, *C. japonica* can also likely survive long periods of overland exposure. Quantifying the ability of non-native freshwater snails to survive air exposure and overland transport provides direct insight into their ability to colonize new bodies of water and impact native species.

In terms of ecological impacts, initial evidence from one study suggests that *C. chinensis* negatively affects native species. In a mesocosm experiment, *C. chinensis* decreased sediment periphyton, significantly increased the ratio of N:P in the water column, and negatively influenced the abundance of the gastropod *Lymnaea stagnalis* (Johnson et al. 2009). Given their

morphological similarities and shared ecological roles, we might expect similar survival abilities and ecological impacts for *C. japonica*. Kurihara and Kadowaki (1988) reported that *C. japonica* grazed heavily on sediment-associated detritus, likely altering nutrient cycles. Furthermore, populations of *C. chinensis* occur at high densities and establish sustaining populations rapidly, which may also occur for *C. japonica*. One of the few population estimates for *C. chinensis* calculated 52,280 snails per 0.1 km² and up to 253,570 snails in a Nebraska reservoir (Chaine et al. 2012). In Long Island, NY, a population of *C. chinensis* increased from an estimated 150 individuals to an estimated 950 individuals within a two-year time period (McCann 2014). These high population levels could also be reached by *C. japonica* where anecdotal evidence exists in which fishermen have reported catching up to two tons of *C. japonica* from a single seine haul (Wolfert and Hiltunen 1968).

Survival probabilities of *C. chinensis* depend on size, with snails over 35 mm in length having almost a 100% probability of survival based on mark-recapture studies (McCann 2014). Higher survival rates for larger individuals likely apply to *C. japonica* and fecundity in this species increases predictably with female body size (Van Bocxlaer and Strong 2016). Distribution of mystery snails across northern and southern latitudes in the United States suggests the ability of this group to tolerate a wide range of temperatures (Karatayev et al. 2009; Solomon et al. 2010). Further investigation of the community pond area and connected waterways in Texas could provide insight into the distribution of *C. japonica* as well as the source of introduction (Karatayev et al. 2009).

Besides the predictable negative effects on native species and ecosystems (Solomon et al. 2010; Soes et al. 2011), non-native viviparids pose genuine disease risks. If consumed, *Cipangopaludina* spp. may transfer human intestinal fluke, *Echinostoma cinetorchis* (Jokinen 1982; Chung and Jung 1999) or serve as a vector for angiostrongyliasis (Lin and Chen 1980). Overall, the discovery of *C. japonica* in Texas highlights the ability of mystery snails to survive in urban waterways and indicates the likelihood that populations may spread successfully across the southern United States. Furthermore, our study affirms the need for genetic identification of species introductions to reduce taxonomic confusion and supports the need for improved monitoring programs coupled with a comprehensive centralized database to better track non-native invasive aquatic species.

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APPENDIX

Table A1. Distribution and presence data of *Cipangopaludina japonica* ($n = 37$) and *Cipangopaludina chinensis* ($n = 505$) gathered from United States Geological Survey Nonindigenous Aquatic Species Database (2016) and used to create distribution maps of collections reported in the United States (Figures 1 and 2). Records include localities within counties and states, year of record, HUC codes, drainage system and the state of introduction (unknown, collected or established).

Id	State	County	Locality	Year	HUC #	Drainage	Status
<i>Cipangopaludina japonica</i>							
262117			Lake Erie	1940	4120200	Lake Erie	collected
241133			Lake Michigan	1968	4060200	Lake Michigan	established
157495	AL	Mobile	Spring Hill Lake [just W of Mobile, AL]	2003	3170008	Escatawpa	collected
279560	CA	Alameda	San Francisco Bay Area	1892	18050004	San Francisco Bay	established
551050	DE	New Castle	Lums Pond, Lums Pond State Park	2013	2040205	Brandywine-Christina	unknown
157127	FL	Orange	Lake Eola, in Orlando	1994	3090101	Kissimmee	collected
50186	IN		state non-specific	1965	0		collected
627160	KS	Ellsworth	Kanopolis seep stream	2013	10260008	Lower Smoky Hill	established
164560	KS	Ottawa	Ottawa State Fishing Lake [~ 8 mi N of Bennington]	2005	10260015	Solomon	established
242200	KS	Ottawa	Sand Creek 1/2 mi. upstream from Ottawa State Fishing Lake [just S of Wells]	2007	10260015	Solomon	collected
238815	KS	Ottawa	Solomon River [near Niles]	2007	10260008	Lower Smoky Hill	collected
52289	MA	Middlesex	Concord River, Concord	1965	1070005	Concord	unknown
878001	MD	Howard	Wilde Lake	2015	2060006	Patuxent	unknown
902609	MD	Prince George's	retaining pond along Hampshire Drive, adjacent to George Washington Cemetery	2014	2070010	Middle Potomac-Anacostia-Occoquan	unknown
50185	MI		state non-specific	1965	4000000	Great Lakes Region	collected
52288	MI	Jackson	Sparks [Foundation County] Park, Jackson, MI	1965	4050004	Upper Grand	unknown
253733	MS	Tunica	McKinney Bayou off Indian Mound Road (=Bud Perry Road and Indian Creek Road), north of Hollywood	2007	8030204	Coldwater	collected
164627	NE	Douglas	Hitchcock Park Lake in Omaha	1999	10230006	Big Papillion-Mosquito	collected
52698	NE	Lancaster	Hedgefield Lake Reservoir [~3 mi. SE of Hickman, NE]	1998	10200203	Salt	established

Continued

Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
50187	OH		Lake Erie, Ohio shoreline	1965	4120200	Lake Erie	established
50184	OH	Erie	Lake Erie, Sandusky Bay	1945	4100011	Sandusky	established
879757	OH	Guernsey	Salt Fork Lake	2015	5040005	Wills	unknown
52286	OK	Carter	Ardmore [Mountain] Lake, Ardmore, OK	1965	11130303	Middle Washita	unknown
52287	OK	Payne	Stillwater, OK [waterbody not named]	1965	11050003	Upper Cimarron	unknown
558767	PA	Crawford	Canadohta Lake, PA Fish and Boat Commission Access	2012	5010003	Middle Allegheny-Tionesta	established
272180	WI	Barron	Rice Lake	2007	7050007	Red Cedar	established
272181	WI	Douglas	St. Croix Flowage	2007	7030001	Upper St. Croix	established
272183	WI	Washburn	Trego Flowage	2007	7030002	Namekagon	established
279560	CA	Alameda	San Francisco Bay Area	1892	18050004	San Francisco Bay	established
551050	DE	New Castle	Lums Pond, Lums Pond State Park	2013	2040205	Brandywine-Christina	unknown
558366	PA	Crawford	Pymatuning Reservoir, at Clark Island	2013	5030102	Shenango	established
558767	PA	Crawford	Canadohta Lake, PA Fish and Boat Commission Access	2012	5010003	Middle Allegheny-Tionesta	established
627160	KS	Ellsworth	Kanopolis seep stream	2013	10260008	Lower Smoky Hill	established
878001	MD	Howard	Wilde Lake	2015	2060006	Patuxent	unknown
879757	OH	Guernsey	Salt Fork Lake	2015	5040005	Wills	unknown
902609	MD	Prince George's	retaining pond along Hampshire Drive, adjacent to George Washington Cemetery	2014	2070010	Middle Potomac-Anacostia-Occoquan	unknown
1241570	PA	Crawford	Pymatuning Reservoir at mouth of Red Cross Bay (at end of Phelps Rd)	2015	5030102	Shenango	unknown
<i>Cipangopaludina chinensis</i>							
50183	NY	Niagara	Niagara River at Cayuga Island, Niagara Falls, NY	1942	4120104	Niagara	established
50230	CA	San Francisco	Mountain Lake in the Presidio of San Francisco	1966	18050002	San Pablo Bay	established
50231	CA	San Francisco	Stow Lake, Golden Gate Park	1966	18050006	San Francisco Coastal South	established
50314	CA	Santa Clara	unspecified waterbody in San Jose, Ca	1966	18050003	Coyote	unknown
50315	CA	San Joaquin	Middle River (east shore of Victoria Island just west of Stockton, CA)	1966	18040003	San Joaquin Delta	unknown
50378	PA	Perry	Sherman Creek from mouth [at the Susquehanna River] to river mile 0.7 (just south of Duncannon, PA)	1997	2050305	Lower Susquehanna-Swatara	collected
50379	PA	Dauphin	Wildwood Lake just N of Harrisburg, PA along the river	1993	2050305	Lower Susquehanna-Swatara	collected
50380	PA	Montgomery	Schuylkill River at Pottstown, PA	1983	2050305	Lower Susquehanna-Swatara	established
52290	MA	Suffolk	Muddy River within the city limits of Boston	1914	1090001	Charles	unknown
52291	MA	Worcester	Lake Quinsigamond, Worcester, MA	1918	1090003	Blackstone	unknown
52292	HI	Maui	Halawa Valley, Molokai	1965	20050000	Molokai	collected
52293	WA	King	Green Lake in Seattle	1965	17110012	Lake Washington	collected
52294	CA	Solano	Suisun City, CA	1965	18050001	Suisun Bay	collected
52295	CA	San Joaquin	San Joaquin River near Stockton	1965	18040003	San Joaquin Delta	collected
52296	CA	Yuba	Jack Slough, N of Marysville, CA	1965	18020159	Honcut Headwaters-Lower Feather	collected
52297	CA	Santa Clara	San Jose	1965	18050003	Coyote	collected
52298	CA	Santa Clara	pond at Stanford University, Palo Alto	1965	18050003	Coyote	collected
52299	CA	Merced	Quinto Creek (north of San Luis Res. and south of Gustine, CA)	1965	18040001	Middle San Joaquin-Lower Chowchilla	collected
52300	CA	Santa Barbara	Santa Barbara	1965	18060013	Santa Barbara Coastal	collected
52301	CA	Los Angeles	Exposition Park, Los Angeles, CA	1965	18070104	Santa Monica Bay	collected
52302	UT	Utah	Warm Springs, 4 mi E of Goshen, UT	1965	16020201	Utah Lake	collected
52303	AZ	Pima	University of Arizona, Tucson, Pima County, AZ (pond)	1965	15050301	Upper Santa Cruz	collected
52304	CO	Ouray	Radium Hot Springs, Ouray, CO	1965	14020006	Uncompahange	collected
52305	TX	McLennan	Waco, pond (= Waco Reservoir? HUC 12060203)	1965	12060202	Middle Brazos-Lake Whitney	collected
52306	MI	Calhoun	Kalamazoo River, 2 mi W of Albion, MI	1965	4050003	Kalamazoo	collected
52307	MI	Ingham	Red Cedar River, East Lansing, MI	1965	4050004	Upper Grand	collected
52308	IN	St. Joseph	Mishawaka, IN	1965	4050001	St. Joseph	collected
52309	OH	Erie	East End Cove, Lake Erie, Sandusky, OH	1965	4120200	Lake Erie	collected
52310	OH	Cuyahoga	Lake Erie, Cleveland, OH	1965	4120200	Lake Erie	collected
52311	FL	Polk	Lake Morton, Lakeland, FL	1965	3110101	Waccasassa	collected
52312	FL	Pinellas	Mirror Lake, St. Petersburg, FL	1965	3100206	Tampa Bay	collected
52313	NC	Pitt	Greenville, NC	1965	3020103	Lower Tar	collected
52314	PA	Lancaster	Herr's Icepond, Lancaster, PA	1965	2050306	Lower Susquehanna	collected
52315	PA	Lebanon	Lake Duffy, near Mt. Gretna [Lebanon], PA	1965	2050305	Lower Susquehanna-Swatara	collected
52316	PA	Montgomery	pond at Haverford College, Norristown	1965	2040203	Schuylkill	collected
52317	DE	Kent	Silver Lake, Milford, DE	1965	2040207	Broadkill-Smyrna	collected
52318	NJ	Mercer	Delaware and Raritan Canal, Princeton	1965	2030105	Raritan	collected
52319	NJ	Middlesex	Shiner Park in Menlo Park, NJ	1965	2030104	Sandy Hook-Staten Island	collected
52320	NJ	Hudson	Old Reservoir, Arlington, NJ	1965	2030103	Hackensack-Passaic	collected
52321	NY	Westchester	Sawmill River, Nepera Park, Yonkers, NY	1965	2030101	Lower Hudson	collected
52322	NY	Orange	Goshen, NY [pond?]	1965	2020007	Rondout	collected
52323	NY	Dutchess	Bahnet's Pond, Poughkeepsie, NY	1965	2020008	Hudson-Wappinger	collected
52324	NY	Queens	Queens Village, Long Island, NY	1965	2030201	Northern Long Island	collected
52325	NY	Nassau	Freeport, NY	1965	2030202	Southern Long Island	collected

Continued

Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
52326	VT	Orange	Lake Fairlee, Thetford Center, VT	1965	1080103	Waits	collected
52327	VT	Windsor	Ottawaquechee River, Quechee, VT	1965	1080106	Black-Ottawaquechee	collected
52328	RI	Washington	Nannacatucket River, Hamilton [=Annaquatucket River]	1965	1090004	Narragansett	collected
52329	MA	Norfolk	Whitman's Pond, East Weymouth	1965	1090001	Charles	collected
52330	MA	Norfolk	Pine Tree Brook and pond, Milton	1965	1090001	Charles	collected
52331	MA	Norfolk	Turners Pond, Milton	1965	1090001	Charles	collected
52332	MA	Suffolk	Leverett Pond, Boston	1965	1090001	Charles	collected
52333	MA	Suffolk	Jamaica Pond, Boston	1965	1090001	Charles	collected
52334	MA	Norfolk	Hawes Pond, Dover	1965	1090001	Charles	collected
52335	MA	Norfolk	Trout Brook, 1 mi S of Dover, MA	1965	1090001	Charles	collected
52336	MA	Middlesex	Peacock Pond, Lexington	1965	1070002	Merrimack	collected
52337	MA	Middlesex	pond at Mount Hood, Melrose	1965	1090001	Charles	collected
52338	MA	Essex	Pillings Pond, Lynnfield	1965	1090001	Charles	collected
52339	ME	Kennebec	Messalonskee Stream, Waterville, ME	1965	1030003	Lower Kennebec	collected
52349	MN	Stearns	Mississippi River at St. Cloud, MN	1944	7010203	Clearwater-Elk	unknown
52350	NH	Strafford	Cocheco River at Rochester, NH	1973	1060003	Piscataqua-Salmon Falls	unknown
52351	MD	Prince George's	Potomac River 1/4 mi below Woodrow Wilson [Memorial] Bridge (I-95 bridge west of Oxon Hill, MD)	1974	2070010	Middle Potomac-Anacostia-Occoquan	collected
52352	MA	Worcester	Putnam Pond in Fitchburg	1974	1070004	Nashua	collected
52353	NE	Saline	Biology Pond at Crete (at Doane College?)	1974	10270202	Middle Big Blue	collected
52354	NJ	Bergen	Roosevelt Commons Pond, Tenafly	1974	2030103	Hackensack-Passaic	collected
52355	NJ		Delaware River in NJ	1974	2040000	Delaware	collected
52356	NJ	Mercer	Millstone River at Kingston, NJ	1974	2030105	Raritan	collected
52357	NY	New York	Pond in Central Park, New York City, NY	1974	2030101	Lower Hudson	collected
52358	NY	Suffolk	Lily Pond on Long Island, NY	1974	2030202	Southern Long Island	collected
52359	PA	Philadelphia	Mount Airy, PA (In north Philadelphia)	1974	2040203	Schuylkill	collected
52360	PA	Montgomery	Mill Creek near Bryn Mawr, PA	1974	2040203	Schuylkill	collected
52361	PA	Bucks	Delaware Canal at Bristol, PA	1974	2040201	Crosswicks-Neshaminy	collected
52362	TX	Dallas	Dallas County	1974	12030000	Trinity	collected
52363	TX	Tarrant	Tarrant County	1974	12030000	Trinity	collected
52364	WI		Green Bay, 10 mi N of Green Bay, WI	1974	4060200	Lake Michigan	collected
52365	WI	St. Croix	Willow River in Hudson, WI	1974	7030005	Lower St. Croix	collected
52366	OH	Ottawa	Terwilliger's Pond of South Bass Island, Lake Erie	1974	4120200	Lake Erie	unknown
52466	IA	Woodbury	Sioux City, IA (Missouri River?)	1943	10230001	Blackbird-Soldier	unknown
52566	IN	Marion	White River, Indianapolis, IN at Indianapolis Power and Light County	1997	5120201	Upper White	established
52714	WI	Oneida	Stella Lake, about 10 miles NE of Rhinelander, WI	1998	7070001	Upper Wisconsin	established
153739	NY		Hudson River, freshwater tidal reach north of River Mile 30 (~168km upriver)[near Haverstraw]	1996	2020006	Middle Hudson	unknown
154103	IL	Cook	Hyde Park Pond (Lake Michigan Drainage) Chicago, Hyde Park	2000	7120003	Chicago	collected
154111	IL	Woodford	Eureka Lake (Mackinaw River Drainage)	1999	7130004	Mackinaw	collected
154132	IL	Cook	Des Plaines River (Illinois River Drainage) Riverside, Barrypoint Rd. bridge	1999	7120004	Des Plaines	collected
154150	IL	Cook	Poplar Creek (Fox River Drainage) 2 mi NW Streamwood (Hanover Township)	1999	7120006	Upper Fox	collected
154196	WI	Waukesha	Muskego Canal (Fox River Drainage) 2 mi NE Wind Lake (village), Rt. 36 bridge (downstream from bridge)	2001	7120006	Upper Fox	collected
154227	IL	Lake	Squaw Creek (Fox River Drainage) Long Lake, Rt. 134 bridge (upstream from bridge)	2001	7120006	Upper Fox	collected
154666	VA	Fairfax	Dogue Creek drainages	2002	2070010	Middle Potomac-Anacostia-Occoquan	established
154667	VA	Fairfax	Accotink Creek drainages	2002	2070010	Middle Potomac-Anacostia-Occoquan	established
154668	VA	Fairfax	Fort Belvoir, nonspecific waterbody	1993	2070010	Middle Potomac-Anacostia-Occoquan	collected
154700	PA	Dauphin	Susquehanna River at Harrisburg	2002	2050305	Lower Susquehanna-Swatara	established
154701	PA	Dauphin	Wildwood Lake at Harrisburg	2002	2050305	Lower Susquehanna-Swatara	established
154702	PA	Chester	Schuylkill River at Pottstown	2002	2040203	Schuylkill	established
155506	NY	Saratoga	Hudson River basin at Niskayuna	1920	2020004	Mohawk	collected
155507	NY	Albany	Buckingham Lake	1987	2020006	Middle Hudson	collected
156944	CT	Tolland	Holbrook Pond [~14 mi SE of East Hartford, CT]	1983	1080205	Lower Connecticut	established
156945	CT	Litchfield	East Twin Lake, Salisbury	1983	1100005	Housatonic	established
156946	CT	Litchfield	Wononskopomuc Lake	1983	1100005	Housatonic	established
156947	CT	Middlesex	Black Pond [~1 mi E of Meriden, CT]	1983	1100004	Quinnipiac	established
156948	CT	New Haven	North Farms Reservoir, Wallingford	1983	1100004	Quinnipiac	established
156949	CT	Fairfield	Beardsley Park Pond [=Bunnells Pond] Bridgeport	1983	1100006	Saugatuck	established
156950	CT	Litchfield	Tyler Pond (Lake) [just N of Goshen, CT]	1983	1100005	Housatonic	established
156951	CT	Hartford	Goodwin Park Pond A	1983	1080207	Farmington	established
156952	CT	New Haven	Southern Connecticut State College Pond in New Haven	1983	1100004	Quinnipiac	established
156953	CT	Fairfield	Pinewood Lake [just N of Bridgeport, CT]	1983	1100006	Saugatuck	established

Continued

Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
164372	KS	Wyandotte	impoundment just N of Bonner Springs [adjacent to Kansas River W of Kansas City, KS]	2005	10270104	Lower Kansas	established
164468	IA	Mahaska	Lake Keomah in Lake Keomah State Park [~4 mi E of Oskaloosa, IA]	2005	7080105	South Skunk	unknown
164628	NE	Lancaster	Oak Lake in Lincoln	2003	10200203	Salt	collected
164638	IN	Marion	West Fork White River at confluence with Eagle Creek [near near Maywood, IN]	2000	5120201	Upper White	established
164639	IN	Clay	urban ponds (2) in Brazil, IN	2005	5120111	Middle Wabash-Busseron	established
164640	IN	Marion	Delaware Lake in Ft. Benjamin Harrison State Park near Lawrence, IN [just NE of Indianapolis]	2005	5120201	Upper White	established
165647	IN	St. Joseph	North Chain Lake [just W of South Bend]	2006	7120001	Kankakee	collected
166767	IN	Kosciusko	Dewart Lake, Milford	2006	4050001	St. Joseph	collected
166768	IN	Kosciusko	Tippecanoe Lake, Oswego	2006	5120106	Tippecanoe	collected
166769	IN	Kosciusko	James Lake [~1 mi. W of North Webster, IN]=[Little Tippecanoe Lake]	2006	5120106	Tippecanoe	collected
166818	IN	Howard	Kokomo Reservoir	2005	5120107	Wildcat	collected
166838	MI	Alpena	Thunder Bay River near mouth, Alpena, MI [Lake Huron]	2006	4070006	Thunder Bay	collected
167640	IA	Polk	Riverview Park Lagoon in Des Moines	1973	7100004	Middle Des Moines	established
167641	MO	Greene	James River just east of River Cut Golf Course	2006	11010002	James	established
237888	MO	Jackson	Swope Park Lake in Kansas City	2002	10300101	Lower Missouri-Crooked	collected
237889	MO	Jackson	lagoons at the Kansas City Zoo	2002	10300101	Lower Missouri-Crooked	collected
238405	AZ	Maricopa	Salt River Project Tempe Canal just downstream of the junction with the South and Consolidated canals	2005	15060106	Lower Salt	established
239237	PA	Chester	Westtown Lake [just E of West Chester]	2007	2040202	Lower Delaware	established
241134	NY	Oswego	Oneida Lake	1978	4140202	Oneida	established
241135	MI		state non-specific	1982	4000000	Great Lakes Region	collected
241136	IN		state non-specific	1982	0		collected
241137	OH		state non-specific	1982	0		collected
241138	WI		state non-specific	1982	0		collected
241139	NY		state non-specific	1982	0	Unknown or N/A	collected
241276	ME	Kennebec	Annabessacook Lake in Winthrop	2007	1030003	Lower Kennebec	established
241277	ME	Aroostook	Island Pond in the Deboullie Lakes Reserve [~15 mi W of Winterville]	2007	1010003	Fish	established
241289	ME	Kennebec	Buker Pond (Tacoma Lakes) [just S of Litchfield]	2007	1030003	Lower Kennebec	established
241290	ME	Lincoln	Damariscotta Lake (near Jefferson)	2007	1050003	St. George-Sheepscot	established
241291	ME	Lincoln	Davis Stream (near Jefferson)	2007	1050003	St. George-Sheepscot	established
241292	ME	Cumberland	Highland Lake [~3 mi N of Portland]	2007	1060001	Presumpscot	established
241293	ME	Androscoggin	Lake Andrews in Lewiston	2006	1040002	Lower Androscoggin	established
241294	ME	Androscoggin	Lake Auburn in Auburn	2007	1040002	Lower Androscoggin	established
241295	ME	Oxford	Little Penneessewassee Pond [~3 mi W of Norway]	2007	1040002	Lower Androscoggin	established
241296	ME	Cumberland	Little Sebago Lake (near North Windham)	2006	1060001	Presumpscot	established
241297	ME	Kennebec	Maranacook Lake in Winthrop	2006	1030003	Lower Kennebec	established
241298	ME	York	Mousam Lake (just E of Acton)	2007	1060003	Piscataqua-Salmon Falls	established
241299	ME	Oxford	North Pond (near Norway)	2006	1040002	Lower Androscoggin	established
241300	ME	Oxford	Penneessewassee Lake	2006	1040002	Lower Androscoggin	established
241301	ME	Oxford	Pleasant Lake (in Casco)	2006	1060001	Presumpscot	established
241302	ME	Androscoggin	Sabattus Pond (in Sabattus)	2006	1040002	Lower Androscoggin	established
241303	ME	Kennebec	Sand Pond (in Litchfield)	2007	1030003	Lower Kennebec	established
241304	ME	Oxford	Sand Pond [~3 mi W of Norway]	2007	1040002	Lower Androscoggin	established
241305	ME	Cumberland	Sebago Lake [W of North Windham]	2006	1060001	Presumpscot	established
241306	ME	Cumberland	Songo River in the Sebago Lake State Park area west of South Casco	2006	1060001	Presumpscot	established
241307	ME	Cumberland	Thomas Pond [~1 mi NW of Raymond]	2006	1060001	Presumpscot	established
241309	PA	Cameron	Sinnemahoning Creek Reservoir at reservoir boat launch on west side of reservoir, Sinnemahoning State Park[=George B. Stevenson Reservoir in Lushbaugh]	2007	2050202	Sinnemahoning	established
243154	WA	Cowlitz	Columbia River, Longview drainage ditch, Solo Storage entrance	2002	17080003	Lower Columbia-Clatskanie	established
243155	WA	Cowlitz	Columbia River, Longview drainage ditch, Solo Storage entrance	2002	17080003	Lower Columbia-Clatskanie	established
243447	MI	Gogebic	Cisco Lake, state natural area	2005	4020102	Ontonagon	collected
243448	MI	Gogebic	Thousand Island Lake, State Natural Area	2005	4020102	Ontonagon	collected
243449	MN	Crow Wing	Mille Lacs, state natural area	1999	7010207	Rum	collected
243450	WI	Barron	Sand Lake	2003	7030001	Upper St. Croix	collected
243451	WI	Bayfield	Diamond Lake	1999	4010302	Bad-Montreal	collected
243452	WI	Bayfield	Eagle Lake (Pike Chain)	2005	4010302	Bad-Montreal	collected
243453	WI	Bayfield	Lake Owen, state natural area, campground landing	2005	4010302	Bad-Montreal	collected
243454	WI	Bayfield	Upper Eau Claire Lake, state natural area	2005	7030001	Upper St. Croix	collected

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Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
243455	WI	Burnett	Long Lake, state natural area	1999	7030001	Upper St. Croix	collected
243456	WI	Burnett	McKenzie Lake, state natural area	2003	7030002	Namekagon	collected
243457	WI	Douglas	Saint Croix Flowage, state natural area	2005	7030001	Upper St. Croix	collected
243458	WI	Forest	Kentuck Lake	1999	4030106	Brule	collected
243459	WI	Iowa	Black Hawk Lake, state natural area	1999	7070005	Lower Wisconsin	collected
243460	WI	Iron	Fisher Lake, state natural area	1999	7050002	Flambeau	collected
243461	WI	Iron	Giles Flowage [a reservoir just S of Montreal, WI]	1999	4010302	Bad-Montreal	collected
243462	WI	Iron	Spider Lake, state natural area	1999	7050002	Flambeau	collected
243463	WI	Iron	Weber Lake [just N of Upson]	1999	4010302	Bad-Montreal	collected
243464	WI	Jefferson	Rock Lake	2005	7090002	Crawfish	collected
243465	WI	Oneida	Bearskin Lake	1999	7070001	Upper Wisconsin	established
243466	WI	Oneida	Buffalo Lake, state natural area	2005	7070001	Upper Wisconsin	established
243467	WI	Oneida	Carrol Lake. State natural area.	2005	7070001	Upper Wisconsin	collected
243468	WI	Oneida	Clear Lake, state natural area	2005	7070001	Upper Wisconsin	collected
243469	WI	Oneida	Cunard Lake, state natural area	2006	7070001	Upper Wisconsin	collected
243470	WI	Oneida	Dam Lake	2006	7070001	Upper Wisconsin	collected
243471	WI	Oneida	Little Tomahawk Lake	2006	7070001	Upper Wisconsin	collected
243472	WI	Oneida	Madeline Lake. State natural area.	2005	7070001	Upper Wisconsin	collected
243473	WI	Oneida	Mid Lake (a.k.a. Nawaii Lake)	2006	7070001	Upper Wisconsin	collected
243474	WI	Lincoln	Lake Nokomis	1999	7070001	Upper Wisconsin	collected
243475	WI	Oneida	Pelican Lake, Oneida County	1999	7070001	Upper Wisconsin	collected
243476	WI	Oneida	Pickereel Lake. State natural area.	2005	7070001	Upper Wisconsin	collected
243477	WI	Oneida	Rainbow Flowage (Wisconsin River in part)	2006	7070001	Upper Wisconsin	collected
243478	WI	Oneida	Sand Lake	2006	7070001	Upper Wisconsin	collected
243479	WI	Oneida	Squaw Lake	1999	7050003	South Fork Flambeau	collected
243480	WI	Oneida	Squirrel Lake	1999	7070001	Upper Wisconsin	collected
243481	WI	Oneida	Stone Lake	2006	7070001	Upper Wisconsin	collected
243482	WI	Oneida	The Thoroughfare, state natural area	1999	7070001	Upper Wisconsin	collected
243483	WI	Oneida	Tomahawk Lake	2006	7070001	Upper Wisconsin	collected
243484	WI	Oneida	Willow Reservoir, state natural area.	1999	7070001	Upper Wisconsin	collected
243485	WI	Oneida	Wisconsin River	2005	7070001	Upper Wisconsin	collected
243486	WI	Polk	Balsam Lake, state natural area	2003	7030005	Lower St. Croix	collected
243487	WI	Polk	Half Moon Lake. State Natural area.	2003	7030005	Lower St. Croix	collected
243488	WI	Polk	Wapogasset Lake, state natural area	2003	7030005	Lower St. Croix	collected
243489	WI	Sawyer	Lake Chetac, state natural area	2005	7050007	Red Cedar	collected
243490	WI	Sawyer	Lake Chippewa (Chippewa Flowage)	1999	7050001	Upper Chippewa	collected
243491	WI	Sawyer	Lac Courte Oreilles, state natural area	2005	7050001	Upper Chippewa	collected
243492	WI	Sawyer	Nelson Lake, state natural area	2003	7030002	Namekagon	established
243493	WI	Sawyer	Sand Lake, state natural area	1999	7050001	Upper Chippewa	collected
243494	WI	Vilas	Allequash Lake, state natural area	1999	7050002	Flambeau	collected
243495	WI	Vilas	Big Lake	2005	4020102	Ontonagon	collected
243496	WI	Vilas	Big Arbor Vitae Lake	2005	7070001	Upper Wisconsin	collected
243497	WI	Vilas	Big Saint Germain Lake	2005	7070001	Upper Wisconsin	collected
243498	WI	Vilas	Lake Content, state natural area	2005	7070001	Upper Wisconsin	collected
243499	WI	Vilas	Lac du Lune, state natural area	2006	4020102	Ontonagon	collected
243500	WI	Vilas	Lac Vieux Desert Lake	1999	7070001	Upper Wisconsin	collected
243501	WI	Vilas	Little Arbor Vitae Lake	2005	7070001	Upper Wisconsin	collected
243502	WI	Vilas	Little Gibson Lake, state natural area	2005	7050002	Flambeau	collected
243503	WI	Vilas	Little Rice Lake, state natural area	2006	7050002	Flambeau	collected
243504	WI	Vilas	Little Saint Germain. State natural area.	2005	7070001	Upper Wisconsin	collected
243505	WI	Vilas	Lost Lake. State natural area.	2005	7070001	Upper Wisconsin	collected
243506	WI	Vilas	Manitowish River, state natural area	2005	7050002	Flambeau	collected
243507	WI	Vilas	Manitowish River, state natural area	2006	7050002	Flambeau	established
243508	WI	Vilas	Moon Lake, state natural area	2005	7070001	Upper Wisconsin	collected
243509	WI	Vilas	Plum Lakes	2005	7070001	Upper Wisconsin	collected
243510	WI	Vilas	Razorback Lake	2005	7070001	Upper Wisconsin	collected
243511	WI	Vilas	Round Lake	2005	7050002	Flambeau	collected
243512	WI	Vilas	Snipe Lake, state natural area	2005	7070001	Upper Wisconsin	collected
243513	WI	Vilas	Spring Creek, state natural area	2006	7070001	Upper Wisconsin	collected
243514	WI	Vilas	Star Lake	2005	7070001	Upper Wisconsin	collected
243515	WI	Vilas	Upper Gresham Lake, state natural area.	2005	7050002	Flambeau	collected
243516	WI	Vilas	West Plum Lake, state natural area.	2005	7070001	Upper Wisconsin	collected
243517	WI	Vilas	Wildcat Lake, state natural area	2005	7050002	Flambeau	collected
243518	WI	Vilas	Wisconsin River, Vilas County, WI, state natural area	2005	7070001	Upper Wisconsin	collected
243519	WI	Washburn	Long Lake, state natural area	2005	7030001	Upper St. Croix	collected
243520	WI	Washburn	Nancy Lake	2005	7030002	Namekagon	collected

Continued

Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
243521	WI	Washburn	Shell Lake, state natural area	2003	7030001	Upper St. Croix	collected
252825	WI	Adams	Goose Lake	2007	4030201	Upper Fox	collected
252826	WI	Adams	Wolf Lake	2007	4030201	Upper Fox	collected
252827	WI	Ashland	Long Lake	2007	4010302	Bad-Montreal	collected
252828	WI	Barron	Big Dummy Lake	2007	7050007	Red Cedar	collected
252830	WI	Barron	Chetek Lake	2007	7050007	Red Cedar	collected
252831	WI	Barron	Echo Lake	2007	7030005	Lower St. Croix	collected
252833	WI	Barron	Horseshoe Lake	2007	7030001	Upper St. Croix	collected
252834	WI	Barron	Little Dummy Lake	2007	7050007	Red Cedar	collected
252835	WI	Barron	North Lake	2007	7030005	Lower St. Croix	collected
252836	WI	Barron	Rice Lake	2007	7050007	Red Cedar	collected
252837	WI	Barron	Scott Lake	2007	7030005	Lower St. Croix	collected
252838	WI	Barron	Silver Lake, ner Cumberland, near CR B	2007	7050007	Red Cedar	collected
252839	WI	Barron	Staples Lake	2007	7030005	Lower St. Croix	collected
252840	WI	Bayfield	Delta Lake	2008	4010302	Bad-Montreal	collected
252842	WI	Burnett	Des Moines Lake	2007	7030002	Namekagon	collected
252843	WI	Burnett	Devils Lake	2007	7030001	Upper St. Croix	collected
252845	WI	Burnett	Gaslyn Lake	2007	7030001	Upper St. Croix	collected
252846	WI	Burnett	Gull Lake	1999	7030001	Upper St. Croix	collected
252848	WI	Burnett	Mud Hen Lake	2007	7030005	Lower St. Croix	collected
252849	WI	Burnett	Twenty-Six Lake	2007	7030001	Upper St. Croix	collected
252850	WI	Chippewa	Lake Wissota (Yellow River Basin)	1999	7050005	Lower Chippewa	collected
252851	WI	Dane	Elver Park Pond	2008	7070005	Lower Wisconsin	collected
252852	WI	Eau Claire	Fall Creek Pond	1999	7050006	Eau Claire	collected
252853	WI	Eau Claire	Halfmoon Lake	2008	7050005	Lower Chippewa	collected
252854	WI	Florence	Sea Lion Lake	1999	4030108	Menominee	collected
252855	WI	Forest	Little Rice Lake	1999	4030202	Wolf	collected
252856	WI	Forest	Pine Lake	2007	4030202	Wolf	collected
252857	WI	Iron	Manitowish River	2005	7050002	Flambeau	collected
252858	WI	Iron	O'Brien Lake	2007	4010302	Bad-Montreal	collected
252859	WI	Lincoln	Nokomis Lake (Rice River Flowage)	1999	7070001	Upper Wisconsin	collected
252860	WI	Marinette	Wiggins Lake	1999	4030108	Menominee	collected
252862	WI	Monroe	Monroe County Flowage	1999	7070003	Castle Rock	collected
252863	WI	Oconto	Pickerel Lake	1999	4030104	Oconto	collected
252865	WI	Oconto	Shay Lake	2008	4030104	Oconto	collected
253557	MO	Laclede	Niangua River [W of Prosperine] at Mountain Creek Campground canoe launch	2008	10290110	Niangua	collected
255088	OR	Marion	pond (old rock quarry and log pond) at 3000 Cherry Ave. in Salem	2008	17090007	Middle Willamette	collected
255246	MI	Alpena	Lake Winyah, shore, boat channel and ponds in private campground	2008	4070006	Thunder Bay	established
255850	OR	Linn	Cox Creek at Bain Drive [St.] SE in Albany (also known as Swan Lakes)	2008	17090003	Upper Willamette	unknown
255970	IN	Elkhart	Elkhart River, from Goshen to Dunlap	2008	4050001	St. Joseph	unknown
255972	IN	Kosciusko	Kuhn Lake about 4 miles SW of North Webster, IN	2006	5120106	Tippecanoe	unknown
255975	IN	Kosciusko	Oswego Lake [Oswego, IN]	2006	5120106	Tippecanoe	unknown
256702	MO	Johnson	Lake Buteo, Knob Noster State Park in Knob Noster	2008	10300104	Blackwater	unknown
256703	MO	Johnson	Powell Gardens Lake [~1 mi NW of Elm]	2008	10300104	Blackwater	unknown
257040	IN	Marion	Fall Creek, vicinity of the Delaware Lake Dam (Ft. Harrison State Park, in NE Indianapolis)	2008	5120201	Upper White	established
260618	MO	Jackson	Alex George Lake in the Blue River Parkway [near I-435 and Blue River Rd. south side of Kansas City]	2009	10300101	Lower Missouri-Crooked	established
261734	MO	Jackson	Bowlin Road Pond in Blue Springs Park [=Fleming Park, just ESE of Kansas City]	2009	10300101	Lower Missouri-Crooked	established
261982	MO	Jackson	Lake Jacomo, near Kansas City	2009	10300101	Lower Missouri-Crooked	established
261983	NY	Sullivan	Braden Brook, just N of Mountain Dale	2009	2020007	Rondout	established
262118	NY	Niagara	Niagara River	1931	4120104	Niagara	collected
263832	PA	Cumberland	Conodoguinet Creek, at mouth [Harrisburg]	2002	2050305	Lower Susquehanna-Swatara	established
264163	MO	Randolph	Rothwell Lake, just upstream of the Rothwell Park Road bridge [in Moberly]	2009	10280203	Little Chariton	collected
264165	MO	Jackson	Penn Valley Park pond, near the intersection of Penn Valley Drive and 27th Street, Kansas City	2009	10270104	Lower Kansas	established
264168	NY	Putnam	John Allen Pond in Clarence Fahnestock State Park in Putnam Valley	2009	2030101	Lower Hudson	established
265065	FL	Lee	a canal in Cape Coral	2009	3100103	Charlotte Harbor	established
265279	MO	Mercer	Lake Marie, ca 2.0 miles SW of Mercer	2009	10280102	Thompson	established
265683	ONT		Moirs Lake, Dummer Twp., Peterborough Co., 2 km east of Madoc, ONT	1997			collected

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Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
265684	ONT		Stony Lake, Dummer Twp., Peterborough Co, near Mt. Eagle Island	1996			collected
265685	ONT		Stony Lake, Dummer Twp., Peterborough Co., Near Fairy Lake Island.	1996			collected
268945	IN	Hamilton	Fall Creek at Geist Reservoir (just NE of Indianapolis)	2010	5120201	Upper White	established
269215	NY	Sullivan	Bashakill Marsh [S of Wurtsboro]	2010	2040101	Upper Delaware	established
269217	NY	Sullivan	Silver Lake (Kreiger Park) in Woodridge	2010	2020007	Rondout	established
269467	ID	Canyon	Duff Lane Pond Public Fishing Area in Middleton	2009	17050114	Lower Boise	established
269468	ID	Latah	Arboretum Pond on University of Idaho campus [Moscow]	2008	17060108	Palouse	established
269735	OR	Klamath	Lost River at Crystal Springs Road boat ramp [SE of Klamath Falls]	2010	18010204	Lost	collected
270109	WI	Vilas	Alder Lake	2007	7050002	Flambeau	established
270110	WI	Eau Claire	Altoona Lake	2009	7050006	Eau Claire	established
270111	WI	Rusk	Amacoy Lake	2009	7050001	Upper Chippewa	established
270112	WI	Vilas	Anvil Lake	2006	7070001	Upper Wisconsin	established
270113	WI	Adams	Arkdale Lake (Arkdale Millpond)	2009	7070003	Castle Rock	established
270114	WI	Vilas	Arrowhead Lake (a.k.a. Little Star Lake)	2006	7070001	Upper Wisconsin	established
270116	WI	Barron	Barron Flowage #3	2009	7050007	Red Cedar	established
270119	WI	Lincoln	Bass Lake	2008	7070001	Upper Wisconsin	established
270121	WI	Rusk	Bass Lake	2009	7050001	Upper Chippewa	established
270122	WI	Washburn	Bass Lake	2007	7050007	Red Cedar	established
270128	WI	Barron	Bear Lake	2009	7050007	Red Cedar	established
270130	WI	Washburn	Bear Lake	2009	7050007	Red Cedar	established
270131	WI	Portage	Bear Lake	2008	4030202	Wolf	established
270132	WI	Portage	Bear Lake	2008	4030202	Wolf	established
270133	WI	Vilas	Big Bass Lake	2006	7070001	Upper Wisconsin	established
270134	WI	Washburn	Big Bass Lake	2007	7030002	Namekagon	established
270136	WI	Polk	Big Blake Lake (Blake)	2007	7030005	Lower St. Croix	established
270137	WI	Oneida	Big Fork Lake	2007	7070001	Upper Wisconsin	established
270138	WI	Burnett	Big McKenzie Lake	2005	7030001	Upper St. Croix	established
270139	WI	Washburn	Big McKenzie Lake	2005	7030002	Namekagon	established
270140	WI	Barron	Big Moon Lake	2009	7050007	Red Cedar	established
270141	WI	Vilas	Big Sand Lake	2006	7070001	Upper Wisconsin	established
270142	WI	Oneida	Big Stone Lake	2007	7070001	Upper Wisconsin	established
270143	WI	Langlade	Big Twin Lake	2009	4030202	Wolf	established
270145	WI	Washburn	Birch Lake	2008	7050007	Red Cedar	established
270146	WI	Sawyer	Birch Lake	2008	7050007	Red Cedar	established
270147	WI	Polk	Bone Lake	2007	7030005	Lower St. Croix	established
270148	WI	Oneida	Booth Lake	2007	7070001	Upper Wisconsin	established
270149	WI	Vilas	Boulder Lake	2006	7050002	Flambeau	established
270150	WI	Vilas	Brandy Lake	2006	7070001	Upper Wisconsin	established
270151	WI	Oneida	Buckskin Lake	2007	7050003	South Fork Flambeau	established
270152	WI	Vilas	Buckskin Lake	2007	7050003	South Fork Flambeau	established
270154	WI	Price	Butternut Lake	2008	7050002	Flambeau	established
270155	WI	Ashland	Butternut Lake	2008	7050002	Flambeau	established
270156	WI	Ashland	Butternut Lake	2008	7050002	Flambeau	established
270162	WI	Washburn	Cable Lake	2007	7030001	Upper St. Croix	established
270163	WI	Polk	Camelia Lake	2007	7030005	Lower St. Croix	established
270164	WI	Vilas	Carpenter Lake	2010	7070001	Upper Wisconsin	established
270165	WI	Vilas	Catfish Lake	2010	7070001	Upper Wisconsin	established
270167	WI	Chippewa	Chapman Lake	2009	7050006	Eau Claire	established
270168	WI	Taylor	Chequamegon Waters Flowage	2010	7050005	Lower Chippewa	established
270169	WI	Oconto	Chute Pond	2008	4030104	Oconto	established
270170	WI	Polk	Clam Falls Flowage	2007	7030001	Upper St. Croix	established
270171	WI	Polk	Clear Lake	2007	7030005	Lower St. Croix	established
270172	WI	Portage	Collins Lake	2008	4030202	Wolf	established
270299	WI	Eau Claire	Coon Fork Lake	2009	7050006	Eau Claire	established
270325	WI	Iowa	Cox Hollow Lake	2007	7070005	Lower Wisconsin	unknown
270326	WI	Vilas	Cranberry Lake	2010	7070001	Upper Wisconsin	unknown
270327	WI	Oneida	Cranberry Lake (Eagle Chain)	2010	4140202	Oneida	unknown
270328	WI	Oneida	Deer Lake	2007	7070001	Upper Wisconsin	unknown
270329	WI	Iowa	Cox Hollow Lake	2007	7070005	Lower Wisconsin	unknown
270330	WI	Bayfield	Delta Lake	2010	4010302	Bad-Montreal	unknown
270331	WI	Sauk	Devils Lake (Spirit Lake)	2008	7070004	Baraboo	unknown
270333	WI	Vilas	Duck Lake	2006	7070001	Upper Wisconsin	unknown
270334	WI	Washburn	Dunn Lake	2007	7030002	Namekagon	unknown
270335	WI	Vilas	Eagle Lake	2010	7070001	Upper Wisconsin	unknown

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Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
270336	WI	Florence	Emily Lake	2009	4030108	Menominee	unknown
270337	WI	Langlade	Enterprise Lake	2008	4030202	Wolf	unknown
270338	WI	Florence	Fay Lake	2009	4030108	Menominee	unknown
270339	WI	Washburn	Fenton Lake	2006	7050007	Red Cedar	unknown
270340	WI	Rusk	Fireside Lakes	2009	7050001	Upper Chippewa	unknown
270341	WI	Rusk	Flambeau River	2010	7050001	Upper Chippewa	unknown
270342	WI	Rusk	Flambeau River	2010	7050001	Upper Chippewa	unknown
270343	WI	Oneida	George Lake	2007	7070001	Upper Wisconsin	unknown
270344	WI	Oconto	Grindle Lake	2008	4030104	Oconto	unknown
270346	WI	Vilas	Gunlock Lake	2007	7070001	Upper Wisconsin	unknown
270347	WI	Sawyer	Hayward Lake	2010	7030002	Namekagon	unknown
270349	WI	Vilas	High Lake	2006	7050002	Flambeau	unknown
270351	WI	Chippewa	Holcombe Flowage	2008	7050001	Upper Chippewa	unknown
270353	WI	Oneida	Horsehead Lake (Leta)	2007	7070001	Upper Wisconsin	unknown
270355	WI	Barron	Horseshoe Lake	2007	7030001	Upper St. Croix	unknown
270357	WI	Polk	Horseshoe Lake	2007	7030005	Lower St. Croix	unknown
270364	WI	Price	Hultman Lake	2009	7070001	Upper Wisconsin	unknown
270365	WI	Oneida	Hat Rapids Flowage	2007	7070001	Upper Wisconsin	unknown
270366	WI	Barron	Hemlock Lake	2009	7050007	Red Cedar	unknown
270368	WI	Vilas	Hunter Lake	2008	7070001	Upper Wisconsin	unknown
270369	WI	Oneida	Jennie Webber Lake	2007	7070001	Upper Wisconsin	unknown
270370	WI	Portage	Joanis Lake	2008	7070003	Castle Rock	unknown
270371	WI	Florence	Keyes Lake	2009	4030108	Menominee	unknown
270372	WI	Price	Lac Sault Dore	2008	7050003	South Fork Flambeau	unknown
270374	WI	Barron	Lake Desair	2009	7050007	Red Cedar	unknown
270375	WI	Wood	Lake Dexter	2009	7070003	Castle Rock	unknown
270376	WI	Marathon	Lake Dubay (T26N, R6E, S14)	2001	7070002	Lake Dubay	unknown
270377	WI	Portage	Lake Dubay	2001	7070003	Castle Rock	unknown
270378	WI	Oneida	Lake Minocqua	2006	7070001	Upper Wisconsin	unknown
270379	WI	Oneida	Lake Thompson	2008	7070001	Upper Wisconsin	unknown
270381	WI	Sawyer	Lake of the Pines	2008	7050002	Flambeau	unknown
270382	WI	Barron	Lake of the Woods (Bass)	2007	7030005	Lower St. Croix	unknown
270383	WI	Langlade	Lawrence Lake	2009	7070002	Lake Dubay	unknown
270384	WI	Portage	Lime Lake	2008	7070003	Castle Rock	unknown
270386	WI	Washburn	Lincoln Lake	2007	7030002	Namekagon	unknown
270390	WI	Washburn	Little Bass Lake	2007	7030002	Namekagon	unknown
270392	WI	Oneida	Little Bearskin Lake	2006	7070001	Upper Wisconsin	unknown
270393	WI	Ashland	Little Butternut Lake	2008	7050002	Flambeau	unknown
270444	WI	Oneida	Little Fork Lake	2007	7070001	Upper Wisconsin	unknown
270445	WI	Vilas	Little John Lake	2010	7050002	Flambeau	unknown
270446	WI	Vilas	Little Spider Lake (a.k.a. Gaffrey Lake)	2006	7070001	Upper Wisconsin	unknown
270447	WI	Florence	Long Lake	2009	4030108	Menominee	unknown
270448	WI	Florence	Long Lake	2009	4030108	Menominee	unknown
270449	WI	Vilas	Long Lake	2007	7070001	Upper Wisconsin	unknown
270450	WI	Barron	Loon Lake, west of Constock, on the Barron/Polk County border	2009	7030005	Lower St. Croix	unknown
270451	WI	Shawano	Loon Lake	2009	4030202	Wolf	unknown
270452	WI	Shawano	Lower Red Lake (Weed Dam Pond)	2010	4030202	Wolf	unknown
270453	WI	Barron	Lower Vermillion Lake	2009	7050007	Red Cedar	unknown
270454	WI	Vilas	Lynx Lake (Eagle Chain)	2007	7070001	Upper Wisconsin	unknown
270455	WI	Polk	Magnor Lake	2007	7030005	Lower St. Croix	unknown
270520	MO	Jackson	Lake Lotawana, (West Fork Sni-A-Bar Creek) at marina boat ramp	2010	10300101	Lower Missouri-Crooked	established
271128	IN	Vigo	Green Valley Mine Pond [NW of Terre Haute]	2010	5120111	Middle Wabash-Busseron	established
271137	ID	Latah	Moose Creek Reservoir [NW of Bovill]	2009	17060306	Clearwater	collected
271138	ID	Latah	Spring Valley Reservoir	2010	17060306	Clearwater	collected
272631	OR	Jackson	ponds (2) at Jackson County Sports Park off Kershaw Rd. in White City	2010	17100308	Middle Rogue	established
272814	WA	Thurston	Long Lake, west side at WDFW boat ramp.	2010	17110019	Puget Sound	established
272815	WA	Thurston	Hicks Lake, north side of Washington State boat ramp.	2010	17110019	Puget Sound	established
272816	WA	Thurston	Hicks Lake, south of Washington State boat ramp.	2010	17110019	Puget Sound	established
272817	WA	Thurston	Chambers Lake, at Thurston County boat ramp.	2010	17110016	Deschutes	established
272818	WA	Thurston	Ken Lake (Simmons Lake) at Christopher Park off Cedarbury Lane, Lakemoor Community Club.	2010	17100103	Upper Chehalis	established
272819	WA	Thurston	Ken Lake (Simmons Lake) at Westside Park off Camelot Park SW, Lakemoor Community Club.	2010	17100103	Upper Chehalis	established
272820	WA	Thurston	Pattison Lake, east side of WDFW boat ramp.	2010	17110019	Puget Sound	established
273128	ID	Kootenai	Hauser Lake	2009	17010305	Upper Spokane	established

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Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
274951	OH	Highland	Rocky Fork Lake (Bayview)	2010	5060003	Paint	established
274952	OH	Highland	Rocky Fork Lake (South Beach)	2010	5060003	Paint	established
274953	OH	Highland	Rocky Fork Lake (East Ramp)	2010	5060003	Paint	established
274954	OH	Medina	Spencer Lake #1	2010	4110001	Black-Rocky	established
274955	OH	Crawford	Robert Clark Neff Reservoir [=Bucyrus Reservoir]	2010	4100011	Sandusky	established
274957	OH	Morrow	Amick Reservoir	2010	5060001	Upper Scioto	established
274958	OH	Morrow	Amann Reservoir	2010	5060001	Upper Scioto	established
274960	OH	Highland	unnamed creek W of Clear Fork Reservoir	2010	5040002	Mohican	established
274961	OH	Hocking	Lake Logan	2010	5030204	Hocking	established
274962	OH	Lawrence	Lake Forest	2010	5090101	Raccoon-Symmes	established
274963	OH	Muskingum	Dillon Lake	2010	5040006	Licking	established
274964	OH	Wayne	Shreve Lake	2010	5040002	Mohican	established
274965	OH	Summit	Silver Creek	2010	5040001	Tuscarawas	established
274966	OH	Summit	Long Lake [Akron]	2010	5040001	Tuscarawas	established
274967	OH	Summit	Turkeyfoot Lake #1	2010	5040001	Tuscarawas	established
274968	OH	Guernsey	Salt Fork Lake	2010	5040005	Wills	established
274969	OH	Guernsey	Salt Fork Reservoir	2010	5040005	Wills	established
274971	OH	Portage	Mogadore Reservoir #1 [Akron]	2010	4110002	Cuyahoga	established
274972	OH	Carroll	Leesville Lake	2010	5040001	Tuscarawas	established
274977	OH	Geauga	East Branch Reservoir	2010	4110003	Ashtabula-Chagrin	established
274979	OH	Jefferson	Jefferson Lake	2010	5030101	Upper Ohio	established
274984	OH	Columbiana	Highlandtown Reservoir	2010	5030101	Upper Ohio	established
274988	OH	Trumbull	Mosquito Creek Lake at marina	2010	5030103	Mahoning	established
274989	OH	Columbiana	Highlandtown Reservoir	2010	5030101	Upper Ohio	established
274990	OH	Trumbull	Mosquito Creek Reservoir	2010	5030103	Mahoning	established
274991	OH	Trumbull	Mosquito Creek Reservoir	2010	5030103	Mahoning	established
278355	MI	Alcona	Badger Lake	2011	4070006	Thunder Bay	established
279153	WV	Upshur	Stonecoal Lake, near eastern boat launch	2011	5020002	West Fork	established
280316	NY	Warren	Lake George, Middleworth Bay at north end cove	2011	4150408	Lake Champlain	established
283344	ME	Cumberland	Mill Creek Park Pond in South Portland	2012	1060001	Presumpscot	established
284973	ME	Franklin	Clearwater Pond	2012	1030003	Lower Kennebec	established
287402	MI	Muskegon	Little Black Lake	2012	4060101	Pere Marquette-White	established
287437	MI	Lake	Little Bass Lake	2012	4060101	Pere Marquette-White	established
287444	MI	Ottawa	Pigeon Lake at mouth of Pigeon River	2012	4050002	Black-Macatawa	established
287664	MI	Roscommon	Houghton Lake	2012	4060102	Muskegon	established
289777	KS	Johnson	Kingston Lake	2012	10300101	Lower Missouri-Crooked	established
289966	OR	Clatsop	Small pond between Sunset Lake and Sunset Beach	2011	17080006	Lower Columbia	unknown
290824	MI	Bay	Saginaw Bay, Lakeward of Cottage Grove Road, Bay County, MI	2008	4080103	Pigeon-Wiscoggin	established
294817	CA	Humboldt	Freshwater Lagoon	2009	18010102	Mad-Redwood	established
294911	MI	Wayne	shoreline of Blue Heron Lagoon located on Belle Isle Park	2013	4090004	Detroit	unknown
324113	NJ	Monmouth	Manasquan Reservoir	2011	2030104	Sandy Hook-Staten Island	unknown
547357	IN	Lake	tributary of Turkey Creek at Arthur Place in Merrillville	2013	4040001	Little Calumet-Galien	unknown
558049	IN	Union	Whitewater Lake	2013	5080003	Whitewater	established
558066	NE	Lancaster	Wild Plum Lake, 28 km SW of Lincoln	2011	10200203	Salt	established
558342	OR	Multnomah	pond at Westmoreland Park in Portland	2013	17090012	Lower Willamette	unknown
565035	MN	St. Louis	pond at Bagley Nature Center, University of Minnesota-Duluth campus	2013	4010102	Beaver-Lester	established
565116	IN	Knox	a ditch in Vincennes, behind Memering Metroplex	2013	5120113	Lower Wabash	unknown
565118	GA	Fulton	a pond in a subdivision off Old Alabama Road and Hwy 141 [N of Norcross]	2013	3130001	Upper Chattahoochee	established
609133	MI	Hillsdale	Crystal Lake near Jerome, MI	2013	4050004	Upper Grand	established
609230	PA	Dauphin	Susquehanna River, below a small island west of Three Mile Island and east of Shelly Island	2013	2050305	Lower Susquehanna-Swatara	unknown
627168	OR	Clackamas	Mompano Reservoir	2014	17090007	Middle Willamette	unknown
630390	KS	Johnson	Prairie Center Park Pond in Olathe	2014	10270104	Lower Kansas, Kansas	unknown
630412	OR	Deschutes	Crane Prairie Reservoir, near Rock Creek boat ramp	2013	17070301	Upper Deschutes	unknown
644342	WA	Whatcom	Squalicum Creek at the inlet to Bug Lake in Bellingham	2012	17110004	Nooksack	established
644343	WA	Whatcom	Squalicum Creek at the inlet to Bug Lake in Bellingham	2013	17110004	Nooksack	established
749946	KS	Sedgwick	KDOT East Lake [N side of Wichita]	2014	11030012	Little Arkansas	established
750050	MI	St. Joseph	Portage Lake [S of Portage]	2014	4050001	St. Joseph	established
750051	MI	St. Clair	Harsens Island in Lake Saint Clair	2014	4090002	Lake St. Clair	established
785649	MI	Bay	Saginaw Bay at inlet just N of Pinconning River mouth	2011	4080300	Lake Huron	unknown
785741	ONT		West Two Creeks at Wheatley Provincial Park	2012	0	Unknown or N/A	unknown
785751	MI	Bay	Saginaw Bay at inlet just N of Pinconning River mouth	2012	4080300	Lake Huron	unknown
785763	ONT		unnamed slough near Gauleys Bay Rd and Tamarack Rd	2013	0	Unknown or N/A	unknown
785774	WI	Brown	marsh area just N of Suamico River mouth	2013	4060200	Lake Michigan	unknown
785786	ONT		Fox Creek at Iler Rd bridge	2013	0	Unknown or N/A	unknown

Continued

Table A1. Continued.

Id	State	County	Locality	Year	HUC #	Drainage	Status
785798	MI	Bay	Saginaw Bay at inlet just N of Pinconning River mouth	2013	4080300	Lake Huron	unknown
785810	ONT		Lake St Claire near shore at end of Mallard Line	2012	4090002	Lake St. Clair	unknown
785822	MI	Houghton	Silver Creek N of Kuusisto Rd	2011	4020300	Lake Superior	unknown
851575	OR	Lane	Eugene East	2013	17090002	Coast Fork Willamette	established
851576	OR	Clatsop	Gearhart	2011	17100201	Necanicum	established
862379	WA	King	Pine Lake	2015	17110012	Lake Washington	established
862470	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862471	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862472	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862473	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862474	VA	Fairfax	Pohick Bay	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862475	VA	Fairfax	Dyke Marsh	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862476	VA	Fairfax	Dyke Marsh	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862477	VA	Fairfax	Dyke Marsh	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862478	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862479	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862480	VA	Fairfax	Mason Neck State Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862481	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862482	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862483	VA	Fairfax	Belle Haven Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862484	VA	Fairfax	Pohick Bay	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862485	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862486	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862487	VA	Prince William	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862488	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
862489	VA	Fairfax	Occoquan Regional Park	2015	2070010	Middle Potomac-Anacostia-Occoquan	established
877596	IL	Kankakee	Kankakee River in Kankakee	2015	7120001	Kankakee	established
877645	MA	Plymouth	Great Herring Pond, at Sagamore Beach access off Eagle Hill Drive	2015	1090002	Cape Cod	established
877664	WV	Hardy	Rock Cliff lake at US Forest Service Trout Pond Campground	2012	2070003	Cacapon-Town	established
878070	MI	Kalamazoo	Woods Lake, at dock at the Kensington Park entrance	2015	4050003	Kalamazoo	established
903011	KS	Johnson	Gardner Lake	2015	10270104	Lower Kansas, Kansas	unknown

Table A2. Reports from state departments of natural resources (DNRs) about *Cipangopaludina japonica* used to add a layer (Figure 1) to the distribution map highlighting collections reported to the national United States Geological Survey Nonindigenous Aquatic Species Database (2016). Designation of np means information was not present.

State	Postal code	Present	Status	Specific notes	Source
Alabama	AL	yes	collected		USGS 2016
Alaska	AK	no	np		
Arizona	AZ	no	np		
Arkansas	AR	no	np		
California	CA	yes	established		USGS 2016
Colorado	CO	no	np		
Connecticut	CT	no	np		
Delaware	DE	yes	unknown		USGS 2016
Florida	FL	yes	collected		USGS 2016
Georgia	GA	no	np		
Hawaii	HI	no	np		
Idaho	ID	yes	established	Invasive	http://www.agri.idaho.gov/AGRI/Categories/Environment/InvasiveSpeciesCouncil/InvSpplList.php
Illinois	IL	no	np		
Indiana	IN	yes	collected		USGS 2016
Iowa	IA	no	np		
Kansas	KS	yes	established		USGS 2016
Kentucky	KY	no	np		
Louisiana	LA	no	np		
Maine	ME	no	np		
Maryland	MD	yes	unknown		USGS 2016
Massachusetts	MA	yes	unknown		USGS 2016
Michigan	MI	yes	collected		USGS 2016
Minnesota	MN	yes	unknown	Regulated	http://www.midwesterngovernors.org/AIS/MGASStateBannedAquaticSpecies
Mississippi	MS	yes	established		USGS 2016
Missouri	MO	no	np		
Montana	MT	no	np		
Nebraska	NE	yes	established		USGS 2016

Continued

Table A2. *Continued.*

State	Postal code	Present	Status	Specific notes	Source
Nevada	NV	no	np		
New Hampshire	NH	no	np		
New Jersey	NJ	no	np		
New Mexico	NM	no	np		
New York	NY	yes	established	Widespread	http://www.nyis.info/user_uploads/601b9_Bellamya%20japonica%20Ecological.pdf
North Carolina	NC	yes	established	Invasive	
North Dakota	ND	no	np		
Ohio	OH	yes	established		USGS 2016
Oklahoma	OK	yes	unknown		USGS 2016
Oregon	OR	yes	established	Invasive	http://www.dfw.state.or.us/conservationstrategy/invasive_species/mystery_snail.asp
Pennsylvania	PA	yes	established		USGS 2016
Rhode Island	RI	no	np		
South Carolina	SC	yes	established	Widespread	http://www.fwgna.org/sp_accts/B-japonica.pdf
South Dakota	SD	no	np		
Tennessee	TN	no	np		
Texas	TX	yes	established		present work
Utah	UT	no	np		
Vermont	VT	no	np		
Virginia	VA	yes	unknown		http://www.fwgna.org/sp_accts/B-japonica.pdf
Washington	WA	yes	established		https://www.fws.gov/alaska/fisheries/fish/Technical_Reports/t_2010_107.pdf
West Virginia	WV	no	np		
Wisconsin	WI	yes	established		USGS 2016
Wyoming	WY	no	np		

Table A3. Species, GenBank accession number, and references used to create the maximum likelihood phylogeny ($n = 51$).

Species	GenBank Accession No.	Citation
<i>Cipangopaludina chinensis</i> (Gray, 1834)	EU528474	Hayes et al. 2008
<i>Cipangopaludina chinensis</i> (Gray, 1834)	EU528589	Hayes et al. 2008
<i>Cipangopaludina japonica</i> (von Martens, 1861)	FJ405876	Sengupta et al. 2009
<i>Cipangopaludina chinensis</i> (Gray, 1834)	FJ710298	Hayes et al. 2009
<i>Cipangopaludina dianchiensis</i> Zhang, 1990	GU198781 - GU198782	Du et al. 2013
<i>Cipangopaludina</i> sp.	GU198783 - GU198784	Du et al. 2013
<i>Cipangopaludina dianchiensis</i> Zhang, 1990	GU198785	Du et al. 2013
<i>Cipangopaludina</i> sp.	GU198786 - GU198791	Du et al. 2013
<i>Cipangopaludina longispira</i> (Heude, 1890)	GU198809 - GU198810	Du et al. 2013
<i>Cipangopaludina dianchiensis</i> Zhang, 1990	GU198818	Du et al. 2013
<i>Cipangopaludina</i> sp.	GU198819	Du et al. 2013
<i>Cipangopaludina dianchiensis</i> Zhang, 1990	JN621284	Jiao et al. unpublished
<i>Cipangopaludina</i> sp.	KP009560	Tian et al. unpublished
<i>Cipangopaludina</i> sp.	KP009566	Tian et al. unpublished
<i>Cipangopaludina japonica</i> (von Martens, 1861)	LC028524 - LC028535	Hirano et al. 2015
<i>Cipangopaludina chinensis laeta</i> von Martens, 1860	LC028536 - LC028548	Hirano et al. 2015
<i>Viviparus georgianus</i> (L. Lea, 1834)	AF120634	Giribet and Wheeler 2002
<i>Viviparus contectus</i> (Millet, 1813)	FJ405835	Sengupta et al. 2009
<i>Viviparus ater</i> (de Cristofori & Jan, 1832)	FJ405882	Sengupta et al. 2009