CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Sixteenth meeting of the Conference of the Parties
Bangkok (Thailand), 3-14 March 2013

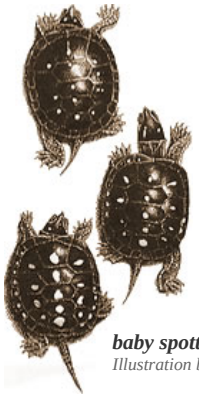
CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

Inclusion of *Clemmys guttata* in Appendix II, in accordance with Article II, paragraph 2(a) of the Convention and satisfying Criteria A and B in Annex 2a of Resolution Conf. 9.24 (Rev. CoP15).

B. Proponent

United States of America*



baby spotted turtles
Illustration by David Carroll

C. Supporting statement

1. Taxonomy

1.1	Class:	Reptilia
1.2	Order:	Testudines
1.3	Family:	Emydidae
1.4	Species:	*Clemmys guttata* SCHNEIDER, 1792
1.5	Scientific synonyms:	*Testudo guttata* SCHNEIDER 1792 *Testudo anonyma* SCHNEIDER 1792 (nomen nudum) *Testudo punctata* SCHOEPFF 1792 *Clemmys guttata* STRAUCH 1862 *Clemmys guttata* CONANT & COLLINS 1991: 50 *Clemmys guttata* CROTHER 2000 *Clemmys guttata* FELDMAN & PARHAM 2002
1.6	Common names:	English: Spotted turtle French: Tortue ponctuée Spanish: Tortuga moteada

2. Overview

Clemmys guttata (Spotted Turtle) is a member of the North American family of freshwater turtles (Emydidae) that is native to Canada and the United States and inhabiting shallow, unpolluted, freshwater habitats and surrounding upland areas. The species is found in two disjoint locations, around the Great Lakes area and along the eastern seaboard, from Maine and southern Ontario, west to Illinois and south to northern Florida (Ernst & Lovich 2009; DYSDEC 2012; Natural Heritage and Endangered Species

* *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

Program 2007; van Dijk 2011). This species is subject to international and national commercial trade, primarily as pets.

Based on the best available information, the population in Canada is estimated at about 2,000 individuals (COSEWIC 2004). There is no total U.S. population estimate, Local populations range from 30-1,205 individuals. Though the species is found across a wide area, it is patchy in distribution and, where it does occur, is found in low densities (Ernst and Lovich 2009; Meylan 2006; Litzgus & Mousseau 2004; van Dijk 2011). Although harvest is regulated on a local level throughout much of its range and captive breeding is reported, the species is taken from the wild for international and national commercial trade, primarily destined for Asia. Available data show that U.S. exports of this species have steadily increased from nearly 350/year in 1999 to about 1000/year by 2010 (LEMIS 2011). Like most turtles, this species' life history traits of delayed sexual maturity, extended adult longevity, and high juvenile mortality – all exhibited by *Clemmys guttata* - make the species particularly vulnerable to the removal of even a few adults from the population. The species' sensitivity to pollutants narrows the amount of available suitable habitat. Habitat destruction and degradation has led to fragmentation and isolation of remaining populations, and has increased their vulnerability to human exploitation.

Clemmys guttata was recently upgraded to Endangered (2011) on the IUCN Red List of Threatened Species because it has undergone a population decline of more than 50 percent over three generations due to due to habitat destruction, invasive species introductions, overexploitation, and vehicular mortality. Given their life history traits, habitat loss, and harvest for the pet trade, U.S. State resource managers and turtle specialists at the 2010 Conservation and Trade Management of Freshwater and Terrestrial Turtles, held in St. Louis, Missouri, recommended including this species in Appendix II. Regulation of the international trade of this species would ensure that exports are not detrimental to the species' survival in the wild and would assist the range countries in stemming illegal trade.

Clemmys guttata qualifies for listing in Appendix II by satisfying both Criteria A and B of Annex 2a of Resolution Conf. 9.24 (Rev. CoP15). Because the species faces an entire suite of threats, including international commercial trade, it can be inferred that regulation of trade in the species is necessary to avoid it becoming eligible for inclusion in Appendix I in the near future (Criterion A, Annex 2a, Resolution Conf. 9.24 (Rev. CoP15)). In addition, available information indicates that the regulation of trade in the species is required to ensure that the harvest of specimens from the wild is not reducing the wild population to a level at which its survival might be threatened by continued harvesting or other influences (Criterion B, Annex 2a, Resolution Conf. 9.24 (Rev. CoP15)).

3. Species characteristics

3.1 Distribution

Canada (Ontario, Québec); **United States** (Connecticut, Delaware - Presence Uncertain, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, West Virginia; van Dijk 2011).

3.2 Habitat

Clemmys guttata inhabits a variety of wetland types, including vernal pools, swamps, bogs and marshes, small streams, wet meadows, and early and mature wet forests. This species requires clear, clean water, with a soft substrate and aquatic or emergent vegetation (Ernst & Lovich 2009). In addition, *Clemmys guttata* require upland habitat for nesting sites, described as open areas with sandy or loamy soil, amidst grass tussocks or sphagnum hummocks. This species is not considered to be very mobile (COSEWIC 2004) and might move up to hundreds of meters (COSEWIC 2004; Natural Heritage and Endangered Species Program 2007). Researchers have determined that habitat size requirements vary with the sexes; one study found that females occupy a home range that is about half the size of males (Kaye et al. 2001).

3.3 Biological characteristics

Clemmys guttata males reach maturity between 7 and 13 years of age, and females similarly between 7 and 15 years of age (Congdon et al. 2008; Ernst & Lovich 2009). Nesting occurs in the spring to early summer (COSEWIC 2004; Kaye et al. 2001; NYSDEC 2012). Females produce one or two clutches of 3–5 eggs (with a range of 1–14). Up to half the female population may not be

reproductive in a single breeding season and most females do not produce eggs every year (COSWEIC 2004). Incubation takes 67 days (ranging from 50–90). Hatchlings measure 27 mm (range 26–31mm) (Litzgus 2006; Meylan 2006; Ernst & Lovich 2009). Generation time is on the order of 25–30 years (Litzgus 2006). Longevity is at least 30 years, possibly as high as 65–110 years (Ernst & Lovich 2009; Litzgus 2006). Therefore, it is possible that female *Clemmys guttata* are reproductive for 20 years or more.

This species exhibits high site fidelity and average daily movement is quite limited (COSEWIC 2004; Harms 2008; Natural Heritage and Endangered Species Program 2007). Seasonal movements consist of females moving to upland nesting areas and entire to lay eggs and population migrations for hibernation (COSEWIC 2004; Harms 2008; Kaye et al. 2008). *Clemmys guttata* feed preferentially on small, live animals, but also consume some fruits and filamentous algae (Congdon et al. 2008; Ernst & Lovich 2009). *Clemmys guttata* is quite sensitive to pollutants (COSEWIC 2004; Litzgus & Mousseau 2004; NYSDEC 2012).

3.4 Morphological characteristics

This is a relatively small turtle with a smooth black carapace (upper shell) that is patterned with small yellow or white dots. The maximum adult size is 13-14.3 cm carapace length (CL). Size at maturity is generally 8–10.5 cm CL in males, and 8–10.3 cm CL in females (COSEWIC 2004; Harms 2008).

3.5 Role of the species in its ecosystem

Clemmys guttata are both predator and prey in the aquatic, semi-aquatic, and terrestrial habitats they utilize. *Clemmys guttata* and their eggs are preyed on by skunks (*Mephitis*) and, especially, raccoons (*Procyon*). Animal foods, eaten live or as carrion, include aquatic insect larvae, small crustaceans, snails, frog tadpoles, salamanders, and small fish (Ernst & Lovich 2009). *Clemmys guttata* also provide conservation benefits to the wetland ecosystem that the species occupies because Freshwater turtles play an extremely important role in maintaining functional freshwater ecosystems, including rivers, ponds, streams, and wetlands. They help disperse seeds and manage vegetation levels, control insect and snail populations, and help keep our waters clean.

In Canada, turtles have cultural importance and are important totem animals in many Aboriginal tribes (e.g., Iroquois and several Algonquin tribes).

4. Status and trends

4.1 Habitat trends

There are no estimates of the amount of suitable spotted turtle habitat still remaining in Canada or the United States. The wetland habitat preferred by *Clemmys guttata* has been converted, degraded, or fragmented for agricultural, residential, and other human uses (COSEWIC 2004; NYSDEC 2012; van Dijk 2011). Habitat trends are inextricably linked to this' species status. In Ohio, where 3–5% of original wetland habitat remains and the species is largely confined to marginal habitat, there are few remaining stable populations considered, (van Dijk 2011). See also Population Trends.

4.2 Population size

Canada - Populations range from 32-187 individuals with population densities of 0.05-0.45 individuals/ha (Ernst & Lovich 2009). Canadian officials estimate a total population of adult *Clemmys guttata* in Canada of about 2000 individuals (COSEWIC 2004).

United States - There is no population estimate for the entire United States. *Clemmys guttata* generally occurs in small localized populations. Population sizes range from 30–1,205 individuals, though most populations are believed to be small or tiny. Litzgus & Mousseau (2004) estimated a southern population to include 31-36 adults, at density of 0.36 turtles/hectare. Reported population densities vary widely across its range, from 0.05–79.1 *Clemmys guttata* per hectare, though most populations average 1–10 animals/ha (Litzgus & Mousseau 2004; Meylan 2006; Ernst & Lovich 2009). Despite the high variability in density across its range, *C. guttata* exhibits a lower overall density than other more common turtles (Litzgus & Mousseau 2004). For instance, in Massachusetts where documented occurrences have been made over the past 25 years in a large portion of the

state, most occurrences consist of 5 or fewer individuals (Natural Heritage and Endangered Species Program 2007).

4.3 Population structure

The sex ratio of most studied *C. guttata* populations is 1:1 (Ernst & Lovich 2009). Juvenile survival is low, so populations contain few young turtles (Litzgus & Mousseau 2004). The species' extended time to maturation and low juvenile survivorship is compensated by adults being long-lived (at least 30 years) and their ability to produce young multiple times over their reproductive lifetime (Natural Heritage and Endangered Species Program 2007). Research indicates that older age classes contribute more to the survival of wild populations over time (Harms 2008). Researchers consider that protection of reproducing adults and juveniles are valuable to the conservation strategy for *Clemmys guttata* (Ernst & Lovich 2009).

4.4 Population trends

The overall population trend is decreasing due to habitat destruction, invasive species introductions, collection for the pet trade and vehicular mortality (Ernst & Lovich 2009; van Dijk 2011). Decline is attributed variously to the loss of adults or lack of recruitment, increased predation, and overcollection (Ernst and Lovich 2009; Harding 2002; Lang 2004; Meylan 2006; NYSDEC 2012). In Canada, declines are thought to be due to the deterioration of the habitat and the illegal collection of individuals (B. van Havre, Environment Canada, pers. comm. 2012). The recent reassessment of this species by the IUCN from Vulnerable in 1996 to Endangered in 2011 (van Dijk 2011) indicates that the population has continued to decline. See also Geographic and Habitat Trends.

4.5 Geographic trends

Canada - *Clemmys guttata* currently occurs in moderate numbers in eastern and southwestern Ontario (Litzgus 1996). The species is known from only two records in Quebec, however there are no records for the species in the province after 1992 (Bider and Matte 1994, cited in Litzgus 1996). Of 104 populations documented in Ontario over the past 30 to 40 years, the species is now considered to be extirpated from 36 of these sites (Environment Canada 2012).

USA - Local extirpations have apparently caused the geographic range to contract or fragment. Most populations are small and colonial in nature. Generalized population declines and local extirpations have occurred, especially in the Great Lakes portion of the range, and more recently in the eastern United States (Ernst & Lovich 2009; Harding 1997; Klemens 1993). The historic range of *Clemmys guttata* in Illinois likely included much of the Chicago metropolitan area (Cook County); no individuals have been discovered in Cook County since the early 1950s (Dreslik *et al.* 1998). In Maine, the species has disappeared (development) from historic range in southern Cumberland County (Maine Department of Inland Fisheries and Wildlife 2003). In New York, *C. guttata* was considered to be perhaps the most common turtle in the New York City area at the turn of the century, but today occurs in only a few isolated populations in protected areas (A. Breisch, NYSDEC, pers. comm. 1999; NYSDEC 2012). See also Legal Instruments and Habitat Conservation.

5. Threats

Clemmys guttata is impacted by collection for personal pets or trade, mortality on roads and from agricultural machinery, habitat degradation, predation, and invasive species.

Habitat degradation and conversion are documented threats throughout this species' range (COSEWIC 2004; NYSDEC 2012; van Dijk 2011). *Clemmys guttata* habitat has been degraded, altered or destroyed by multiple causes, including: reductions in the water table (Harding 2002; Harms 2008); draining of wetlands and conversion for residential or agricultural purposes and the resulting effluents from agricultural land carry pesticides, fertilizer and other pollutants into the wetlands (Harding 2002; NYSDEC 2012); commercial and casual collection; predation; roadkill and injuries from heavy machinery; forestry activities (Natural Heritage and Endangered Species Program 2007); and encroachment from invasive species (Harding 2002; Harms 2008). For example, in southwestern Ontario, particularly around Lake St. Clair, invasive *Phragmites* is destroying Spotted Turtle habitat and is a major threat (COSEWIC 2004). This species' inability to tolerate pollutants (COSEWIC 2004; Litzgus & Mousseau 2004; NYSDEC 2012) makes it susceptible where human encroachment of their habitat leads to increased pollution and destruction. Increased isolation of populations renders them more vulnerable to the impacts of human exploitation

(Harding 2002). As *Clemmys guttata* populations become more isolated, they are more vulnerable to human exploitation, predation and chance disturbance (Harding 2002).

Most populations are small to very small (Litzgus & Mousseau 2004; Meylan 2006) and are thus susceptible to localized extinction. As habitat has become more fragmented and remaining turtle populations become more isolated, there is little or no opportunity for genetic exchange with other sites (Harding 2002), which could jeopardize the species' long-term survival. Loss of genetic diversity and has been documented in Ohio and Indiana (Harms 2008; Lewis et al. 2004). Because *Clemmys guttata* is not a good disperser or colonizer, individuals would be unlikely or unable to migrate to alternative locations following habitat disturbance, which could result in local extirpation.

Clemmys guttata population dynamics rely on the long-term reproductive contributions of adult animals over time (Harms 2008; Litzgus 2006). Increases in the size of *Clemmys guttata* populations occur only gradually and the species requires a lengthy period of time to recover from decline (Natural Heritage and Endangered Species Program 2007; Litzgus 2006). This species is particularly sensitive to the loss of adults from a population, whether due to mortality or collection (Harms 2008; Litzgus 2006). Subsidized predators, such as raccons, that occur in unnaturally large populations of predators near human population centers) probably represent a further impact on eggs and juveniles, and likely reduce recruitment into existing populations (Ernst & Lovich 2009; Harding 2002; Meylan 2006).

6. Utilization and trade

6.1 National utilization

In an internet survey in 2002, 5 dealers were selling *Clemmys guttata* for an average price of US$148.40 (ranging from US$100-240). Based on the descriptions and sizes of animals provided by the sellers, it was estimated that 60 percent of the animals were wild-caught (Reed & Gibbons, 2002). A web survey of 5 dealers in 2011 showed an average price for juvenile *Clemmys guttata* of US$168.97 (ranging from US$100-249.95) and adult *Clemmys guttata* selling for US$386.47 (ranging from US$199.95-500). Thus, market prices are rising.

6.2 Legal trade

Canada – Canada does not collect species-specific export data, but legal and regulatory conservation requirements generally prohibit the commercial export of this species. Due to prohibitions under Canada's endangered species legislation - which does not distinguish between specimens of captive born, bred in captivity or wild origin - the export of *Clemmys guttata* would only occur for purposes related to conservation (van Havre, pers. comm. 2012).

United States - U.S. trade data were obtained from the U.S. Fish and Wildlife Service Law Enforcement Management Information System (LEMIS) for the period from 1999 to 2010 (see Table 1 and Figure 1; LEMIS 2011). These data are compiled from U.S. wildlife declaration forms required for import or export of any fish and wildlife.

Table1. U.S. Exports of *Clemmys guttata*; 1999-2010

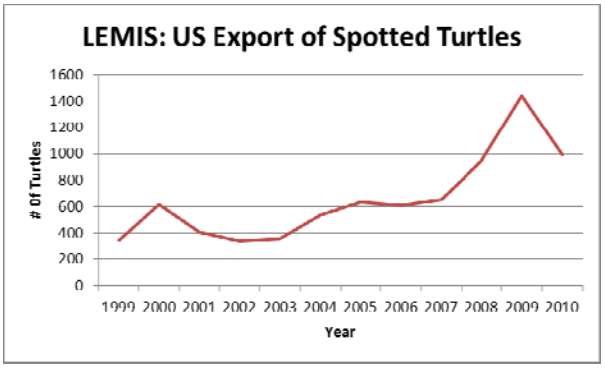
Year	# Individuals	# Shipments
1999	344	37
2000	617	66
2001	407	64
2002	342	52
2003	358	43
2004	537	74
2005	638	66
2006	611	61
2007	653	73
2008	943	64

Year	# Individuals	# Shipments
2009	1442	72
2010	989	55
Total	**7881**	**727**

Source: U.S. Fish and Wildlife Service (LEMIS 2011)

Nearly all (98 percent) of the exports in Table 1 and Figure 1 were reported as commercial trade (LEMIS 2011). The data show that U.S. exports of this species have steadily increased from under 350/year in 1999 to about 1000/year by 2010. Reed and Gibbons (2002) examined LEMIS data for the 5-year period from 1996 to 2000 and reported that a total of 1,848 individuals were exported. This equates to about 370 individuals per year. The total exports for the 12-year period in Table 1 were 7,881 specimens (LEMIS 2011), which averages to 657 specimens per year. This indicates that there has been a trend in the trade incre trade re is an increasing us, there appears to be an increase in the number of U.S. exports. Thus, overall, annual U.S. exports are increasing.

Figure 1. U.S. Exports of *Clemmys guttata;* 1999-2010



Between 1999 and 2010, approximately 16 percent of the exports in Table 1 were reported as wild and 80 percent were reported as captive-bred or farmed (LEMIS 2011). However, because these species are not CITES-listed, it is not possible to determine whether the animals are bred according to Resolution Conf. 10.16 on *Specimens of animal species bred in captivity*, or whether and what level of wild material is being used as parental stock or are being collected from the wild and reared in captivity. Moreover, this reportedly high level of captive breeding is quite different from that reported in earlier analyses. Reed and Gibbons (2002) reported that, of the 1,848 individuals exported from the United States during 1996-2000, 57 percent were wild caught, 23 percent were unknown or undeclared, and 16 percent were captive born or bred.

6.3 Parts and derivatives in trade

This species is not traded for parts and derivatives it is predominantly the whole animal for the pet trade.

6.4 Illegal trade

Canada – Canada Border Services Agency (CBSA) and enforcement officials continue to encounter smuggling attempts of turtles from the United States and Asia. In Ontario, there have been several convictions for the collection, transport, sale, and illegal aquaculture of freshwater turtle species, including *Clemmys guttata*. This leads Environment Canada to believe that there is an established demand for this species in the pet trade, as the species brings a relatively high price on the Canadian market (see Table 2). Their market value is considerably higher than other turtles because of their ornate markings as well as their rarity and difficulty to acquire legally. Ontario *Clemmys guttata* are also thought to be more ornately patterned than those from the United States, causing further demand in the illegal pet trade (van Havre, pers. comm. 2012).

Table 2. Value on the illegal Canadian market for *Clemmys guttata*

Species	Description	$USD
Spotted Turtle	all individuals	From 125 to 400

Source: Environment Canada, WIldlife Enforcement Directorate, Intelligence Division, summary compiled 2012.

In Ontario, evidence suggests that this species is also harvested for the food industry and traditional medicinal uses. One case in Ontario involved the illegal harvest of *Clemmys guttata*, among other turtle species, for human consumption. During an interview with enforcement staff, one individual involved stated that he was a practitioner of traditional medicine and the turtle was believed to bring long life when possessed and consumed (van Havre, pers. comm. 2012).

* In 2010, an Ontario man was convicted on 8 charges for internet sale of native Ontario Turtles (including *Clemmys guttata*) which are protected under Canada's Fish and Wildlife Conservation Act. He was fined $4000.00 (*Source: Ministry of Natural Resources, ontario.ca/mnr, March 16, 2010*). In 2008

* In 2008, an Ontario man was arrested for unlawful possession of turtles (including *Clemmys guttata*) under Schedule I of the *Species at Risk Act.* He was fined $10,000.00 and given a 3-year probation (www.ec.gc.ca/default.asp?lang=En&n=714D9AAE-1&news=A3E69C1E-A384-43FF-AD52-0FEEAEA05B92).

* In 2008, an Ontario man was arrested in a black-market operation for illegally trading at-risk species. Protected species (including *Clemmys guttata*) were sold across the Canada-U.S. border. The man was fined: $4000.00 & 90 days in jail (http://www.breitbart.com/article.php?id=cp_gua4evjt18&show_article=1).

China – From August 2006 to March 2008, up to 10 spotted were sold in Yuehe Pet Market in Guangzhou (Gong et al. 2009).

USA – In 2011, a Pennsylvania man was convicted on charges of selling 13 *Clemmys guttata* which are protected under Pennsylvania law. He was fined US$ 1100.00 (http://www.northcentralpa.com/article/bucks-county-reptile-dealer-pleads-guilty-illegally-trading-native-turtles).

* *United States* – In 2010, "Operation Shellshock," conducted by the New York State Department of Enviornmental Conservation-Division of Law Enforcement, charged 30 individuals and companies with felonies and misdemeanors relating to the commercialization of wildlife (including 30+ *Clemmys guttata*) under state provincial and federal laws by New York State Department of Environmental Conservation, U.S. Fish and Wildlife Service, Pennsylvania Fish and Boat Commission, Environment Canada, and the Ontario Ministry of Natural Resources. Fine and forfeitures totaled US$100,000.00 (www.fws.gov/international/DMA_DSA/CITES/pdf/abstracts.pdf).

* In 2008, a Florida reptile dealer was arrested by North Carolina Wildlife Enforcement officers while he was commercially harvesting *Clemmys guttata* for later sale in the pet trade to Japan (http://www.loudounwildlife.org/blog/2011/02/wood-turtle-poaching-in-west-virginia/).

6.5 Actual or potential trade impacts

Removal of turtles from the wild for trade equates to mortality because the individual is no longer able to contribute to the gene pool. *Clemmys guttata* population dynamics rely on the long-term reproductive contributions of adult animals over time (Harms 2008; Litzgus 2006). Decreased genetic variability has already been documented in some populations (Harms 2008; Lewis et al. 2004). Increases in the size of *Clemmys guttata* populations occurs only gradually and the species requires a lengthy period of time to recover from decline (Natural Heritage and Endangered Species Program 2007; Litzgus 2006). As a result, the species is particularly sensitive to removal of adults from a population, and the impacts of even casual collection have significant impacts on a population (Harms 2008; Litzgus 2006). The impact of collection pressure for trade is magnified by other concurrent and

growing threats to this species' survival in the wild (i.e., increased predation and increased habitat fragmentation).

7. Legal instruments

7.1 National

Canada – Clemmys guttata was designated as Special Concern in 1991 and Endangered in 2004, under Schedule 1 of the Species at Risk Act (SARA; COSEWIC 2004, 2008). Protection under SARA makes it an offence to kill, harm, harass, capture or take these turtles, to destroy the residence of one or more individuals, and to possess, collect, buy, sell or trade these turtles on federal lands. Permits may be issued under SARA for activities beneficial to the conservation of the species or related to incidental catch. Provincially, in Ontario, which is the primary range jurisdiction for this species, *Clemmys guttata* is listed as Endangered under the Ontario Endangered Species Act. This Act prohibits the killing, harming, harassing, capturing, taking, collecting, possessing, transporting, buying, selling, leasing or trading of members of this species and prohibits the damage or destruction of its habitat. *Clemmys guttata* are also protected under Ontario's Fish and Wildlife Conservation Act of 1997, which provides similar protections to individual turtles but not their habitat. Known localities of turtles are not publicly released to reduce the possibility of poaching. In Quebec, spotted turtle nests are protected from disturbance, destruction or alteration by the *Loi sur la Conservation et la Mise en Valeur de la Faune*, under which it is prohibited to hunt, capture, keep in captivity or sell individuals without a permit. Additional strict federal regulations administered by the Canada Food Inspection Agency (CFIA) prohibit the import of live Testudines or their eggs except for certain non-commercial purposes (van Havre, pers. comm. 2012).

United States - Clemmys guttata are protected to varying degrees in all States (Nanjappa and Conrad 2011; see Annex 1). In Massachusetts, an increase in recorded occurrences (individuals, but not necessarily populations) led to a down listing of its status from 'Species of Special Concern' to 'Species of Conservation Interest' in 2006 (van Dijk 2011). In New York, *C. guttata* was considered to be perhaps the most common turtle in the New York City area at the turn of the century, but today occurs in only a few isolated populations in protected areas (A. Breisch, NYSDEC, pers. comm. 1999; NYSDEC 2012). Within the context of recovery land acquisition grants (under section 6 of the Act), the Department of the Interior has provided funds to the State of Michigan for actions that, in part, will help conserve *Clemmys guttata*, as well as several other species of plants and animals (Department of the Interior 2004). The species occurs in a number of protected areas across its range, but those habitats may not be secure due to problems associated with pollution and illegal collection (van Dijk 2011).

7.2 International

None

8. Species management

8.1 Management measures

Commercial harvest is not allowed in some U.S. States within this species range, and is allowed but restricted in others (Nanjappa and Conrad 2011; Annex 1). The Natural Heritage Central Database, which maintains conservation information that is accessible to all resource managers throughout this species' range recommends among their management measures that are very important to the protection, restoration, creation, and management of this species: efforts to manage nesting habitat; preventing the invasion of non-native plants and eradicating them from spotted turtle habitat is essential; restoration of wetlands would be beneficial in some areas; and maintenance of high water quality is important; the degradation of water quality leads to a tendency to emigrate in search of more desirable habitat (D. Carroll, pers. comm. with NHCD 1999).

8.2 Population monitoring

Maine: *Clemmys guttata* was state-listed as threatened in 1986. Surveys of over 2500 wetlands conducted in Maine in the 1990s documented *Clemmys guttata* at about 100 new sites. It is believed that only a few thousand *Clemmys guttata* occur in the state in a highly fragmented landscape (http://www.maine.gov/ifw/wildlife/species/endangered_species/spotted_turtle/).

Vermont: Considerable effort has gone into surveying for *Clemmys guttata* in Vermont since 1984. Surveys are generally limited to locations of new reports of potential occurrence. Additional work has been focused on management activities and habitat conservation at known sites. (M. Ferguson, Vermont Natural Heritage Program, pers. comm. with DSA, USFWS 1999, 2012).

New Hampshire: Several individuals have been permitted to conduct mark-recapture studies, and D. Carroll, who has extensive knowledge of turtle biology, has conducted long-term monitoring of a local New Hampshire population. A search for rare turtles (e.g., Blanding's, spotted, and wood turtles) was conducted in the Great Bay and Lamprey River areas, and13 blocks of relatively extensive and contiguous suitable habitat were identified (Carroll 1999). In addition, 14 *Clemmys guttata* were monitored at sites in the coastal watershed as part of graduate research (NMWAP, 2005).

Maryland: There has not been population monitoring specifically for *Clemmys guttata*, however there is a 5-year (2010-2014) effort currently underway to produce a herpetology atlas in which spotted turtle presence is being recorded by atlas "block" (1/6 of a 7.5 min USGS quadrangle=~10 sq. mile block). There was a long-term (20 years of data) monitoring project at Aberdeen proving ground (S. Smith, Maryland Department of Natural Resources, pers. comm. Feb 2012).

Georgia: There has been no recent monitoring effort, but and they are difficult to find in the state (J. Jensen, Georgia Department of Natural Resources, pers. comm. Feb 2012).

Illinois: There has been ongoing monitoring of spotted turtle populations in Illinois since 1987. Surveys are conducted every 2-3 years (T. Wilson, M Dreslik, pers. comm. 1999, 2012).

8.3 Control measures

8.3.1 International

None

8.3.2 Domestic

The species is protected at the state and provincial level throughout some of its range (see Section 7.1 Legal Instruments, National).

8.4 Captive breeding and artificial propagation

Clemmys guttata is being bred by hobbyists but there have been no large scale breeding programs. Headstarting of hatchlings is not recommended for this species, except in cases of severe species decline (D. Carroll, pers. comm. with NHCD 1999). However, where headstarting is attempted, researchers have learned that hatchlings should be released at nest sites, rather than transporting them to wetlands (NHCD 1999).

8.5 Habitat conservation

Clemmys guttata habitats are protected in a number of federal, state, local, and private preserves and natural areas throughout the species' range. However, the proportion of the species' habitat that has been protected is not quantified. Van Dijk (2011) notes that even protected habitats may not be secure for this species, given its sensitivity to pollution and the potential ease of illegal collection. However, in New York, for instance, where *C. guttata* was considered to be perhaps the most common turtle in the New York City area at the turn of the century, but today occurs in only a few isolated populations in protected areas (A. Breisch, NYSDEC, pers. comm. 1999; NYSDEC 2012).

The Nature Conservancy has recommended the following habitat conservation measures for *Clemmys guttata*:

1. Restoration Potential: Wetland restoration and landscape level planning can increase the connections among suitable habitat patches; this could help improve the security of existing populations. The natural reconstruction or human replacement of beaver dams, lesser impoundments, and channels may be beneficial, as all appear to have historically led to the creation of wetland complexes that this turtle favored (D. Carroll, pers. comm.with NHCD 1999).

2. Preserve Selection & Design Considerations: Preserves should be designed around wetland complexes and include adequate habitat for nesting and estivation. Priority should be given to habitat well removed from paved and all but minimum-use dirt roads and buffered from commercial and incidental collecting. Nesting habitat should be extensive, varied, centrally located within the overall habitat, and buffered against human access and activity. Habitat integrity must be maintained and secured so that populations have the ability to disperse and interchange genes with other populations.

8.6 Safeguards

N/A

9. Information on similar species

Clemmys guttata is a member of the Emydidae family. Similar species in this family that have overlapping ranges include the bog turtle (*Glyptemys muhlenbergii*), which used to be considered the same genus as *Clemmys guttata*, and the Blanding's turtle (*Emydoidea blandingii*). This is especially true of juvenile turtles since adult Blanding's turtles are substantially bigger than *Clemmys guttata*. Blanding's turtles also have yellow marking on their chin.

10. Consultations

The United States Fish and Wildlife Service consulted with all States having populations of *Clemmys guttata* through the Association of Fish and Wildlife Agencies and also with Canada for this species. Canada provided an in depth response including relevant data in June 2012 via Basile van Havre Director, Population Conservation management Division, Environment Canada.

11. Additional remarks

This species was recommended for inclusion in Appendix II by State resource managers and turtle specialists at the *2010 Conservation and Trade Management of Freshwater and Terrestrial Turtles in the United States* held in St. Louis, Missouri (convened and hosted by the U.S. Fish and Wildlife Service, International Wildlife Trade Program).

IUCN information: This species was recently upgraded from Vulnerable A1cd+2cd, ver. 2.3 (1996) to Endangered A2cde+4ce, ver 3.1 (2011) because of habitat loss and slow recovery time (van Dijk 2011).

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State regulation of Spotted Turtle (*Clemmys guttata*)

State	State Protected Status	Trade	Regulatory Citation
Connecticut	SGCN	No Commercial Collection	CTGS 490 26-78
District of Columbia	Protected; SGCN	No Commercial Collection	DC ST 1981 6-923
Florida	SGCN	No Commercial Collection; Personal Collection allowed	FAC 68A 25.002-27.005
Georgia	Protected; SGCN	No Commercial Collection	GA AC 27-1-28
Illinois	Endangered; SGCN	No Commercial Collection	IL CS 56 1-20
Indiana	Endangered; SGCN	No Commercial Collection	IAC 312 9-5
Maine	Threatened; SGCN	No Commercial Collection; Scientific Permit	MRSA 12 10001-12159
Maryland	SGCN	No Commercial Collection	COMAR 08.03.11.03B & .04C
Massachusetts	Protected	No Commercial Collection	CMR 9.01-10.0
Michigan	Threatened; SGCN	No Commercial Collection	MI AR 299.1024-1025
New Hampshire	Threatened; SGCN	No Commercial Collection	NHTOCXVIII 212A
New Jersey	Protected; SGCN	No Commercial Collection	NJSA 23:2A-6
New York	Protected; SGCN	No Commercial Collection	ECL 11-0103, 0512; 6 NY CRR Part 3 and 175
North Carolina	SGCN	No Commercial Collection; Personal Collection allowed	15A NCAC 10B.0119
Ohio	Threatened	No Commercial or Personal Collection	ORC 1531.01
Pennsylvania	SGCN	Collection prohibited; Possession with permit allowed	30 PA CS 102 58 PA CS 79
Rhode Island	Protected; SGCN	No Commercial Collection	RI GL 20 37 1-5
South Carolina	Threatened; SGCN	No Commercial Collection; Personal Collection allowed	SC CL R 123-150.3 and SC CL 50-11-2190
Vermont	Endangered; SGCN	No Commercial Collection	VSA 10-123-5401 to 5408
Virginia	SGCN	No Commercial Collection	VAC 15-360-10 & VAC 15-30-5
West Virginia	SGCN	No Commercial Collection; Personal Collection allowed	58 WV CSR46

Source: Nanjappa and Conrad (2011)

** SGCN – State designation of Species of Greatest Conservation Need.