

NOBANIS – Invasive Alien Species Fact Sheet

Trachemys scripta

Author of this fact sheet: Henrik Bringsøe, Nordisk Herpetologisk Forening (Nordic Herpetological Society), Irisvej 8, DK-4600 Køge, Denmark; +45 5666 3023; E-mail: bringsoe@email.dk

Bibliographical reference – how to cite this fact sheet:

Bringsøe, H. (2006): NOBANIS – Invasive Alien Species Fact Sheet – *Trachemys scripta*. – From: Online Database of the North European and Baltic Network on Invasive Alien Species – NOBANIS www.nobanis.org, Date of access x/x/200x.

Species description

Scientific name: *Trachemys scripta* (Schoepff, 1792), Testudines, Emydidae

Synonyms: *Chrysemys scripta*: Boulenger 1889

Pseudemys scripta: Jordan 1899

Common names: Slider (US), Nordamerikansk terrapin (DK), Buchstaben-Schmuckschildkröte (DE), punakorvakilpikonna (FI), Krasnoukhaya cherepakha (красноухая черепаха) (RU), żółw ozdobny (PL), sarkanāusu bruņurupucis (LV), punakõrv-ilukilpkonn (EE).

Subspecies and their common names:

Trachemys scripta scripta (Schoepff, 1792): yellow-bellied slider (US), yellow-bellied terrapin (GB), guløret terrapin or gulbuget terrapin (DK), gulbukad vattensköldpadda (SE), eigentliche Buchstaben-Schmuckschildkröte or Gelbbauch-Schmuckschildkröte (DE), żółw żółtolicy or żółw żółtouchy or żółw żółto brzuchy (PL).

Trachemys scripta elegans (Wied, 1839): red-eared slider (US), red-eared terrapin (GB), rødøret terrapin (DK), rödörad vattensköldpadda (SE), rødøreterrapin (NO), punakorvakilpikonna (FI), Rotwangen-Schmuckschildkröte (DE), żółw czerwonolicy or żółw czerwonouchy (PL), punakõrv-ilukilpkonn (EE), raudonausis vēžļys or raudonskruostis vēžļys (LT).

Trachemys scripta troostii (Holbrook, 1836): Cumberland slider (US), Troost's terrapin (GB), cumberland-terrappin (DK), Gelbwangen-Schmuckschildkröte or Troosts Schmuckschildkröte (DE).



Fig 1. Adult female *Trachemys scripta elegans* basking on a rock in the Botanical Garden of Copenhagen, Denmark. The conspicuous reddish orange to red stripe behind the eye is characteristic of that subspecies, photo by Henrik Bringsøe.



Fig 2. A group of juvenile *Trachemys scripta elegans* photographed in a pet shop. In all three subspecies the carapace is bright green, photo by Henrik Bringsøe.

Species identification

Trachemys scripta is a medium-sized to large freshwater turtle as females reach a carapace length (straight carapace length) of up to 28 cm and males up to 20 cm. The carapace (the dorsal or upper component of the shell) is oval and feebly keeled and posterior margin is slightly serrated. The carapace is olive to brown with yellow stripes or bars. The undersides of the marginal scutes have marks which usually take the form of dark blotches partly surrounded by a light band.

Adult males become darker or even melanistic as they become larger and older.

The plastron (the ventral or lower component of the shell) is hingeless. Its colour is yellow or yellowish and has a pattern consisting of a single dark blotch or ocellus on each scute or merely on each scute in the front. Rarely the plastron may be uniform without any pattern.

On each side of the head there is a prominent red, orange or yellow stripe or spot (differs in each of the three subspecies). Otherwise the yellowish head stripes are conspicuous, especially those on the sides of the head. On the throat the lines meet in a Y- or V-shaped pattern anteriorly. The top of the head generally has a characteristic “snout arrow” which is formed by stripes coming from the eyes combined with a median stripe. The limbs have many narrow yellow stripes. The soft parts on either side of the tail have a pattern of vertical bars.

A dark line runs through the yellow to greenish iris of the eye.

There is obvious sexual dimorphism in *T. scripta*. In addition to females growing significantly larger than males, adult males have elongated curved claws on the front feet, and long thick tails with the anal opening posterior to the carapacial rim.

The nominate subspecies *T. scripta scripta* has a maximum carapace length of 28 cm (females). A wide vertical yellow bar on each pleural scute (the pleurals are situated on the carapace, between the vertebral scutes and the marginal scutes). Uniform yellow plastron which commonly has a dark blotch or ocellus (eyespot) on each of the two scutes which are in the very front. A conspicuous yellow blotch behind the eye. It may join a neck stripe, but only strongly evident in young and many females.

T. scripta elegans has a maximum carapace length of 28 cm (females). A transverse yellow bar on each pleural scute. A plastral pattern consisting of a dark blotch or an ocellus on each scute, on a yellow ground colour. A wide red, or sometimes orange, stripe behind the eye. As the stripe continues further down the neck in a light colour, it is reduced to a width of about one fourth. This stripe right behind the eye is considerably wider than the stripe which extends downwards behind the lower edge of the eye to the throat. Narrow chin stripes.

T. scripta troostii has a maximum carapace length of 21 cm (females). A transverse yellow bar on each pleural scute. A dark ocellus or small black smudge on each scute of the plastron, on a yellow ground colour. A narrow yellow stripe behind the eye; it is about twice as wide as the lighter stripe continuing posteriorly from it. This stripe right behind the eye is only slightly wider than the stripe which extends downwards behind the lower edge of the eye to the throat. Broad chin stripes. Further details are provided by Ernst *et al.* (1994), Bringsøe (2001b, 2002b) and Veenvliet & Bringsøe (2002).

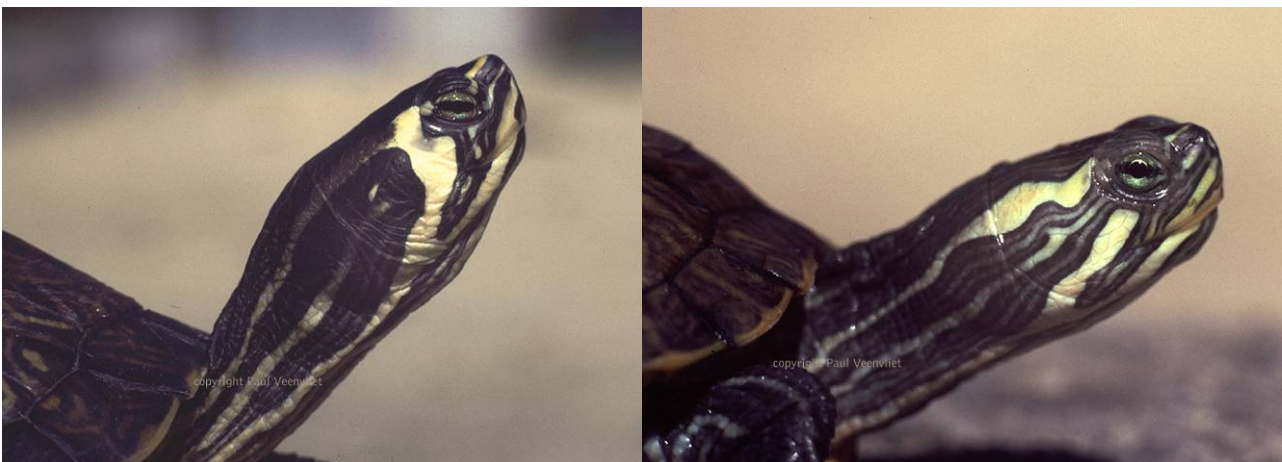


Fig 3. Head and neck of *Trachemys scripta scripta*. Notice the yellow blotch behind the eye, photo by Paul Veenvliet. **Fig. 4.** Head and neck of *Trachemys scripta troostii*. Notice the stripe pattern behind the eye which does not have a form of a blotch, photo by Paul Veenvliet.

Native range

Trachemys scripta is a New World species with a natural distribution in eastern USA and adjacent areas of northeastern Mexico. It ranges from southeastern Virginia southwestward through northern Florida, Alabama, Mississippi, Louisiana and Texas to northeastern Mexico. The southern limit lies in Mexico approx. 60-70 km south of Rio Grande (Texas), east of the mouth of the Pecos River in the Mexican Gulf. To the north, the distribution of *T. scripta* reaches through Kentucky and Tennessee to southern Ohio, northern Indiana, Illinois and southeastern Iowa, and west to Kansas, Oklahoma and New Mexico. Previously *T. scripta* was considered a very widely distributed New World species consisting of 13-19 subspecies, however, today the Latin American taxa are included in other species and *T. scripta* only consists of the three North American subspecies, i.e. *T. s. scripta*, *T. s. elegans* and *T. s. troostii* (Bringsøe 2001a, Seidel 2002).

T. scripta scripta has an eastern range and occurs from southeastern Virginia to northern Florida. *T. scripta elegans* dominates within this species and has a western and central range. It occupies the Mississippi Valley from Illinois via parts of eastern New Mexico in the west to the Gulf of Mexico. Towards southeast it overlaps with *T. s. scripta* in Alabama (and adjacent areas) and forms a zone of intergradation. *T. scripta troostii* has a small distribution and is found in the upper portions of the Cumberland and Tennessee rivers, from southeastern Kentucky and southwestern Virginia through Tennessee to northeastern Alabama.

Alien distribution

History of introduction and geographical spread

By the end of the Second World War the demand for pet turtles increased dramatically which resulted in a high pressure on the natural populations due to collection in the wild. For that reason several turtle farms were established in southern USA in the late 1950's and during the 1960's. Commercial farming began around 1957 and by 1960 more than 150 farms were in operation. However, in 1975 the U.S. Food and Drug Administration banned the sale of turtles under 4 inches (10 cm) carapace length in the United States and Canada because they transmitted salmonellosis by the bacteria of the genera *Salmonella* and *Arizona*. In spite of major exports to Old World countries, an annual market of some 10 million individuals was lost and as a result only about 50 farms were left in business. The vast majority was formed by the subspecies *Trachemys scripta elegans*.

Through the 1980's the annual exports of *T. s. elegans* from USA amounted to roughly 1-2 million, and during the first half of the 1990's approx. 3-4 million per year. In 1996 the total exports of *T. s. elegans* from USA were 7,884,634 individuals, of which 2,240,172 individuals (28%) were imported by Europe.

Country	Annual import
Denmark	18,050
Germany	2,378
Poland	119,332
Finland	2,000
Russia	43,050
TOTAL	184,810

Table 1. In 1996 2% of the total USA exports were shipped to the countries of NOBANIS.

However, it is unknown how many of these turtles were re-exported to other countries and to what extent North European and Baltic countries received turtles from countries other than USA.

From the 1980's several reports of *T. s. elegans* in the Federal Republic of Germany (West Germany), especially the Ruhr, are known (*e.g.* Lange 1983, Kordges *et al.* 1989). In other countries of the region the occurrences have never been paid much attention as they have not been considered any significant threat to indigenous ecosystems. But in Denmark a few records have also existed during the 1980's (Bringsøe 2001b).

The lack of reports during the 1960's and 1970's can partly be ascribed to the fact that owners of pet turtles lacked knowledge of their basic requirements causing the death of most turtles in captivity. Nevertheless, some individuals survived and were released. The concern for the natural environment became obvious from the 1980's (especially in Germany), because increasing numbers of red-eared sliders were released. From that time herpetological societies and animal welfare societies provided better information to the public about the basic care of these turtles which meant that more individuals survived and grew to very big body length and mass compared to their original juvenile size. This was a negative surprise to many owners, some of whom released them in the wild as neither pet shops, zoo exhibitions nor private animal keepers were prepared to receive them.

In Sweden turtles (and other reptiles) have generally been rare due to the former import ban from 1970 to 1995. However, from 1995 the the number of turtles has increased considerably (Andrén, pers. comm. 2006). Turtles have been nearly absent in Norway as extremely strict import

restrictions have been in force since the 1980's (Gjerde, pers. comm. 2005). In Germany (the former western Federal Republic of Germany) and Denmark the major imports of juveniles continued up to and including 1997. Some of these individuals were released, mainly in urban areas. Until around 1990 *T. s. elegans* was virtually never imported to eastern European communist regimes. Later the imports gradually increased.

With effect from 22 December 1997 the EU implemented a ban on import of *T. s. elegans* via Council Regulation (EC) No. 338/97 on the Protection of Species of Wild Fauna and Flora by Regulating Trade (Bringsøe 1998, 2001b).

Subsequently *T. s. elegans* has been partly replaced by other taxa of North American freshwater turtles, one being *T. s. scripta* (Adrados *et al.* 2002). But the replacement species have significantly higher prices than *T. s. elegans* in the 1990's, generally 3-4 times higher. Today's imports have so far been considerably smaller. It is possible that prices may drop and trade will increase later if the American turtle farms will become equally successful producing *T. s. scripta* as they are or previously were with *T. s. elegans*.

Pathways of introduction

Trachemys scripta is introduced to European nature because pet turtles are released by their owners. The vast majority of turtles are imported individuals, bred in farms in USA. Previously *T. s. elegans* was imported in huge quantities (see above), but after the EU ban of that particular subspecies in December 1997, other North American freshwater turtles have partly replaced it in the pet market; *T. s. scripta* is one of the replacement species although they are sold at higher prices and in smaller quantities. The turtles have apparently not been able to spread by any other means than release by their owners. This means they may only be found in the places where they are discarded.

Alien status in region

Trachemys scripta generally has a scattered distribution in the North European and Baltic region, with occurrences in or near urban areas. Bringsøe (2001b, 2002a) has previously provided overviews, but the data of Laufer (in print 2007) are more up-to-date for Germany.

T. scripta is known from most of Germany as there are still remains of the major releases of *T. s. elegans* which were made in densely populated urban regions (typically in the Rhine and Ruhr area) up to the early 1990's (Kordges *et al.* 1989, Kordges 1990, Thiesmeier & Kordges 1990, 1991, Goese 1995, Geiger & Waitzmann 1996, Laufer 1997, 1999). But the turtles are decreasing in numbers (Laufer in print 2007). On the other hand, the numbers of *T. s. scripta* found in the wild are increasing (Kordges, pers. comm. 2005). The highest concentrations of turtles are found in the German state of Nordrhein-Westfalen, notably in the densely populated Rhine and Ruhr area like Essen, Bochum, Dortmund, Herne and Hattingen. *T. scripta* is also common in Niedersachsen. For historical reasons of trade policy the number of individuals recorded in the eastern part, i.e. the former German Democratic Republic (GDR), is low.

Single individuals of *T. s. elegans* are observed in various parts of Denmark now and then (Bringsøe 1997, 2001b, unpubl. 2005, Kjærgaard 1997). A special case is known in the town of Hjørring in north Jutland: At least during the 1990's a group of *T. s. elegans* lived and survived in a pond (named Sct. Knuds Kilde) which was heated by industrial cooling water (from a factory of Nestlé), but as in other parts of Denmark, they were unable to reproduce (Rasmussen 1995, Bringsøe 2001b). However, in 2002 or 2003 the factory closed and the heating of the pond also ceased. Until now (2006) 3 adults are still seen in the pond (Rasmussen, pers. comm. 2006).

In Sweden, a few single individuals of *T. s. elegans* have previously been recorded around the major towns of Stockholm, Gothenburg and Eskilstuna (Nilson & Andrén 1986, Cedhagen & Nilson 1991). The current situation is unclear, however, individuals of *T. scripta* ssp. are today found at scattered localities in Sweden (Andrén, pers. comm. 2006). The number of localities is unknown, but it may be low. A few cases of abandoned *T. scripta* ssp. have been found in Finland (Saarikivi, pers. comm. 2005).

In Poland scattered observations of *T. s. elegans* have been made in the western and southwestern part of the country including Wrocław and its vicinity (Najbar 2001, Kopka 2003). Furthermore *T. s. elegans* is observed sporadically from other parts of Poland including Krakow, however, the situation is poorly investigated (Mitrus, pers. comm. 2005). From Lithuania two cases (perhaps a few more) of *T. s. elegans* having escaped from gardens during the summer are known, however, nothing is known about possible survival (Trakimas, pers. comm. 2005).

T. scripta has not been recorded in the wild in Estonia, Faroe Islands, Greenland, Iceland, Latvia and Norway. In the countries where the species occurs in natural surroundings no self-reproducing populations are known, the frequency estimates thus relate to the total abundance of the species, not to self-reproducing populations (see table 2).

Country	Not found	Not established	Rare	local	Common	Very common	Not known
Denmark			X				
Estonia	X						
European part of Russia		X					
Finland		X					
Faroe Islands	X						
Germany				X			
Greenland	X						
Iceland	X						
Latvia	X						
Lithuania		X					
Norway	X						
Poland			X				
Sweden		X					

Table 2. The frequency and establishment of *Trachemys scripta*, please refer also to the information provided for this species at www.nobanis.org/search.asp. Legend for this table: **Not found** –The species is not found in the country; **Not established** - The species has not formed self-reproducing populations (but is found as a casual or incidental species); **Rare** - Few sites where it is found in the country; **Local** - Locally abundant, many individuals in some areas of the country; **Common** - Many sites in the country; **Very common** - Many sites and many individuals; **Not known** – No information was available.

Ecology

Habitat description

Within its natural North American range, *Trachemys scripta* lives in a wide variety of freshwater habitats and is unmistakably a habitat generalist. It prefers larger bodies of quiet water with soft bottoms, an abundance of aquatic plants and suitable basking sites (Carr 1952, Ernst *et al.* 1994,

Bringsøe 2001b). The habitats typically comprise rivers, wide ditches, swamps, lakes and ponds. Occurrences in small ponds and other small freshwater areas are usually associated with the presence of larger freshwater habitats in the vicinity. Carr (1952) reported it from smaller habitats like temporary streams and ponds close to lakes. Small turtles characteristically limit their activity to areas of heavy floating vegetation.

It has even been observed that *T. s. scripta* can tolerate a period of progressive pollution under which circumstances the population increased (Carr 1952).

The circumstances under which released individuals of *T. scripta* (previously only *T. s. elegans*, now to a lesser extent also *T. s. scripta*) are found in Europe, are quite different. The turtles are generally released in freshwater areas which are frequently visited by humans. Usually they consist of various sorts of ponds and lakes in public urban parks and other recreational parks which are considered of very low biological value (*e.g.* Kordges 1990, Thiesmeier & Kordges 1990, 1991). However, to a lesser extent natural habitats close to urban areas are also used for releases.

In the urban region of Rhein and Ruhr, Kordges *et al.* (1989) observed that the survival of *T. s. elegans* was higher in habitats close to nature areas than in purely urban parks. The high mortality in urban habitats could probably be ascribed to limited access to terrestrial basking spots and unfavourable feeding opportunities. Another important factor might be the conditions for hibernating in clean water with sufficient contents of oxygen which will often be absent in urban parks, due to *e.g.* high concentrations of fish and water birds. Similar results have been reported by Kordges (1990).

T. scripta is an opportunistic omnivore subsisting on a wide variety of plant and animal foods (Ernst *et al.* 1994). The food preferences change with age. Juveniles are highly carnivorous, but as they become older they eat progressively larger quantities of vegetable matter. In the wild adults predominantly often eat various species of aquatic plants. Captives readily eat virtually all sorts of meat which may, however, cause metabolic bone diseases and other nutritional deficiencies.

Reproduction and life cycle

Males are usually sexually active and perform mating in the spring, but the period extends to the autumn and sometimes warm periods in winter. The timing of reproductive activities of the two sexes is only fully matched during April-June. The differences of peak seasons may be attributed to alternative male and female reproductive strategies. Autumn mating will probably require sperm storage in females. After complex courtship behaviour in the water, involving *e.g.* titillation by the elongated foreclaws of the male, the male mounts the female as he clasps her carapace with the claws. The copulation may last up to 15 minutes.

Within the North American range, the nesting season is between April and July, with a peak in May and June. The females select open, unshaded areas where the soil is not muddy and with some protection by weeds. Nests are often located on the nearest spot of land providing these conditions, but some females will move as far as 1.6 km from the water to find a suitable nest site. The jug-shaped nest is generally up to 11-12 cm deep.

The clutch size is extremely variable and may range from 2 to 23 eggs per clutch (maximum 30 eggs). Mean values of natural populations is around 6-11 eggs per clutch. *T. scripta* is capable of laying more than one clutch per year, especially in warmer climates.

The eggs which are ovoid in shape, are 30.9-43.0 mm long, 19.4-25.6 mm wide (length:width ratio 1.48-1.70) and weigh 6.1-15.4 g.

Detailed accounts of reproduction have been provided by Ernst et al. (1994) and Bringsøe (2001b).

Although egg-laying or egg-laying behaviour of *T. scripta* (mainly *elegans*) has been observed in some European countries now and then, successful reproduction in the wild has been extremely rare, and only in the south. In the Botanical Garden of Copenhagen egg-laying was observed 2-3 times around July to early August 1996, and in 1997 an unsuccessful attempt to dig a nest on a path was observed on approx. 20 July. The delay was probably due to an unnaturally cold climate (Bringsøe 2001b). However, at Altrip near Ludwigshafen and Mannheim two hatchlings with egg-teeth were found in September 1999 (Bringsøe 2001b). In October 2004 one young individual was captured near Kehl (Ortenaukreis) which is situated in southwestern Baden-Württemberg and it was probably hatched the preceding year and had hibernated successfully (Pieh and Laufer 2006, Laufer, in print 2007). These two cases indicate that successful breeding may occur in the south during very favourable summers, and it is likely that reproduction in the North European and Baltic countries will only occur exceptionally.

Dispersal and spread

T. scripta is not successful in spreading within the North European and Baltic area. Generally it is only observed at localities where individuals are released by humans. Since it very rarely manages to breed under outdoor, natural or semi-natural conditions (so far only in southern Germany), *T. scripta* will only be able to increase its numbers by additional releases.

Impact

Affected habitats and indigenous organisms

Negative impacts of *Trachemys scripta* on natural habitats and ecosystems are unknown. The vast majority of individuals are observed in urban parks and other urban areas of limited ecological value. Potentially *T. scripta* may be released in other natural habitats with high ecological value, especially close to urban areas. Should that occur, it will be very relevant to monitor any possible consequence on native faunas and floras, typically invertebrates, amphibians, native turtles (*E. orbicularis*) and nesting birds.

Genetic effects

None.

Human health effects

Trachemys scripta is often infected by bacteria of the genera *Salmonella* and *Arizona*, especially *S. java*. In USA and Canada several cases of transmission of salmonellosis from captive *T. s. elegans* were previously known. However, in Europe such cases have apparently been rare. The reason for this difference remains unknown, but it is possible that people may keep turtles under different circumstances in their homes in America and in Europe as it may be speculated that American children might to a greater extent have treated the young turtles literally as pets, *i.e.* playing actively with them, even kissing them and afterwards sucking their fingers (Bringsøe 2001b).

It is unlikely that alien turtles which occur in the wild in Europe, should transmit salmonellosis or other pathogens to humans. Anglers regularly catch *T. scripta*, however, no human health problems have been registered so far.

Economic and societal effects (positive/negative)

None in relation to occurrences in the wild.

Management approaches

Prevention methods

With effect from December 22nd 1997 the EU implemented a ban on import of *T. s. elegans* via Council Regulation (EC) No. 338/97 on the Protection of Species of Wild Fauna and Flora by Regulating Trade. For four states (Poland, Estonia, Latvia and Lithuania) this ban only came into force with effect from 2004 as they entered the EU. The affected subspecies formed the vast majority of turtles imported to Europe, and especially in southern Europe many adults were released in urban areas by their owners. The listing was caused by a concern that extensive successful reproduction in the wild may occur in southern, with potential harmful effects on fauna, flora and ecosystems.

Consequently imports of *T.s. elegans* were virtually eliminated, however, the trade switched to other North American freshwater turtles such as *T. s. scripta*. However, due to higher prices and lower quantities imported, the “new” species and subspecies of turtles have so far not become any real replacement (Adrados *et al.* 2002). Minor quantities of the third subspecies, *T. s. troostii*, have also been imported to Europe.

Some of the North American turtle species are assumed to be more resistant to cold winter conditions than *T. s. elegans*, such as *Chrysemys picta* (especially juveniles) which are known to be adapted to better survive cold environments (Bringsøe 2001b). For that reason an import ban of *C. picta* was also implemented by the EU via Council Regulation (EC) No. 338/97, in line with that of *T. s. elegans*.

Eradication, control and monitoring efforts

Trachemys scripta is not part of any monitoring program in the NOBANIS region due to the lack of threat to indigenous ecosystems.

Information and awareness

Especially in the western part of the North European and Baltic region targeted public awareness campaigns have been carried out. They have usually been made at a general level and not specifically pointing at slider turtles. These campaigns have aimed at informing pet owners to obtain sufficient information about the animals in advance, to care well for them and never to release them in the wild. In Denmark a brochure on releasing pets in the wild has been produced by the Danish Forest and Nature Agency (Skov- og Naturstyrelsen 1998) and a beginners’ booklet on acquisition of reptiles and amphibians for captive husbandry focuses on *e.g.* proper preparation and awareness of the juvenile turtles attaining big size (Bringsøe 2006).

Knowledge and research

No research is known to be carried out in the region at the moment, basically because *Trachemys scripta* does not form any real ecological threat. In certain areas further to the south in Europe more

concern is expressed by conservationists as warmer climates generally give better opportunities for successful reproduction. Though research efforts in southern Europe are still limited, competition of *T. scripta* with the indigenous turtle *Emys orbicularis* has been studied in France (Cadi & Joly 2003).

Recommendations or comments from experts and local communities

Any further efforts to reduce releases of pet turtles in the wild should definitely give high priority to information campaigns via the media. In that way people should be encouraged to better care for their pet turtles and refrain from releasing them in the wild. Impulse buying of cheap North American freshwater turtles will often lead to neglect and improper care especially as they attain adult size.

Via legislation at national level or EU level all pet shops in the individual NOBANIS countries should be compelled to provide proper and trustworthy care sheets about turtles and other animals to the buyers. They should also be prevented from selling live animals to children. Most adult buyers are basically interested in giving their pets good conditions.

Another important factor is supply and demand. Especially before 1997 as *Trachemys scripta elegans* was allowed to be imported without restrictions, the prices were low and millions of juveniles were imported. Often they were bought more or less like disposable goods!

Initiatives to control imports and keep import quantities at a low level will have a positive impact. That will prevent the prices from dropping to the same low levels as before 1997. Relatively high prices will make owners better care for their turtles and they will most probably not release them in the wild.

It is considered superfluous and inappropriate to implement further import restrictions which may cause trade to merely switch to other turtle species, some of which could well be better adapted to surviving cold winter conditions. An example of such a well adapted turtle is the North American snapping turtle, *Chelydra serpentina*, which is already sold by pet shops. However, at present it is not so popular because it is not vividly coloured and it grows even bigger than sliders.

It is possible that individuals of *T. scripta* may be released in ponds or other freshwater bodies comprising valuable ecological systems with e.g. rare amphibians. In such cases it may be considered necessary to eradicate the turtles quickly. In our climate *T. scripta* will have to bask on land regularly in order to maintain an optimal body temperature. Thus, in sunny weather turtles will be easy to spot while basking on logs, branches, rocks, banks and other suitable terrestrial places very close to the water. In this position it will be easy to shoot them with guns (Bringsøe 2001b). Public opinion against such methods as well as the need to hold shooting licence and permits may, however, be preventive to such eradication methods. Furthermore shooting turtles in recreational areas may well cause problems with some visitors who become emotionally attached to the turtles.

Following the EU ban effective from December 1997, the trade has partly switched to other North American subspecies and species of freshwater turtles. A “potential replacement species” is considered to be a species of which import numbers has increased by at least 50% after the enforcement of an import suspension (Adrados *et al.* 2002). That also applies at subspecies level. According to that criterion *Chrysemys picta*, *Graptemys pseudogeographica kohnii*, *Pseudemys nelsoni* and *T. s. scripta* should be regarded as replacement species/subspecies for *T. s. elegans* (Adrados *et al.* 2002). However, the EU import ban now also applies to *C. picta* (see above). To a lesser extent imports of *G. p. pseudogeographica*, *P. concinna*, *P. floridana* and *P. peninsularis*

have also increased (Adrados *et al.* 2002, Tversted, pers. comm. 2005). These turtles are all closely related to *T. s. elegans* as they belong to the subfamily Deirochelyinae and have more or similar habits and habitats. It is unknown to what extent their survival/mortality in the region may be similar to those of *T. s. elegans*.

Chelydra serpentina has also become more common in the trade; however, it is a totally different freshwater turtle in terms of relationship, morphology and habits as it is very big, dull coloured (brown), crepuscular and relatively secretive. It has a very big distribution which includes northern occurrences in Canada where it is adapted to low temperatures. Since *C. serpentina* is not as attractive as *T. scripta* and the other members of the subfamily Deirochelyinae, it will probably not be so popular in the pet trade. However, if substantial numbers of individuals will become released, they may form a considerably greater risk than deirochelyine turtles because *C. serpentina* is adapted to cold environments, it is crepuscular and adults may prove aggressive to *e.g.* swimming children. Thus, it is recommended to monitor the development in the trade and potential releases of *C. serpentina* closely. So far no problems with that species have been encountered in the region though a few individuals have been found in Germany (Bringsøe 2001b, Vogel 2006).

On the basis of a visit in June 2003, Bonin (2004) described the conditions at the largest of the 73 turtle farms of Louisiana, producing 2,000,000 turtles of 22 different species per year. Half of these turtles were *T. s. elegans*. Moreover, high numbers of *T. s. scripta*, *T. s. troostii*, *C. picta*, *G. p. kohnii* and *P. concinna* were produced. Apparently the conditions of that farm were hygienic and proper.

References and other resources

Contact persons

Claes Andrén (SE) Nordens Ark, Åby Säteri, SE-450 46 Hunnebostrand, Sweden, Phone: + 0523 79590, E-mail: claes.andren@nordensark.se

Dag Dolmen (NO) Vitenskapsmuseet NTNU, NO-7491 Trondheim, Norge, Phone: ++ 7359 2108, E-mail: dag.dolmen@vm.ntnu.no

Ingibjörg Egholm (FO) Miljø, Veterinær og Levnedsmiddelstyrelsen, Falkavegur 6,2 hædd FO-100 Tórshavn, Faroe Islands, Phone: +298 356400, E-mail: ingibjorge@hfs.fo

Leif Gjerde (NO) Norsk Herpetologisk Forum, Postboks 247, N-2001 Lillestrøm, Norway, Phone: +47 40228817, E-mail: nobi@oyeren.info

Andris Ceirans (LV) Latvian Environment, Geology and Meteorology Agency, LV-Maskavas Str. 165, Latvia, E-mail: andris.ceirans@lvgma.gov.lv

Thomas Kordges (DE) Sprockhövel, Ökoplan Essen, Savignystr. 59, D-45147 Essen, Germany, Phone: +0201 623037, E-mail: thomas.kordges@oekoplan-essen.de

Sergius L. Kuzmin (RU) Russian Academy of Sciences, Institute of Ecology and Evolution, Leninsky prospect 33, Moscow 117071, Russia, E-mail: slksu@orc.ru

Hubert Laufer (DE) Büro für Landschaftsökologie, Friedenstrasse 28, D-77654 Offenburg, Germany, Phone: 0781/9482642, E-mail: BfL.Laufer@t-online.de

Slawomir Mitrus (PL) Department of Biosystematics, Division of Zoology, University of Opole, Oleska 22, PL-45-052 Opole, Poland, E-mail: emyspl@yahoo.com

Riinu Rannap (EE) Nature Conservation Department, Ministry of the Environment, Narva Road 7A, EE-15172 Tallinn, Estonia, Phone: +372 6262 889, E-mail: Riinu.Rannap@envir.ee

Jarmo Saarikivi (FI) University of Helsinki, Department of Biological and Environmental Sciences, P.O. Box 65, FIN-00014, Finland Phone: +358 (0)9 191 57711, E-mail: jarmo.saarikivi@helsinki.fi

Tõnu Talvi (EE) Viidumäe Nature Reserve, Lümanda, EE-93822, Saaremaa Island, Estonia, E-mail: t.talvi@tt.ee

Giedrius Trakimas (LT) Center for Environmental Studies, Vilnius University, Lithuania, E-mail: gt.herp@takas.lt

Nick Arnold (GB) The Natural History Museum, London, England, E-mail: enarnoldnhm@hotmail.com or ena@nhm.ac.uk

Links

References

- Adrados, L. C., Veenvliet, P. & Veenvliet, J. K. 2002. Assessment of trade and ecological threat of species, potentially replacing *Rana catesbeiana* or *Trachemys scripta elegans* in the European Union. In: Adrados, L. C. & Briggs, L. (eds.): Study of application of EU wildlife trade regulations in relation to species which form an ecological threat to EU fauna and flora, with case studies of American bullfrog (*Rana catesbeiana*) and red-eared slider (*Trachemys scripta elegans*). – Unpubl. study report to the European Commission. Ref. no. B4-3040/2001/326066/MAR/E.3. Pp. III1-III27.
- Bonin, F. 2004. *Concordia Turtle Farm* – The greatest Red-eared Sliders farm of the USA. – *Radiata* (Engl. ed.), 13(3): 18-24.
- Bringsøe, H. 1997. Forekomst af europæisk sumpskildpadde, *Emys orbicularis*, i Danmark. – *Nord. Herpet. Foren.*, 40(2): 57-64.
- Bringsøe, H. 1998. Forbud mod at importere rødøret terrapin, *Trachemys scripta elegans*, til EU. – *Nord. Herpet. Foren.*, 41(5): 114-117.
- Bringsøe, H. 2001a. *Trachemys* Agassiz, 1857 – Schmuckschildkröten. In: Fritz, U. (Hrsg.): *Handbuch der Reptilien und Amphibien Europas. Schildkröten (Testudines) I.* – Aula, Wiebelsheim, pp. 517-523.
- Bringsøe, H. 2001b. *Trachemys scripta* (Schoepff, 1792) – Buchstaben-Schmuckschildkröte. In: Fritz, U. (Hrsg.): *Handbuch der Reptilien und Amphibien Europas. Schildkröten (Testudines) I.* – Aula, Wiebelsheim, pp. 525-583.
- Bringsøe, H. 2002a. Review of the status of *Trachemys scripta elegans* in the European Union. In: Adrados, L. C. & Briggs, L. (eds.): Study of application of EU wildlife trade regulations in relation to species which form an ecological threat to EU fauna and flora, with case studies of American bullfrog (*Rana catesbeiana*) and red-eared slider (*Trachemys scripta elegans*). – Unpubl. study report to the European Commission. Ref. no. B4-3040/2001/326066/MAR/E.3. Pp. II27-II40.
- Bringsøe, H. 2002b. Ease of identification of *Trachemys scripta elegans*. In: Adrados, L. C. & Briggs, L. (eds.): Study of application of EU wildlife trade regulations in relation to species which form an ecological threat to EU fauna and flora, with case studies of American bullfrog (*Rana catesbeiana*) and red-eared slider (*Trachemys scripta elegans*). – Unpubl. study report to the European Commission. Ref. no. B4-3040/2001/326066/MAR/E.3. Pp. IV1-IV9.
- Bringsøe, H. (ed.) 2006. *Anskaffelse af krybdyr og padder.* – *Nord. Herpet. Foren.* 60 pp.
- Cadi, A. & Joly, P. 2003. Competition for basking places between the endangered European pond turtle (*Emys orbicularis galloitalica*) and the introduced red-eared slider (*Trachemys scripta elegans*). – *Can. J. Zool.* 81(8): 1392-1398.
- Carr, A. 1952. *Handbook of Turtles: The Turtles of the United States, Canada, and Baja California.* – Comstock Publ. Assoc., Ithaca, New York. xv + 542 pp.

- Cedhagen, T. & Nilson, G. 1991. Grod- och kräldjur i Norden. – Fältbiologerne, Sollentuna. 141 pp.
- Ernst, C. H., Lovich, J. E. & Barbour, R. W. 1994. Turtles of the United States and Canada. – Smiths. Inst. Press, Washington, D.C. & London. xxxviii + 578 pp.
- Geiger, A. & Waitzmann, M. 1996. Überlebensfähigkeit allochthoner Amphibien und Reptilien in Deutschland - Konsequenzen für den Artenschutz. *In*: Gebhardt, H., Kinzelbach, R. & Schmidt-Fischer, S. (Hrsg.): Gebietsfremde Tierarten. Auswirkungen auf einheimische Arten, Lebensgemeinschaften und Biotope, Situationsanalyse. – Ecomed, Landsberg, pp. 228-240.
- Goese, R. 1995. Die Herpetofauna von Mülheim an der Ruhr. – Univ. GHS Essen (unpubl. report). 154 pp.
- Kjærgaard, J. 1997. Skildpadder i Danmark. – Naturens Verden, 10: 361-375.
- Klewen, R. & Müller, A. 1988. Aspekte des Arten- und Naturschutzes. *In*: Klewen, R. (Hrsg.): Die Amphibien und Reptilien Duisburgs – ein Beitrag zur Ökologie von Ballungsräumen. – Abh. Westfäl. Mus. Naturkd. Münster, 50(1): 102-115.
- Kopka, M. 2003. Żółw czerwonolicy (*Chrysemys scripta elegans*) w zbiornikach wodnych Wrocławia. Red-eared terrapin (*Chrysemys scripta elegans*) in water reservoirs of Wrocław. *In*: VII Ogólnopolski Przegląd Działalności Studenckich Kół Naukowych Przyrodników, Białystok 21-23 listopada 2003. – Univ. Białymstoku. http://biol-chem.uwb.edu.pl/knb/download/mat_konf/p117_121.pdf
- Kordges, T. 1990. Faunenverfälschung im Ballungsraum, dargestellt am Beispiel nordamerikanischer Rotwangen-Schmuckschildkröten (*Chrysemys scripta elegans*). – NZ NRW Seminarber. Recklinghausen, 9: 36-41.
- Kordges, T., Thiesmeier, B., Münsch, D. & Bregulla, D. 1989. Die Amphibien und Reptilien des mittleren und östlichen Ruhrgebietes. Verbreitung, Bestand und Schutz der Herpetofauna im Ballungstaum. – Dortmund. Beitr. z. Landeskd., naturwiss. Mitt., Beiheft 1, 112 pp.
- Lange, H. 1983. Nordamerikanische Schmuckschildkröte – *Pseudemys spec.* *In*: BUND Hagen (Hrsg.): Die Reptilien im Raum Hagen, pp. 22-23.
- Laufer, H. 1997. Schmuckschildkröten (*Trachemys scripta*) im Waldsee auf Gemarkung Oberachern (Ortenaukreis). – Stadt Achern, Stadtbauamt (unpubl. report). 5 pp.
- Laufer, H. 1999. Die Roten Listen der Amphibien und Reptilien Baden-Württembergs (3. Fassung, Stand 31.10.1998). – Naturschutz Landschaftspflege Bad.-Württ., 73: 103-134.
- Laufer, H. In print 2007. Buchstaben-Schmuckschildkröte *Trachemys scripta* (Schoepff, 1792). *In*: Laufer, H., Fritz, K. & Sowig, P. (Hrsg.): Die Amphibien und Reptilien Baden-Württembergs. – Ulmer Verl., Stuttgart.
- Najbar, B. 2001. Żółw czerwonolicy *Trachemys scripta elegans* (Wied, 1839) w województwie lubuskim (zachodnia Polska). The red-eared terrapin *Trachemys scripta elegans* (Wied, 1839) in the Lubuskie Province (western Poland). – Przegląd Zoologiczny, 45(1-2): 103-109.
- Nilson, G. & André, C. 1986. Sköldpaddor i Sverige – förr och nu. – Fauna och flora, Stockholm, 81(1): 17-22.
- Pieh, A. & Laufer, H. 2006. Die Rotwangen-Schmuckschildkröte (*Trachemys scripta elegans*) in Baden-Württemberg – mit Hinweis auf eine Reproduktion im Freiland. – Z. f. Feldherpet., 13(2): 225-234.
- Rasmussen, J. B. 1995. Hjørrings Skildpadder – et årsstudie – interaktion med omgivende miljø. – Unpubl. report, Hjørring. 26 pp.
- Seidel, M. E. 2002. Taxonomic Observations on Extant Species and Subspecies of Slider Turtles, Genus *Trachemys*. – J. Herpet., 36(2): 285-292.
- Skov- og Naturstyrelsen. 1998. Kæledyr i naturen. – [Web version](#)
- Thiesmeier, B. & T. Kordges, T. 1990. Versuch einer ökologischen Klassifizierung der Amphibien- und Reptilienfauna des mittleren und östlichen Ruhrgebietes. – Decheniana, Bonn, 143: 222-231.
- Thiesmeier, B. & T. Kordges, T. 1991. Leitlinien zur ökologischen Verbesserung städtischer Teiche in Park- und Grünanlagen unter besonderer Berücksichtigung der Amphibienfauna. *In*: Schuhmacher, H. & Thiesmeier, B. (Hrsg.): Urbane Gewässer. – Westarp Wissenschaften, Essen, Ökologie 4, pp. 103-113.
- Veenvliet, P. & Bringsøe, H. 2002. Guidelines for identification of *Trachemys scripta elegans*. *In*: Adrados, L. C. & Briggs, L. (eds.): Study of application of EU wildlife trade regulations in relation to species which form an ecological threat to EU fauna and flora, with case studies of American bullfrog (*Rana catesbeiana*) and red-eared slider (*Trachemys scripta elegans*). – Unpubl. study report to the European Commission. Ref. no. B4-3040/2001/326066/MAR/E.3. 14 pp.
- Vogel, S. 2006. Begegnung mit einer Schnappschildkröte (*Chelydra serpentina*) in Oberbayern. – Marginata, 3(3): 58-59.

Date of creation/modification of this species fact sheet: 11-10-2006