

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



Nineteenth meeting of the Conference of the Parties
Panama City (Republic of Panama), 14 – 25 November 2022

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

The Proponents propose the transfer of the Leith's Softshell Turtle (*Nilssonina leithii*) from Appendix II to Appendix I in accordance with paragraph 1 of Article II of the Convention. *Nilssonina leithii* qualifies for listing in Appendix I of the Convention because the species faces a high risk of extinction with rapid declines in population due to loss of habitat and overexploitation for consumption and illegal trade of live animals as well as the calipee (dried, processed carapacial cartilage) (Das et al. 2014, Praschag *et al.* 2021). The IUCN classifies *Nilssonina leithii* as Critically Endangered under category and criteria A2cd+4cd (i.e., an observed, estimated, inferred or suspected population size reduction of $\geq 80\%$ over the last 10 years or three generations, whichever is the longer, where the reduction or its causes may not have ceased or may not be understood or may not be reversible, based on exploitations and/or a decline in habitat.).

Nilssonina leithii qualifies for listing on CITES Appendix I because the species meets the biological criteria found in Resolution Conf, 9.24 (Rev. CoP17), Annex I, specifically categories A(i) and (v), B(i) and B(iv), and C(i) as follows:

- A: The wild population is small, and is characterized by: (i) an inferred decline in the number of individuals and the quality of habitat; and (v) a high vulnerability to intrinsic or extrinsic factors, such as habitat loss.
- B: The wild population has a restricted area of distribution and is characterized by: (i) fragmentation; and (iv) an inferred decrease in the area of distribution, area of habitat, number of subpopulations, number of individuals, and the quality of habitat.
- C: There has been a marked decline in the population size in the wild, which has: (i) occurred in the past and has been observed as ongoing.

Nilssonina leithii is or may be affected by trade because it is illegally harvested for both domestic and international food markets (Praschag *et al.* 2021), live animals as well as its calipee (Das et al. 2014). Due to the ongoing decline in the species' population and continued threats to the species, both of which are expected to continue into the future, any trade in the species will have a detrimental impact on its status.

B. Proponent

India*

C. Supporting statement

1. Taxonomy

1.1 Class: Reptilia

1.2 Order: Testudines

1.3 Family: Trionychidae

1.4 Genus, species or subspecies, including author and year: *Nilssonina leithii* (Gray, 1872).

1.5 Scientific synonyms: *Aspideretes leithii* Gray, 1872; *Aspilus gataghol* Gray, 1872; *Testudo gataghol* Buchanan-Hamilton in Gray, 1831 (nomen nudum); *Trionyx javanicus* Gray, 1830; *Trionyx leithii* Gray, 1871; *Trionyx sulcifrons* Annandale, 1915; *Nilssonina leithii* Praschag et al, 2007.

1.6 Common names: English: Leith's Softshell Turtle/ Nagpur Soft-shelled Turtle

Tamil: Parisal amai (Locally made round boat made of split bamboo and buffalo hide), Seravi amai (Seravi= common teal, because the turtles have a webbed foot like the common teal), Thoni amai (boat turtle). Kannada: Pale poo (Pale = leaf spath of areca nut palm). Telugu: Nadi tabelu (river turtle).

1.7 Code numbers: A-301.007.019.002

2. Overview

Turtles are the world's most endangered vertebrates with almost half being categorized on the IUCN Red List of Threatened Species (Critically Endangered, Endangered, or Vulnerable). They are at high risk of extinction because of their combination of biological life history traits, overexploitation, as well as habitat degradation and loss (Stanford et al., 2020). A study by TRAFFIC based on reported seizures for India calculated that between 2009 and 2019 on average more than 11,000 tortoises and freshwater turtles were poached and illegally traded every year and that species identification was not reported in 51.5% of the cases (Badola et al. 2019).

Nilssonina leithii has been subject to intensive exploitation over the past 30 years, and has also suffered habitat degradation, and is believed to have suffered a range-wide decline averaging over 90% during this period, and the population decline is ongoing (Praschag et al. 2021). The species has been assessed as Critically Endangered by the IUCN (Praschag et al. 2021). *N. leithii* meets the listing criteria for CITES Appendix I because the population is rapidly declining due to loss of habitat and exploitation. The species meets the listing criteria for CITES Appendix I because it meets the biological criteria found in Resolution Conf, 9.24 (Rev. CoP17), Annex I, specifically categories A(i) and (v), B(i) and B(iv), and C(i).

Nilssonina leithii is or may be affected by trade because it is illegally harvested for both domestic and international food markets, live animals as well as its calipee (Das et al. 2014; Praschag et al. 2021). Due to the ongoing decline in the species' population and continued threats to the species, both of

* 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.

which are expected to continue into the future, any trade in the species will have a detrimental impact on its status.

3. Species characteristics

3.1 Distribution

N. leithii is endemic to peninsular India, and occurs in rivers and reservoirs. The early records of this species from a few northern Indian drainages (e.g., Annandale 1912; Hora 1948) are considered erroneous. The source of some of these misidentifications appears to stem from Smith's (1931) erroneous diagnosis of the lack of ocelli on the hatchling carapace of the congeneric *N. gangetica*, leading to the extralimital records of the current species from northern drainages of India, where *N. leithii* is replaced by *N. gangetica*. However, other large softshell turtles, such as *Chitra indica*, have occasionally been misidentified as *N. leithii* in the literature (see, for instance, Webb 1981; Murthy 2011); both species have been found at the Thungabhadra Dam in Hospet, Karnataka, and may be sympatric (Murthy, 2009).

3.2 Habitat

Nilssonina leithii inhabits rivers and reservoirs (Boulenger, 1890; Annandale, 1915; Moll and Vijaya, 1986; Kalaiarasan et al., 1992; Thomas et al., 1997; Kumar, 2004; Vasudevan et al., 2006; Nameer et al., 2007; Praschag, et al., 2007; Deepak and Vasudevan 2010). They are reported from shallow waters with substrates varying from sand to granite boulders (Thomas et al., 1997; Nameer et al., 2007). They are reported to feed on fish, crabs, freshwater molluscs and mosquito larvae (Biswas and Acharjyo, 1984; Das, 1995; Deepak and Vasudevan, 2010). Nesting occurs in mid-June and possibly also in January, and eggs measuring 30-31mm are laid (Das, 1991). The species is likely to be locally extinct from Odisha and Chhattisgarh (Mohapatra et al., 2010; Behera et al., 2019; Ahmed et al., 2021).

3.3 Biological characteristics

Generally, *N. leithii* is distributed in the east-west-flowing rivers arising from the low hills of Peninsular India, with isolated records from large reservoirs and occasional encounters in estuarine habitats. An individual was also recorded from Perinjalam, Thrissur district, Kerala. *Nilssonina leithii* is known to consume fish, crabs, freshwater molluscs, and mosquito larvae. Fishermen along the Kali River report that the species often retrieves fish trapped in monofilament gill nets. A captive population in a temple tank at Kotapalli village, Andhra Pradesh is reportedly feeding on flowers of the red china rose (*Hibiscus rosa-sinensis*) and banana (*Musa domestica*) (Deepak and Vasudevan 2010).

Little is known of the reproductive behavior of the species. In mid-June, a female was found to carry fully developed, shelled eggs with a diameter of 31 mm (Deepak & Vasudevan, 2010; Das et al., 2014). Oviductal eggs, ready for oviposition, were also found in the month of January, suggesting that at least two clutches may be laid in a year, and fishermen along the Kali River reported that nesting occurs in the months of December and January (Deepak & Vasudevan, 2010). Two hatchlings were observed in the Moyar River, near Tengumaragada village on 15 July 1994, and eggs found in Pune, Maharashtra, west-central India, were spherical and 29.8–31.1 mm in diameter. Nesting in the Sharavathi Valley Wildlife Sanctuary reportedly occurs between the months of April and May (Deepak & Vasudevan, 2010). The intestinal parasite, *Astiotrema cirricurvatus*, has been recorded from this species (Simha and Chattopadhyaya 1970). Sagar et al. (2019) reported a hatchling (carapace length of 6cm) on 7th July 2019 inside a puddle on a forest road that runs beside the Bhadra River, within the Bhadra tiger reserve, Karnataka (13.435°N, 75.510°E).

3.4 Morphological characteristics

Nilssonina leithii is a large fresh water species, known to attain carapace length of 720 mm, and possibly as much as 1000 mm. It has a low carapace and is oval in shape. The carapace is gray or grayish-olive with yellow vermiculations, most prominent in the young ones. The head is greenish with a more or less defined black longitudinal streak from between the eyes on to the nape, with two or three oblique black streaks diverging from it on either side, and another streak starting behind the eye; the corner of the mouth has a yellow or reddish-orange spot and patches of dark reddish-grey are present on the hind part of the head; the plastron is cream coloured; the outer surface of the limb is olive and the inner surface is cream coloured. The snout is longer than the diameter of the orbit; the post-orbital arch is one-half to one-third the diameter of the orbit. The alveolar surfaces of the mandible are not raised at its inner margin, and more or less flat at the symphysis, which is usually longer than the diameter of the orbit (Gray, 1872; Boulenger, 1890; Smith, 1931; Das, 1991).

The young ones possess 4–6 dark-centered, light bordered eye-like spots on the dark grey carapace. On the carapace, a preneural with one or two neurals separates the first pair of pleural bones. The eighth pair of pleurals meets at the midline of the carapace. The neurals are eight-nine in number; The plastral callosities are large and five in number. The triturating surfaces of the maxilla are flat with a prominent median groove. A patch of flat, wart-like tubercles is often present on the anterior median edge of the carapace (Das 1991; Mohapatra et al., 2007; Behera et al., 2019). This species is sexually dimorphic, males having longer and thicker tails than females (Das, 1991).

3.5 Role of the species in its ecosystem

Nilssonina leithii, like other aquatic freshwater turtle species, plays a number of useful functions in the ecosystem. Turtles play the role of both prey and predator in the ecosystem. They control invertebrate pests and invasive weeds, providing food for other animals, and scavenging on dead animals, thereby helping in the release of locked-up nutrients back to the environment. Turtles also become prey to other predators such as monitor lizards and crocodiles.

4. Status and trends

4.1 Habitat trends

The available habitat for *Nilssonina leithii* is decreasing at a fast rate. The species, which is endemic to India, has disappeared from many of the historically reported distribution ranges, and populations are now only known with certainty from the Kali River, Bhadra Tiger Reserve in Karnataka; Manjira Wildlife Sanctuary and Siwaram Wildlife Sanctuary in Telangana; Moyar River in Tamil Nadu; Chalakudy River in Kerala (Nameer et al. 2007; Das et al., 2014; Sagar et al., 2009). The species is probably locally extinct from Odisha and Chhattisgarh (Behera et al., 2019; Ahmed et al., 2021) and its status in Andhra Pradesh and Maharashtra needs confirmation.

4.2 Population size

In past two decades there are very few reliable records of the species except from the states of Karnataka and Telangana (Ahmed et al., 2021; Praschag et al. 2021). Its range has shrunk from most of the large river systems and reservoirs of the Deccan Peninsula. Owing to intensive exploitation over the past 30 years, *Nilssonina leithii* has suffered from poaching and habitat degradation, and is believed to have declined averaging over 90% during this period (Praschag et al., 2021). Very little data is available for the population status of this species, the turtle not being common anywhere, even within protected areas, such as the Mudumalai Wildlife Sanctuary, Tamil Nadu, southwestern India, presumably because of hunting for the trade in calipee and habitat loss. Nonetheless, viable populations appear to remain in the Thungabhadra River, Kali River, Bheema River (around the Krishna River tributaries, except the

Malaprabha River). This species is probably locally extinct from Odisha (last individuals recorded during 1984 from Balimela reservoir) and Chhattisgarh (last record of the species in 1991 from Bilaspur) (see Mohapatra et al., 2010; Behera et al., 2019; Ahmed et al., 2021).

4.3 Population structure

A month-long sampling effort on two separate occasions in 2012 and 2013 in the Kali River yielded 4 (sex ratio: 2.2) and 2 (sex ratio: 1.1) individuals, respectively (Das et al., 2014). Juveniles are observed during the month of July (Das et al., 2014; Sagar et al., 2019).

4.4 Population trends

The population continues a large-scale decline, caused by habitat loss and illegal collection and trade both locally and internationally (Praschag et al. 2021). Despite a lack of quantitative data, an inferred population reduction of at least 90% in the past 30 years, and ongoing, is realistic (Praschag et al. 2021).

4.5 Geographic trends

Endemic to Peninsular India, the species is now restricted to the states of Karnataka, Tamil Nadu and Kerala. The habitat of the species is in decline due to sand mining, pollution and hydrological alteration of rivers and so the geographic range of the species is shrinking (Praschag et al. 2021). The species is likely to be locally extinct from Odisha and Chhattisgarh (Mohapatra et al., 2010; Behera et al., 2019; Ahmed et al., 2021).

5. Threats

In most of its range, *Nilssonia leithii* is poached and illegally consumed throughout peninsular India (Moll, 1983; Kalaiarasan et al., 1992; Choudhury and Bhupathy 1993; Kumar, 2004). Kumar (2004) noted its supply to local markets and toddy shops in Kerala for rupees 100 to 300 depending on the size. Increasingly large-scale exploitation for regional and sporadic national meat trade continued (Hanfee in Choudhury et al. 2000) and had taken the form of extensive collection efforts in the south for trade to northern and northeastern India and beyond (Das et al., 2014). *Nilssonia leithii* is harvested for both the domestic and international (East Asian) food markets (Praschag et al., 2021). Trade shifted from live animals to calipee (dried, processed carapacial cartilage) in recent years (Das et al. 2014) which appears to mainly cater to demand for it as an ingredient in soups and traditional medicines in East and South-East Asian countries (Sengottuvel, WCS, 2020).

By 2011, the species was considered very difficult to find, with no viable population known, and interviews indicating that hunters were no longer pursuing the species as it was no longer worth the effort. Questionnaire surveys of Bengali settlers were conducted in 2011 in Sindanoor town in north-eastern Karnataka (Sirsi 2011) and the respondents indicated that the species is exploited for its fibro-cartilaginous rim or calipee. Local populations in the Tungabhadra, Krishna, and Bhima drainages were apparently being exploited for this purpose. Two poached adult specimens were also confiscated in Amaravathi, within the Annamalai Tiger Reserve, Tamil Nadu, in January 2009 (V. Deepak, *pers. comm.*; Das et al., 2014). Seizures from illegal trade have been reported from Maharashtra and Karnataka (Praschag et al. 2021). Threats to the species also include riverine development projects, aquatic pollution, sand mining, and hydrological alteration of rivers.

6. Utilization and trade

6.1 National utilization

Nilssonina leithii is locally exploited throughout peninsular India illegally for meat and some medicinal use of the calipee (Das et al., 2014; Praschag et al. 2021). In Kerala, this species was reported to be sold in the local markets and toddy shops (Kumar, 2004). Increasingly large-scale exploitation for regional and sporadic national meat trade was in peak during the early twenty first century (see Hanfee in Choudhury et al. 2000) and extensive illegal trade of the species has been reported to northern and northeastern India and beyond (Das et al., 2014). Off late, with increasing illegal trade of calipee (dried, processed carapacial cartilage) of the large freshwater turtles, this species was also exploited to a greater extent (Das et al. 2014). By 2011, the species was considered very difficult to find, with no viable population known, and interviews indicating that hunters were no longer pursuing the species as it was no longer worth the effort.

6.2 Legal trade

Nilssonina leithii is protected under Schedule IV of the India's Wild Life (Protection) Act (1972), hunting and collection of the species is prohibited (Section 9 of the Act). Commercial utilization of the species requires authorization (Section 44 of the Act) and cannot occur from wild populations (Section 48). The species is listed on Appendix II of CITES but no legal trade records are available for the species on the CITES Trade Database.

6.3 Parts and derivatives in trade

The species is poached and illegally traded primarily for its meat. Das et al. (2014) reported that the species is also exploited for its fibro-cartilaginous rim or calipee. This species is also in live pet trade (Das et al., 2014; Praschag et al. 2021).

6.4 Illegal trade

This species is protected under Schedule IV of the India's Wild Life (Protection) Act (1972) which prohibits collection of the species for trade. The species is illegally traded for its meat, and use of its calipee for traditional medicine. In the past, seizures are reported from Maharashtra, Karnataka and Tamil Nadu. *Nilssonina leithii* is harvested for both the domestic and international (East Asian) food markets (Praschag et al., 2021).

6.5 Actual or potential trade impacts

As per IUCN Red List Assessment, *N. leithii* was assessed Lower Risk/Near Threatened (LR/NT) in 1996, was Vulnerable (VU) in 2000 and most recently assessed as Critically Endangered (Praschag et al., 2021). The population of *N. leithii* has reduced to a great extent in past three decades.

Coupled with loss and degradation of its habitat, the continued exploitation of the species for its meat, for trade in live specimens and calipee has resulted in an estimated decrease in its population by over 90% in the past 30 years, such that the species is now difficult to find. The species is illegally harvested for both the domestic and international (East Asian) food markets (Praschag et al., 2021). Given the decline in population and habitat of the species, any actual or potential trade in the species will have a detrimental impact on its status.

7. Legal instruments

7.1 National

Nilssonina leithii is protected under Schedule IV of the India's Wild Life (Protection) Act (1972), hunting and collection of the species is prohibited (Section 9 of the Act). Commercial utilization of the species requires authorization (Section 44 of the Act) and cannot occur from wild populations (Section 48).

Das et al (2014) proposed to include the species in Schedule I of Wild Life (Protection) Act, 1972 and mentioned that a review of the listing of this species in the Wild Life (Protection) Act of 1972 is required in concurrence with its present conservation status. As per the Wild Life (Protection) Amendment Bill 2021 introduced in Parliament, the species is expected to be up-listed to Schedule I of the Wild Life (Protection) Act, 1972. This species is culturally protected as some populations are worshiped in temple ponds.

7.2 International

Since 2013, *N. leithii* has been listed on CITES Appendix II, allowing international commercial trade in the species provided such trade is not detrimental to the species. No legal trade records are available for the species on the CITES Trade Database.

8. Species management

8.1 Management measures

Nilssonia leithii has been recorded from many Protected Areas across its distribution range, such as Nagarjunsagar National Park (3568 km²), Sathymangalam Tiger Reserve (Tamil Nadu), Manjira Wildlife Sanctuary (Andhra Pradesh, 20 km²), Kudremukh National Park, Bheemeshwari Wildlife Reserve/Cauvery Wildlife Sanctuary, Tungabhadra River Sanctuary, Dandeli Anshi Tiger Reserve and Sharavati Wildlife Sanctuary (Karnataka, 413 km²) Mudumalai Wildlife Sanctuary (Tamil Nadu), and Sivaram Wildlife Sanctuary (AP, 30 km²) in India (Das 1995, Hanfee 1999), and might occur in the Cauvery Protected Area (527 km²).

The Madras Crocodile Bank Trust (MCBT) and the Turtle Survival Alliance (TSA) are engaged in conducting species surveys and developing captive assurance colonies at regional zoos within the species' range. The species is expected to be up-listed to Schedule I of the Wild Life (Protection) Act, 1972 (see the Wild Life (Protection) Amendment Bill 2021). Murthy (2009) proposed to include the species in Appendix I of CITES.

Very little natural history and status data is available for the species, and further surveys and conservation biology studies for the species are urgently needed. Research is needed to identify evolutionary significant lineages and their taxonomic implications.

8.2 Population monitoring

The last status survey undertaken for the species was based on a questionnaire survey in south India (Murthy, 2009 and Kumar, 2010) and resulted in the sighting of very few individuals. Recent publications indicate that this species is not seen since more than two decades in Odisha and Chhattisgarh (Mohapatra et al., 2010; Behera et al., 2019; Ahmed et al., 2021). Fresh status surveys, engaging local communities, are urgently needed for monitoring of the subpopulations across the distribution range of the species.

8.3 Control measures

8.3.1 International

N. leithii is included in CITES Appendix II, which allows for international commercial trade in the species provided such trade is not detrimental to the species.

8.3.2 Domestic

In India, some of the distribution range of the species lies within protected areas. Since this species is listed in the Schedule IV of the Wild Life (Protection) Act, 1972, hunting and collection of the species is prohibited (Section 9 of the Act). Commercial utilization of the species requires authorization (Section 44 of the Act) and cannot occur from wild populations (Section 48 of the Act).

8.4 Captive breeding and artificial propagation

This species is in captivity in some of the zoos in India. Two female specimens were kept in Nadankanan zoo during 1980s which lived for two years on a fish diet (Biswas and Acharjyo, 1984). An adult female of this species was maintained for over 10 years at the Madras Crocodile Bank. It was housed in a large (> 10 x 10 m) cemented tank, along with a variety of other freshwater turtles, including *N. gangetica*. It accepted fish and vegetables, including cabbage and tomatoes, and was rarely seen basking at the surface of water, and never approached the land. It was thought that this individual was less aggressive than *N. gangetica*. A solitary adult female is presently housed in Nehru Zoological Park, Hyderabad. Additional data on husbandry are given by Vardia and Tonapi (1992) and Varghese and Tonapi (1986). In captivity, the species was found to prefer oligochaete worms, prawns, molluscs, and fish fingerlings and tadpoles to plants, nibbling the tender root-tips of floating aquatic macrophytes only when starved for 1–2 weeks. The young accepted mosquito larvae. Some specimens of *N. leithii* are kept in a temple tank at Kotapalli village, Andhra Pradesh, southeastern India, where they are fed on flowers of the red china rose (*Hibiscus rosa-sinensis*) and banana (*Musa domestica*). There are no reported breeding populations of the species existing in the country (Deepak and Vasudevan, 2010).

8.5 Habitat conservation

In India, some of the distribution range of the species lies within protected areas. *N. leithii* requires site / area protection, resource and habitat protection, and site / area management including trade and harvest management (Praschag et al., 2021).

8.6 Safeguards

Not applicable.

9. Information on similar species

Nilssononia leithii looks similar to its congeners such as *N. gangeticus* and *N. hurum*, however *N. leithii* replaces both the species in southern India. The juveniles can be readily distinguished from the congeners in having four to six blackish ocelli surrounded by a reddish circle and the corner of the mouth with yellow patches on either side. Adults can be distinguished by having a low and oval carapace, a preneural with one or two neurals separating the first pair of pleural bones and a patch of flat, wart-like tubercles is often present on the anterior median edge of the carapace. However, it is very difficult to identify the species from its calipee, for which this species is in demand.

10. Consultations

The species is endemic to India and so no consultations have been undertaken.

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