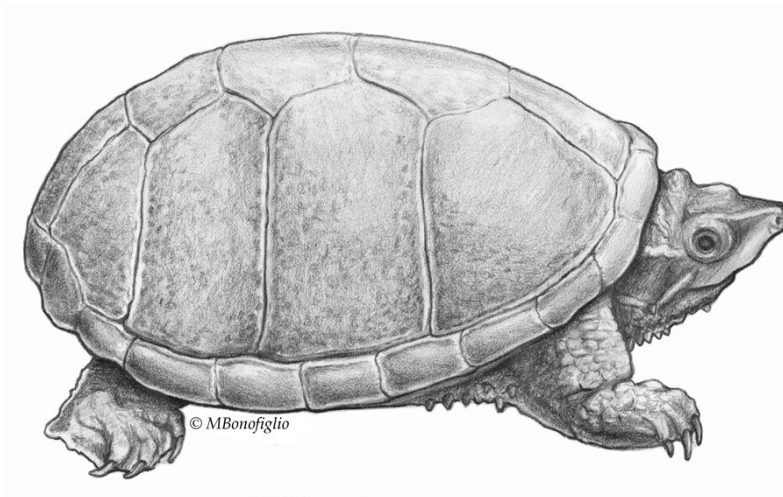


COSEWIC
Assessment and Status Report

on the

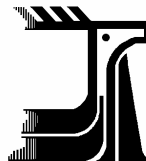
Stinkpot
Sternotherus odoratus

in Canada



THREATENED
2002

COSEWIC
COMMITTEE ON THE STATUS OF
ENDANGERED WILDLIFE IN
CANADA



COSEPAC
COMITÉ SUR LA SITUATION DES
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Également disponible en français sous le titre Rapport du COSEPAC sur la situation de la tortue musquée (*Sternotherus odoratus*) au Canada

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COSEWIC Assessment Summary

Assessment Summary – May 2002

Common name

Stinkpot

Scientific name

Sternotherus odoratus

Status

Threatened

Reason for designation

This species has disappeared over most of the southern half of its range and is vulnerable to shoreline development and increased mortality from outboard motors. The specific causes of this species' decline are unclear, but the species does not appear to do well in conjunction with increased anthropogenic activity.

Occurrence

Ontario and Quebec

Status history

Designated Threatened in May 2002. Assessment based on a new status report.



COSEWIC Executive Summary

Stinkpot *Sternotherus odoratus*

Species Information

The stinkpot (*Sternotherus odoratus*) is a small, aquatic freshwater turtle from the family Kinosternidae. Its brown-black carapace rarely exceeds 13 cm in length and its plastron is small and yellowish and has a hinge. Males differ from females in having scaly patches on the inner thighs. The species exudes a musky odor from glands under the carapacial margins and possesses a surly disposition.

Distribution

In Canada, the species is found in scattered localities across south-central Ontario, and in one small area of Quebec, north of Ottawa-Hull. They are also found along the southern edge of the Canadian Shield from Georgian Bay to the Frontenac Axis into the Ottawa-Hull region.

Habitat

Stinkpots require a shallow body of water with a soft substrate and little or no current. However, in Canada, they are relatively common in Georgian Bay. Nesting habitat is variable, but it must be close to the water and exposed to direct sunlight. The species is highly aquatic and rarely leaves the water. On land, it is clumsy and awkward.

Biology

In Canada, females may lay up to one clutch of 2-7 eggs per year in late June or early July. From year to year, females may return to the same general area to nest. Stinkpots are omnivorous, but eat mainly aquatic mollusks and insects. Stinkpots hibernate, often in groups, during winter when water temperatures drop below 10°C. Peak mating season is in the spring and fall when turtles are near hibernacula. Adults make up the majority of stinkpot populations because nesting success and recruitment are very low and adult survivorship is relatively high. Because of this, increased adult mortality can have severe negative impacts from which populations recover slowly or not at all.

Population sizes and trends

Although there is a fairly extensive body of knowledge concerning the biology of this species in the US, only one Canadian population has been studied. Records from the Ontario Herpetological Survey and the Hamilton Herpetological Atlas Project indicate that stinkpots have disappeared from all of the species' former haunts in southwest Ontario and the north shore of Lake Ontario west of Prince Edward County. Currently, they occur in small numbers at Point Pelee National Park and in small ponds near Port Franks near Ipperwash on Lake Huron. Both "populations" appear small and are probably isolated. The species is occasionally reported from the Detroit River. The species persists in several sites along the southern margin of the Canadian Shield, but abundance has only been estimated at one site in Georgian Bay. Population trends are unknown. It is likely there is no exchange between the Shield and southwestern Ontario turtles, at the present time.

Limiting factors and threats

High motorboat traffic and intense fishing increase adult mortality rates. Probably, the most significant threat to stinkpots is habitat destruction, primarily through wetland drainage and shoreline development.

Existing protection or other status

In both Ontario and Quebec, laws prohibit hunting and collecting stinkpots.



COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) determines the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada. Designations are made on all native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fish, lepidopterans, molluscs, vascular plants, lichens, and mosses.

COSEWIC MEMBERSHIP

COSEWIC comprises representatives from each provincial and territorial government wildlife agency, four federal agencies (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biosystematic Partnership), three nonjurisdictional members and the co-chairs of the species specialist groups. The committee meets to consider status reports on candidate species.

DEFINITIONS

| | |
|------------------------|--|
| Species | Any indigenous species, subspecies, variety, or geographically defined population of wild fauna and flora. |
| Extinct (X) | A species that no longer exists. |
| Extirpated (XT) | A species no longer existing in the wild in Canada, but occurring elsewhere. |
| Endangered (E) | A species facing imminent extirpation or extinction. |
| Threatened (T) | A species likely to become endangered if limiting factors are not reversed. |
| Special Concern (SC)* | A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events. |
| Not at Risk (NAR)** | A species that has been evaluated and found to be not at risk. |
| Data Deficient (DD)*** | A species for which there is insufficient scientific information to support status designation. |

* Formerly described as “Vulnerable” from 1990 to 1999, or “Rare” prior to 1990.

** Formerly described as “Not In Any Category”, or “No Designation Required.”

*** Formerly described as “Indeterminate” from 1994 to 1999 or “ISIBD” (insufficient scientific information on which to base a designation) prior to 1994.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list.



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COSEWIC Status Report

on the

Stinkpot

Sternotherus odoratus

in Canada

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2002

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Kanata, ON
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SPECIES INFORMATION

Description

The stinkpot (*Sternotherus odoratus*) is known in French as “la tortue musquée” (Johnson 1989). This “surly-tempered little reptile” is so named for the musky odor it exudes from four glands located on the underside of the carapacial margins (Logier 1939). It is a small freshwater turtle with a highly arched carapace that rarely exceeds 13 cm in length. The carapace is grey-brown to black and the plastron is yellow to brown. The plastron is small and has a single inconspicuous hinge. The turtle's skin colour is grey to black and many individuals have two prominent light stripes on the side of the head. Males have longer tails, ending in a blunt terminal nail, and have more exposed skin around the median plastral seams than do females (Cook 1984). Males also have two conspicuous patches of scales on the inner surface of each hind leg.

Taxonomy

This species is a member of the family Kinosternidae, which is composed of four genera and 22 species (Cook 1984). Morphological evidence suggests that it may be more appropriate to consider the genus *Sternotherus* as a subgenus of the genus, *Kinosternon*, (Iverson 1991), thus renaming the stinkpot *Kinosternon odoratus*. There is still strong debate about this proposed change in the species' taxonomy and biologists continue to view *Sternotherus* and *Kinosternon* as separate genera (Ernst *et al.* 1994, Iverson 1998, Crother 2000). The stinkpot is the only species of the family Kinosternidae to range into Canada.

Research

The ecology of *S. odoratus* has been studied across most of the species' range, including Michigan (Risley 1933), Oklahoma (Mahmoud 1969), southeastern Pennsylvania (Ernst 1986), Virginia (Mitchell 1988), Alabama (Dodd 1989), and Ontario (Edmonds and Brooks 1996; Edmonds 1998). Most research has collected data on stinkpot demography (Tinkle 1961; Wade and Gifford 1964; Bancroft *et al.* 1983; Ernst 1986; Dodd 1989; Mitchell 1988; Meylan *et al.* 1992; Edmonds and Brooks 1996), or focused on aspects of stinkpot reproductive biology (Risley 1933; Tinkle 1961; Lindsay 1965; Mahmoud 1967; Gibbons 1970; McPherson and Marion 1981*a,b*; Mitchell 1985*a,b*; Ernst 1986). There are also some studies documenting aspects of stinkpot behaviour: such as, activity cycles (Risley 1933; Mahmoud 1969; Ernst 1986), home range and movements (Risley 1933; Williams 1952; Mahmoud 1969; Ernst 1986; Mitchell 1988; Edmonds 1998), courtship (Mahmoud 1967; Ernst 1986), nesting habits (Lindsay 1965; Ernst 1986), and feeding behaviour (Mahmoud 1968).

In Canada, research on the stinkpot is mostly confined to simple records of observation (e.g. Brunton 1981; Brunton and McIntosh 1985; Chabot and St. Hilaire 1991; Bendall 1959), compiled in the Ontario Herpetofaunal Summary (Weller and Oldham 1986) and at the Ontario Natural Heritage Information Centre (NHIC), in

Peterborough, Ontario. Bendall (1959) described finding 12 stinkpot shells in a bald eagle nest at the Queen's University Biological Station at Lake Opinicon. Lindsay (1965) described the nesting behaviour of *S. odoratus* in Frontenac District, Ontario. The only in-depth study on stinkpots in Canada focused on a population at the mouth of Twelve Mile Bay, in Georgian Bay, Ontario (Edmonds and Brooks 1996; Edmonds 1998). From 1991 to 1997, demographic parameters of this population (i.e. sex ratio, body size, growth rates etc.) were estimated and compared with those of more southern (U.S.) populations (Edmonds and Brooks 1996; Edmonds 1998). In 1995 and 1996, individual stinkpots were radio-tracked and movement patterns were described (Edmonds 1998).

DISTRIBUTION

The stinkpot ranges from Florida north to southern Ontario and Quebec, and west to Wisconsin and central Texas. In Canada, the species ranges from southern Ontario north to approximately 46° N (Fig. 1). Most sightings in Ontario have occurred along the southern edge of the Precambrian (Canadian) Shield (Fig. 1, 2). The stinkpot has also been reported at various locations close to the edges of Lake Huron, Lake Erie, and Lake Ontario. The most northern locations were recorded in Hull and Pontiac counties, Quebec, just north of the Ottawa River (Fig. 1). These recent observations in Quebec have shown that the range in that province extends further north than previously thought (Chabot and St. Hilaire 1991).



Figure 1. North American range of the stinkpot, *Sternotherus odoratus*. From Ernst et al., 1994.

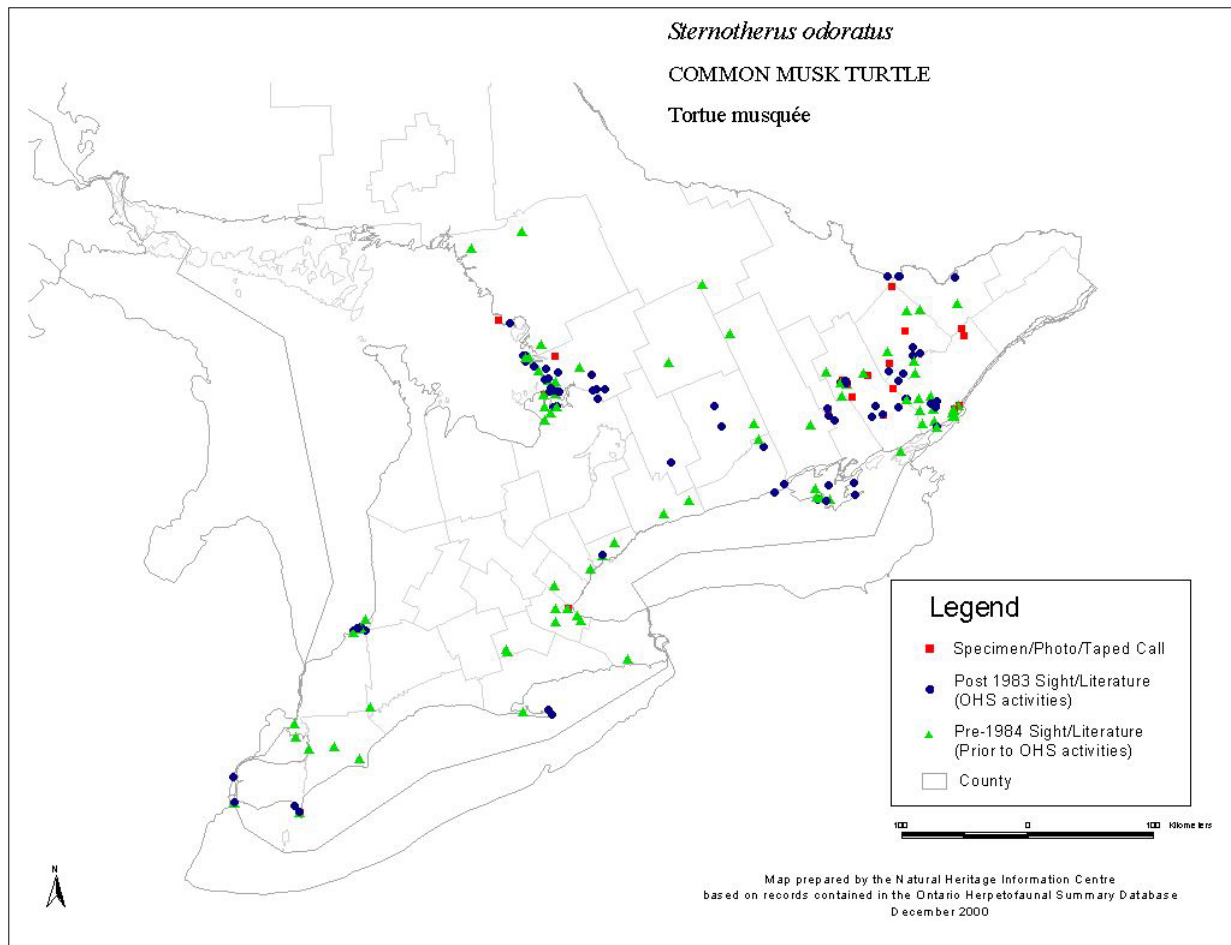


Figure 2. Locations of observations of the stinkpot (*Sternotherus odoratus*) in Ontario. From Oldham and Weller, 2000.

HABITAT

The stinkpot is highly aquatic and can occupy any shallow water body with a slow current and soft substrate (Cook 1984). In Canada, stinkpots have been found in lakes, streams, marshes, ponds and rivers (e.g. Lindsay 1965; Brunton 1981; Chabot and St. Hilaire 1991; Edmonds and Brooks 1996; NHIC unpubl. data). Stinkpots prefer shallow water and are rarely found at depths greater than 2 m (Mahmoud 1969; Edmonds 1998). In Oklahoma, the dominant vegetation where stinkpots were found consisted of *Chara* and *Myriophyllum* (Mahmoud 1969). In a Parry Sound, Ontario, population, stinkpots were found in association with a variety of vegetation, including grasses (Poaceae), sedges (Cyperaceae), rushes (Juncaceae), cattails (*Typha* sp.), pipewort (*Eriocaulon* sp.), water shield (*Brasenia* sp.), hornwort (*Ceratophyllum* sp.), Elodea (*Elodea* sp.), bullhead lilies (*Nuphar variegatum*), fragrant lilies (*Nymphaea odorata*), pickerel weed (*Pontederia cordata*), pondweed (*Potamogeton* sp.), arrowhead

(*Sagittaria* sp.), bladderwort (*Utricularia* sp.), and water celery (*Vallisneria* sp.) (Edmonds 1998). In Quebec, stinkpots were found in association with *Elodea canadensis*, *Hydrocharis morsus-ranae*, *Sagittaria lanifolia*, *Nymphaea odorata* and *Potamogeton ephedrus* (Chabot and St. Hilaire 1991). Stinkpots require a soft substrate within which to bury during hibernation (Ernst *et al.* 1994).

Stinkpots usually do not venture onto land except when females lay their eggs. Nesting habitat is considerably variable. Some females lay eggs on the open ground, whereas other females dig well-formed nests up to 10 cm in depth. Most nests are shallow excavations in decaying vegetable matter, leaf mold, rotting wood (such as under stumps or fallen logs), or muskrat lodges (Ernst *et al.* 1994). In Point Pelee National Park, stinkpot eggs were found in a muskrat lodge, and at Mellon Lake, 12 eggs were found in a hollow rotting log that formed part of a dock (NHIC unpubl. data.). In two populations on the Precambrian Shield, stinkpot nests were in shallow gravel or soil-filled rock crevices close to the shoreline (Lindsay 1965; Edmonds and Brooks unpubl. data). These crevices were located on rock faces exposed to direct sunlight. It is probable that such atypical nesting habitat was selected because most decaying vegetable matter in this geographic region (Precambrian Shield) is not exposed to direct sunlight. Direct sunlight may be necessary at northern latitudes to maintain a sufficiently high incubation temperature for complete embryo development (Bobyne and Brooks 1994). Hence, suitably warm nest sites may be limiting for the stinkpot in central and eastern Ontario.

Suitable stinkpot habitat is abundant across south-central Ontario, especially in the Canadian Shield Region. However, urbanization continues to encroach on many wetlands in Ontario, primarily close to Lake Ontario and Lake Erie, where some stinkpot populations are (were) located. As well, shoreline development for cottages and recreational activity is destroying suitable habitat in the Precambrian Shield areas occupied by stinkpots.

BIOLOGY

Reproduction

Peak mating times for stinkpots are in the spring and fall when the turtles are congregated at hibernation sites (Risley 1933; McPherson and Marion 1981*b*; Mendonça 1987). Although courtship and mating behaviours have been described in detail (Mahmoud 1967), the mating system of this species (e.g. polygynous, random, etc.) is unknown. It is likely that multiple paternities are possible for individual clutches of eggs. Females can store viable sperm from a fall mating through the winter (Gist and Jones 1989), and there is an account of a female copulating with two different males during same breeding season (Ernst 1986).

Age and size at maturity vary across latitude, with northern individuals maturing at a later age and a larger size than southern ones (Tinkle 1961; Edmonds and Brooks

1996). Males mature younger and at a smaller size than females (Tinkle 1961; Mahmoud 1967; McPherson and Marion 1981*a,b*; Mitchell 1988, Edmonds 1998). In the Twelve Mile Bay population, males matured at an average carapace length of 63.6 mm (between 5 and 6 years old) and females matured at an average carapace length of 80.7 mm (between 8 and 9 years old) (Edmonds 1998).

Nesting can occur from February through July, depending on the latitude of the population. In Canada, nesting usually occurs between June and early July (Logier 1939; Lindsay 1965; Johnson 1989, Edmonds 1998). Clutch frequency varies with latitude; southern females lay from 2 to 4 clutches per year and northern females lay one or fewer clutches per year (Risley 1933; Tinkle 1961; Gibbons 1970; McPherson and Marion 1983; Edmonds 1998). Individual clutch size increases with body size (Gibbons 1970) and can range from 1 to 9 eggs (Ernst *et al.* 1994). The incubation time ranges from 65 to 86 days (Ernst *et al.* 1994). Often, more than one female will nest in the same place (Cagle 1937; Edgren 1942). Female stinkpots may exhibit year-to-year nesting site fidelity. During the radio-telemetry study of the Twelve Mile Bay population, 7 of 10 radio-tracked females with a mean home range of 28 ha nested along the shoreline of a single 2.5 ha bay (Edmonds 1998). Three females were tracked in 2 consecutive years, and two of them nested at the same bay in both years (The third was not gravid in the second year) (Edmonds and Brooks unpubl. data).

In Ontario, stinkpot nesting behaviour has been described only twice. At Big Clear Lake, individual females laid single clutches of 2 to 6 eggs (average 4) between 27 June and 23 July (Lindsay 1965). At Twelve Mile Bay, individual females laid single clutches of 3 to 7 eggs (N = 10 clutches, mean = 4.7 eggs, SE = 0.12) between 6 June and 20 July (Edmonds 1998; Edmonds and Brooks unpubl. data). In both of these Ontario populations, nests were in shallow, gravel or soil-filled rock crevices close to the shoreline. The crevices were located on rock faces exposed to direct sunlight.

Lindsay (1965) noted that several stinkpot nests laid close to the shoreline were exposed by the wave action of the water. There are insufficient data to estimate nesting success, hatchling survival or recruitment rates in stinkpot populations. Typical freshwater turtle life-history patterns are such that recruitment and early juvenile survivorship are low (Iverson 1990; Congdon *et al.* 1993).

Physiology

Stinkpots are ectotherms and regulate their body temperatures through environmental temperatures. They rarely emerge from the water to bask, instead basking close to the surface of the water. The thermal activity range is 10° to 34°C, with a preferred field body temperature of 24°C (Mahmoud 1967). In laboratory experiments, stinkpots would only accept food if their body temperatures were between 13°C and 35°C (Mahmoud 1967). Out of water, stinkpots are highly susceptible to desiccation and are relatively quick to show signs of distress (Ernst 1968).

Food Habits

Stinkpots are omnivorous and will eat clams, snails, crayfish, aquatic insects, earthworms, fish eggs, minnows, tadpoles, carrion, algae, and parts of vascular plants (Lagler 1943; Mahmoud 1968; Bancroft et al. 1983). Their primary food items are mollusks and aquatic insects. They actively forage while walking on the substrate and search for food by probing their heads into soft mud, sand, and rotting vegetation.

Growth and Survivorship

The growth pattern of stinkpots is logarithmic. Growth rates of young turtles are greater than in older turtles, and as the turtle ages, growth approaches an asymptote (Edmonds 1998). Males and females reach maturity at 58% and 74% of their maximum body size, respectively (Edmonds 1998). A captive stinkpot lived for more than 54 years (Snider and Bowler 1992). Two wild stinkpots in Pennsylvania were estimated to be at least 27 and 28 years old at the time of their last capture (Ernst 1986). Little is known of age specific mortality for this species. In a Virginia population, annual survival rates for all age and sex groups were estimated at 84% to 86% (Mitchell 1988). However, this estimate was biased because the time interval of the study was short (three years), relative to the life span of these turtles (27+ years). In such a short time period, temporary emigration or cryptic behaviour may have been mistaken for mortality. Adults make up the majority of most stinkpot populations (Ernst 1986, Dodd 1989, Edmonds and Brooks 1996). Typical freshwater turtle species tend to have very high hatchling and juvenile mortality rates and low adult mortality rates (Brooks *et al.* 1990; Iverson 1990; Congdon *et al.* 1993). Populations with this pattern of survivorship can withstand periods of zero or low recruitment into the population. However, unusually high adult mortality rates can have serious negative impacts on the population, and even slight increases (as low as 1-2% annually) in these rates can lead to the decline of and eventual extirpation of a population (Brooks *et al.* 1990; Congdon *et al.* 1993, Compton 1999).

Hibernation

Stinkpots hibernate underwater, buried in approximately 30 cm of mud. They begin hibernation when water temperatures drop below 10°C (Ernst *et al.* 1994). They sometimes congregate in high densities in suitable hibernacula (Ernst *et al.* 1994).

Movement and Migration

There is no evidence of stinkpots defending territories. Estimates of size of home ranges vary considerably among populations: from 0.05 ha in a Florida population (Mahmoud 1969) to 1.50 ha in a Pennsylvania population (Ernst 1986) to between mean values (minimum convex polygon) of 50 and 155 ha for females and males respectively in a population in Ontario (Edmonds 1998). Because they rarely leave the water, stinkpot home ranges are likely confined to single bodies of water (Ernst et al. 1994). During their active season, stinkpots disperse from their hibernation site. Males

tend to move more than females (Ernst 1986; Edmonds 1998). Females in a Parry Sound district population may have restricted their movements because they were forced to use a specific nesting area because nest sites were a limited resource (Edmonds 1998).

Behaviour

Provided their habitat remains intact, stinkpot populations can usually coexist with human populations. However, there are still two potential threats to the stinkpots. First, stinkpots are often captured when they attempt to eat bait from fishing hooks, and consequently, are often killed by the fishermen or from the injuries from hooks (Mahmoud 1969). The second threat occurs from motorboat traffic. Stinkpots bask at the surface of the water and can be wounded or killed by propellers when boats pass over the turtles (Bancroft *et al.* 1983; Edmonds 1998). Mortality from motorboat traffic was a major source of stinkpot mortality in a Florida population (Bancroft *et al.* 1983).

POPULATION SIZES AND TRENDS

There are not enough data to estimate the overall size of the Canadian population of stinkpots. The population appears to be broken up into scattered localities across south-central Ontario. Twenty-seven Ontario districts have documented reports of the stinkpot between the years 1881 and 1997 (NHIC unpubl. data) (Table 1). Some locations have relatively high populations. For example, at Twelve Mile Bay, 575 individuals were marked between 1991 and 1997 (Edmonds 1998); and in Big Clear Lake, 69 individuals were recorded from casual sampling between 1983 and 1990 (NHIC unpubl. data; R. Saumure pers. comm.). Populations in some other districts were based on a single sighting. In Quebec, stinkpots have been found in only two counties — Hull and Pontiac (Chabot and St. Hilaire 1991). In both counties, only a few individuals were found.

Of the 27 Ontario districts that have records of stinkpots, 11 (41%) have had no confirmed sightings after 1984 (Table 1). It is possible that populations in many of these districts have been extirpated (M. Oldham pers. comm.). Most of these 12 districts are in the southwestern end of Ontario, a region experiencing intense agricultural activity and increasing urban development. Although stinkpots behave cryptically and are not normally observed unless one deliberately searches for them (Bendall 1959; Lamond 1994), it is striking that they have apparently disappeared in the most heavily developed areas, where there are more potential observers (e.g. Hamilton-Wentworth, Lamond 1994). Nevertheless, it would be prudent to search areas with old stinkpot sightings to confirm or refute local extirpation.

Table 1. A list of Ontario districts for which there are records of the presence of *Sternotherus odoratus*. The first and last years in which the species was recorded are listed (NHIC, unpubl. data).

| District | First sighting | Last sighting |
|------------------------|----------------|---------------|
| Peel (RM) | 1969 | 1969 |
| Sudbury (RM) | 1970 | 1970 |
| Durham (RM) | 1974 | 1975 |
| Hastings | 1977 | 1977 |
| Halton (RM) | 1977 | 1977 |
| Hamilton Wentworth | 1932 | 1978** |
| Kent | 1970 | 1978 |
| Nipissing | 1978 | 1978 |
| Niagara (RM) | 1979 | 1979 |
| Brant | 1979 | 1980 |
| Simcoe | 1961 | 1984 |
| Haldimand Norfolk (RM) | 1978 | 1985 |
| Ottawa Carleton (RM) | 1958 | 1987 |
| Northumberland | 1973 | 1987 |
| Lennox and Addington | 1988 | 1988 |
| York | 1858 | 1988 |
| Essex | 1881 | 1989 |
| Frontenac | 1931 | 1989 |
| Lanark | 1926 | 1989 |
| Prince Edward | 1941 | 1990 |
| Lambton | 1957 | 1990 |
| Renfrew | 1992 | 1992 |
| Peterborough | 1958 | 1992 |
| Victoria | 1993 | 1993 |
| Leeds and Grenville | 1936 | 1994 |
| Muskoka | 1925 | 1995 |
| Parry Sound | 1973 | 1997 |

*RM indicates a regional municipality.

**From Lamond (1994).

LIMITING FACTORS AND THREATS

Turtle egg and hatchling survival are highly vulnerable to temperature extremes and periods of unusually high rainfall or drought. Because stinkpot nests close to the shoreline (Lindsay 1965; Ernst 1986; Edmonds unpubl. data), abnormally high water levels after the nesting season can drown eggs. Increased motorboat traffic and fishing can increase mortality rates of adults (see above). The most significant threat to stinkpot populations is habitat destruction; primarily shoreline development, wetland drainage and pollution (Ernst et al. 1994). Shoreline development can eliminate nesting sites which are limited, particularly in the cooler parts of the species' Canadian range in

central Ontario. Low water levels are usually of little threat to stinkpots because they prefer shallow water. However, they are also very vulnerable to desiccation when they are out of water (Ernst 1968), and they cannot survive in completely drained areas. If they can, stinkpots will move overland from drained areas to nearby bodies of water (Ernst 1986). However, such dispersal is limited because the stinkpot rapidly desiccates when out of water, and because this species is extremely awkward on land and also vulnerable to a wide range of predators owing to its small size and ludicrously slow and clumsy locomotion. Drainage of a common hibernation site can kill a large proportion of a population. For example, drainage of a canal in Ohio eliminated approximately 450 hibernating stinkpots (Thomas and Trautman 1937). Habitat modification, combined with intense fishing is thought to be the cause of the extirpation of the stinkpot around the city of Hamilton (Lamond 1994).

EXISTING PROTECTION AND OTHER STATUS

In Ontario, stinkpots are listed as 'specially protected reptiles' under Schedule 9 of the Fish and Wildlife Conservation Act of 1997. In Quebec, stinkpots are protected under '*La loi sur la conservation et la mise en valeur de la faune* (The Law on Conservation and Value of Wildlife)' and '*La loi sur les espèces menacées et vulnérables* (The Law on Threatened and Vulnerable Species)'. In these two provinces, it is illegal to hunt, trap, keep, sell, purchase, or transport live specimens without a government permit.

The Nature Conservancy has assigned this species a global rank of 'G5' (very common). It is a very common turtle in the eastern United States, and it is seen in that country's pet trade. However, demand is low and the supply is high (They are currently sold for less than 10\$ each). There is little threat to the stinkpot in Canada from the United States' pet trade. In Ontario, the stinkpot is ranked 'S4' (common) and in Quebec, 'S1'.

SUMMARY OF STATUS REPORT

The Canadian population of stinkpots has certainly suffered a decline. In particular, most local populations in southwestern Ontario may have been extirpated presumably because of agricultural and urban development. Drainage of wetland habitat continues to pose a major threat to stinkpot populations in developing areas. As well, increasing human recreational activity (i.e. boating, fishing) and development in relatively undisturbed wetland habitat will likely result in higher mortality of adult turtles and destruction of shoreline nesting habitat. This is of great concern because the low recruitment rate, late maturity (8-10 years), and long-lived life history (>25 years) of this species will impede population recovery and, consequently, lead to serious long-term decline in population size over time. The data, albeit limited, indicate that stinkpots have largely disappeared in much of their original range in southern Ontario and are now confined primarily to the Georgian Bay area and southeastern Ontario. The areas from

which they seem to have disappeared are those with the greatest alteration by agriculture, urbanization and cottage development. Cottage development is rapidly expanding in the remaining areas occupied by stinkpots. The pattern of apparent extirpation across Ontario means that the stinkpot populations in Georgian Bay area and southwest Ontario are probably isolated from each other and even within these areas the populations are often not continuous but occur in scattered locations. This species has low mobility; therefore, it is unlikely that extinctions in one locality can be prevented by immigration from another; therefore, local extirpations will probably be permanent. The stinkpot should therefore be designated as **threatened**.

TECHNICAL SUMMARY

Sternotherus odoratus

Stinkpot

Ontario and Quebec

La tortue musquée

| | |
|---|---|
| Extent and Area information | |
| • extent of occurrence (EO)(km ²) | 93600 km ² |
| • specify trend (decline, stable, increasing, unknown) | decline |
| • are there extreme fluctuations in EO (> 1 order of magnitude)? | no |
| • area of occupancy (AO) (km ²) | Not Calculated |
| • specify trend (decline, stable, increasing, unknown) | decline |
| • are there extreme fluctuations in AO (> 1 order magnitude)? | No |
| • number of extant locations | unknown |
| • specify trend in # locations (decline, stable, increasing, unknown) | Decline (43% of districts) |
| • are there extreme fluctuations in # locations (>1 order of magnitude)? | No |
| • habitat trend: specify declining, stable, increasing or unknown trend in area, extent or quality of habitat | Declining |
| Population information | |
| • generation time (average age of parents in the population) (indicate years, months, days, etc.) | 15+ years |
| • number of mature individuals (capable of reproduction) in the Canadian population (or, specify a range of plausible values) | Unknown |
| • total population trend: specify declining, stable, increasing or unknown trend in number of mature individuals | probably declining |
| • if decline, % decline over the last/next 10 years or 3 generations, whichever is greater (or specify if for shorter time period) | 30-40% over last 18 years (based on lack of observations in 12 districts since 1984) |
| • are there extreme fluctuations in number of mature individuals (> 1 order of magnitude)? | No |
| • is the total population severely fragmented (most individuals found within small and relatively isolated (geographically or otherwise) populations between which there is little exchange, i.e., ≤ 1 successful migrant / year)? | Yes |
| • list each population and the number of mature individuals in each | Unknown |
| • specify trend in number of populations (decline, stable, increasing, unknown) | Unknown |
| • are there extreme fluctuations in number of populations (>1 order of magnitude)? | No |
| Threats (actual or imminent threats to populations or habitats) [add rows as needed] | |
| <ul style="list-style-type: none"> - habitat alteration through drainage of wetlands, recreational activity and development, - shoreline development reduces limited sites for nesting, especially in Canadian Shield where nest sites are likely most restrictive - habitat pollution - death by boat propeller or by being caught on fish hooks | |

| | |
|---|----------------------|
| Rescue Effect (immigration from an outside source) | |
| • <i>does species exist elsewhere (in Canada or outside)?</i> | yes in US |
| • <i>status of the outside population(s)?</i> | stable |
| • <i>is immigration known or possible?</i> | no |
| • <i>would immigrants be adapted to survive here?</i> | possibly, see report |
| • <i>is there sufficient habitat for immigrants here?</i> | unknown |
| Quantitative Analysis | |

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