

Information about GB Non-native Species Risk Assessments

The Convention on Biological Diversity (CBD) emphasises the need for a precautionary approach towards non-native species where there is often a lack of firm scientific evidence. It also strongly promotes the use of good quality risk assessment to help underpin this approach. The GB risk analysis mechanism has been developed to help facilitate such an approach in Great Britain. It complies with the CBD and reflects standards used by other schemes such as the Intergovernmental Panel on Climate Change, European Plant Protection Organisation and European Food Safety Authority to ensure good practice.

Risk assessments, along with other information, are used to help support decision making in Great Britain. They do not in themselves determine government policy.

The Non-native Species Secretariat (NNSS) manages the risk analysis process on behalf of the GB Programme Board for Non-native Species. Risk assessments are carried out by independent experts from a range of organisations. As part of the risk analysis process risk assessments are:

- Completed using a consistent risk assessment template to ensure that the full range of issues recognised in international standards are addressed.
- Drafted by an independent expert on the species and peer reviewed by a different expert.
- Approved by an independent risk analysis panel (known as the Non-native Species Risk Analysis Panel or NNRAP) only when they are satisfied the assessment is fit-for-purpose.
- Approved for publication by the GB Programme Board for Non-native Species.
- Placed on the GB Non-native Species Secretariat (NNSS) website for a three month period of public comment.
- Finalised by the risk assessor to the satisfaction of the NNRAP.

To find out more about the risk analysis mechanism go to: www.nonnativespecies.org

Common misconceptions about risk assessments

To address a number of common misconceptions about non-native species risk assessments, the following points should be noted:

- Risk assessments consider only the risks posed by a species. They do not consider the practicalities, impacts or other issues relating to the management of the species. They therefore cannot on their own be used to determine what, if any, management response should be undertaken.
- Risk assessments are about negative impacts and are not meant to consider positive impacts that may also occur. The positive impacts would be considered as part of an overall policy decision.
- Risk assessments are advisory and therefore part of the suite of information on which policy decisions are based.
- Completed risk assessments are not final and absolute. Substantive new scientific evidence may prompt a re-evaluation of the risks and/or a change of policy.

Period for comment

Draft risk assessments are available for a period of three months from the date of posting on the NNSS website*. During this time stakeholders are invited to comment on the scientific evidence which underpins the assessments or provide information on other relevant evidence or research that may be available. Relevant comments are collated by the NNSS and sent to the risk assessor. The assessor reviews the comments and, if necessary, amends the risk assessment. The final risk assessment is then checked and approved by the NNRAP.

*risk assessments are posted online at:

<https://secure.fera.defra.gov.uk/nonnativespecies/index.cfm?sectionid=51>

comments should be emailed to nnss@fera.gsi.gov.uk

GB NON-NATIVE ORGANISM RISK ASSESSMENT SCHEME

For more information visit: www.nonnativespecies.org

	Name of Organism:	<i>Triturus cristatus</i> - Italian crested newt	
	Objectives:	Assess the risks associated with this species in GB	
	Version:	FINAL 04/04/11	
N	QUESTION	RESPONSE	COMMENT
	1 What is the reason for performing the Risk Assessment?		Request by the GB Non-native Species Programme Board.
	2 What is the Risk Assessment area?	GB	As the only means by which <i>Triturus cristatus</i> can reach the wild in the UK is by the deliberate release of captive animals, this species has the potential to turn up anywhere in the country. However, established breeding populations are only known in the UK from two sites, at Newdigate in Surrey and in the Birmingham area (Gillett 1988; 1991; Beebee & Griffiths 2000). <i>Triturus cristatus</i> has never spread widely from these sites and further trade in this species is now illegal in the EU.
	3 Does a relevant earlier Risk Assessment exist?	NO OR UNKNOWN (Go to 5)	
	4 If there is an earlier Risk Assessment is it still entirely valid, or only partly valid?		
A	Stage 2: Organism Risk Assessment SECTION A: Organism Screening		
	5 Identify the Organism. Is the organism clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?	YES (Give the full name & Go to 7)	<i>Triturus cristatus</i> . Salamandridae, Caudata. Amphibian, animal. Common name: Italian crested newt. This species is part of the crested newt species complex. Four species, <i>Triturus cristatus</i> , <i>T. cristatus</i> , <i>T. dobrogicus</i> and <i>T. karelinii</i> , were originally described as separate species, were then combined as one species (<i>T. cristatus</i>) and are now recognised as separate species again, albeit now within a species complex (Bucci-Innocenti <i>et al.</i> 1983; Macgregor 1990; Macgregor <i>et al.</i> 1990; Griffiths 1996; Edgar & Bird 2007). Two subspecies of <i>Triturus cristatus</i> have been described, <i>T.c. cristatus</i> and <i>T.c. macedonicus</i> , and it is the former that has been introduced to the UK.
	6 If not a single taxonomic entity, can it be redefined?		
	7 Is the organism in its present range known to be invasive, i.e. to threaten species, habitats or ecosystems?	YES (Go to 9)	In some areas, hybridisation between introduced <i>Triturus cristatus</i> and the closely related great crested newt <i>Triturus cristatus</i> has been highlighted as a potential problem. For example, at least one introduced population of <i>Triturus cristatus</i> , near Lake Geneva in Switzerland, is known to have hybridised with <i>Triturus cristatus</i> , which is native to that area (Schmidler 1976; Freytag 1978; Arntzen & Thorpe 1999; Arntzen 2001; Scalera 2007). The number of <i>Triturus cristatus</i> breeding sites declined in this area from 22 in the mid-1970s, to 15 in 1987 to 7 in 1997. However, this is thought to be due more to changes in habitat and pond quality than to competition or hybridisation. Moreover, the Lake Geneva population of <i>Triturus cristatus</i> , and its associated hybridisation with <i>Triturus cristatus</i> , has been limited to a very small area for at least 100 years (the oldest museum specimen from the region was collected in 1908). Hybridisation therefore does not appear to pose a serious threat. Nonetheless, since <i>Triturus cristatus</i> also occurs in the UK, where it is both a European Protected Species - being listed on Annex II of the Habitats Directive (Edgar & Bird 2007) - and a UKBAP species, and is known to have hybridised with introduced <i>Triturus cristatus</i> here too (Brede <i>et al.</i> 2000), a risk assessment is clearly a sensible precaution. Furthermore, the only three known cases of the amphibian disease chytridiomycosis recorded in the UK to date have all been associated with introduced amphibians (albeit not <i>Triturus cristatus</i>). Although no disease problems have been reported for the two existing populations of <i>Triturus cristatus</i> , and the chances of further deliberate introductions into the UK are now much reduced, there is nonetheless still a potential risk of chytrid fungus transmission from such non-native species to native amphibians (Fisher & Garner 2007), especially where animals have been kept in close proximity to a range of other species in captivity. Similarly, the potential transmission of <i>Ranavirus</i> , another amphibian pathogen implicated in mass mortalities, is also feasible.

8	Does the organism have intrinsic attributes that indicate that it could be invasive, i.e. threaten species, habitats or ecosystems?	YES or UNCERTAIN (Go to 9)	Uncertain. The main direct threat from introduced <i>Triturus carnifex</i> in the UK would be to the native and closely related great crested newt, <i>Triturus cristatus</i> , either through direct competition or "genetic pollution" due to hybridisation. In general, however, the two species occupy different types of habitat so competition would be limited by habitat separation (Schoor & Zuiderwijk 1981; Arntzen & Wallis 1991). Natural hybridisation has been reported in Austria (Klepsch 1994) and can also occur as a result of introductions, e.g. in the Lake Geneva Basin (see the response to Question 7), although it has been claimed that hybrids found in the UK, while viable, have very low fertility (Beebee & Griffiths 2000) and are therefore a biological "dead end". Other amphibians and aquatic species found in the UK are generally not likely to be threatened by the introduction or spread of <i>Triturus carnifex</i> as they already coexist naturally with this species in Europe. There is an undetermined risk of chytrid fungus transmission, however, especially if animals that have been kept in captivity with a range of other amphibians were ever to be released into the wild.
9	Does the organism occur outside effective containment in the Risk Assessment area?	YES (Go to 10)	This species presently has a very limited distribution within the UK so control would be fairly simple. However, any eradication attempts would be complicated by the fact that this species may co-exist and hybridise with native <i>Triturus cristatus</i> - and the hybrids are difficult to identify - so it would be difficult to implement a control programme that did not impact on native species. In addition, although the trade in <i>Triturus carnifex</i> is now banned in the EU, there may be some long-standing captive populations in the UK that could potentially pose a threat (not least from disease transmission) if animals from them were ever to be released. However, as pet keepers are becoming more aware of the potential damage caused by deliberate releases, there is now far less likelihood of further deliberate introductions of <i>Triturus carnifex</i> into the wild in the UK.
10	Is the organism widely distributed in the Risk Assessment area?	NO (Go to 11)	<i>Triturus carnifex</i> is only known from two small areas in the UK - one in Surrey and the other near Birmingham.
11	Does at least one species (for herbivores, predators and parasites) or suitable habitat vital for the survival, development and multiplication of the organism occur in the Risk Assessment area, in the open, in protected conditions or both?	YES (Go to 12)	There are numerous ponds, lakes and other water bodies that are potentially suitable for the survival of this species in the UK. However, <i>Triturus carnifex</i> prefers more disturbed, far less vegetated water bodies than <i>Triturus cristatus</i> , and seems to be better adapted to large-scale landscape changes, so the two species would usually occupy different pond types.
12	Does the organism require another species for critical stages in its life cycle such as growth (e.g. root symbionts), reproduction (e.g. pollinators; egg incubators), spread (e.g. seed dispersers) and transmission (e.g. vectors)?	NO (Go to 14)	Not relevant to this species.
13	Is the other critical species identified in question 12 (or a similar species that may provide a similar function) present in the Risk Assessment area or likely to be introduced? If in doubt, then a separate assessment of the probability of introduction of this species may be needed.		
14	Does the known geographical distribution of the organism include ecoclimatic zones comparable with those of the Risk Assessment area or sufficiently similar for the organism to survive and thrive?	YES (Go to 16)	<i>Triturus carnifex</i> occurs in southern Europe across a wide altitudinal range, from sea level to over 2000m (Edgar & Bird 2007), and in a variety of habitats, so the UK climate is similar enough to parts of the native range to allow survival and breeding.
15	Could the organism establish under protected conditions (e.g. glasshouses, aquaculture facilities, terraria, zoological gardens) in the Risk Assessment area?	YES (Go to 16)	It would be perfectly possible for <i>Triturus carnifex</i> to survive and breed under protected conditions, although subsequent spread would probably be limited.

16	Has the organism entered and established viable (reproducing) populations in new areas outside its original range, either as a direct or indirect result of man's activities?	YES (Go to 17)	<i>Triturus carnifex</i> has been introduced to, and established viable populations in, relatively few areas outside its natural range in Europe. Two populations are known from the UK, the main one on the premises of a former biological suppliers at Beam Brook Nurseries in Newdigate, Surrey, where it has been present since the 1920s (Gillett 1988; 1991; Beebee & Griffiths 2000; Brede <i>et al.</i> 2000). A second UK population has been reported in the Birmingham area (Gillett 1991; Beebee & Griffiths 2000) and appears to be centred round several garden ponds, having only spread about 600m from the original introduction site. Introduced populations occur in the Lake Geneva basin, in both Switzerland (Schmidler 1976; Freytag 1978; Arntzen & Thorpe 1999; Arntzen & Wallis 1999; Arntzen 2001; Wittenberg 2005) and at Lake Lemans in south east France (Duguet & Melki 2003; Lorvelec <i>et al.</i> 2003; Edgar & Bird 2007). Introduced <i>Triturus carnifex</i> have been found at ten locations in the Netherlands, between Apeldorn and Epe, although native <i>Triturus cristatus</i> do not occur in this area as the substrate is too sandy (Bogaerts 2002). It is now believed that a supposed native population of <i>Triturus carnifex</i> in Bayern, southern Germany, may be the result of hybridisation between <i>Triturus cristatus</i> and previously introduced <i>Triturus carnifex</i> (Edgar & Bird 2007). Introduced <i>Triturus carnifex</i> have also been present on Sao Miguel in the Azores since at least 1922 (Malkmus 2004), and have spread to occupy 46 breeding sites between 200 and 900 m in altitude in the centre of the island (although there is no competition or hybridisation here since there are no native newt species in the Azores). Most of the above introductions appear to involve newts from Italy where this species is widespread and abundant (Andreone & Marconi 2006).
17	Can the organism spread rapidly by natural means or by human assistance?	YES (Go to 18)	This does not appear to be the case, at least in the UK, for either means of spread. <i>Triturus carnifex</i> has never been widely introduced into the UK by humans and, even at the two sites where it has been introduced and survived, its subsequent spread has been virtually non-existent. Nonetheless, the potential still exists under the right conditions for natural spread (as in the Azores, above) and for future, much more rapid spread by human assistance so a Yes is given here.
18	Could the organism as such, or acting as a vector, cause economic, environmental or social harm in the Risk Assessment area?	YES OR UNCERTAIN (Go to 19)	Uncertain, but limited potential exists for <i>Triturus carnifex</i> to pose a threat to some native populations of the great crested newt, <i>Triturus cristatus</i> , in the UK, through both competition and hybridisation. In addition, although no disease problems have been reported for the two existing populations of <i>Triturus carnifex</i> , and the chances of further deliberate introductions into the UK are now much reduced, there is nonetheless still a potential risk of chytrid fungus transmission from such non-native species to native amphibians (Fisher & Garner 2007), especially where animals have been kept in close proximity to a range of other species in captivity.
19	This organism could present a risk to the Risk Assessment area and a detailed risk assessment is appropriate.	Detailed Risk Assessment Appropriate GO TO SECTION B	While <i>Triturus carnifex</i> is extremely unlikely to present a serious general risk to the Risk Assessment area, it could conceivably act as a vector for the transmission of chytrid fungus and may also possibly cause unknown competitive and/or genetic impacts on some UK populations of the native great crested newt, <i>Triturus cristatus</i> , which is both a European Protected Species and a UKBAP species. Though the perceived risk of one or both of these impacts actually occurring in the UK is considered very low, a detailed risk assessment is deemed appropriate.
20	This organism is not likely to be a harmful non-native organism in the Risk Assessment area and the assessment can stop.		

B SECTION B: Detailed assessment of an organism's probability of entry, establishment and spread and the magnitude of the economic, environmental and social consequences				
Probability of Entry		RESPONSE	UNCERTAINTY	COMMENT
1.1	List the pathways that the organism could be carried on. How many relevant pathways can the organism be carried on?	very few - 0	LOW - 0	Deliberate or accidental human introduction is the only possible method of entry.
1.2	Choose one pathway from the list of pathways selected in 1.1 to begin the pathway assessments.	Human introduction		Deliberate introduction by humans is the only way by which <i>Triturus carnifex</i> could reach the wild in the UK.
1.3	How likely is the organism to be associated with the pathway at origin?	unlikely - 1	LOW - 0	<i>Triturus carnifex</i> is not widely kept in captivity in the UK, and was only ever traded in small numbers.
1.4	Is the concentration of the organism on the pathway at origin likely to be high?	very unlikely - 0	LOW - 0	Not relevant as trade in this species is now banned in the EU, although there are still an unknown number (presumed small) still maintained in captive collections in the UK.
1.5	How likely is the organism to survive existing cultivation or commercial practices?	very unlikely - 0	LOW - 0	Not relevant as trade in this species is now banned in the EU, although there are still an unknown number (presumed small) still maintained in captive collections in the UK.
1.6	How likely is the organism to survive or remain undetected by existing measures?	moderately likely - 2	HIGH - 2	<i>Triturus carnifex</i> prefers relatively open, unvegetated ponds so is easy to spot during the breeding season (even in daylight). Although coordinated amphibian surveys are increasing in frequency in the UK every year and, to an experienced observer at least, <i>Triturus carnifex</i> is quite distinctive, there are so many potential sites, and so few experts to survey them all, that new populations are therefore somewhat likely to remain undetected, at least in the short term. The high uncertainty rating also reflects the possibility of inexperienced observers confusing <i>Triturus carnifex</i> with native <i>Triturus cristatus</i> , especially hybrids between the two species.
1.7	How likely is the organism to survive during transport /storage?	N/A		Not relevant as trade in this species is now banned in the EU.
1.8	How likely is the organism to multiply/increase in prevalence during transport /storage?	N/A		Not relevant as trade in this species is now banned in the EU.
1.9	What is the volume of movement along the pathway?	N/A		Not relevant as trade in this species is now banned in the EU.
1.10	How frequent is movement along the pathway?	N/A		Not relevant as trade in this species is now banned in the EU.
1.11	How widely could the organism be distributed throughout the Risk Assessment area?	not widely - 0	MEDIUM -1	The current distribution (and potential for spread) of <i>Triturus carnifex</i> within the Risk Assessment area is very limited.
1.12	How likely is the organism to arrive during the months of the year most appropriate for establishment ?	likely - 3	MEDIUM -1	Any conceivable future introductions would invariably be carried out by individuals who were maintaining and breeding existing populations of this species, and who would therefore have knowledge of the appropriate conditions and timing required for survival of <i>Triturus carnifex</i> . However, the possibility of such actions occurring must be deemed highly unlikely.
1.13	How likely is the intended use of the commodity (e.g. processing, consumption, planting, disposal of waste, by-products) or other material with which the organism is associated to aid transfer to a suitable habitat?	N/A		Not relevant to this species.
1.14	How likely is the organism to be able to transfer from the pathway to a suitable habitat?	likely - 3	MEDIUM -1	Any conceivable future introductions would invariably be carried out by individuals who were maintaining and breeding existing populations of this species, and who would therefore have knowledge of the appropriate conditions and timing required for survival of <i>Triturus carnifex</i> . However, the possibility of such actions occurring must be deemed highly unlikely.

	Probability of Establishment	RESPONSE	UNCERTAINTY	COMMENT
1.15	How similar are the climatic conditions that would affect establishment in the Risk Assessment area and in the area of current distribution?	moderately similar - 2	MEDIUM -1	The UK climate is similar enough to that of parts of the native range to allow survival and breeding.
1.16	How similar are other abiotic factors that would affect establishment in the Risk Assessment area and in the area of present distribution?	similar - 3	MEDIUM -1	Many water bodies in the UK are probably similar in other abiotic aspects to those in the natural range of <i>Triturus carnifex</i> .
1.17	How many species (for herbivores, predators and parasites) or suitable habitats vital for the survival, development and multiplication of the organism species are present in the Risk Assessment area? Specify the species or habitats and indicate the number.	many - 3	MEDIUM -1	There are numerous ponds and other water bodies that are potentially suitable for the long-term survival of <i>Triturus carnifex</i> in the UK, particularly if it were to be selectively introduced to further sites by knowledgeable individuals.
1.18	How widespread are the species (for herbivores, predators and parasites) or suitable habitats vital for the survival, development and multiplication of the organism in the Risk Assessment area?	widespread - 4	LOW - 0	Widespread throughout the Risk Assessment area.
1.19	If the organism requires another species for critical stages in its life cycle then how likely is the organism to become associated with such species in the risk assessment area?			Not relevant to this species.
1.20	How likely is it that establishment will not be prevented by competition from existing species in the Risk Assessment area?	moderately likely - 2	MEDIUM -1	<i>Triturus carnifex</i> is unlikely to compete directly with <i>Triturus cristatus</i> in most ponds, as these species select different pond types for breeding, although there would be potentially be competition in terrestrial habitats.
1.21	How likely is it that establishment will not be prevented by natural enemies already present in the Risk Assessment area?	very likely - 4	MEDIUM -1	The main natural enemies, e.g. herons, grass snakes, would be the same as those occurring in the native range of <i>Triturus carnifex</i> .
1.22	If there are differences in man's management of the environment/habitat in the Risk Assessment area from that in the area of present distribution, are they likely to aid establishment? (specify)	very unlikely - 0	MEDIUM -1	The density of human populations and developments in the UK are much denser than in many parts of the natural range of <i>Triturus carnifex</i> so would be more likely to hinder, rather than aid, establishment.
1.23	How likely is it that existing control or husbandry measures will fail to prevent establishment of the organism?	unlikely - 1	MEDIUM -1	There appears to be no direct control over the illegal practice of releasing unwanted pets into the wild, although increased public education and publicity will have an impact in preventing this practice.
1.24	How often has the organism been recorded in protected conditions, e.g. glasshouses, elsewhere?	very rare - 0	MEDIUM -1	There are no known records of feral <i>Triturus carnifex</i> in such conditions.
1.25	How likely is the reproductive strategy of the organism and duration of its life cycle to aid establishment?	unlikely - 1	MEDIUM -1	<i>Triturus carnifex</i> does not appear not to breed prolifically in the UK under current conditions.
1.26	How likely is it that the organism's capacity to spread will aid establishment?	unlikely - 1	MEDIUM -1	Current distribution within the UK is very restricted and natural spread over the past 80 years or so appears to have been very slow to non-existent under current climatic conditions.
1.27	How adaptable is the organism?	moderately adaptable - 2	MEDIUM -1	In its natural range in southern Europe, <i>Triturus carnifex</i> occupies a wide altitudinal range, and a variety of different habitats.
1.28	How likely is it that low genetic diversity in the founder population of the organism will not prevent establishment?	moderately likely - 2	HIGH -2	Unknown - presumably only a few individuals established the existing populations.
1.29	How often has the organism entered and established in new areas outside its original range as a result of man's activities?	very few - 0	LOW - 0	See the comment for Question 16.
1.30	How likely is it that the organism could survive eradication campaigns in the Risk Assessment area?	unlikely - 1	MEDIUM -1	As <i>Triturus carnifex</i> occurs at so few sites in the UK, a deliberate, targeted eradication campaign would probably eliminate this species fairly rapidly, although experienced personnel would be required to minimise confusion with native <i>Triturus cristatus</i> and follow-up control measures and surveys would also be necessary.
1.31	Even if permanent establishment of the organism is unlikely, how likely is it that transient populations will be maintained in the Risk Assessment area through natural migration or entry through man's activities (including intentional release into the outdoor environment)?	unlikely - 1	MEDIUM -1	As long as some <i>Triturus carnifex</i> still exist in captivity in the UK the possibility for future deliberate releases will remain, although see the comments for Questions 1.12 and 1.14.

	Spread	RESPONSE	UNCERTAINTY	COMMENT
2.1	How rapidly is the organism liable to spread in the Risk Assessment area by natural means?	very slow - 0	LOW - 0	Despite being established at a small number of sites in the UK for many decades, <i>Triturus cristatus</i> has been unable to spread far by natural means.
2.2	How rapidly is the organism liable to spread in the Risk Assessment area by human assistance?	slow - 1	MEDIUM -1	Humans could easily spread this species rapidly, although the risk of this happening appears to be minimal and decreasing.
2.3	How difficult would it be to contain the organism within the Risk Assessment area?	very easily - 0	MEDIUM -1	So few sites are occupied in the UK that known populations could be readily controlled if this was ever deemed necessary. Follow up monitoring surveys would be important in order to determine the success of any control measures.
2.4	Based on the answers to questions on the potential for establishment and spread define the area endangered by the organism.	The UK, primarily England and Wales		Since small introduced populations have existed in the UK for so long (over 80 years in one case) without increasing or spreading appreciably, or causing any serious problems through disease, and since trade in this species is banned and further introductions are unlikely, this area is not considered to be at serious risk from the presence of <i>Triturus cristatus</i> at present.

	Impacts	RESPONSE	UNCERTAINTY	COMMENT
2.5	How important is economic loss caused by the organism within its existing geographic range?	minimal - 0	LOW - 0	Not important - there are no obvious ways in which <i>Triturus cristatus</i> could cause economic loss within its existing geographic range.
2.6	Considering the ecological conditions in the Risk Assessment area, how serious is the direct negative economic effect of the organism, e.g. on crop yield and/or quality, livestock health and production, likely to be? (describe) in the Risk Assessment area, how serious is the direct negative economic effect of the organism, e.g. on crop yield and/or quality, likely to be?	minimal - 0	LOW - 0	Not relevant to this species.
2.7	How great a loss in producer profits is the organism likely to cause due to changes in production costs, yields, etc., in the Risk Assessment area?	minimal - 0	LOW - 0	Not relevant to this species.
2.8	How great a reduction in consumer demand is the organism likely to cause in the Risk Assessment area?	minimal - 0	LOW - 0	Not relevant to this species.
2.9	How likely is the presence of the organism in the Risk Assessment area to cause losses in export markets?	very unlikely - 0	LOW - 0	Not relevant to this species.
2.10	How important would other economic costs resulting from introduction be? (specify)	minimal - 0	LOW - 0	Minor costs would be associated with a survey and eradication programme if this was ever deemed necessary.
2.11	How important is environmental harm caused by the organism within its existing geographic range?	minor - 1	LOW - 0	Limited harm has been reported due to hybridisation of this species with <i>Triturus cristatus</i> in the Lake Geneva area, although in the UK most hybrids appear not to be viable. There have been no reports of disease transmission associated with this species (although the future potential for this exists should any captive animals be released into the wild).
2.12	How important is environmental harm likely to be in the Risk Assessment area?	minor - 1	HIGH - 2	Although chytrid fungus has not been recorded in <i>Triturus carnifex</i> , this does not mean that this species is unable to harbour or transmit this pathogen. The impact of any such chytridiomycosis transmission could of course be potentially very severe for native amphibians. However, the risk of this species actually becoming a significant vector for this pathogen in the UK is minor since 1. no disease problems have been reported in the existing <i>Triturus carnifex</i> populations and 2. the likelihood of any further introductions is considered to be very low. <i>Ranavirus</i> is another amphibian pathogen of concern in the UK that species introduced via the pet trade may potentially carry. However, <i>Ranavirus</i> is now already so widespread across the UK that the reduced risks of further <i>Triturus carnifex</i> introductions, plus the small numbers of animals potentially involved, are very unlikely to add significantly to this problem. The other potentially serious problem, that of a rapid spread of the existing <i>Triturus carnifex</i> populations causing damaging competition and hybridisation with native <i>Triturus cristatus</i> , has never become a major issue in the UK, despite the presence of this species in the country for over 80 years. Therefore the risk of serious environmental harm occurring, due to competition and hybridisation with native <i>Triturus cristatus</i> , would appear to be minor. It is currently unknown what affect any future change in the UK's climate would have on any of these potential impacts.
2.13	How important is social and other harm caused by the organism within its existing geographic range?	minimal - 0	LOW - 0	Not relevant to this species.
2.14	How important is the social harm likely to be in the Risk Assessment area?	minimal - 0	LOW - 0	Not relevant to this species.
2.15	How likely is it that genetic traits can be carried to native species, modifying their genetic nature and making their economic, environmental or social effects more serious?	unlikely - 1	LOW - 0	This does not appear to be happening in the UK - while hybridisation with <i>Triturus cristatus</i> has been recorded at the main <i>Triturus carnifex</i> population in Surrey, these hybrids are reported to have very low fertility and, in addition, have never been found outside this one small site despite the continued presence of this species here for over 80 years.
2.16	How probable is it that natural enemies, already present in the Risk Assessment area, will have no affect on populations of the organism if introduced?	very unlikely - 0	LOW - 0	See the comment for Question 1.21.
2.17	How easily can the organism be controlled?	easily - 1	LOW - 0	So few sites are currently occupied in the UK that known populations could be readily controlled e.g. removal via bottle trapping, netting, and egg collection, if deemed necessary. Confusion with native <i>Triturus cristatus</i> , and confusion caused by hybrids between the two species, would have to be minimised by the use of experienced personnel. Follow-up monitoring would also be important in order to determine the success of any control measures.
2.18	How likely are control measures to disrupt existing biological or integrated systems for control of other organisms?	unlikely - 1	MEDIUM - 1	Selective removal would be unlikely to conflict with the control of other organisms.
2.19	How likely is the organism to act as food, a host, a symbiont or a vector for other damaging organisms?	moderately likely - 2	MEDIUM - 1	The potential exists for any further deliberate introductions of this species, as with any other non-native amphibians, to cause the spread of disease (especially chytridiomycosis), although the potential for the introductions themselves occurring in the UK is now decreasing.

2.20	Highlight those parts of the endangered area where economic, environmental and social impacts are most likely to occur	The UK, primarily England and Wales	LOW - 0	This is not relevant at present as any economic, environmental and social impacts are likely to be extremely minimal under current conditions due to the tiny number of localities where this species is currently established and the seemingly limited ability of this species to spread in the UK. It is impossible to predict where any further deliberate introductions of <i>Triturus carnifex</i> , which are considered very unlikely, would occur.
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Summarise Entry	unlikely - 1	MEDIUM -1	This species is no longer traded and only small numbers of <i>Triturus carnifex</i> are likely to be still present in captivity as pets. The risks of people deliberately releasing unwanted animals into the wild in the UK, or of future escapes, are now very small indeed and are almost certainly still declining.
Summarise Establishment	unlikely - 1	MEDIUM -1	Since <i>Triturus carnifex</i> does not appear to be able to breed prolifically or spread rapidly in the wild under current climatic conditions in the UK, and the risk of further releases is also declining, this species appears very unlikely to become any more widely established here. However, potential climate change will have unknown effects so this does not rule out further establishment of this species in the UK in the future. This establishment would be most likely to occur in central and southern England and parts of lowland south Wales.
Summarise Spread	very slow - 0	MEDIUM -1	Historical evidence indicates that <i>Triturus carnifex</i> is unable to spread rapidly in the UK under current climatic conditions, at least in the two areas where it was introduced. The preference of this species for disturbed ponds, however, and also to adapt better than <i>Triturus cristatus</i> to large-scale landscape changes, may allow it to spread more rapidly under certain conditions in the future.
Summarise Impacts	minimal - 0	MEDIUM -1	At present, the main impacts of introduced <i>Triturus carnifex</i> populations in the UK are their interactions with the native, and closely related, <i>Triturus cristatus</i> , either through competition or hybridisation. Both impacts appear to be extremely limited in their severity in the UK, however, as witnessed by the presence of <i>Triturus carnifex</i> in the country for over 80 years having created no significant problems or cause for concern - and also by the natural and relatively trouble free co-existence of both species in parts of Europe (e.g. Austria). The potential impacts on native amphibian species from the transmission of chytrid fungus are severe. However, there are no known cases of chytrid fungus transmission associated with <i>Triturus carnifex</i> and, although such a scenario is certainly possible, the actual risks of infected animals appearing in the wild in the UK are very low. The potential spread of chytrid fungus in the UK (regardless of origin) is of such concern, however, that it is already being addressed and monitored under the auspices of a separate, specific project (Zoological Society of London 2008). The risks of <i>Triturus carnifex</i> causing significant additional impacts through the transmission of <i>Ranavirus</i> are also minor since infected animals are unlikely to be introduced and this pathogen is already widespread in the UK anyway.
Conclusion of the risk assessment	LOW - 0	MEDIUM -1	<i>Triturus carnifex</i> is having very minimal impacts in the UK under current circumstances, with only two populations present in the wild (one established for many decades and neither showing signs of spreading or of disease), very few recorded adverse effects on the native crested newt, <i>Triturus cristatus</i> , very few opportunities for further spread without human assistance and an increasing recognition by the public that future deliberate releases are undesirable. Furthermore, this species is very unlikely to be able to spread and become a major problem in a modern industrialised country with such fragmented habitats, even if climate change facilitated this (indeed, both <i>Triturus cristatus</i> and <i>Triturus carnifex</i> are protected species in Europe precisely because of the huge declines they have suffered). The potential spread of chytrid fungus in the UK, including via non-native amphibian species, is much more serious, although this general issue is already being addressed and monitored and, in any event, is also very unlikely to specifically involve <i>Triturus carnifex</i> .
Conclusions on Uncertainty		MEDIUM -1	This risk assessment is reasonably reliable for the current situation and present climatic conditions in the UK. It is possible, however, that future deliberate introductions (potentially involving animals infected with chytrid fungus) and/or climate change may create unforeseen scenarios that would favour the more rapid establishment of this species, or cause more severe impacts, although this is considered unlikely. Moreover, even if further introductions or natural spread should ever occur, <i>Triturus carnifex</i> would be a relatively easy species to control in the early stages with only moderate resources.

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