

Marbled newt (*Triturus marmoratus*)

- The marbled newt is a popular species for garden ponds and is available from specialist dealers.
- They have a distinctive bright green and black colouration
- Only known to be established at one site in Devon at present.
- Can hybridise with great crested newts where both are present.



History in GB

Reported from a garden pond in Devon in 2014 and subsequently several garden ponds by 2016. In addition, there are some records from the London area and it has previously been present in Macclesfield; however, it appears to have died out in these locations.

Native Distribution

Iberia and western France



GB Distribution

Several sites in Devon; a few records in London.



Impacts

Environmental (moderate)

- Natural hybridization with great crested newts (*T. cristatus*) is well-known in native area.
- Impacts would be localised in the UK, though issues could occur due to introgression.
- If a vector for chytrid in GB (currently unknown), there is potential for impact as a result of transmission to other amphibians.

Economic (minimal)

- None known

Social (minimal)

- None known

Introduction pathway

Widely kept as pets and in garden ponds. May have been released accidentally or intentionally on a number of occasions.

Spread pathway

Natural (slow) - Established colonies have not extended beyond their current release sites (since at least 2014).

Human-aided (rapid) – widely-kept species and the potential for rapid human-mediated spread is high.

Summary

	Response	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	VERY LIKELY	VERY HIGH
Spread	INTERMEDIATE	MEDIUM
Impact	MODERATE	HIGH
Overall risk	MEDIUM	MEDIUM

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: <http://www.nonnativespecies.org/index.cfm?pageid=143>
comments should be emailed to nnss@apha.gov.uk

GB Non-native Species Rapid Risk Assessment (NRRAP)

Rapid Risk Assessment of: *Triturus marmoratus* (*Marbled newt*)

Author: Dr. John W. Wilkinson, Amphibian and Reptile Conservation

Version: Draft 1 (*March 2016*), NNRAP 1st review (*Nov 2016*), Peer review (*Jan 2017*), Draft 2 (*Jan 2017*), NNRAP 2nd review (*Feb 2018*)

Signed off by NNRAP: *Feb 2018*

Approved by Programme Board: *June 2019*

Placed on NNS website: TBC

Introduction:

The rapid risk assessment is used to assess invasive non-native species more rapidly than the larger GB Non-native Risk Assessment. The principles remain the same, relying on scientific knowledge of the species, expert judgement and peer review. For some species the rapid assessment alone will be sufficient, others may go on to be assessed under the larger scheme if requested by the Non-native Species Programme Board.

Guidance notes:

- We recommend that you read all of the questions in this document before starting to complete the assessment.
- Short answers, including one word answers, are acceptable for the first 10 questions. More detail should be provided under the subsequent questions on entry, establishment, spread, impacts and climate change.
- References to scientific literature, grey literature and personal observations are required where possible throughout.

1 - What is the principal reason for performing the Risk Assessment? (Include any other reasons as comments)

Response: *To rapidly assess the risk associated with this species in Great Britain*

2 - What is the Risk Assessment Area?

Response: *Great Britain*

3 - What is the name of the organism (scientific and accepted common; include common synonyms and notes on taxonomic complexity if relevant)?

Response: Marbled newt (*Triturus marmoratus*) though GB records may possibly refer to the pygmy marbled newt (*Triturus pygmaeus*) which was recently separated as a distinct species (Garcia-Paris et al., 2001). The two species are similar in appearance. Both species are members of the *Triturus cristatus* species complex and thus closely related to native great crested newts, with which hybridisation is possible (and occurs naturally at the *marmoratus/cristatus* contact zone in France (Arntzen and Wallis, 1991; Arntzen et al., 2009). Marbled newts can be distinguished from native species by their bright green, marbled with black, overall colouration and grey/dappled underside (which lacks orange/yellow as found in great crested newts). Males in breeding condition have a crescent-shaped (rather than jagged) crest. Hybrids may have characteristics of both species (e.g. be green/black WITH orange undersides).

4 - Is the organism known to be invasive anywhere in the world?

Response: Yes. Present and breeding in Drenthe Province, Netherlands (Beukema et al., 2015).

5 - What is the current distribution status of the organism with respect to the Risk Assessment Area?

Response: Reported from a garden pond in Devon in 2014 (no location data) (JWW) and from “several garden ponds” in Devon in February 2016, again without location data (ARC Facebook page). The sites are possibly in the Teignmouth area but the exact location cannot be confirmed without further investigation (which may be unwelcome due to localities being in private gardens). No records of the species occur on the NBN Gateway.

In London, there are a few records from Birdbrook NR and an adjoining garden pond. Outside they are reported at Beam Brook Nurseries but breeding records do not seem to have been confirmed at any site although this seems quite possible (Langton et al, 2011).

I (JWW) am not aware of any confirmed breeding records “in the wild” in the UK other than the Devon records.

6 - Are there conditions present in the Risk Assessment Area that would enable the organism to survive and reproduce? Comment on any special conditions required by the species?

Response: Yes. Marbled newts occur naturally in Iberia and in western France up to and including the north-west (e.g. Arntzen and Wallis, 1991). The climate of Devon, especially in areas with readily available garden ponds, represents no barriers to reproduction for the species.

7 - 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?

Response: Yes (see above).

8 - Has the organism established viable (reproducing) populations anywhere outside of its native range (answer N/A if you have answered ‘yes’ to question 4)?

Response: N/A

9 - Can the organism spread rapidly by natural means or by human assistance?

Response: Natural spread is likely slow but, as an attractive species popular in herpetoculture, spread could be rapid where assisted by humans.

10 - Could the organism itself, or acting as a vector, cause economic, environmental or social harm in the Risk Assessment Area?

Response: Yes - environmental.

Entry Summary

Estimate the overall likelihood of entry into the Risk Assessment Area for this organism (comment on key issues that lead to this conclusion).

Response: *very likely (already present)*

Confidence: *very high*

Comments (include list of entry pathways in your comments):

Two reports from Devon, both confirmed with photographs.

The species has been available in the GB pet trade for many decades and is still available from specialist dealers (see e.g. <http://www.dartfrog.co.uk/amphibians.html#sals>). It is not known whether the species is sold with advice not to release into gardens/elsewhere. Deliberate releases are difficult to estimate and accidental escapes unlikely but transfer of eggs with pond plants between breeding facilities and outdoor ponds remains a constant possibility.

Establishment Summary

Estimate the overall likelihood of establishment (comment on key issues that lead to this conclusion).

Response: *very likely (already established)*

Confidence: *very high*

Comments (state where in GB this species could establish in your comments, include map if possible):

Confirmed naturalized only from Devon at present but widely available and commonly bred in captivity. Most of southern GB, and likely further north too, could support the species. There are no known barriers to prevent this species becoming widely established, the only limiting factors being networks of ponds (as found in suburban and other areas) and probably altitude (i.e. cooler ponds will be more inimical as with great crested newts).

Lack of prior records of establishment, despite many decades of captive breeding in GB, implies that any colonies which may have been established for a time have not extended beyond their release sites and/or died out after a time. Garden ponds frequently contain fish, to which *Triturus spp.* have low tolerance (due to egg and larval predation) and this may have been a factor in limiting spread elsewhere.

Spread Summary

Estimate overall potential for spread (comment on key issues that lead to this conclusion).

Overall response: *intermediate*

Confidence: *medium*

Sub scores:

Natural spread only:

Response: *slow*

Confidence: *high*

Human facilitated spread only:Response: *rapid*Confidence: *high*

Comments (in your comments list the spread pathways and discuss how much of the total habitat that the species could occupy has already been occupied):

The species is so far known only from one broad location in Devon though no doubt has been released on many occasions and in many localities. As an attractive, widely-kept species, potential for rapid human-mediated spread is high, but the ability of local releases to establish and spread will vary.

There are no data on spread from the site from which the species was first recorded established in the Netherlands though it is likely marbled newts could successfully breed in much great crested newt habitat. Currently only a tiny proportion of the potentially available habitat (most of southern GB and likely further north) is occupied.

Impact Summary

Estimate overall severity of impact (comment on key issues that lead to this conclusion)

Overall response: *moderate***Confidence:** *high***Sub-scores****Environmental impacts:**Response: *moderate*Confidence: *medium***Economic impacts:**Response: *minimal*Confidence: *very high***Social impacts:**Response: *minimal*Confidence: *very high***Comments (include list of impacts in your comments):**

Natural hybridization with great crested newts (*T. cristatus*) is well-known and described both within native French range (Arntzen and Wallis, 1991; Arntzen et al., 2009) and from the non-native Netherlands population (Beukema et al., 2015). Great crested newt populations are present but sparse in Devon so, though hybridization is a real possibility, the impacts would likely be localized (moderate). GB great crested newts will not have developed any species-isolation mechanisms (e.g. behavioural, utilisation of different habitats on a local scale) to prevent it. Competition may also result with native newts (both from marbled newts themselves and possible hybrids) though this is difficult to predict.

If this species is acting as a vector for chytrid in GB (currently unknown) there is potential for major impact on other amphibians in the region. *B. dendrobatidis* (chytrid) has been isolated from both *T. marmoratus* and *T. pygmaeus* in Spain (Duffus & Cunningham, 2010). Additionally, they occur in Devon with non-native alpine newts (*Ichthyosaura alpestris*), which are known to be associated with chytrid occurrence in GB. The chytrid risk is likely lower than assessed for alpine newts and American bullfrogs (*Lithobates catesbianus*) though the possibility remains that marbled newts could be asymptomatic vectors of the disease and GB individuals have not been tested.

Climate Change

What is the likelihood that the risk posed by this species will increase as a result of climate change?

Response: *high*
Confidence: *medium*

Comments (include aspects of species biology likely to be effected by climate change (e.g. ability to establish, key impacts that might change and timescale over which significant change may occur):

As a species native to more southerly latitudes and variable habitats (e.g. in Iberia), warming of the climate is likely to increase the potential to colonize additional sites, potentially at the expense of native species which may be less resilient to climatic changes. Main potential impacts remain the same, though the disease dynamics of chytrid (if present) may also change (unpredictably) with changes in climate.

Conclusion

Estimate the overall risk (comment on the key issues that lead to this conclusion).

Response: *medium*
Confidence: *medium*

Comments:

Further investigation is required to assess the extent of occurrence of the marbled newt in Devon, if possible, and proximity to great crested newt localities, as well as testing for the presence of chytrid (currently unknown). Substantial pollution of the native great crested newt gene pool is currently considered unlikely, noting locations and extent of presence in Devon is still as yet unknown. Control/limitation/elimination of possible impacts should be possible if the extent of occurrence is not yet large; control of impacts if chytrid is present may be more difficult. I conclude that this species should be considered to represent a medium risk until further information is available.

References

Provide here a list of the references cited in the course of completing assessment

List:

Arntzen, J. W., & Wallis, G. P. (1991). Restricted gene flow in a moving hybrid zone of the newts *Triturus cristatus* and *T. marmoratus* in western France. *Evolution*, 805-826.

Arntzen, J. W., Jehle, R., Bardakci, F., Burke, T., & Wallis, G. P. (2009). Asymmetric viability of reciprocal-cross hybrids between crested and marbled newts (*Triturus cristatus* and *T. marmoratus*). *Evolution*, 63(5), 1191-1202.

Beukema, W., Bok, B., Tiemann, L., & Speybroeck, J. (2015). Local hybridisation between native *Triturus cristatus* and introduced *Triturus marmoratus* (Urodela: Salamandridae) in the Netherlands. *Herpetology Notes*, 8, 549-552.

Duffus, A. L., & Cunningham, A. A. (2010). Major disease threats to European amphibians. *The Herpetological Journal*, 20(3), 117-127.

García-París, M., Arano, B., & Herrero, P. (2001). Molecular characterization of the contact zone between *Triturus pygmaeus* and *T. marmoratus* (Caudata: Salamandridae) in Central Spain and their taxonomic assessment. *Revista española de herpetología*, 15, 115-126.

Langton, T.E.S., Atkins, W., & Herbert, C. (2011) On the distribution, ecology and management of non-native reptiles and amphibians in the London Area. Part 1. Distribution and predator/prey impacts, *The London Naturalist*, 90, 83-155. <http://herpecology.co.uk/wp-content/uploads/2009/04/Langton-pages.pdf>