RISK ASSESSMENT SUMMARY

Updated: September 2015

Black-tailed Prairie Dog (*Cynomys ludovicianus*)

- Short-tailed diurnal burrowing rodent from North America, kept in zoos and wildlife collections in GB
- Favours flat or gently sloping grassland with short sward
- Breeding populations have been found outside captivity in GB but have not yet established long-term
- Potential impacts on vegetation and farming if it did establish

History in GB

C. ludovicianus has been found breeding outside captivity in GB but has never established a long-term population. Current feral colonies associated with captive colonies in zoos and parks have been reported in Perthshire and Norfolk, and previous feral colonies have been reported in Cornwall, Cambridgeshire, and on the Isle of Wight. Much of the suitable land in its preferred habitat (flat / gently sloping grassland with short swards and soil types suitable for formation of burrows) is likely to be under agricultural management, limiting establishment.

Native distribution

Native to North America

Source: IUCN, 2014

Distribution in GB

No significant populations exist outside North America. Sightings in a few areas in GB (see history in GB).

Impacts

As the risk assessment suggests that this species is not expected to establish widely, most impacts have been scored as minor/minimal.

Environmental (minor)

- Could impact on local vegetation composition
- May act as a wildlife disease reservoir

Economic (minimal)

- Potential impacts on livestock due to competition
- Likely to be minimal on a national scale, but could be significant on a very localised scale

Social (minor)

- Potential to act as a source of zoonotic disease

Introduction pathway

Ornamental (very likely)— already present in GB in public and private captivity. Uncommon in pet shops but available online, common in zoos and parks.

Spread pathway

Natural (very slow) — due to the nature of its dispersal (individuals seek out new colonies).
Human (moderate) — any establishment in the wild is likely to be associated with a captive colony, either due to ongoing poor containment or multiple escapes

Summary

	Risk	Confidence
Entry	VERY LIKELY	VERY HIGH
Establishment	LIKELY	HIGH
Spread	SLOW	HIGH
Impacts	MINOR	HIGH
Conclusion	LOW	HIGH

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@apha.gsi.gov.uk

GB NON-NATIVE ORGANISM RISK ASSESSMENT SCHEME

Name of organism: *Cynomys ludovicianus*
Author: Steve Campbell, SASA
Date commenced: 25/11/11
Risk Assessment Area: Great Britain (England, Scotland, Wales and their islands)

Draft: Final (April 2016) – Draft 1 (Jan 2012), Draft 2 (Sep 2012), Draft 3 (July 13)
Signed off by NNRAP: July 2013
Approved by Programme Board: March 2015
Placed on NNSS website: September 2015

SECTION A – Organism Information and Screening		
Stage 1. Organism Information	**RESPONSE** **[chose one entry, delete all others]**	**COMMENT**
1. Identify the organism. Is it clearly a single taxonomic entity and can it be adequately distinguished from other entities of the same rank?	Yes	*Cynomys ludovicianus* (Ord) : Black-tailed Prairie Dog. However other Cynomys species may also occur at a much lower risk of entry.
2. If not a single taxonomic entity, can it be redefined? (if necessary use the response box to re-define the organism and carry on)	n/a	n/a
3. Does a relevant earlier risk assessment exist? (give details of any previous risk assessment)	No	n/a
4. If there is an earlier risk assessment is it still entirely valid, or only partly valid?	n/a	n/a
5. Where is the organism native?		North America
6. What is the global distribution of the organism (excluding Great Britain)?		North American Great Plains. Specifically the western central United States extending north to a small area of Saskatchewan, Canada and south to include remnant populations in Northern Mexico (Ulev 2007, Lomolino & Smith 2001). There are no known significant wild populations outside of North America (Long 2003)
7. What is the distribution of the organism in Great Britain?		There are captive colonies at a number of zoos and parks. Several of these have associated

		feral colonies such as those in Perthshire, Belfast, and Norfolk. Previous feral colonies reported in Cornwall, Cambridgeshire and on Isle of Wight (Baker & Hills 2008) also in Lurgan, Northern Ireland (NIEA pers. comm.) Individual animals periodically found around the country (assumed domestic escapees/releases)
8. Is the organism known to be invasive (i.e. to threaten organisms, habitats or ecosystems) anywhere in the world?	No	There is a widely quoted report that they were introduced to islands in the North-eastern US (Martha's Vineyard and Nantucket island) and caused damage leading to their extermination. However the original source (de Vos 1956) is anecdotal and no supporting evidence has been located.
Stage 2. Screening Questions		
9. Has this risk assessment been requested by the **GB** Programme Board?	Yes If yes, go to section B (detailed assessment) If no, got to 10	

SECTION B – Detailed assessment

PROBABILITY OF ENTRY

Important instructions:

- Entry is the introduction of an organism into GB. Not to be confused with spread, the movement of an organism within GB.
- For organisms which are already present in GB, only complete the entry section for current active pathways of entry or if relevant potential future pathways. The entry section need not be completed for organisms which have entered in the past and have no current pathways of entry.

QUESTION	RESPONSE [chose one entry, delete all others]	CONFIDENCE [chose one entry, delete all others]	COMMENT
1.1. How many active pathways are relevant to the potential entry of this organism? (If there are no active pathways or potential future pathways respond N/A and move to the Establishment section)	very few	high	The primary source of animals is most likely to be from existing captive collections. The most likely source of additional animals into GB is the zoo trade or exotic pet trade. However breeding production of animals in GB might be sufficient to sustain much of this trade, reducing the import risks.
1.2. List relevant pathways through which the organism could enter. Where possible give detail about the specific origins and end points of the pathways. For each pathway answer questions 1.3 to 1.10 (copy and paste additional rows at the end of this section as necessary).	Intentional import of captive animals		*C. ludovicianus* is already present in captivity and hence already in GB. However the zoo trade, exotic pet trade and private individuals are all potential sources of additional animals. It is highly likely that the source of any new wild population will be an existing captive colony.
Pathway name:	Import of Captive Animals		
1.3. Is entry along this pathway intentional (e.g. the organism is imported for trade) or accidental (the organism is a contaminant of imported goods)?	intentional	very high	

(If intentional, only answer questions 4, 9, 10, 11)			
1.4. How likely is it that large numbers of the organism will travel along this pathway from the point(s) of origin over the course of one year? Subnote: In your comment discuss how likely the organism is to get onto the pathway in the first place.	unlikely	medium	Trade in prairie dogs takes place but the market for animals is likely to be relatively small e.g. RSPCA (2004) quotes a survey of 3000 pet shops of which only 300 sold exotic animals and of those only one had prairie dogs for sale. However it is possible that the primary source may be from either individuals breeding from their pets and selling the young via internet forums, or from surplus animals produced at existing captive colonies in GB. However some imports from the EU might be possible. The animals are traded frequently in the US and have been transported around the world for the pet trade. Animals could be imported by private individuals and come in undetected from the EU.
1.9. How likely is the organism to be able to transfer from the pathway to a suitable habitat or host?	moderately likely	high	The animal has already exhibited an ability to survive and breed in the habitat surrounding some captive colonies.
1.10. Estimate the overall likelihood of entry into GB based on this pathway?	very likely	very high	*C. ludovicianus* is already present.
End of pathway assessment, repeat as necessary.			
1.11. Estimate the overall likelihood of entry into GB based on all pathways (comment on the key issues that lead to this conclusion).	very likely	very high	Is already present both in public captivity, private captivity and in a semi-wild breeding capacity outside of captivity.

PROBABILITY OF ESTABLISHMENT

Important instructions:

- For organisms which are already well established in GB, only complete questions 1.15 and 1.21 then move onto the spread section.

QUESTION	RESPONSE	CONFIDENCE	COMMENT
1.12. How likely is it that the organism will be able to establish in GB based on the similarity between climatic conditions in GB and the organism's current distribution?	moderately likely	high	There are unlikely to be any major climatic barriers to establishment. Captive outdoor colonies (and associated escapee colonies) have survived for many years in the UK through a wide range of weather conditions and temperatures. (Baker & Hills 2008, SASA unpublished, NIEA pers comm.)
1.13. How likely is it that the organism will be able to establish in GB based on the similarity between other abiotic conditions in GB and the organism's current distribution?	moderately likely	high	Given that captive outdoor colonies (and associated escapee colonies) have survived for many years in the UK it is clear that there are areas within the UK where abiotic factors are unlikely to hinder establishment. However habitat, vegetation height, soil type and topography are important to establishment of colonies (Clippinger 1989, Roe & Roe 2003,Avila-Flores, Boyce and Boutin 2010), potentially limiting the areas vulnerable to establishment.
1.14. How likely is it that the organism will become established in protected conditions (in which the environment is artificially maintained, such as wildlife parks, glasshouses, aquaculture facilities, terraria, zoological gardens) in GB? Subnote: gardens are not considered protected conditions	very likely	very high	This has already occurred in several locations.
1.15. How widespread are habitats or species necessary for the survival, development and multiplication of the	moderately widespread	medium	Flat or gently sloping grassland areas, with short swards and soil types suitable for formation of burrows (well

organism in GB?			drained silty loam, and other fine non-sandy soils) (Clippinger 1989, Roe & Roe 2003, Buseck et al 2005) are present in many areas of GB. However the frequent cultivation and active management of such areas would probably act as a barrier to long term establishment in many cases. Agricultural development is thought to be a primary factor in population decline in the US (Buseck et al 2005).
1.16. 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 GB?	N/A		
1.17. How likely is it that establishment will occur despite competition from existing species in GB?	likely	high	Escapee colonies have been established in the vicinity of captive colonies and have survived for many years in parts of the UK.
1.18. How likely is it that establishment will occur despite predators, parasites or pathogens already present in GB?	likely	high	Escapee colonies have been established in the vicinity of captive colonies and have survived for many years in parts of the UK.
1.19. How likely is the organism to establish despite existing management practices in GB?	unlikely	medium	Much of the suitable land in their preferred habitat is likely to be under agricultural management. Thus potential burrow sites in the open may be subjected to disturbance (e.g. ploughing) reducing long-term establishment; in addition the burrows may attract control procedures aimed at rabbits.
1.20. How likely are management practices in GB to facilitate establishment?	unlikely	medium	The effects of livestock grazing on some agricultural grassland and meadows may prove to be attractive to *C. ludovicianus*, by creating short sward heights, however 1.19 details some reasons why other associated management activities might counter that attractiveness in the longer term.
1.21. How likely is it that biological properties of the	unlikely	medium	In the UK *C. ludovicianus* is likely to form colonies in

organism would allow it to survive eradication campaigns in GB?			relatively visible areas (flat or gently sloping, open, short-sward grazing land) and its burrows are susceptible to a range of readily available management techniques such as gassing and ploughing. Its diurnal activity makes it susceptible to shooting, and it can be relatively easily trapped. These attributes; visibility and ease of removal should facilitate eradication.
1.22. How likely are the biological characteristics of the organism to facilitate its establishment?	moderately likely	medium	Once established it should be able to maintain a relatively high reproductive output and expand colony size provided adjacent habitat is available. However Dispersal to found new separate colonies is rare (Buseck et al 2005) and unlikely to have a high success rate so any expansion is likely to be contiguous with an existing colony.
1.23. How likely is the capacity to spread of the organism to facilitate its establishment?	unlikely	medium	While the organism does disperse, dispersal tends to be individuals (often young males) that seek out other colonies to join. (Garret & Franklin 1988, Buseck et al 2005) If there are no other colonies then dispersal will mostly be unsuccessful. The risk of a male and female dispersing and setting up a colony at a significant distance from the existing colony is considered to be much lower than burrowing on the outskirts of the existing site. Mortality among dispersers is high (Garret & Franklin 1988).
1.24. How likely is the adaptability of the organism to facilitate its establishment?	unlikely	medium	C ludovicianus may not be particularly adaptable, particularly in respect to habitat disturbance and human interference. Under pressure from humans its home range has become fragmented and there are large areas of North America which it has never colonised (Sidle et al 2001, Buseck et al. 2005). Human impacts and disease may have resulted in a population loss of up to 98% across its historic range (Hof et al 2002, Pauli et al

			2006), Delibes-Mateos et al 2010) possibly indicating a lack of adaptability.
1.25. How likely is it that the organism could establish despite low genetic diversity in the founder population?	likely	medium	Current semi-captive populations do not seem to have had problems with producing viable offspring (it is estimated that around 200 were removed at one site and breeding is still ongoing (SASA unpublished).
1.26. Based on the history of invasion by this organism elsewhere in the world, how likely is to establish in GB? (If possible, specify the instances in the comments box.)	moderately likely	medium	From current experience it seems likely that given suitable habitat and a low level of interference around existing colonies that the animals could become established and survive without the long-term support of the original colony. However there is a notable lack of reports in the literature of any establishment outside of North America and those colonies formed outside of their natural range appear to have been small and were eventually destroyed (Long 2003).
1.27. If the organism does not establish, then how likely is it that transient populations will continue to occur? Subnote: Red-eared Terrapin, a species which cannot re-produce in GB but is established because of continual release, is an example of a transient species.	likely	high	It is likely that from time to time lapses in containment at captive colonies will lead to the establishment of feral populations, possibly breeding, in the immediate vicinity.
1.28. Estimate the overall likelihood of establishment (mention any key issues in the comment box).	likely	medium	Fragmentation of suitable habitat combined with intensive agricultural management practices may help to reduce the risk of wider permanent establishment over a large geographic area. It is considered that isolated colonies may form (associated with captive collections) but that they are less likely to spread significantly. Local establishment has already occurred and can therefore be considered highly likely, however widespread establishment across a wide area appears much less likely.

PROBABILITY OF SPREAD

Important notes:

- Spread is defined as the expansion of the geographical distribution of a pest within an area.

QUESTION	RESPONSE	CONFIDENCE	COMMENT
2.1. How important is the expected spread of this organism in GB by natural means? (Please list and comment on the mechanisms for natural spread.)	minor	high	Due to the nature of its dispersal. (Garret & Franklin 1988, Buseck et al 2005) any natural spread would be very slow beyond the immediate vicinity of an existing colony.
2.2. How important is the expected spread of this organism in GB by human assistance? (Please list and comment on the mechanisms for human-assisted spread.)	moderate	high	Any establishment in the wild is likely to be associated with a captive colony, either due to ongoing poor containment or multiple escapes.
2.3. Within GB, how difficult would it be to contain the organism?	easy	medium	Improved containment facilities at breeding colonies, specifically zoos/parks would help to prevent future escapes. A range of readily available control measures should be able to eradicate existing escapee/feral animals.
2.4. Based on the answers to questions on the potential for establishment and spread in GB, define the area endangered by the organism.	Local to captive populations but throughout UK	high	Captive colonies can be found across the UK at a range of wildlife parks, zoos and farm parks. Many of these could have suitable habitat in the vicinity.
2.5. What proportion (%) of the area/habitat suitable for establishment (i.e. those parts of GB were the species could establish), if any, has already been colonised by the organism?	0-10	high	Total area 'colonised' so far is likely to be confined to the immediate vicinity of a few captive colonies with occasional dispersal by individual animals. This is likely to be a very small proportion of the potential suitable habitat in the UK.
2.6. What proportion (%) of the area/habitat suitable for establishment, if any, do you expect to have been invaded by the organism five years from now (including any current presence)?	0-10	very high	Current and past UK records suggest that any establishment is likely to be in association with a captive colony. The number of captive colonies is unknown but likely to be relatively low. Not all

			captive colonies have resulted in recorded escapes, not all will be surrounded by significant amounts of suitable habitat. It is reasonable to conclude therefore that only a small % of the total suitable habitat in the UK is likely to be invaded in the next 5 years.
2.7. What other timeframe (in years) would be appropriate to estimate any significant further spread of the organism in Great Britain? (Please comment on why this timeframe is chosen.)	40 80	medium	In terms of geographic spread, any increase is likely to be very slow; growth is likely to come due to expansion of an existing colony (associated with a captive colony) rather than by formation of new ones. Significant expansion of any colony is likely to encounter restrictions due to human management practices, in particular farming or by urban areas.
2.8. In this timeframe what proportion (%) of the endangered area/habitat (including any currently occupied areas/habitats) is likely to have been invaded by this organism?	0-10	medium	Current records and reports do not suggest that the species will establish over a significantly larger area.
2.9. Estimate the overall potential for future spread for this organism in Great Britain (using the comment box to indicate any key issues).	very slowly	medium	Likely to increase in area only very slowly in GB terms, but new colonies could spring up anywhere that a supporting captive colony is present.

PROBABILITY OF IMPACT

Important instructions:

- When assessing potential future impacts, climate change should not be taken into account. This is done in later questions at the end of the assessment.
- Where one type of impact may affect another (e.g. disease may also cause economic impact) the assessor should try to separate the effects (e.g. in this case note the economic impact of disease in the response and comments of the disease question, but do not include them in the economic section).
- Note questions 2.10-2.14 relate to economic impact and 2.15-2.21 to environmental impact. Each set of questions starts with the impact elsewhere in the world, then considers impacts in GB separating known impacts to date (i.e. past and current impacts) from potential future impacts. Key words are in bold for emphasis.

QUESTION	RESPONSE	CONFIDENCE	COMMENTS
2.10. How great is the economic loss caused by the organism within its existing geographic range **excluding GB**, including the cost of any current management?	moderate	medium	In its existing natural range there have been huge declines due to control efforts and other human activity. Current damage estimates are low but take into account population fall. Estimates in the US are few and far between, Clarke (1987) presents figures for North Dakota which suggests an average direct loss of $4.79 per acre and average indirect loss of $13.7 per acre to farmers across the state. A 6 year study of livestock weight gain suggested that in areas where 20% of land was occupied by prairie dogs, there was an economic loss of around 5.5% per hectare ($2.23) due to reduced livestock weight gain rising to 14% where 60% of land was occupied (Derner et al 2006). There are no quantitative records of economic loss outside of its natural range. Management techniques vary; in some areas (including urban situations) there is a balance to be found between

			preventing damage/infestation and conserving animals (Delibes-Mateos et al 2011. Such situations might preclude cheaper lethal options; for example requiring expensive exclusion barriers ($20,000+ per mile) Witmer et al (2000).
2.11. How great is the economic cost of the organism **currently** in GB **excluding management** costs (include any past costs in your response)?	minimal	high	zero
2.12. How great is the economic cost of the organism likely to be **in the future** in GB **excluding management** costs?	minimal	medium	Minimal on a national scale; could be significant on a very localised scale. Based on Clarke's (1987) figures for North Dakota (see 2.10). If they were to occur in the UK it is likely that localised damage would be broadly similar to rabbits.
2.13. How great are the economic costs **associated with managing** this organism **currently** in GB (include any past costs in your response)?	minor	high	Any local control costs are likely to be on a par with or slightly less than those of a similar sized rabbit infestation , taking into account the Prairie dogs more diurnal activity and choice of burrow sites that should make them easier to locate. No estimates are available for any control operations that have been conducted.
2.14. How great are the economic costs **associated with managing** this organism likely to be **in the future** in GB?	minor	medium	Minor, based on the conclusion that the organism is only likely to occur in very localised areas associated with a small number of captive colonies which are likely to expand very slowly, if at all.
2.15. How important is environmental harm caused by the organism within its existing geographic range **excluding GB**?	minimal	high	Minimal, they generally only occur in their natural range where they are an important key species, damage tends to be to agricultural interests, not environmental.
2.16. How important is the impact of the organism on biodiversity (e.g. decline in native species, changes in native species communities, hybridisation) **currently** in GB (include any past impact in your response)?	minimal	high	Minimal. Distribution is currently on too localised and small a scale.
2.17. How important is the impact of the organism on	minor	high	Minor. Likelihood of large scale spread is low, however

biodiversity likely to be in the **future** in GB?			if they were to become established on a large scale then locally they could have a big impact on vegetation composition with knock-on effects on other species. They may also act as a wildlife disease reservoir.
2.18. How important is alteration of ecosystem function (e.g. habitat change, nutrient cycling, trophic interactions) caused by the organism **currently** in GB (include any past impact in your response)?	minimal	high	Minimal, *C ludovicianus* is unlikely to significantly influence ecosystem function in its current status.
2.19. How important is alteration of ecosystem function (e.g. habitat change, nutrient cycling, trophic interactions) caused by the organism likely to be in GB in the **future**?	minor	high	Unlikely to become established over a large enough area to have long-term effect on ecosystem. However might have a local impact, particularly on habitat. One area where influence may be greater would be the potential to act as a disease vector or reservoir.
2.20. How important is decline in conservation status (e.g. sites of nature conservation value, WFD classification) caused by the organism **currently** in GB?	minimal	very high	Not currently known to occur at any significant conservation sites, or to have caused serious levels of damage in places where it does occur.
2.21. How important is decline in conservation status (e.g. sites of nature conservation value, WFD classification) caused by the organism likely to be in the **future** in GB?	minor	high	The risk of the animal establishing in significant numbers at a site of conservation concern is low.
2.22. How important is it that genetic traits of the organism could be carried to other species, modifying their genetic nature and making their economic, environmental or social effects more serious?	minimal	very high	The most likely pathway for passing on genetic traits would be by hybridisation with a closely related native species. However there are no species in GB likely to interbreed with *C. ludovicianus*
2.23. How important is social, human health or other harm (not directly included in economic and environmental categories) caused by the organism within its existing geographic range?	minor	medium	*C. ludovicianus* may act as a source of zoonotic disease, e.g. FWS (1999) quotes data from CDC showing 30 (13%) cases of plague in humans in a 40 year period were linked to contact with prairie dogs.
2.24. How important is the impact of the organism as food, a host, a symbiont or a vector for other damaging	moderate	medium	*C. ludovicianus* has been implicated as a contributing factor in persistence of plague outbreaks in other small

organisms (e.g. diseases)?			mammal populations (Brinkerhoff *et al* 2008), these other small mammals may act as a disease reservoir, while the prairie dogs themselves are highly susceptible to the plague bacterium (Thiagarajan *et al* 2008, USGS 2011). While prairie dogs may be no more likely to directly spread diseases than some species already found widely in GB, if fully established their high density colonies and high susceptibility to some diseases could facilitate the maintenance and increased dispersal of infection via other wildlife species during a disease outbreak, either the aforementioned small mammals, or via predators/scavengers (McGee et al 2006, Brinkerhoff 2008).Prairie dogs have been involved in a number of human zoonoses outbreaks in the US, including Tularemia (Avashia et al 2004) and also the spreading of monkey pox virus (Azad 2004). Prairie dogs populations may also harbour Bartonella and Rickettsia bacteria both of which can cause disease in humans (Reves, Rogers & Dasch 2007).
2.25. How important might other impacts not already covered by previous questions be resulting from introduction of the organism? (specify in the comment box)	N/A	medium	The main concerns have been adequately dealt with.
2.26. How important are the expected impacts of the organism despite any natural control by other organisms, such as predators, parasites or pathogens that may already be present in GB?	minor	high	
2.27. Indicate any parts of GB where economic, environmental and social impacts are particularly likely to occur (provide as much detail as possible).	[Geographically none, although areas of flat, grazed grassland might	high	There are no places where significant economic, environmental or social impacts are likely to occur. Any such impacts are likely to be very localised, small scale and linked to captive colonies rather than geography.

	be most vulnerable to establishment		

RISK SUMMARIES

	RESPONSE	CONFIDENCE	COMMENT
Summarise Entry	very likely	very high	Is already here
Summarise Establishment	likely	high	Has established free-living colonies in the vicinity of captive colonies. Is unknown how self-sustaining these would be in the long-term without human assistance (in the form of an adjacent captive colony and possible supplementary feeding).
Summarise Spread	slowly	high	Experience with escaped colonies in UK suggests limited spread beyond initial colony. Spread is likely to depend on suitable habitat and lack of human interference.
Summarise Impact	minor	high	Impact is likely to be low because establishment over a wide area seems unlikely and could probably be prevented.
Conclusion of the risk assessment	low	high	While some risk clearly exists, the establishment of an invasive spreading population appears a low risk .

Additional questions are on the following page ...

ADDITIONAL QUESTIONS - CLIMATE CHANGE			
3.1. What aspects of climate change, if any, are most likely to affect the risk assessment for this organism?	Changes in land management	medium	Topography, soil type and human interference are likely to be key factors, none of these are likely to significantly affected by climate change. However if farmers were to significantly alter grazing regimes or grass management on a large scale then there might be an impact on the availability of land for colonisation. Cannot predict if this would be positive or negative.
3.2. What is the likely timeframe for such changes?	50,	high	It seems unlikely that any changes would have sufficient impact to change the landscape in the short to medium term
3.3. What aspects of the risk assessment are most likely to change as a result of climate change?	risk of spread	low	If more suitable land was to appear them risk of spread may increase, and vice a versa.
ADDITIONAL QUESTIONS - RESEARCH			
4.1. If there is any research that would significantly strengthen confidence in the risk assessment please summarise this here.	[Survey of ownership, and trade. Monitoring of disperal	low medium high very high	A useful starting point would be an attempt to establish how many people/establishments in GB keep prairie dogs and the circumstances. If possible a radio-tracking study of animals in a feral colony might yield useful data on the nature of their dispersal movements and levels of mortality in a non-native situation.

Please provide a reference list on the following page ...

REFERENCES:

Avila-Flores, R., Boyce, M.S. & Boutin, S. (2010) Habitat Selection by Prairie Dogs in a Disturbed Landscape at the Edge of Their Geographic Range. Journal of Wildlife Management, Vol 74, pp945-953.

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