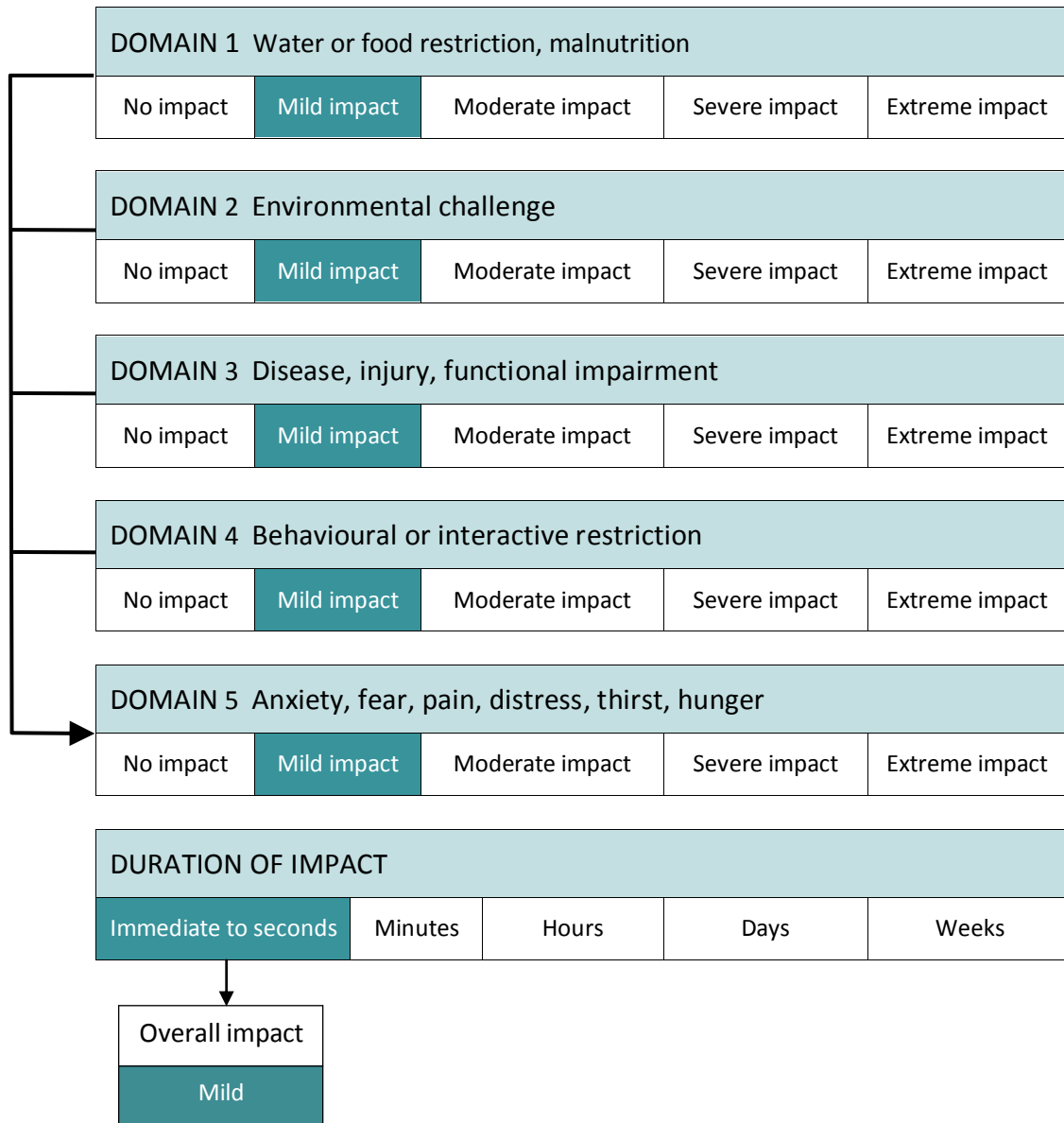


Control method: Rodenator – with adequate blast pressure

Assumptions:

- This humaneness assessment assumes that blast pressure is **adequate** throughout the warren to cause death for the majority of rabbits within the warren. (Another assessment has been done to assess humaneness when blast pressure is not adequate and the majority of animals are not killed).
- Best practice is followed in accordance with the standard operating procedure (currently under development).
- Operators must be fully trained in the effective, safe and humane application of this equipment.
- This method is used primarily as a method for killing small numbers of rabbits within a warren without causing the external destruction that occurs with ripping. It is best practice to use the Rodenator when rabbit numbers are at their lowest e.g. after a disease incursion (e.g. calicivirus) or after a control method such as fumigation (e.g. phosphine) or poisoning (e.g. 1080) has been applied.
- To achieve adequate blast pressure: -
 - Warrens must be small, with no more than 7 entrances and shallow (less than around 1-1.5 metres below ground level).
 - Burrows in the warren must be sealed prior to blasting. A smoker must be used to detect all openings.
 - The duration of gas flow required will depend on the size of the warren but must be adequate to achieve an adequate blast pressure throughout the entire warren (i.e. could be up to 6 minutes for warrens with 7 entrances).
- If there is any doubt that blast pressure has not been adequate, operators must always dig out a burrow and blow back with further blasts.

PART A: assessment of overall welfare impact



SCORE FOR PART A:	2
Summary of evidence:	
Domain 1	No impact in this domain.
Domain 2	It is possible that small numbers of rabbits could be outside the warren when blasting occurs and these may experience short-term exposure to extreme temperatures until they find alternative shelter.
Domain 3	Rabbits are exposed to the propane/oxygen mixture for a short period of time prior to ignition, however the concentration of propane is not high (around 2%) so the likelihood of suffering due to hypoxia is low. In humans death from hypoxia occurs with inhalation of high concentrations of propane (around 80%) ^{1,2} . Inhalation of smoke produced by heating of mineral oil by the 'smoker' could possibly cause respiratory tract irritation for a short period.
Domain 4	There is minor behavioural restriction because the warren entrances are sealed and rabbits are thus prevented from escaping. Also, prior to blasting, rabbits are driven underground into the warren by making loud noises (e.g. riding motorbikes) or using dogs. These disturbances are likely to cause flight or fight stress responses that are similar to those seen when prey escape from a predator. These endocrine responses are short lived and stress hormone levels quickly return to normal ³ .
Domain 5	The rabbits are likely to experience some fear and distress due to the noise and activity if they are chased into the warren and also whilst the warren entrances are being sealed and the propane/oxygen mixture is pumped in. They could potentially experience discomfort due to breathing in smoke.

PART B: assessment of mode of death

Time to insensibility (minus any lag time)				
Immediate to seconds	Minutes	Hours	Days	Weeks
Level of suffering (after application of the method that causes death but before insensibility)				
No suffering	Mild suffering	Moderate suffering	Severe suffering	Extreme suffering

SCORE FOR PART B:	C
Summary of evidence:	
Duration –	When the blast pressure is adequate throughout the warren, rabbits should die very quickly from the severe injuries sustained.
Suffering –	<p>If rabbits are rendered immediately insensible due to the blast-generated pressure waves and they do not regain consciousness prior to death, there will be no suffering. Thus, when blast pressure is adequate it is likely that the majority of rabbits will die without significant suffering however, there could still be some variability in the injuries received by each animal. Severity of injuries depends on proximity to blast, orientation of the rabbit's body and whether there are shielded from the blast (e.g. by another rabbit or structure within the warren such as a rock or tree root). Rabbits that are closer to the blast and are exposed to the full force of the blast will be the most severely injured.</p> <p>Post-mortems of rabbits killed by the Rodenator reveal that they all had perforated eardrums and major haemorrhages in the lungs (termed blast lung)⁴. Most animals had superficial burns to the skin. Around 50% of rabbits also had middle ear damage and foreign bodies (dirt and small pieces of vegetation) in the ears and eyes. 25% had myocardial contusions, most likely due to the compression of the chest wall against the heart. One animal had an abdominal perforation, specifically a perforation of the large intestine and another had fractures of the ribs. If animals are not rendered immediately insensible they will experience pain due to these injuries.</p>

Summary

CONTROL METHOD:	Rodenator – with adequate blast pressure
OVERALL HUMANENESS SCORE:	2C
Comments	With the Rodenator, the influence of blast pressure on likelihood of death is very important. For every unit increase in blast pressure (i.e. 1 psi) the odds of death are 1.17 times greater ⁴ .

Bibliography

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