CLAIMS

1. **A method of incapacitating a target pest species** comprising or including the steps of:

Providing a trap enclosure, the trap enclosure having an entry point for the target pest species into an interior of the trap enclosure, and a bait station to attract the target pest species, the trap enclosure including an exit aperture from the interior of the trap enclosure,

providing a kill engine, at least in part mounted from the trap enclosure, to at least in part deliver incapacitating energy to the target species, whereby the kill engine does not require electricity, the kill engine using an nonflammable gas charge, the kill engine when triggered actuates and then resets itself,

providing a source of compressed nonflammable gas, connected to, and supplying the kill engine,

having a species adapter connected at least in part to the trap enclosure to adapt the trap enclosure to the target pest species, the species adapter based on the size, habits or travel, nature of the target pest species,

defining a kill zone within an interior of the trap enclosure and or the species adapter,

providing a trigger mechanism to actuate the kill engine when triggered by the target pest species when in the kill zone,

providing a force delivery hammer, driven by the kill engine, to deliver the incapacitating energy,

expelling the target pest species out the exit aperture at least in part by the delivered incapacitating energy,

such that when the target pest species enters the apparatus and the kill zone it triggers the trigger mechanism to in turn actuate the kill engine to deliver the incapacitating energy by impacting the pest.

2. A method as claimed in claim 1 wherein the pest additionally impacts other force delivery portions after impact by the hammer, to delivery sufficient energy to incapacitate the target pest species.

3. A method as claimed in claim 1 wherein the trap enclosure or species adapter has the force delivery portion(s), whether static or mobile as a result of the incapacitating energy, that aid in delivering the incapacitating energy, and wherein the force delivery portion(s) act from the opposing side the force delivery hammer acts from, and the force delivery portion at least in part obscures the exit aperture, and the force delivery portion includes a latchable door that co-operates with the force delivery hammer in ejecting the pest

from trap and/or delivering the incapacitating energy by initially resisting the force delivery hammer, and the latchable door at least in part further obscures the exit aperture, wherein the latchable door opens in a direction parallel to the motion of the force delivery hammer.

~~2.~~4. A method as claimed in claim 1 the trap enclosure includes, at least in part, the exit aperture from the interior to the exterior, such that the incapacitated target pest species can be ejected from the interior to the exterior.

~~3.~~5. A method as claimed in claim ~~2~~ 1 which includes providing the exit aperture substantially parallel to a translational force of the incapacitating energy, such that the incapacitating energy expels the pest from the trap interior to a trap exterior.

~~4.~~6. A method as claimed in ~~any one of claims 1 to 3~~claim 1 wherein the translational force alone is sufficient to incapacitate the target pest species.

~~5.~~ A method as claimed in ~~any one of claims 1 to 4~~claim 1 wherein the nonflammable gas is any one or more of air, carbon dioxide or similar~~.~~

~~6.~~7. ~~A method as claimed in claim 5 wherein~~, and the force released by the trigger is caused by, any one or more of,

a. a pressure bias acting on an area or multiple areas of the delivery hammer,
b. the removal of a restraint that stops movement of a compressed elastic member,
c. a gas spring,
d. an electromagnetic effect, and
e. an impact from another moving component on the delivery hammer.

~~7.~~8. A method as claimed in ~~any one of claims 1 to 6~~claim 1 wherein the impact of the hammer alone is sufficient to incapacitate the target pest species.

~~8. A method as claimed in any one of claims 1 to 7 wherein the pest additionally impacts other force delivery portions after impact by the hammer, to delivery sufficient energy to incapacitate the target pest species.~~

~~9. A method as claimed in claim 8 wherein the trap enclosure or species adapter has the force delivery portion(s), whether static or mobile as a result of the incapacitating energy, that aid in delivering the incapacitating energy.~~

~~10. A method as claimed in either of claims 8 or 9 wherein the force delivery portion(s) act from the opposing side the force delivery hammer acts from.~~

~~11. A method as claimed in claim 10 wherein the force delivery portion at least in part obscures the exit aperture.~~

~~12. A method as claimed in either of claims 10 or 11 wherein the force delivery portion includes a latchable door that co-operates with the force delivery hammer in ejecting the pest from trap and/or delivering the incapacitating energy by initially resisting the force delivery hammer.~~

~~13.~~9. A method as claimed in claim ~~12~~ 3 wherein the force delivery hammer delivers a primary incapacitating energy and the force delivery portion co-operates to deliver a secondary incapacitating energy, one or more or both together sufficient to incapacitate the target pest species.

~~14. A method as claimed in any either of claims 12 or 13 wherein the latchable door at least in part further obscures the exit aperture.~~

~~15.~~ A method as claimed in ~~any one of claims 12 to 14~~claim 1 wherein the latchable door is on a time or energy delay to increase the energy delivery to the target pest species~~.~~

~~16.~~10. ~~A method as claimed in claim 15~~, wherein after the time or energy delay the latchable door opens to expel the target pest species via the exit aperture, the latchable door uses a magnet, mechanical latch, timing or similar mechanism that is overcome by the energy to then release the door, or that releases the door a certain period of time after triggering of the kill engine, or movement of the force delivery hammer.

~~17. A method as claimed in any one of claims 12 to 16 wherein the latchable door opens in a direction parallel to the motion of the force delivery hammer.~~

~~18.~~11. A method as claimed in ~~any one of claims 12 to 17~~claim 10 wherein the latchable door is pivoted on an axis above the kill zone such that when it opens it swings out of the way, the energy imparted to the target pest species then expels it from the kill zone, the exit aperture is in a plane substantially perpendicular to the linear action of the force delivery hammer.

~~19. A method as claimed in any one of claims 13 to 18 wherein the latchable door uses a magnet, mechanical latch, timing or similar mechanism that is overcome by the energy to~~

~~then release the door, or that releases the door a certain period of time after triggering of the kill engine, or movement of the force delivery hammer.~~

~~20.~~12. A method as claimed in ~~any one of claims 12 to 19~~claim 11 wherein the latchable door is biased to return to the closed latched state by gravity or a biasing mechanism.

~~21. A method as claimed in any one of claims 1 to 20 wherein the exit aperture is in a plane substantially perpendicular to the linear action of the force delivery hammer.~~

~~22. A method as claimed in any one of claims 1 to 21 wherein the entry point is in a plane substantially parallel to the linear action of the force delivery hammer.~~

~~23.~~13. A method as claimed in ~~any one of claims 1 to 22~~claim 1 wherein the force delivery hammer impacts the target pest species at a first location, and then, after the first location, at a second location, wherein the first location is the skull region and the second location is the body region.

~~24.~~14. A method as claimed in ~~any one of claims 8 to 23~~claim 1 wherein the force delivery portion is a fixed portion of the trap enclosure which the target pest species will be forced against by the force delivery hammer, to deliver further energy to the target pest species.

~~25. A method as claimed in any one of claims 1 to 24 wherein the exit aperture can serve as an entry point for the target pest species.~~

~~26.~~15. A method as claimed in ~~any one of claims 1 to 26~~claim 1 wherein the kill engine can be removed from the trap enclosure should it need repair, maintenance or replacement, and the trap enclosure can be left in place.

~~27.~~16. A method as claimed in ~~any one of claims 1 to 26~~claim 1 wherein the species adapter includes a guide portion to the entry point, the species adapter at least in part defines the entry point, and the species adapter at least in part defines the exit aperture.

~~28.~~17. A method as claimed in claim ~~26~~ 16 wherein the guide portion is a guide surface or surfaces for the target pest species, or part thereof, to move along from the mounting surface to the entry point.

~~29. A method as claimed in any one of claims 1 to 28 wherein the species adapter at least in part defines the entry point.~~

~~30. A method as claimed in any one of claims 1 to 29 wherein the species adapter at least in part defines the exit aperture.~~

~~31.~~18. A method as claimed in ~~any one of claims 1 to 30~~claim 1 wherein the incapacitating energy is sufficient to do to the target pest species any one or more of,

- stop the heart,
- dislocate the neck and,
- disrupt brain matter, or
- sever the spinal column,

sufficient to render the pest irreversibly unconscious.

~~32.~~ A method as claimed in any one of claims 1 to 31 wherein the target pest species is rendered irreversibly unconscious and expelled within a time frame of under 1 second~~.~~

~~33.~~19. ~~A method as claimed in any one of claims 1 to 32,~~ wherein the target pest species is rendered incapacitated and expelled within a time of 0.050 seconds to 0.2 seconds and preferably within 0.02 seconds.

~~34. A method as claimed in any one of claims 1 to 33 wherein the force delivery hammer connects with either the body portion or head portion of the target pest species.~~

~~35. A method as claimed in claim 34 wherein the force delivery hammer impacts the target pest species at a first location, and then, after the first location, at a second location.~~

~~36. A method as claimed in claim 34 wherein the first location is the head portion and the second location is the body portion.~~

~~37.~~20. A method as claimed in ~~any one of claims 1 to 36~~claim 1 wherein the force delivery hammer is contoured to reduce the area of delivery to the target pest species, to increase the impact stress/energy delivered to effect a humane kill.

~~38.~~21. A method as claimed in ~~any one of claims 1 to 37~~claim 1 wherein there is a restraining portion to restrain at least in part, the body portion, or head portion, when the force delivery hammer connects with the head portion, or body portion.

~~39.~~22. A method as claimed in claim ~~38~~ 21 wherein the restraining is dynamic.

~~40. A method as claimed in any one of claims 1 to 39 wherein the incapacitating energy, and or gravity is at least in part sufficient to expel the target pest species from the trap interior to the trap exterior.~~

~~41.~~23. A method as claimed in ~~any one of claims 1 to 40~~claim 1 wherein the trap is substantially vertically mounted, and entry into and exit out of the trap of the pest is in a vertical direction.

~~42.~~24. A method as claimed in claim ~~41~~ 23 wherein the pest is a possum or similarly vertically moving pest.

~~43.~~25. A method as claimed in ~~any one of claims 1 to 42~~claim 1 wherein the trap is substantially horizontally mounted, and entry into, and exit out of the trap is in a horizontal direction.

~~44.~~26. A method as claimed in claim ~~43~~ 25 wherein the pest is a mouse, rat, stoat, ferret or similar animal.

~~45.~~27. A method as claimed in any one of claims 1 to 44 wherein the pest control apparatus includes a fluidly connected refillable gas reservoir to hold a store of gas for the gas charge.

~~46.~~28. A method as claimed in ~~any one of claims 1 to 45~~claim 1 wherein the gas is stored in the refillable reservoir at a pressure between 600 pounds per square inch and 6000 pounds per square inch, preferably the gas is stored at 800 pounds per square inch and the gas is regulated to operate the piston at between 125 pounds per square inch and 600 pounds per square inch, and wherein the gas is regulated to operate the piston at 175 pounds per square inch.

~~47. A method as claimed in any one of claims 1 to 46 wherein the gas is regulated to operate the piston at between 125 pounds per square inch and 600 pounds per square inch.~~

~~48. A method as claimed in any one of claims 1 to 47 the gas is stored at 800 pounds per square inch.~~

~~49. A method as claimed in any one of claims 1 to 48 wherein the gas is regulated to operate the piston at 175 pounds per square inch.~~

~~50.~~29. A method as claimed in ~~any one of claims 1 to 49~~claim 1 wherein the refillable reservoir remains connected when being refilled.

~~51.~~30. A method as claimed in ~~any one of claims 1 to 50~~claim 1 wherein a specific target species apparatus can be assembled from the kill engine, trap enclosure and specific target species adapter.

~~52.~~31. A method as claimed in ~~any one of claims 1 to 51~~claim 1 wherein the trigger mechanism is activated by a body part of the pest, such as the head, body or feet, or may be operated when the pest bites a portion of the trigger mechanism.

~~53.~~32. A method as claimed in ~~any one of claims 1 to 52~~claim 1 wherein the entry point has a line of sight from the entry, through the trap enclosure, to exterior of the trap enclosure.

~~54.~~33. A method as claimed in claim ~~53~~ 32 wherein the linear action of the force delivery hammer is substantially perpendicular to the line of sight.

~~55.~~34. **A method of operating a self re-setting trap to incapacitate a target pest species** comprising or including the steps of:

Luring a target pest species into an interior of a trap enclosure, the trap enclosure with a species adapter excluding non-target pest species from entering, the trap enclosure including an exit aperture from the interior of the trap enclosure, the target pest species entering a kill zone defined by the trap enclosure and or species adapter,

The target pest species triggering a trigger mechanism when in the kill zone, which in turn actuates a kill engine, the kill engine, at least in part mounted from the trap enclosure, to at least in part deliver incapacitating energy to the target species, whereby the kill engine does not require electricity, the kill engine using an nonflammable gas charge , the kill engine when triggered actuates and then resets itself,

Driving a force delivery hammer across the kill zone to deliver the incapacitating energy,

Expelling the target pest species from the interior of the trap enclosure via the exit aperture by the incapacitating energy and orgravity.

~~56.~~35. A **self-resetting pest control apparatus** to incapacitate a target pest species and reset itself after such incapacitation, comprising or including,

A kill engine to at least in part deliver incapacitating energy to the target species, whereby the kill engine does not require electricity, the kill engine using an nonflammable gas charge, the kill engine when triggered, will actuate and then reset itself,

a source of compressed nonflammable gas, connected to and supplying the kill engine,

a force delivery hammer, driven by the kill engine, that when actuated linearly delivers the incapacitating energy to the target pest species by impacting thereon,

A trap enclosure from which the kill engine is at least in part mounted, the trap enclosure having an entry point for the target pest species into an interior of the trap enclosure, a bait station, and trigger mechanism to trigger the kill engine, the trap enclosure includes, at least in part, an exit aperture from the interior of the trap enclosure, and the target pest species is ejected, at least in part by the incapacitating energy, out the exit aperture, and,

A species adapter to connect at least in part to the trap enclosure to adapt the trap enclosure to the target pest species, the species adapter based on the size, habits or travel
nature of the target pest species,

such that when a target pest species enters the apparatus it triggers the trigger mechanism, causing the kill engine to actuate and deliver incapacitating energy to the target pest species.

~~57. A trap as claimed in claim 56 wherein the exit aperture is in a plane substantially perpendicular to the linear action of the force delivery hammer.~~

~~58. A trap as claimed in either of claims 56 or 57 wherein the entry point is in a plane substantially parallel to the linear action of the force delivery hammer.~~

~~59. A trap as claimed in any one of claims 56 to 58 wherein the linear action of the force delivery hammer is substantially perpendicular to the line of sight.~~

~~60. **A method of incapacitating a target pest species** as described herein with reference to any one or more of the accompanying drawings.~~

61. A **method of operating a trap to incapacitate a target pest species** as described herein with reference to any one or more of the accompanying drawings.

62. A **pest control trap to incapacitate a target pest species** as described herein with reference to any one or more of the accompanying drawings.