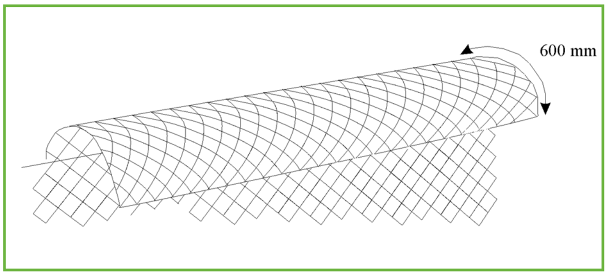
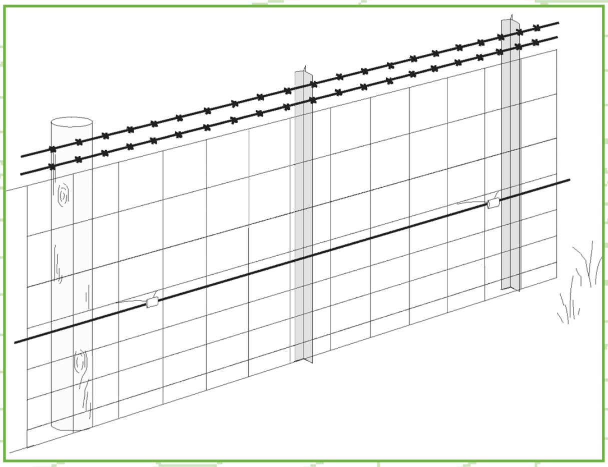


Catalogue of fence designs



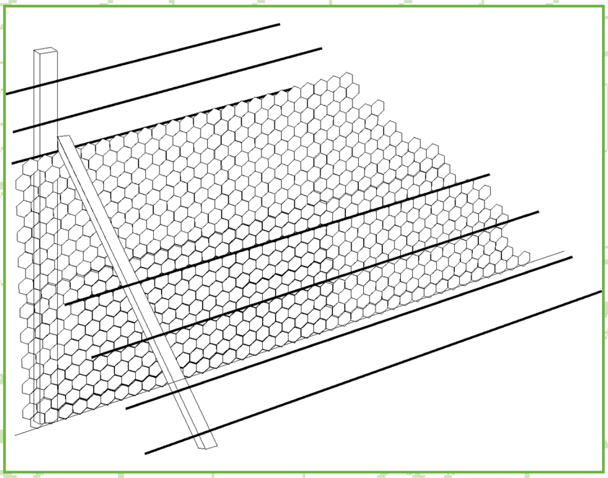


Table of Contents

Introduction **C-3**

Raw materials and costs C-3

Feral pig fences

Fabricated pig fences C-5

Electrified trip-wire pig fence C-6

Feral goat fences

Fabricated goat fence 1 . . . . C-7

Fabricated goat fence 2 . . . . C-8

Feral rabbit fence

Rabbit netting fence C-9

Fox fences

Sloping fox fence 1 . . . . C-10

Sloping fox fence 2 . . . . C-11

Combined fox, feral cat, feral rabbit fences

Floppy-top fences C-12

Overhang fences C-13

Electric wire overhang fences C-14

Mesh/electric wire composite fences C-15

Capped fences C-16

Dingo/feral dog fences

Sloping dog fence C-17

Composite dog fence C-18

Fabricated dog fence C-19

Breakdown of fence costs **C-20**

Raw material costs C-25

Introduction

This catalogue compiles schematic diagrams and specifications (where available) of fences that have been used to exclude the specified feral animals (foxes, feral cats, feral rabbits, feral goats, feral pigs and dingoes/feral dogs). The catalogue designs were identified either from the reviewed literature or discussions with current managers of exclusion fences in Australia and New Zealand. Note that the diagrams are not drawn to scale and provide only a general depiction of raw materials and construction specifications.

In some cases the catalogue designs have been experimentally tested and their effectiveness can be accurately quantified. In other cases qualitative in situ assessments of the effectiveness have been made by fence managers, based on observations of feral animal incursions (or lack thereof) into the enclosed area. Where multiple fence designs have been experimentally tested and compared (e.g. Bird et al.1997, Hone and Atkinson 1983) only the most effective design/s have been included. In all cases the effectiveness of each design, and the methods by which this was determined, are stated in the catalogue, as is the origin of the fence design. The effectiveness of a fence may vary under a different set of environmental conditions, as discussed in section 7. A summary of the primary design features of each fence and the estimated cost (in Australian dollars, current as of January 2004) of the fencing materials per kilometre is also provided.

Fence cost estimates (materials only)

The estimated cost of materials per kilometre is provided for each fence design to allow their relative cost-effectiveness to be assessed. A breakdown of the cost estimates for each design, along with the raw material costs, can be found on catalogue pg 19 – 28. Quotes for materials were sought from several fencing suppliers in the outer Melbourne region between July 2003 and January 2004. These prices should be used as guides only, as material costs are likely to vary considerably across Australia depending on the cost of freight and the availability of raw materials. The cost estimates do not include the cost of minor incidentals or of electric fence energisers or gates, as the type and quantity of these will vary depending on the size of the area to be fenced and access requirements. The additional cost of labour to plan and construct the fence may comprise up to 50% of the final budget.

To allow cost comparisons to be made between fences designed to exclude the same species, the distances between posts and droppers, and the number of end assemblies used were standardised (Unless stated otherwise, all cost estimates include two end assemblies, each with two strainer posts and one rail). These specifications and the products used, sometimes differ from those used in the original, referenced designs. Advice should be sought from local fencing contractors when planning an exclusion fence, as the spacing between posts and end assemblies, and hence the cost, will vary appreciably between locations according to the terrain and the shape of the area to be fenced.

If a different product is chosen as a substitute from those specified in the fence catalogue it is important to ensure that the minimum critical dimensions, such as mesh size and fence height, are maintained. Altered or custom-made components used to reduce material costs, or to achieve a unique design, are a feature of many exclusion fences. Durable, high quality, products should always be purchased to minimise future maintenance requirements and maximise the long-term cost-effectiveness of the fence. For example, porcelain insulators are more durable and fire resistant than plastic insulators, and hence are used in the cost estimates.

Wire netting specifications are listed as the height x the mesh size (in centimetres) x wire diameter (in millimetres). Fabricated fencing specifications are listed as the number of horizontal wires / the height (in centimetres) / the distance between vertical wires (in centimetres). Brand or product names, by which some components are frequently referred, have been omitted so as not to show any product bias. To avoid confusion, however, note that 'steel standards' in the tables below, refer to products that are most commonly known by the Star® Post product name and fabricated fencing refers to a range of products (with graduated spacings between horizontal wires and regularly spaced vertical wires) commonly known by the product names Titegrip, Ringlock and Hinged Joint.

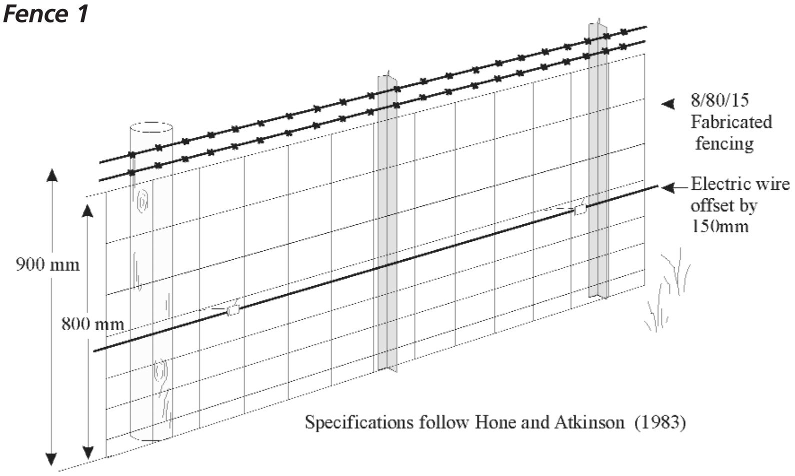
Wire netting with a 30 mm mesh size is necessary to exclude independent,Wire netting with a 30 mm mesh size is necessary to exclude independent, juvenile rabbits (see section 9.2), but this is not readily available in Australia. We have therefore costed most fences (the exception being the rabbit fence) using the price of the more readily available 40 mm netting. Thirty millimetre netting can be sourced from overseas (K. Moseby pers. comm.) or, if sufficient quantities are required, Australian manufacturers may produce customised batches to order. The price of imported 30 mm netting is provided in the list of raw material costs (pg 28 of this catalogue), and if used at the base of combined fox, cat and rabbit fences, it would reduce the cost of these fences by approximately $1000/km.

Ironbark droppers, or those made with similarly dense timber, are used in some of the cost-estimates. These provide a sufficiently high resistance such that electric wires do not require additional insulators, at least in short and medium length fences, and in all areas except those that are subject to very high rainfall or salt spray (McCutchan 1980). Note that the insulating properties of these droppers may vary between products, and local fencing suppliers should be consulted on this. Some products have predrilled wire spacings that do not necessarily correspond with the wire spacings in many of the exclusion fence designs shown (since fences designed to exclude feral animals typically have more wires, that are spaced closer than those designed to contain domestic stock). This has necessitated the use of multi-grooved droppers in the cost-estimates which are cheaper than the pre-drilled option but their insulating properties may not be as effective (R. Ambrose pers. comm.).

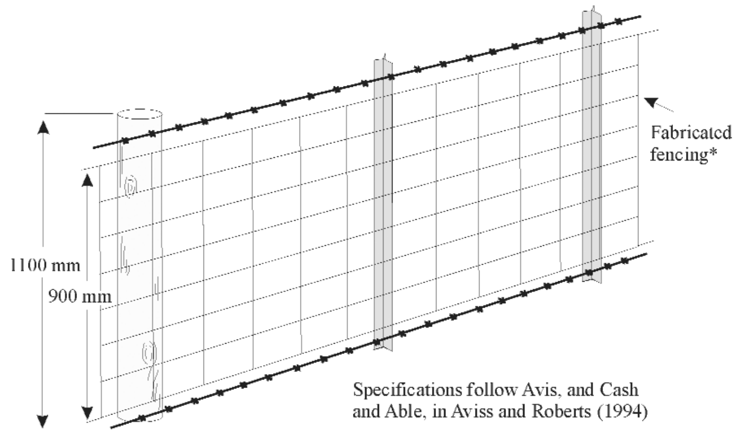
Feral pig fences

Fabricated pig fences

Fence 1



Fence 2



Efficiency:

Fence 1: Hone and Atkinson (1983) found this fence effectively contained four feral pigs in a 600 m2 enclosure during 100 hour trial periods when it was both electrified and non-electrified.

Fence 2: This design has not been formally tested but has proven effective in situ (Aviss 1994, Cash and Able 1994).

Examples of use:

Fence 1: Used during trials conducted by NSW Dept. of Agriculture (Hone and Atkinson 1983).
Fence 2: Used to protect threatened snail colonies and significant native vegetation in New Zealand from feral pigs and goats (Aviss 1994, Cash and Able 1994).

Features:

- Fabricated fencing provides an effective barrier
- Barbed wire or fabricated fencing is placed close to the ground to prevent pigs passing under the fence.
  Note: If the fabricated fencing is placed directly on the ground, as is suggested by fence design 1, it will corrode relatively quickly.

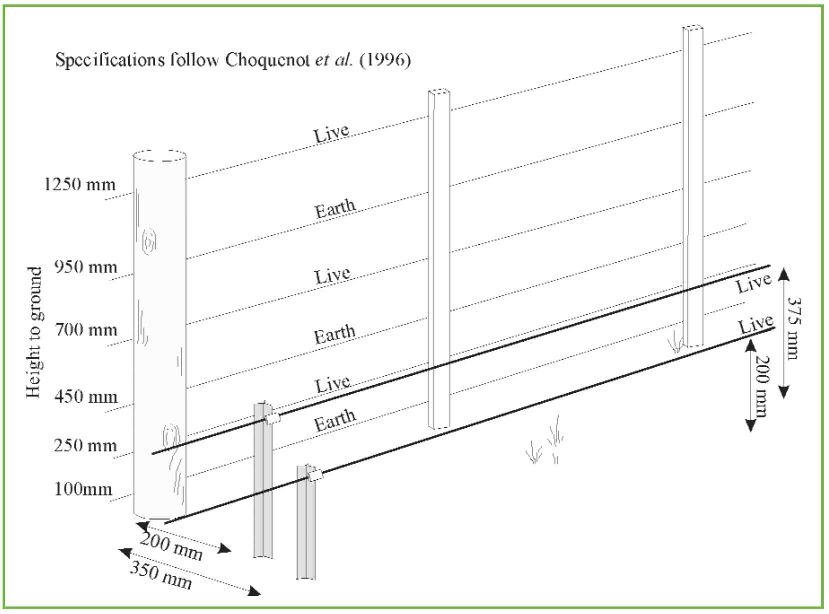
Estimated cost of materials:

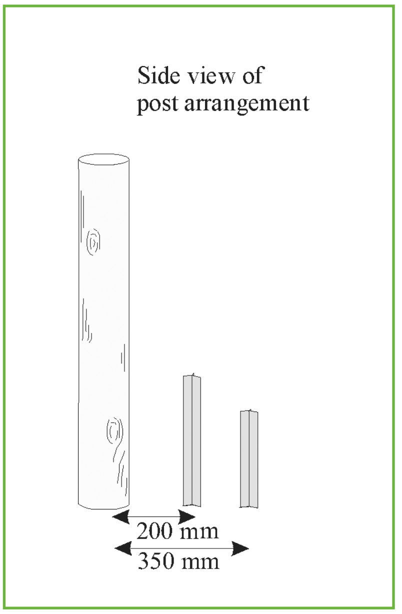
Fence 1: $3,500/km, Fence 2: $3,100/km (using 8/90/30), $3,200/km (using 8/90/15)*

Additional Information:

**** Fence 2:*** This design can also be used to exclude feral goats. Fabricated fencing 8/90/30 and 9/90/15 can be used. The former is preferred for goats and the latter for pigs (see section 10.4).

Electrified trip-wire pig fence





Examples of use:

Extent of use unknown, however, the use of trip-wires in conjunction with existing fences is being used on agricultural properties to protect domestic stock (see 'Efficiency section).

Features:

- Trip wires deter pigs before they reach the main fence, reducing possible damage and breaches.
- Alternate earth and live wires ensure that animals attempting to cross the fence receive a shock.

Estimated cost of materials:

$3,900/km

Additional information:

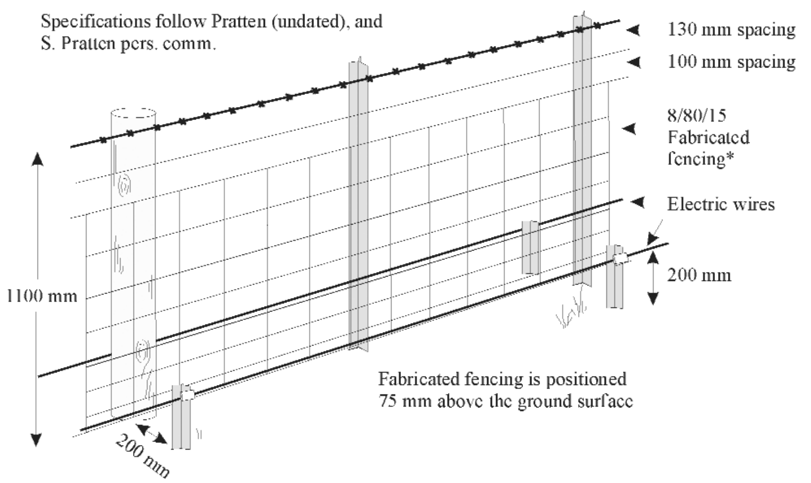
In areas where the soil is dry, the trip wires in this fence are likely to be more effective if one is an earth wire (see section 5.1.1 for further details)

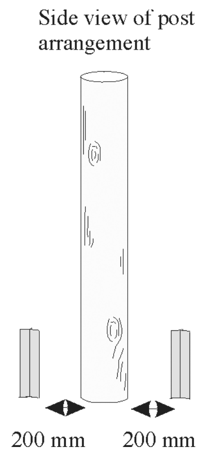
Efficiency:

This fence was developed by NSW Agriculture (Choquenot et al. 1996), however during this review we were unable to locate any data quantifying its success. A variation of this design is being successfully used on an agricultural property in NSW (I. McDouall pers. comm.). In this case only a single electric trip wire (approx. 30 cm off the ground and 30 cm in front of fence) is being used outside an existing rabbit proof/domestic stock fence (90 cm high rabbit meshing topped with two plain wires and one barbed wire and a rabbit mesh apron). The electric wire is supported by metal posts spaced at one metre intervals.

Feral goat fences

Fabricated goat fence 1





Examples of use:

This design (but with only a single trip-wire) is recommended by NSW Agriculture and the National Parks and Wildlife Service, NSW, as a boundary standard goat fence (Pratten undated). The author of this report suggests an additional trip wire is required (as illustrated) to prevent non-target animals pushing beneath the fence and creating holes that will later by used by goats (S. Pratten pers. comm.). A variation of this design uses shorter fabricated fencing (570 mm high) with an extra electric wire above this and below the first plain wire (Pratten undated). Note that to comply with the Australian/New Zealand Standard AS/NZS 3014:2003, the barbed wire should be replaced with a plain wire for this design variation. These fences are currently being used to keep feral goats out of several agricultural properties in the Hunter Valley, N.S.W. (S. Pratten pers. comm.).

Features:

- Fabricated fencing forms an effective barrier.
- Trip-wires and a minimal gap between the fence and the ground deter goats and other animals from pushing beneath the fence.

Estimated cost of materials:

$4,200/km

Additional information:

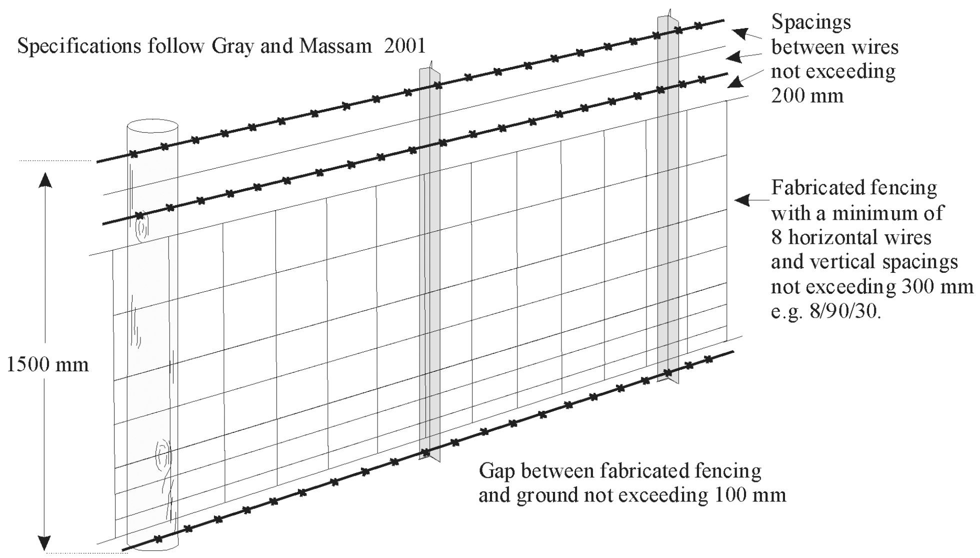
* Fabricated fencing with vertical wire spacings of 150 mm (as used in this design) is generally not recommended, as horned goats may get their heads stuck in the mesh (Parkes *et al*. 1996). See section 10.4 for further information.

Note: Also see Fabricated pig fence 2, which is used to exclude feral goats as well as pigs.

Efficiency:

This design has not been formally tested but has proven effective *in situ* (S. Pratten pers. comm.).

Fabricated goat fence 2



Examples of use:

This design is recommended by the Department of Agriculture, Western Australia to enclose feral goats that are being domesticated (Gray and Massam 2001). Extent of use unknown.

Features:

- Fabricated fencing forms an effective barrier.
- A minimal gap between the fence and the ground deter goats and other animals from pushing beneath the fence.
- Additional wires above the fabricated fencing increase the fence height to prevent goats jumping the fence.

Estimated cost of materials:

$3,400/km. Note, to allow comparison with other goat fences, a 4 m post spacing has been used in this cost estimate rather than the post spacing stipulated (below) by Gray and Massam (2001).

Additional information:

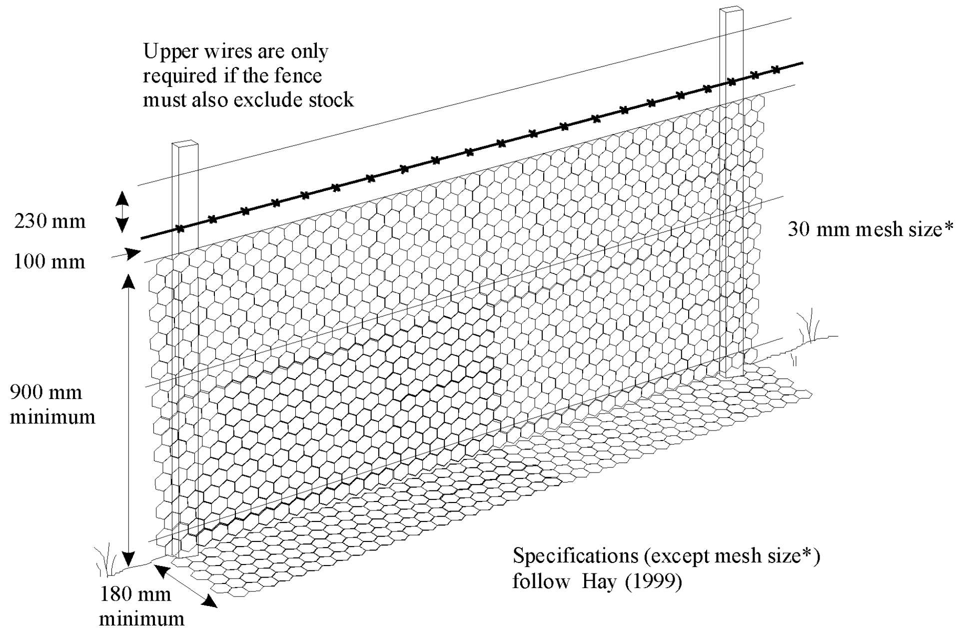
Gray and Massam (2001) state that line posts should be spaced no more than 6 m apart and droppers at 2 m. If this is not possible, the bottom barbed wire should be securely pegged to the ground at 6 m intervals.
Note: Also see Fabricated pig fence 2, which is used to exclude feral goats as well as pigs.

Efficiency:

This design has not been formally tested (G. Gray pers. comm.), but represents the minimum specifications accepted by the Department of Agriculture, W.A. for enclosing feral goats that are to be domesticated (Gray and Massam 2002). It is suggested that adding an offset electric wire, such as the trip-wire used for the previous fence design, would improve the level of protection provided by this fence (G. Gray pers. comm.).

Feral rabbit fence

Rabbit netting fence



Examples of use:

Widely used throughout Australia to protect agricultural land and threatened vegetation communities from feral rabbits.

Features:

- Wire netting provides an effective barrier
- Mesh apron prevents animals passing beneath the fence

Estimated cost of materials:

$4,000/km, or $3,700/km without the top two stock wires. Both of these prices have been costed using a single 1200 mm width of 30 mm imported wire netting. In moist environments, use of a separate apron that is easy to replace is advisable.

Additional information:

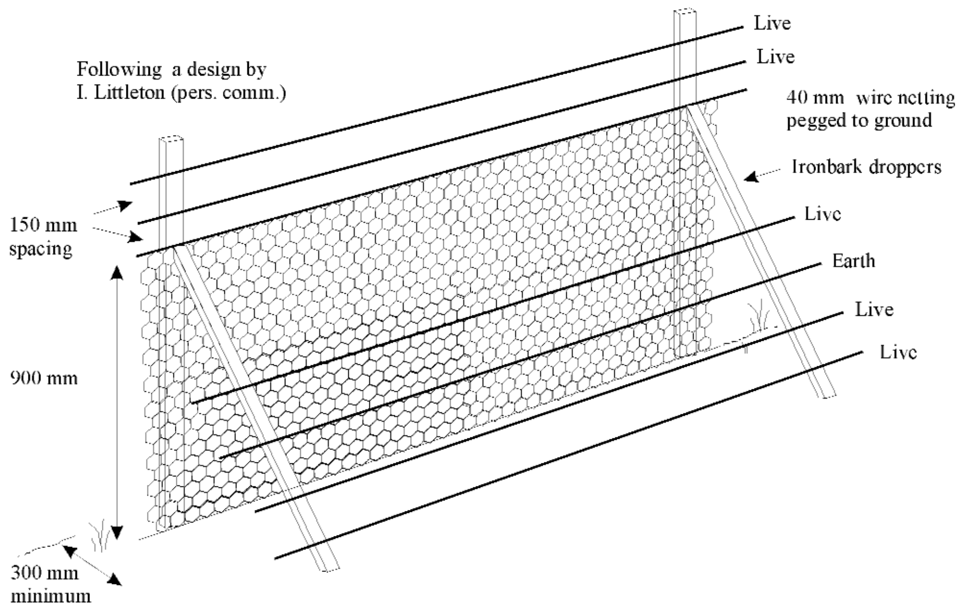
The fence specifications above follow Hay (1999), however, of the fences surveyed during this review (which were combined feral rabbit, cat and fox fences), larger aprons (typically 300 to 600 mm) were more frequently used. *Wire netting with the recommended 30 mm mesh size is not readily available in a suitably heavy gauge wire, but it can be sourced from overseas (K. Moseby pers. comm.) or, if sufficient quantities are required, Australian manufacturers may produce customised batches to order.

Efficiency:

Wire netting with a 30 mm mesh size has been found to be necessary to exclude independent juvenile rabbits (Moseby and Read in prep). Captive trials show that rabbits are capable of crossing a 900 mm high fence but this is unlikely to occur frequently (McKillop et al. 1988). Extending the height or adding a small overhang may be warranted if an added level of protection is required.

Fox fences

Sloping fox fence 1



Examples of use:
Used to protect domestic, free-range poultry. A variation of this design, using fabricated fencing as a substitute for wire netting, is being trialed on private properties in NSW to protect bush-stone curlew nests from fox predation.

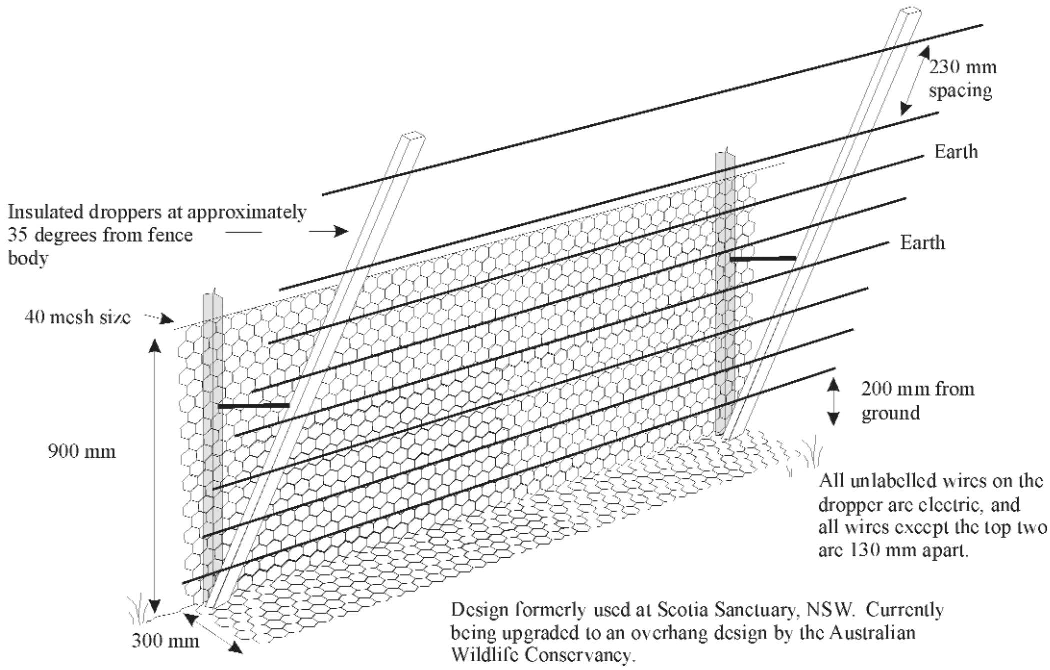
Features:

- Electric wires deter animals from the fence
- Wire netting prevents animals pushing through the base of the fence.

Estimated cost of materials:
$6,200/km

Efficiency:
This design, and a variation of it (with two electric wires offset 150 – 200 mm from the fence at heights of 200 mm and 1000 mm high, as a substitute for the electric wires on the dropper) has proven effective in situ (I. Littleton pers. comm., Lund and DeSilva 1987). However, in some situations where this design has been used effectively it has been done so in combination with the use of guard dogs (I. Littleton pers. comm.). Another variation, using seven electric and earth wires as a substitute for the wire netting, was found to be ineffective, and the use of an existing fence with fabricated netting was relatively effective but did not afford the same level of protection as the design illustrated (I. Littleton pers. comm.). Foxes that are sufficiently motivated are theoretically capable of jumping fences of this height and therefore the use of these fences may be best restricted to areas that can tolerate occasional fox incursions.

Sloping fox fence 2



Examples of use:

Previously used by Earth Sanctuaries Pty Ltd at Scotia Sanctuary (N.S.W.) to protect native wildlife

Features:

- Electric wires deter animals from the fence
- Wire netting prevents animals pushing through the base of the fence.
- Mesh apron deters animals from pushing or digging under the fence

Estimated cost of materials:

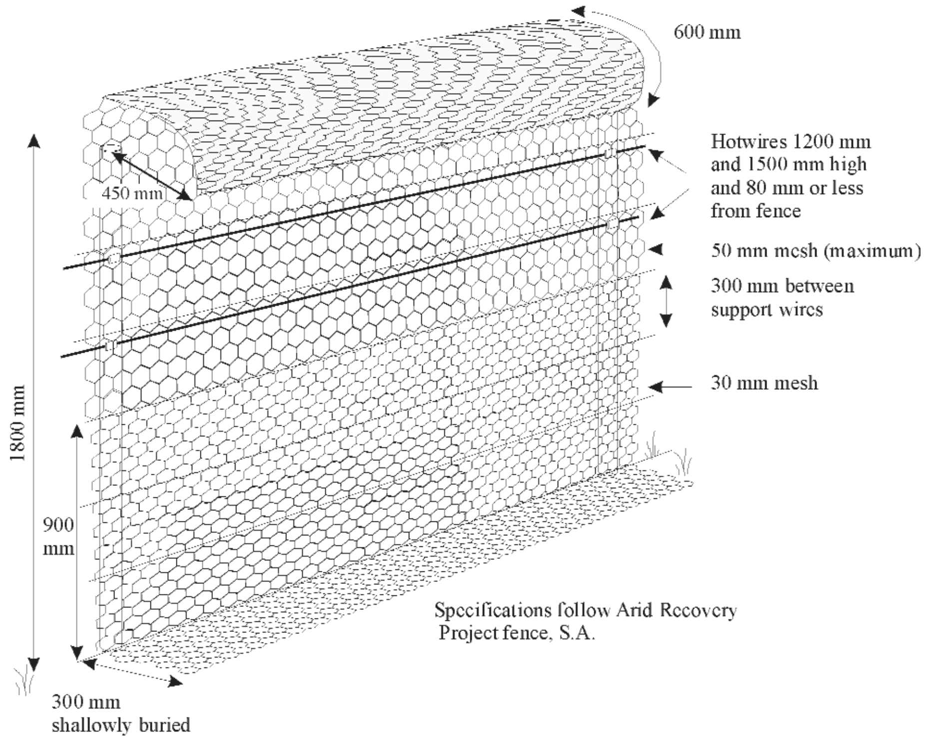
$6,800/km

Efficiency:

This design has not been formally tested but has proven effective in situ. Daily monitoring of track transects within the 6,000 ha Scotia Sanctuary has shown no evidence of fox incursions since July 2002 (although cats have been detected; A. Schmitz pers. comm.). Foxes that are sufficiently motivated are theoretically capable of jumping fences of this height and therefore the use of these fences may be best restricted to areas that can tolerate occasional fox incursions.

Combined fox, feral cat, feral rabbit fences

Floppy-top fences – for foxes, cats and rabbits



Examples of use:
Used at the Arid Recovery Project (S.A.) to protect resident native and reintroduced wildlife and native vegetation. Similar designs are also used at Wardang Island (S.A.), Currawinya National Park (Qld.), Royal Botanic Gardens Cranbourne (Vic.), Heirisson Prong (W.A.), Watarrka National Park (N.T.), Yaraandoo Environmental Centre (N.S.W.) and by the N.S.W Roads and Traffic Authority.

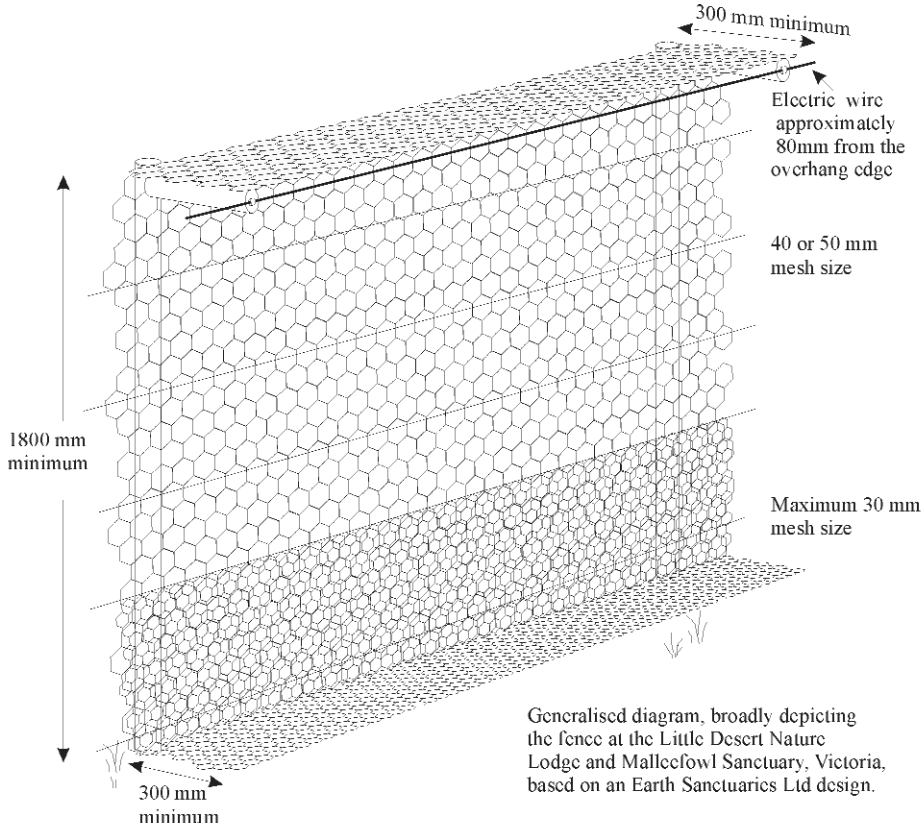
Features:
- Floppy top prevents climbing animals scaling the fence.
- Electric wires deter climbing animals from attempting to scale the floppy top.
- Wire netting with 30 mm mesh at the base prevents rabbits passing through the fence.
- Mesh apron deters animals from pushing or digging under the fence.

Estimated cost of materials:
$10,300/km or $9,700/km without the electric wires.

Additional information:
Variations of this design include differences in the size and degree of curvature of the floppy top and in the utilisation of electric wires. These variations have not been experimentally tested.

Efficiency:
No cats breached this fence during captive trials conducted at the Arid Recovery Project site (Moseby and Read in prep.). Additionally, regular track transects have indicated no fox or cat breaches since these animals were eradicated from within the 60 km2 reserve in March 1999, even though a majority of the perimeter fence does not include the two electric wires that were found to be necessary during captive trials. Trials also showed that a mesh of 30 mm is necessary to exclude independent juvenile rabbits (Moseby and Read in prep.).

Overhang fences – for foxes, cats and rabbits



Generalised diagram, broadly depicting the fence at the Little Desert Nature Lodge and Malleefowl Sanctuary, Victoria, based on an Earth Sanctuaries Ltd design.

Examples of use:

Variations of this design are used at the Little Desert Lodge and Malleefowl Sanctuary (Vic.), Scotia Sanctuary (NSW), Venus Bay Conservation Park (S.A.), Peron Peninsula, Paruna Sanctuary, Ellenbrook Nature Reserve and Twin Swamps Nature Reserve (W.A.) to protect native resident and reintroduced wildlife.

Features:

- Overhang with an electric wire at the edge deters climbing animals.
- Wire netting provides an effective barrier
- Mesh apron deters animals from pushing or digging under the fence

Estimated cost of materials:

$9,900/km or $8,900/km using 30 mm netting (imported) at base.

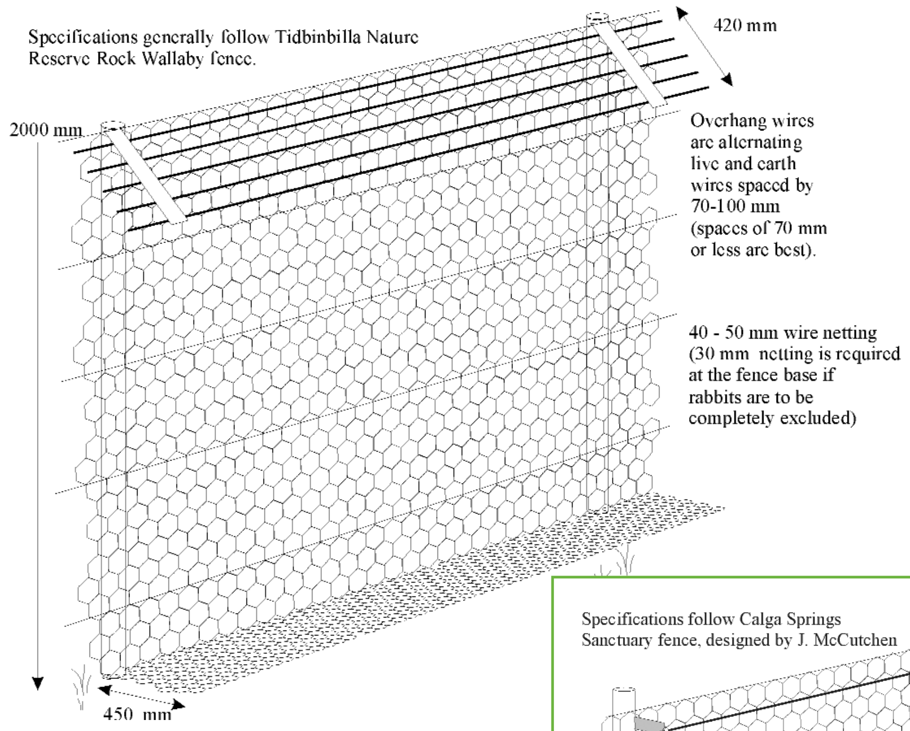
Additional information:

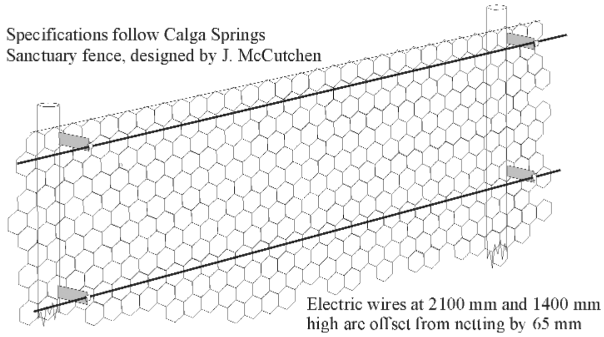
The generalised design shown does not truly depict any of the existing fences mentioned and, as a result, exact specifications are not given. The size of the overhang, and the number and position of electric wires varies between designs. Most versions of this design also include electric wires on outriggers at different heights in the body of the fence to further deter climbing animals and non-target species such as kangaroos. Chain mesh rather than wire netting is used at Peron Peninsula, Paruna Sanctuary and Twin Swamps Nature Reserve.

Efficiency:

This design does not appear to have been formally tested, although discussions with fence managers suggest that such fences have proven effective in situ.

Electric wire overhang fences – for foxes, cats and rabbits





Examples of use:

These designs, and variations of them, are used at Calga Springs Sanctuary (N.S.W.), Tidbinbilla Nature Reserve (A.C.T.), Woodlands Historic Park and Hamilton Community Parklands (Vic.) and Cleland Wildlife Park (S.A.) to protect native wildlife.

Features:

- Overhang electric wires deter climbing animals.
- Wire netting forms an effective barrier
- Mesh apron deters animals from pushing or digging under the fence

Estimated cost of materials:

$11,400/km (based on the use of two electric wires and an earth-wire in the overhang), 9,800/km if lighter grade posts are used (see Appendix 3).

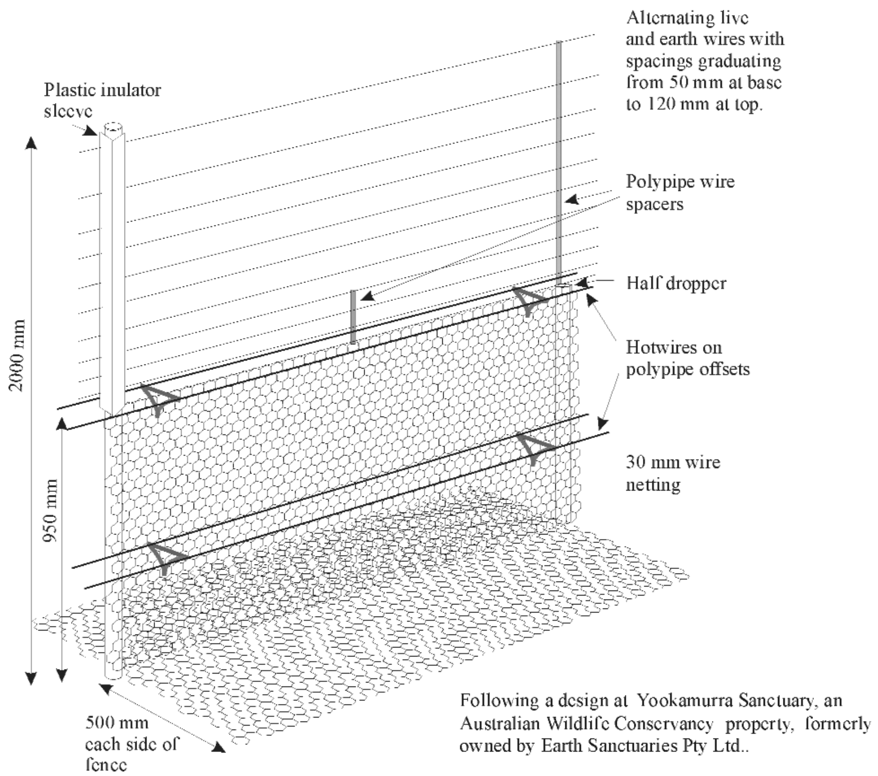
Additional information:

Electric wire overhang designs vary considerably in the number and positioning of electric wires. The illustrated designs represent the simplest, and one of the more complex fences. Some fences include additional electric wires offset from the fence body.

Efficiency:

The designs illustrated have not been formally tested but have proven effective in situ. However, some fences with overhangs comprised of electric wires have experienced repeated breaches. These can probably be explained by low voltages and the formation of relatively wide gaps between the electric wires and between the first electric wire and the wire netting. Maintaining a narrow spacing between these components is critical (see section 5.1.1).

Mesh/electric wire composite fences – for foxes, cats and rabbits



Examples of use:

This designs and variations of it are used at Yookamurra Sanctuary (S.A.), the Living Desert Wildlife Park (N.S.W.) and Karakamia (W.A.) to protect resident and reintroduced native wildlife.

Features:

- Closely spaced electric wires form a physical barrier and an electrical deterrent.
- Wire netting prevents animals pushing through the base of the fence.
- Mesh apron deters animals from pushing or digging under the fence

Estimated cost of materials:

$8,000/km.

Efficiency:

This design and variations of it have not been formally tested but have proven effective in situ (A. Schmitz and J. Brayshaw pers. comm.):

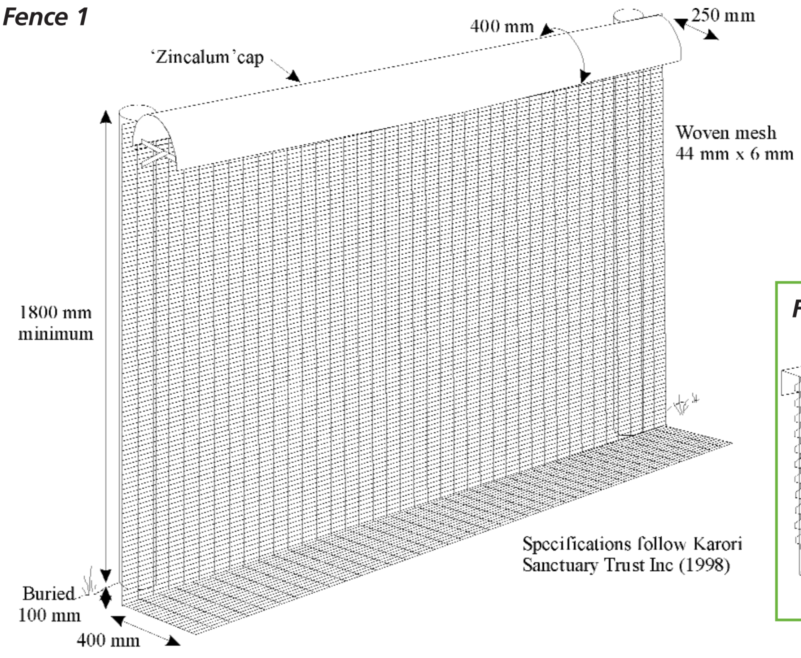
– One fox has breached the Yookamurra fence in the 18 months the property has been managed by the Australian Wildlife Conservancy

– Opportunistic spotlight searches have not detected cats or foxes within the Living Desert Wildlife Park in the 10 months since their eradication, and

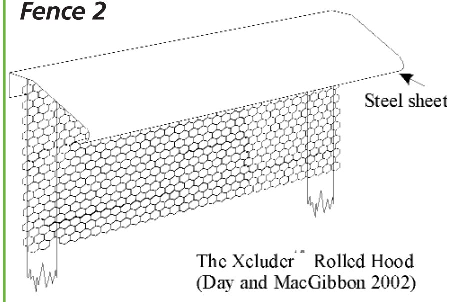
– At Karakamia monitoring of sandpads, radio-collared threatened species and fortnightly spotlighting have detected just one fox, two cats and two rabbit breaches in the last 10 years.

Capped fences – for cats, rabbits and other mammalian pests

Fence 1



Fence 2



Designed to exclude:

All feral mammals (in N.Z.) including rabbits, cats, goats, pigs, mustelids, possums, and rodents.

Examples of use:

Fence 1. Used at the Karori Wildlife Sanctuary, New Zealand to protect native wildlife and native vegetation.

Fence 2. Used at Rapanui Point and Omaha Beach, New Zealand to protect native wildlife.

Features:

- Wire mesh forms an effective barrier
- Wire netting apron prevents animals passing beneath the fence
- Steel roll cap prevents animals climbing over the fence.
- Internal corner angles greater than 120∞ to prevent climbing animals jumping or bracing against adjacent fence panels.

Estimated cost of materials:

Exact material costs are not available for these designs but would exceed $50,000/km.

Efficiency:

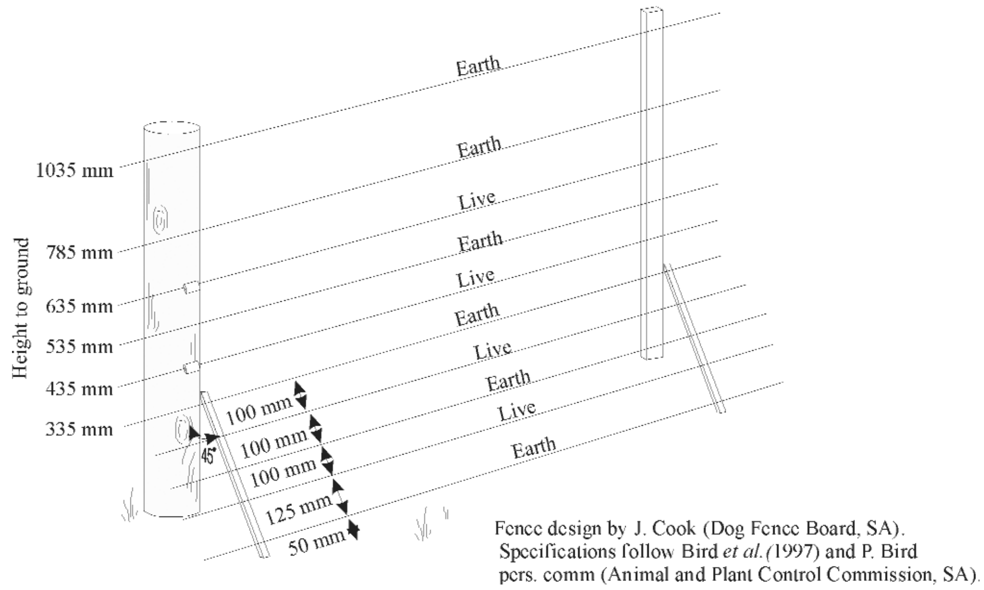
Extensive captive trials of these designs have been conducted. Of the species trialed, cats are of most interest to this report.

Fence 1. The Karori Sanctuary Trust Inc. trialed a small number of cats against this fence, none of which were able to cross it. possums were observed to be more proficient climbers than cats and, of the thirty individuals trialed, only two breached the fence. Neither of these animals crossed the fence in a second trial (Karori Sanctuary Trust Inc. 1998).

Fence 2. The XcluderTM Pest Proof Fencing Company's rolled hood successfully excluded the 21 feral cats and 12 wild possums trialed against it (Day and MacGibbon 2002).

Dingo/feral dog fences

Sloping dog fence



Examples of use:

Used to protect livestock at "Muloorina" Station, SA (Bird et al. 1997).

Features:

- Narrow wire spacings form a barrier in the lower portion of the fence where pressure from dingoes is greatest.
- The sloping wire arrangement may also slow the approach of animals to the fence.

Estimated cost of materials:

$2,900/km

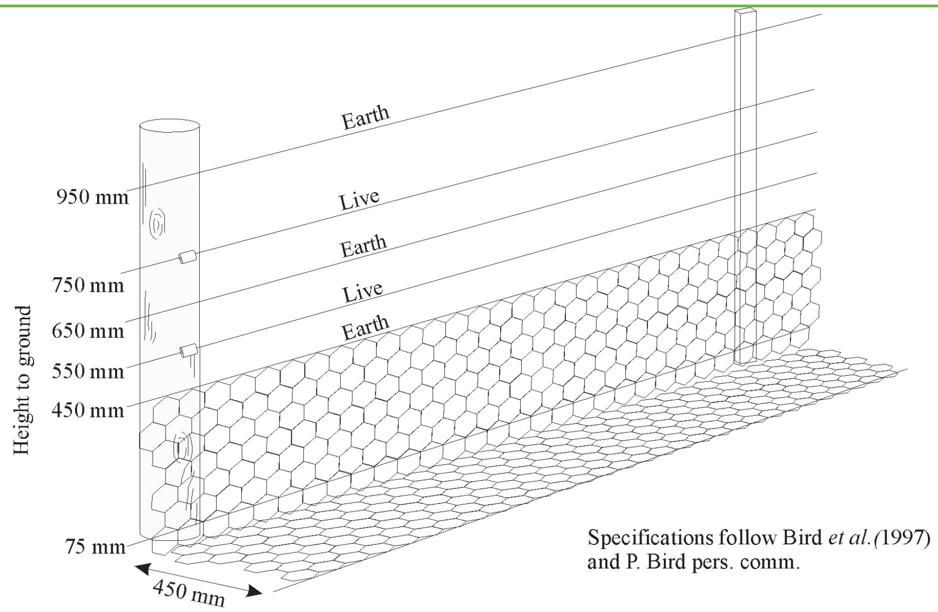
Additional information:

This fence is cheaper to construct and maintain compared to the composite dog fence (see over page). Therefore, Bird et al. (1997) recommend its use over the latter fence except in situations where the substrate is susceptible to erosion as this may result in the formation of gaps below the fence. The positioning of electric wires close to the ground is likely to result in mortalities of echidnas and large reptiles. Where these species are prevalent, this design should be avoided. Low electric wires are also likely to be problematic in environments with considerable ground vegetation which will cause electrical shorts and leakage.

Efficiency:

A 5 km length of this fence was tested for 46 months with no known dingo breaches (Bird et al.1997).

Composite dog fence



Examples of use:

Used at "Muloorina" Station, SA, to protect domestic stock (Bird et al. 1997).

Features:

- Mesh base to prevent animals passing through the lower portion of fence.
- Mesh apron to prevent animals passing underneath the fence and to effectively earth animals that are standing on it, ensuring they will receive an electric shock when touching the electric wires.

Estimated cost of materials:

$4,600/km

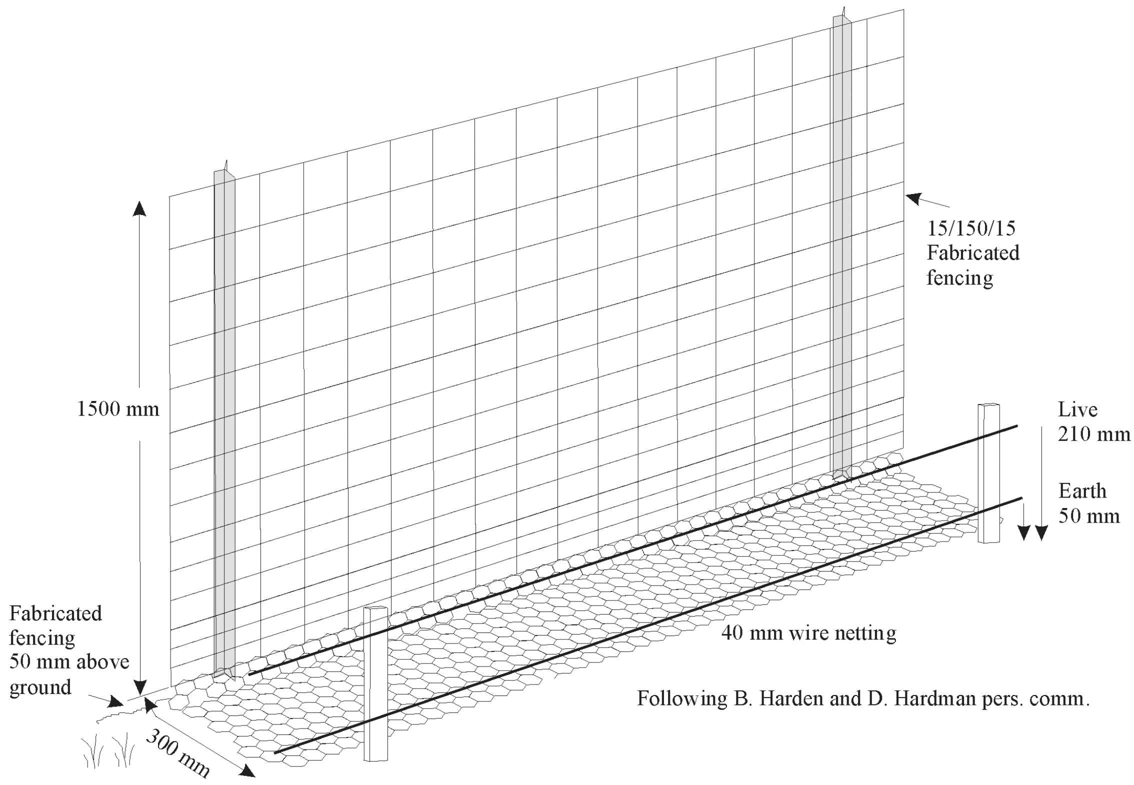
Additional information:

This fence is more expensive to construct and maintain than the sloping dog fence, but is recommended by Bird et al. (1997) for use in areas were soils are susceptible to erosion.

Efficiency:

A 5 km length of this fence was trialed for 69 months with no known dingo breaches (Bird et al. 1997). The efficiency of this fence proved similar to that of the sloping fence (previous page) during trials, but the netting in this fence is likely to afford slightly greater protection from animals pushing under the fence or running through it (Bird et al. 1997).

Fabricated dog fence



Examples of use:

Staff from the Department of Environment and Conservation in the NSW Northern Tablelands region recommend this design to landholders wanting to protect domestic stock from dingoes/wild dogs (B. Harden and D. Hardman pers. comm.). A similar fabricated fence is being used in Queensland to protect the Northern Hairy-nosed wombat population from dingoes. This fence is 1900 mm high (17/190/15), with a 300 mm apron and no trip wire (A. Horsup pers. comm.).

Features:

- Fabricated fencing provides an effective barrier
- Mesh apron prevents animals passing beneath the fence.
- Trip-wire provides additional protection (if necessary) by deterring animals from the fence and reducing the incidence of animals digging beneath the apron.

Estimated cost of materials:

$7,600/km with trip-wire, $6,800 without trip-wire.

Efficiency:

This design (as a whole) has not been formally tested but it, and similar designs, have proven effective in situ (B. Harden, D. Hardman and A. Horsup pers. comm.). The effectiveness of the trip-wire has been trialed. Three, one kilometre sections of fencing with an electric trip-wire were monitored for two years. Electrified sections had a reduced incidence of hole formation beneath the fence (by target and non-target animals) compared to non-electrified sections, resulting in no dingo or foxes breaches by this route (Fleming et al. 2001).

Breakdown of fence costs

Prefabricated pig fence 1

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer posts	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$546.00
Steel standards (1.8 m)	$5.00	167	$835.00
2.5mm high tensile wire	$100.00	3	$300.00
Barbed wire	$170.00	2	$340.00
Insulators on offset wire	$1.80	125	$225.00
Fabricated fencing 8/80/15	$1,350.00	1	$1,350.00
		Total	**$3,510.00**

Note: Based on a post spacing of 4 m with two metal posts to every pine post.

Prefabricated pig/goat fence 2

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer post	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$546.00
Steel standards (1.8 m)	$5.00	167	$835.00
Barbed wire	$170.00	2	$340.00
Fabricated fencing 8/80/15	$1,350.00	1	$1,350.00
Fabricated fencing 8/90/30	$1,250.00	1	$1,250.00
		Total for goats (using 8/90/30)	**$3,085.00**
		Total for pigs (using 8/80/15)	**$3,185.00**

Note: Based on a post spacing of 4 m with two metal posts to every pine post.

Electrified trip-wire pig fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer post	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	100	$650.00
Ironbark droppers	$2.70	200	$540.00
Steel standards (1.8 m)	$4.50	200	$900.00
2.5 mm high tensile wire	$100.00	8	$800.00
Porcelain Insulators	$1.30	700	$910.00
		Total	**$3,914.00**

Note: Based on posts spaced at 10 m with droppers every 3 m in between. 1.65 m steel standards (cut in half) have been used for the trip-wire support posts and these have been spaced at 5 m intervals.

Fabricated goat fence 1

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer posts	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$546.00
Steel standards (1.8 m)	$5.00	167	$835.00
Steel standards (1.65 m)	$4.50	125	$562.50
Fabricated fencing 8/80/15	$1,350.00	1	$1,350.00
2.5 mm high tensile wire	$100.00	3	$300.00
Barbed wire	$170.00	1	$170.00
Porcelain insulators	$1.30	250	$325.00
		Total	**$4,202.50**

Note: Based on a post spacing of 4 m with two metal posts to every pine post. 1.65 m steel standards (cut in half) have been used for the trip-wire support posts and these have been spaced at 4 m intervals.

Fabricated goat fence 2

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer posts	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$546.00
Steel standards (1.8 m)	$5.00	167	$835.00
Fabricated fencing 8/90/30	$1,250.00	1	$1,250.00
2.5mm high tensile wire	$100.00	1	$100.00
Barbed wire	$170.00	3	$510.00
		Total	**$3,355.00**

Note: Based on a post spacing of 4 m with two metal posts to every pine post

Sloping dog fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer post	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	100	$650.00
Ironbark droppers	$2.50	350	$875.00
2.5mm high tensile wire	$100.00	10	$1,000.00
Insulators	$1.30	200	$260
		Total	**$2,899**

Note: Based on posts spaced at 10 m with droppers every 3 m in between. Of the 350 droppers, 200 are used to support the wires in the upright fence section and 150 (300 halves) are used to support the sloping wire section.

Composite dog fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer post	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$546.00
Ironbark droppers	$2.5	167	$417.50
2.5 mm high tensile wire	$100.00	7	$700.00
Wire netting 90 x 5 x 1.6	$2,600.00	1	$2,600.00
Porcelain insulators	$1.30	172	$224.00
		Total	**$4,601.00**

Note: Based on a post spacing of 4 m with two ironbark droppers to every pine post.

Fabricated dog fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer posts	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line posts	$6.50	84	$714.00
Steel standards (2.4 m)	$9.00	167	$1,503.00
Steel standards (1.65 m)	$4.50	63	$283.50
Fabricated fencing 15/150/15	$3,500.00	1	$3,500.00
Wire netting 30/4/1.4	$1,000.00	1	$1,000.00
2.5mm high tensile wire	$100.00	2	$200.00
Porcelain Insulators	$1.50	250	$375.00
		With trip-wire	**$7,521.50**
		Without trip-wire	**$6,663.00**

Note: Based on a post spacing of 4 m with two metal posts to every pine post. 1.65 m steel standards (cut in half) have been used for the trip-wire support posts and these have been spaced at 8 m intervals. In the Northern Tablelands of NSW where this fence is used extensively, the Parks and Wildlife staff recommend the use of steel line and strainer posts. For the purposes of comparison with other dingo fence designs in this catalogue pine posts (and steel standards) have been used.

Rabbit fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Wooden strainer posts	$22.00	4	$88.00
End assembly rails	$13.00	2	$26.00
Wooden line-posts	$6.50	84	$546.00
Steel standards	$5.00	167	$835.00
Wire netting 120/3/1.4	$1,920.00	1	$1,920.00
Wire netting 90/4/1.4	$2,500.00	1	$2,500.00
Wire netting 30/4/1.4	$1,000.00	1	$1,000.00
2.5mm high tensile wire	$100.00	4	$400.00
Barbed wire	$170.00	1	$170.00
		Total using recommended 30 mm netting (imported)	**$3,985.00**
		Total without the stock-wires	**$3,715.00**
		Total using readily available 40 mm netting	**$5,565.00**

Note: Based on a post spacing of 4 m with two metal posts to every pine post.

Floppy-top fence

Material	Estimated cost/ unit or km	Quantity	Price/km
Steel strainer posts	$115.00	10	$1,150.00
Steel standards (2.4 m)	$9.00	115	$1,035.00
Wire netting 30/4/1.4	$1,000.00	1	$1,000.00
Wire netting 120/4/1.4	$2,900.00	2	$5,800.00
2.5 mm high tensile wire	$100.00	9	$900.00
1 m lengths 4 mm high tensile spring steel	$0.60	150	$90.00
Porcelain insulators	$1.30	250	$325.00
		With electric wires	**$10,300.00**
		Without electric wires	**$9,685.00**

Notes: Based on stainer posts spaced at 100 m intervals and a line post spacing of 8 m.

Rigid overhang

Material	Estimated cost/ unit or km	Quantity	Price/km
Steel strainer posts	$115.00	10	$1,150.00
Steel C-section posts	$8.00	115	$920.00
Wire netting 120/4/1.4	$2,900.00	1	$2,900.00
Wire netting 90/4/1.4	$2,500.00	1	$2,500.00
Wire netting 30/4/1.4	$1,000.00	1	$1,000.00
2.5mm high tensile wire	$100.00	11	$1,100.00
Porcelain Insulators	$1.30	250	$325.00
		Total	**$9,895.00**

Note: Based on stainer posts spaced at 100 m intervals and line posts every 8 m. Two electric wires have been included in this estimate (one for the overhang and one offset from the body of the fence).

Electric wire overhang

Material	Estimated cost/ unit or km	Quantity	Price/km
Strainer posts	$115.00	10	$1,150.00
C-section droppers	$8.00	115	$920.00
50mm Galvanised steel post	$22.00	115	$2,530.00
90/4/1.4 wire netting	$2,500.00	2	$5,000.00
30/4/1.4 wire netting	$1,000.00	1	$1,000.00
2.5mm high tensile wire	$100.00	12	$1,100.00
Porcelain insulators	$1.30	375	$487.50
		Total with 50 mm posts	**$11,367.50**
		Total with C-section droppers*	**$9,757.50**

Note: Based on stainer posts spaced at 100 m intervals and line posts every 8 m. Three electric wires (two in the overhang and one offset from the body of the fence) and one earthwire have been included in this estimate.

* Those fences visited all used 50 mm galvanised steel posts and chain mesh (or similar). If wire netting was used instead, a lighter grade post such as the C-section post could be used. The cost of this is alternative is provided to allow for a cost comparison with the Rigid Overhang design.

Wire netting/electric wire composite fence

Material	Estimated cost/ unit or km	Quantity	Price/km
100 mm steel strainer posts	$115.00	10	$1,150.00
Intermediate steel posts – 2.4m	$9.00	90	$810.00
Steel standards	$2.00	90	$180.00
1050/4/1.4 wire netting	$2,700.00	1	$2,700.00
30/4/1.4 wire netting	$1,000.00	1	$1,000.00
2.5mm high tensile wire	$100.00	15	$1,500.00
Poly Guard Insulators	$2.00	90	$180.00
Polypipe spacer	$0.40	100	$40.00
Porcelain insulators	$1.30	300	$390.00
		Total	**$7,950.00**

Note: Based on stainer posts spaced at 100 m intervals and line posts every 10 m with steel droppers and polypipe wire spacers between each line post. Five electric wires and five earth wires have been used for the top section of the fence and two electric wires offset from the wire netting. Porcelain insulators have been costed for each strainer post and for the two electric wires offset from the wire netting (in some cases (e.g. Karakamia,) plastic insulating sleeves for steel posts are used to support the offset electric wires).

Sloping fox fence 1

Material	Estimated cost/ unit or km	Quantity	Price/km
Steel strainer posts	$130.00	2	$260.00
Wire netting 900/4/1.4	$2,500.00	1	$2,500.00
Steel standards – 1.8 m	$5.00	250	$1,250.00
Ironbark droppers	$2.50	250	$625.00
2.5 mm high tensile wire	$100.00	9	$900.00
Insulators	$1.30	540	$702.00
		Total	**$6,237.00**

Note: Steel standards spaced at 4 m intervals. Wooden posts can not be used as foxes will use these as a platform to jump up to. Four strainer posts are used in this design.

Sloping fox fence 2

Material	Estimated cost/ unit or km	Quantity	Price/km
Steel strainer posts	$130.00	2	$260.00
Wire netting 900/4/1.4	$2,500.00	1	$2,500.00
Wire netting 30/4/1.4	$1,000.00	1	$1,000.00
Steel standards – 1.8 m	$5.00	250	$1,250.00
Ironbark droppers	$2.50	250	$625.00
2.5 mm high tensile wire	$100.00	11	$1,100.00
Insulators	$1.30	48	$62.40
		Total	**$6797.40**

Note: Steel standards spaced at 4 m intervals. Wooden posts can not be used as foxes will use these as a platform to jump up to. Four strainer posts are used in this design. Insulator costs are provided for the strainer posts.

Capped Design

Given that most of the components of this fence design are specialised or custom-made, an exact costing can not be provided. As a guideline, costs of materials are likely to exceed %50,000.

Raw material costs

Material	Price per Unit	Price per km
Wire		
2.5mm high tensile galvanised wire	$150/1500 m	$100.00
Barbed wire	$85/500 m	$170.00
Wire Netting		
120 x 3 x 1.4 (imported)	$96/50 m	$1,920.00
120 x 4 x 1.4	$145/50 m	$2,900.00
105 x 4 x 1.4	$270/100 m	$2,700.00
90 x 4 x 1.4	$250/100 m	$2,500.00
30 x 4 x 1.4	$100/100 m	$1,000.00
90 x 50 x 1.6	$135/50 m	$2,700.00
Chain mesh 1900 x 50 x 3.1	$125/10 m	$12,000.00
Fabricated fencing		
8/80/15	$135/100 m	$1,350.00
8/90/30	$250/200 m	$1,250.00
15/150/15	$350/100 m	$3,500.00
End assembly components		
Strainer post – treated pine 3 m x 125–150 mm	$13.00	
Strainer post – treated pine 2.4 m x 150–200 mm	$22.00	
End assembly rail – treated pine post, 3 m x 100–125 mm	$13.00	
Steel strainer and stay assembly, 1.8 m	$130.00	
Square section steel posts 3.4 m x 100 x 100 mm	$115.00	
Line posts		
Line post – treated pine post 2.1 m x 100–125 mm	$8.50	
Line post – treated pine post 1.8 m x 100–125 mm	$6.00	
Steel standard 1.65 m	$4.50	
Steel standard 1.8 m long	$4.50	
Steel standard 2.4 m long	$9.00	
Steel C–section post, 3 m	$8.00	
Galvanised steel post, 40 mm diameter, 3.1 m	$22.00	
Droppers		
Ironbark dropper, 1100 mm (approx.)	$2.50	
Ironbark dropper, 1200 mm (approx.)	121.92	
Galvanised steel dropper 940 mm	$2.00	
Insulators		
Porcelain reel insulator	$1.30	
Bullnose strainer insulator	$1.30	
Porcelain reel insulator on 300 mm spring steel offset wire	$1.80	
Insulated sleeve for steel standard (815 mm)	$2.00	
Polypipe (20 mm diameter)	$112/300 m	