

Supplementary material

Supplementary Table S1. Fence use and fence-related taxa mortalities for non-South African countries based on an electronic questionnaire survey.

Country	Responses	Fence types	Fence mortalities
Botswana	8	1 multiple wire excluding ground; 5 non-electric; two with no fence	Pangolin (non-electric); snake, tortoise, antelope, other (fence type unreported)
Tanzania	5	1 multiple wire excluding ground; 3 unelectrified; one with no fence	None
Zimbabwe	3	1 top-only electric; one unelectrified; one with no fence	None
Namibia	1	None	None
Mozambique	1	None	None

Supplementary Table S2. Fence category groupings where fences with electrified wires ≤ 200 mm above ground level are grouped into 'with ground-level wires, and those without were grouped into 'without ground-level wires'.

Original fence category	New fence category
No electric wire	Not grouped
Ground-level electrified wire only	With ground-level wires
Multiple wires with ground-level	With ground-level wires
Multiple wires excluding ground-level	Without ground-level wires
Top wire only	Without ground-level wires
Other	Grouped when possible or removed from the analyses. For example, several respondents listed ground-level wires on a fence type not included in the original categories so these were grouped together with ground-level wires.

Supplementary Table S3. Demographic information on 44 participants, including pangolin and fence use, based on an electronic questionnaire survey.

	Sample
N	73 (44 primary responses, 29 subsequent responses)
Profession	Manager=11; landowner and manager=5; landowner=5; conservationist=5; guide=4; researcher=3; student=2; tracker=1; scientific director=1; ranger=1; ecologist=1; biomonitoring manager=1
Country	South Africa=52; Botswana=8; Tanzania=5; Zimbabwe=3; Mozambique=1; Namibia=1
Known pangolin presence	62 (84.61%)
Fence presence	64 (33 with electric wires)

Supplementary Table S4. Land use purpose from responses within South Africa based on an electronic questionnaire survey.

Land purpose	Frequency	Proportion
Game ranch/reserve	22	81.5 %
Farmland	1	3.7 %
Wildlife rehabilitation	2	7.4 %
Farmland, Residential	2	7.4 %

Supplementary Table S5. Number of times each fence category was reported in South Africa based on an electronic questionnaire survey; this includes participants who reported more than one fence type.

Fence Type	Frequency	Proportion
No electric wires	7	16.66
Ground-level only	7	16.66
Multiple heights with ground-level wires	23	54.76%
Multiple heights excluding ground-level wires	3	7.14%
Top wires only	2	4.76%
Other	0	0

Supplementary Table S6. Likert concern level responses from participants who also reported the number of fence-associated mortalities that they have witnessed in South Africa.

Likert score	1	2	3	4	5	6	7	8	9	10
Number of respondents	4	3	2	2	5	1	2	0	1	6
Mean number of species killed	4	2.5	1	1	2.2	5	6	0	4	3

Supplementary Materials SI – Animal Electrocutation Questionnaire

Animal Electrocutation Questionnaire

1. Are you a landowner or land manager? Please answer for the primary land you own/work on. If you work across multiple sites you can record this in Part Two.
 - a. Yes, landowner
 - b. Yes, land manager
 - c. Yes, both landowner and land manager
 - d. No

If you selected No, please specify profession (e.g. tour guide, farmer, conservation professional, student, game rancher, professional hunter, or any other profession):

2. Please state the name and location of this land (e.g. reserve or farm name and province). Answer the sections you are comfortable with. Why am I being asked this? We wish to gather information on where electrocutations occur and where pangolins are present. This information will also give us habitat information.
 - a. Prefer not to say

Land name:

Province:

Postcode:

Country:

3. Please state the name and location of the land you work/have worked on (e.g. reserve or farm name and province). Answer the sections you are comfortable with. Why am I being asked this? We wish to gather information on where electrocutations occur and where pangolins are present. This information will also give us habitat information.
 - a. Prefer not to say

Land name:

Province:

Postcode:

Country:

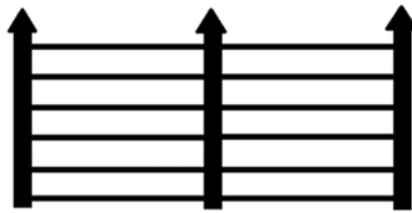
4. How long have you worked in this role?
- a. Less than 1 year
 - b. 1-5 years
 - c. 5+ years
5. Where does the majority of the land's income come from? Select all that apply.
- a. Tourism
 - b. Trophy hunting
 - c. Meat/livestock production
 - d. Agriculture/farming
 - e. Prefer not to say
 - f. Other (please specify): _____
6. Is there fencing on or around the land?
- a. Yes
 - b. No
7. Approximately how long is the fence in total?
- a. Prefer not to say
 - b. Don't know
 - c. Kilometres: _____
8. What is the purpose of the fence? Please select all that apply.
- a. To mark a land boundary
 - b. Security (keep people out)
 - c. To keep animals in

- d. Prefer not to say
- e. Other (please specify): _____

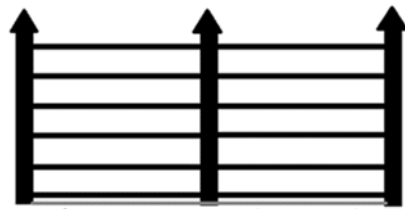
9. How often are the fences monitored? Please fill in whichever box is most appropriate, you do not need to respond in every box. Why am I being asked this? This will help us understand how frequently electrocutions occur. The number of electrocutions reported may be influenced by how often the fence is observed. This question is not intended to gather information on fence security.

- a. Times per day _____
- b. Times per week _____
- c. Times per month _____
- d. Other (please specify): _____

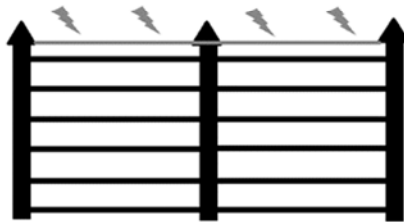
10. What type of fence(s) is present? Please select all that apply. Why am I being asked this? We would like to determine how prevalent electric fences are and if a particular fence type is more prone to electrocutions. This question is not intended to gather information on fence security.



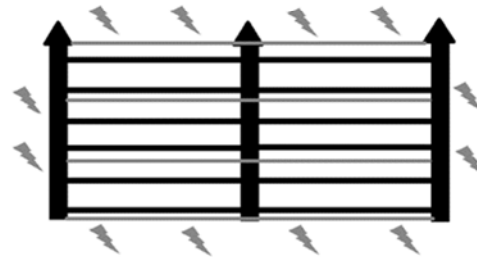
No electric wires present



Electric wires present at ground level (under 20cm approx.)



Electric wires present on top of fence



Electric wires present at multiple heights including ground level (under 20cm approx.)

- a. No electric wires present
- b. Electric wires present at ground-level (under 20cm approximately)
- c. Electric wires present on top of fence

- d. Electric wires present at multiple heights including ground-level (under 20cm approx.)
- e. Other
- f. Don't know
- g. Prefer not to say

For electric wires present at ground-level (under 20cm approximately) please indicate the approximate total length (km) of this fence type: _____

For electric wires present on top of fence please indicate the approximate total length (km) of this fence type: _____

For electric wires present at multiple heights including ground-level (under 20cm approximately) please indicate the approximate total length (km) of this fence type: _____

If you selected Other, please describe the fence type(s) and indicate total fence length(s) (km) of these fences: _____

11. If electric wires are present what voltage(s) is the fence?

- a. No electric wires present
- b. Don't know
- c. Prefer not to say
- d. If known, please list any/all voltages used: _____

12. How high are the electric wires off the ground? Please select all that apply.

- a. 0-5cm
- b. 5-20cm
- c. 20-40cm
- d. 60-100cm
- e. 100cm+
- f. Don't know

g. Prefer not to say

13. Which of these photos represents a pangolin?



- a. A
- b. B
- c. C
- d. D
- e. None of these
- f. Don't know

14. Have you or anyone else seen a pangolin or signs of pangolins on this land? Please select all that apply.

- a. No
- b. Don't know
- c. Yes, live animal
- d. Yes, burrow, tracks, or other field signs
- e. Yes, dead pangolin carcass

f. Other (e.g. records from wildlife surveys, etc.) Please specify _____

15. Have you or someone else ever seen any dead or electrocuted animals of any species on or near the fences (within approximately 10m)?

- a. No fences present
- b. Yes
- c. No

16. If yes, which animal(s)? Please select all that apply.

- a. Tortoise
- b. Pangolin
- c. Snake
- d. Lizard
- e. Antelope
- f. Bird
- g. Other

If known, please specify which species: _____

17. Do you currently use any fence modifications or other methods to prevent animal electrocutions?

- a. Yes
- b. No

If you selected Yes, please give details _____

18. How many times have pangolin deaths or electrocutions occurred on this land?

- a. Don't know
- b. None to my knowledge
- c. Number of times within the last month _____

- d. Number of times within the last 6 months _____
- e. Number of times within 6 months – 1 year _____
- f. Number of times within the last 1-5 years _____

19. How long have you (or the person providing this information) worked/lived on/managed this land? Please fill in whichever box is most appropriate, you do not need to respond in both boxes.

- a. Don't know
- b. Months _____
- c. Years _____

20. Please enter any additional comments or relevant information below:

21. Optional: Please select any of the following if you would like to be:

- a. Entered in a prize draw (voucher will be emailed to you) – South Africa participants only
- b. Involved in a follow-up survey
- c. Updated with the research findings

Name:

Email address:

Phone number:

Address:

22. Do you wish to continue to Part Two?

- a. Yes
- b. No

23. What is the purpose of this land? Please select all that apply.

- a. Farmland

- b. Game ranch/reserve
- c. Residential
- d. Other (please specify)_____

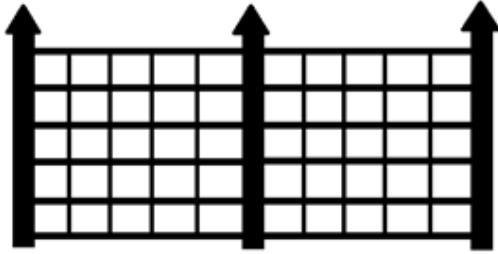
24. What habitats exist on this land? Select all that apply.

- a. Nama-Karoo
- b. Savannah
- c. Succulent karoo
- d. Fynbos
- e. Grassland
- f. Desert
- g. Albany thicket
- h. Indian ocean coastal belt
- i. Forest
- j. Don't know
- k. Other (please specify)_____

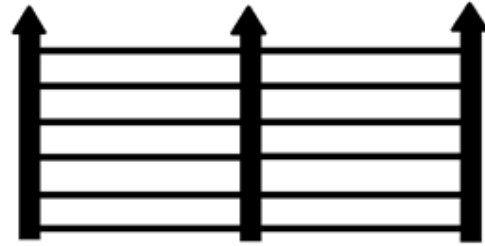
25. What is the size of the land? Please indicate whether this is in kilometres squared or hectares (you only need to answer one of these).

- a. Prefer not to say
- b. Don't know
- c. Km²_____
- d. Hectares_____

26. Does the fence have both horizontal and vertical wires, or only horizontal?



Horizontal and Vertical



Horizontal only

- a. No fences present
- b. Horizontal and vertical
- c. Horizontal only
- d. Don't know
- e. Prefer not to say

27. Are electrocutions damaging the fences?

- a. Yes
- b. No
- c. Don't know

28. If yes, is this a concern of yours?

- a. Yes
- b. No

29. Overall, how concerned are you about the number of animal electrocutions the land experiences?

Concern level:

- 1 (not concerned at all)
- 2
- 3
- 4

5

6

7

8

9

10 (extremely concerned)

30. Why is this?

- a. I am not concerned.
- b. I am not currently concerned but may be if electrocutions increased.
- c. I am concerned for wildlife conservation reasons.
- d. I am concerned for reasons of animal suffering/welfare.
- e. I am concerned the fence is being damaged.
- f. Other (please specify) _____

31. Have you lived or worked in other areas that have pangolins?

- a. Yes
- b. No
- c. Don't know

32. If yes, please list all these areas and give details of any electrocutions known to you. If possible, please be specific.

- a. Prefer not to say

Land name, province, postcode, country: _____

If you have witnessed electrocutions of any species, including pangolins, please elaborate: _____

Land name, province, postcode, country: _____

If you have witnessed electrocutions of any species, including pangolins, please elaborate: _____

Land name, province, postcode, country: _____

If you have witnessed electrocutions of any species, including pangolins, please elaborate: _____

33. Would future methods to prevent electrocutions interest you? If you/your land are already using prevention methods answer if further methods would interest you.

- a. Yes
- b. No

34. Please enter any additional comments or relevant information below: