EURASIAN OTTER WORKSHOP
26-28 February 2021

IUCN SSC Species Survival Commission

Small Carnivore Specialist Group IUCN-SCSG

Emiliano Manzo - Fondazione Ethoikos

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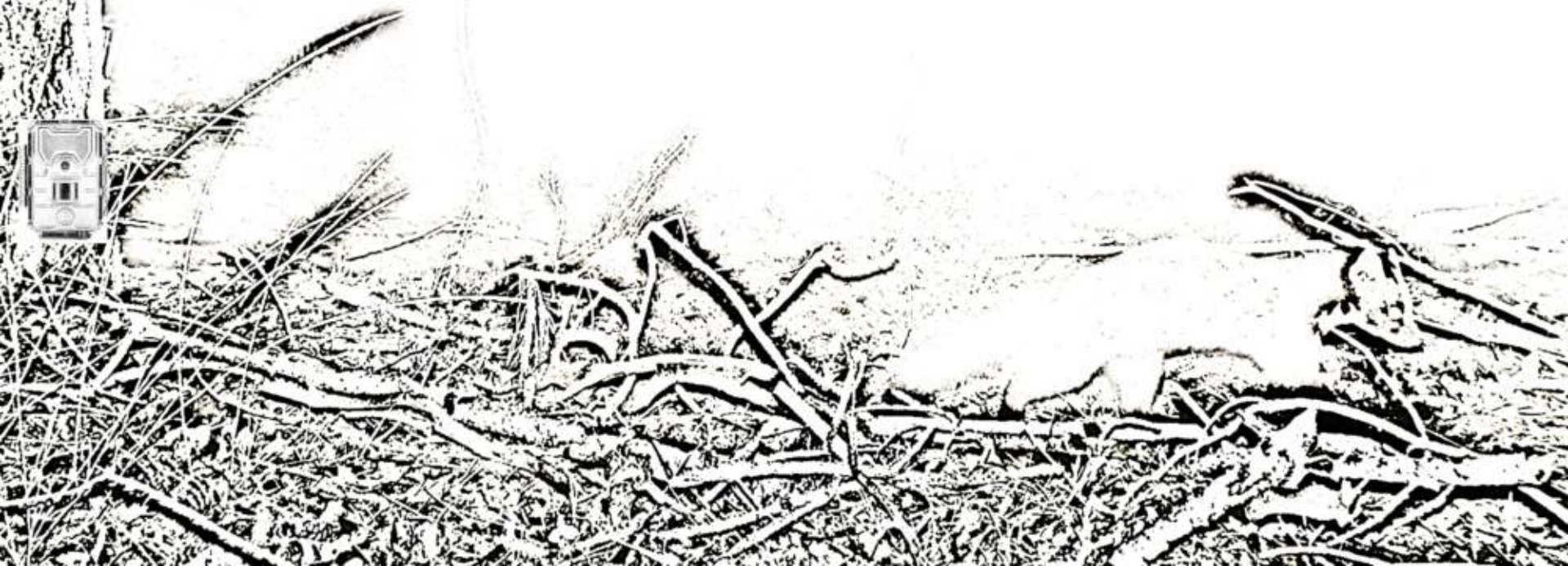
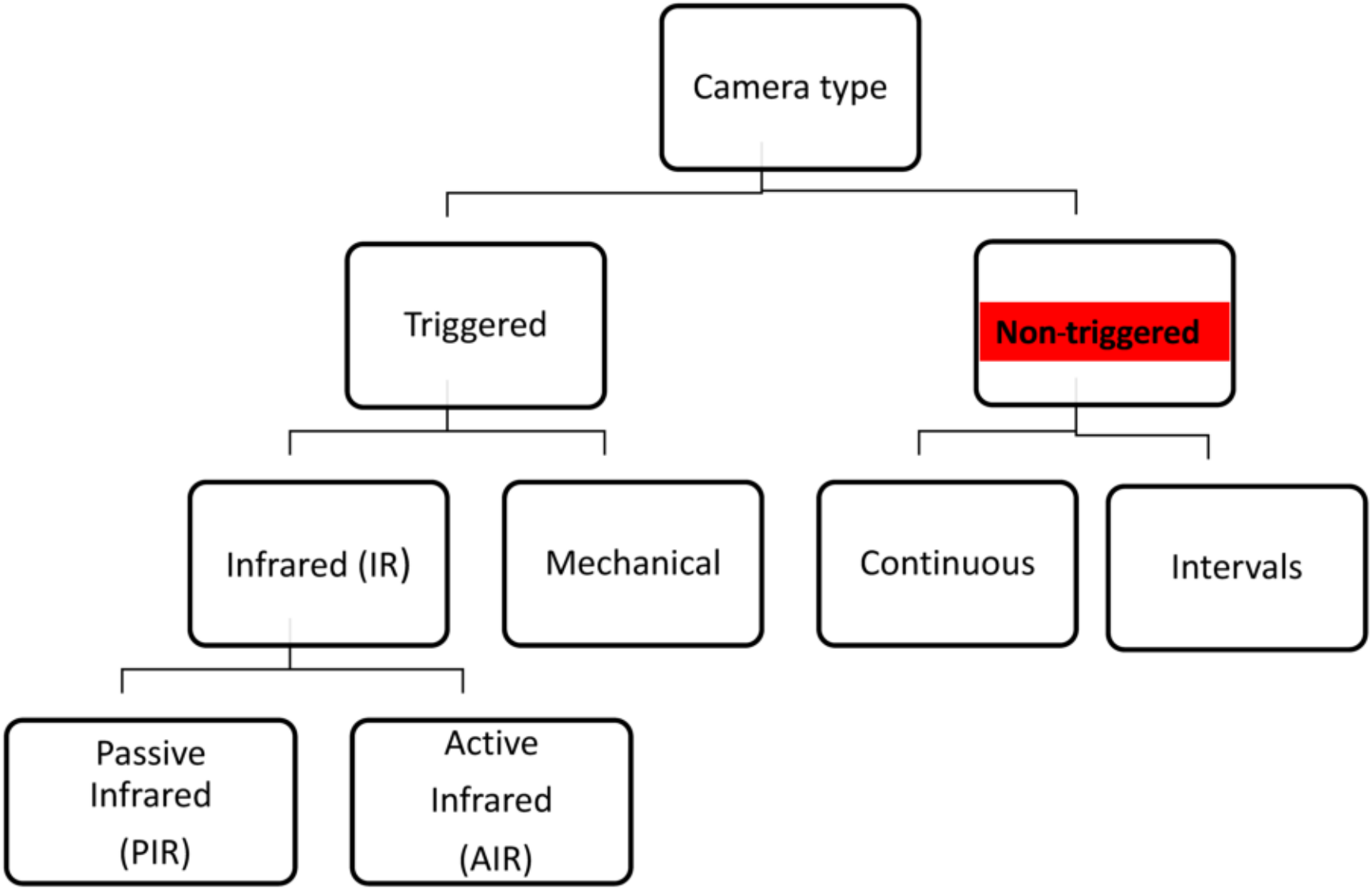
Camera Traps - The Unknown

How to select an appropriate camera trap



Camera traps type



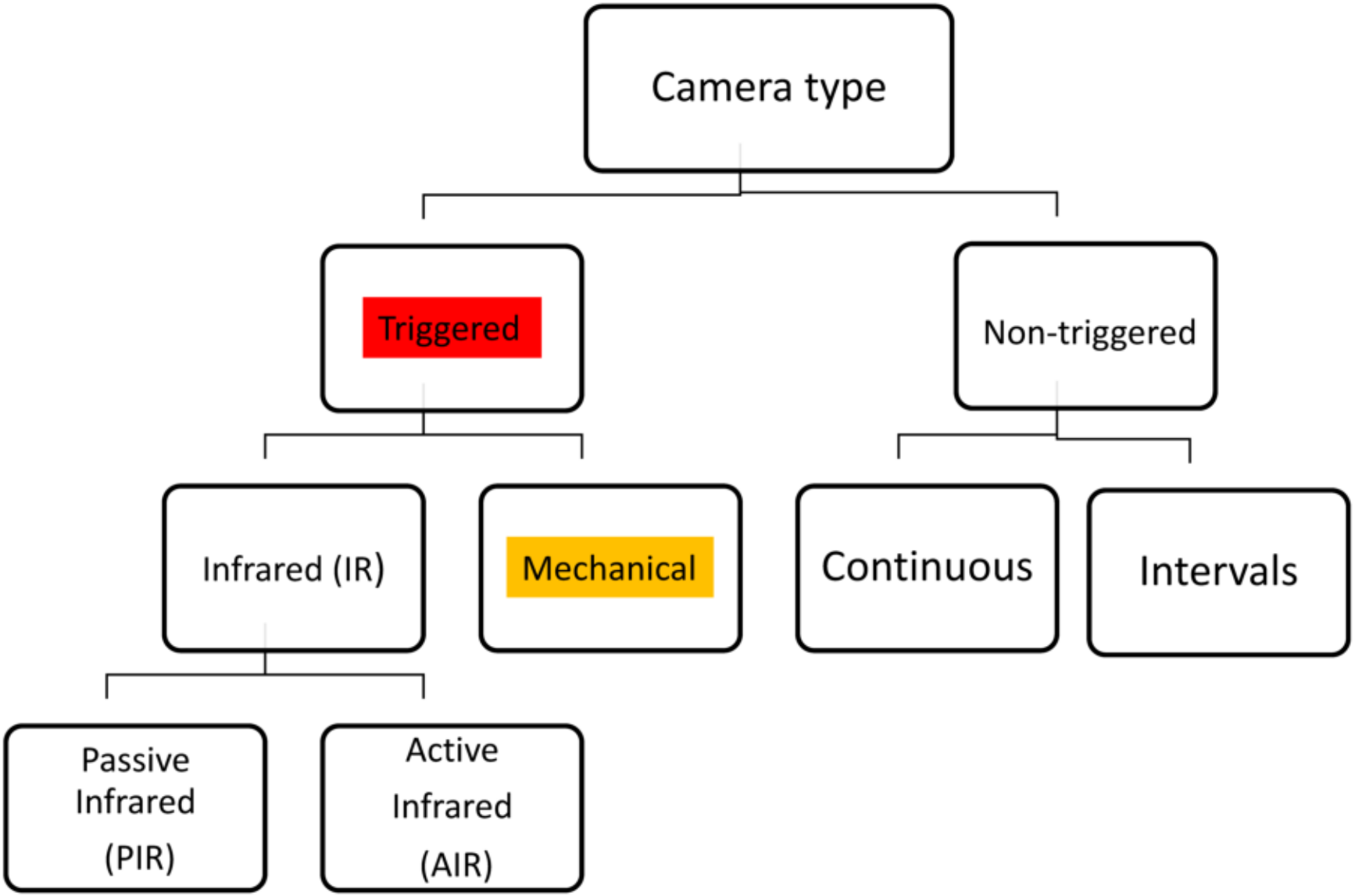
Camera traps type – Non Triggered Camera

Camera traps type – Non Triggered Camera

Tipi di Fototrappole – Non Triggered Camera

https://blog.nature.org/science/2017/04/03/where-have-steller-sea-lions-oceans-citizen-science-wildlife/

Camera traps type



Camera traps type – Triggered Mechanical

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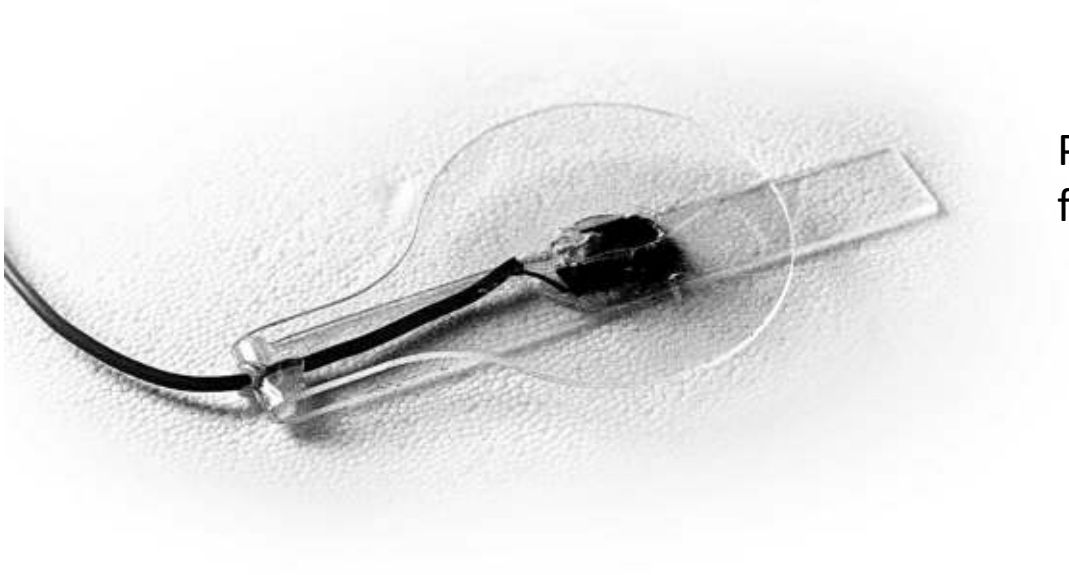
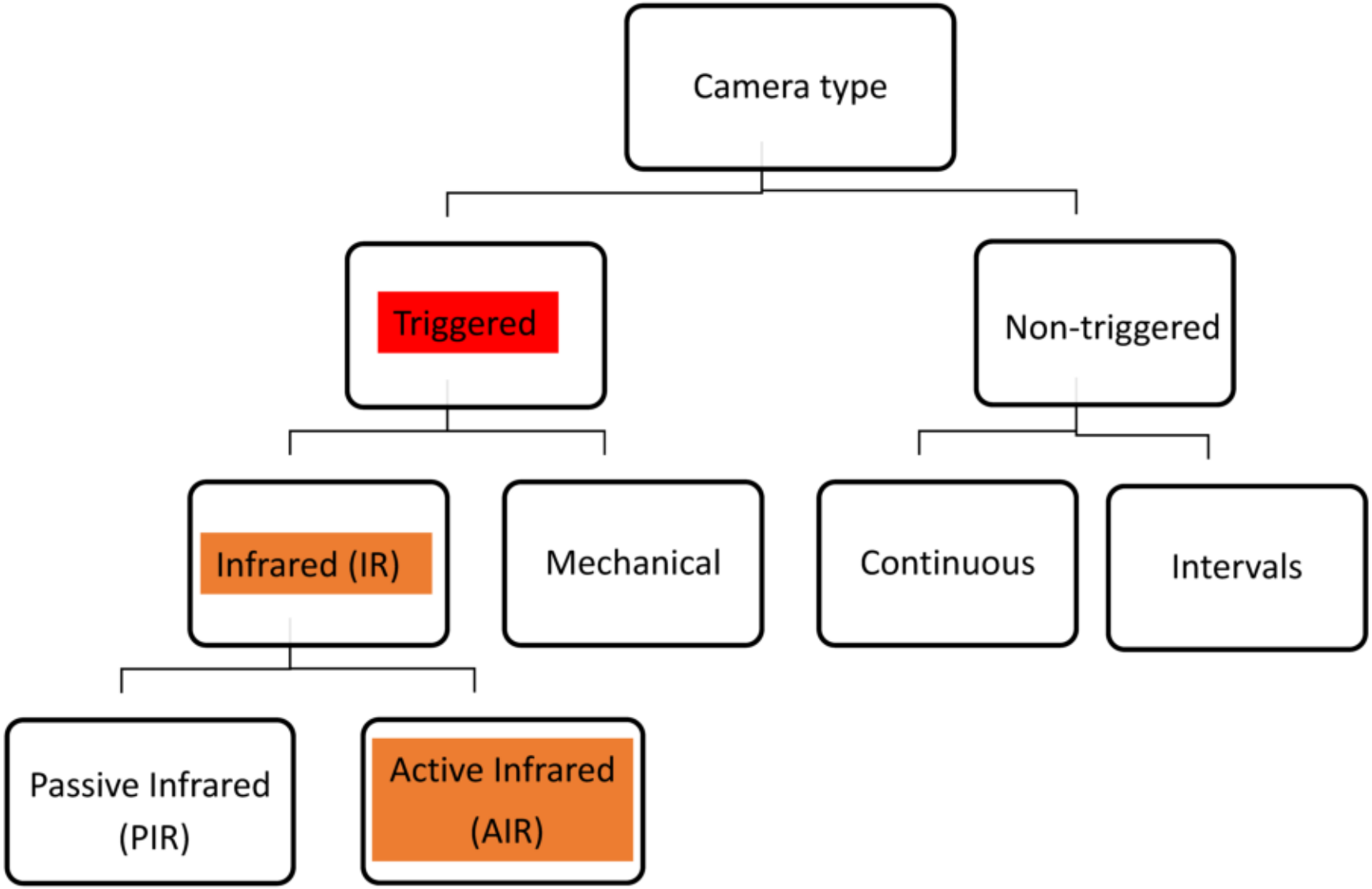


Pressure trigger used for otter in Italy

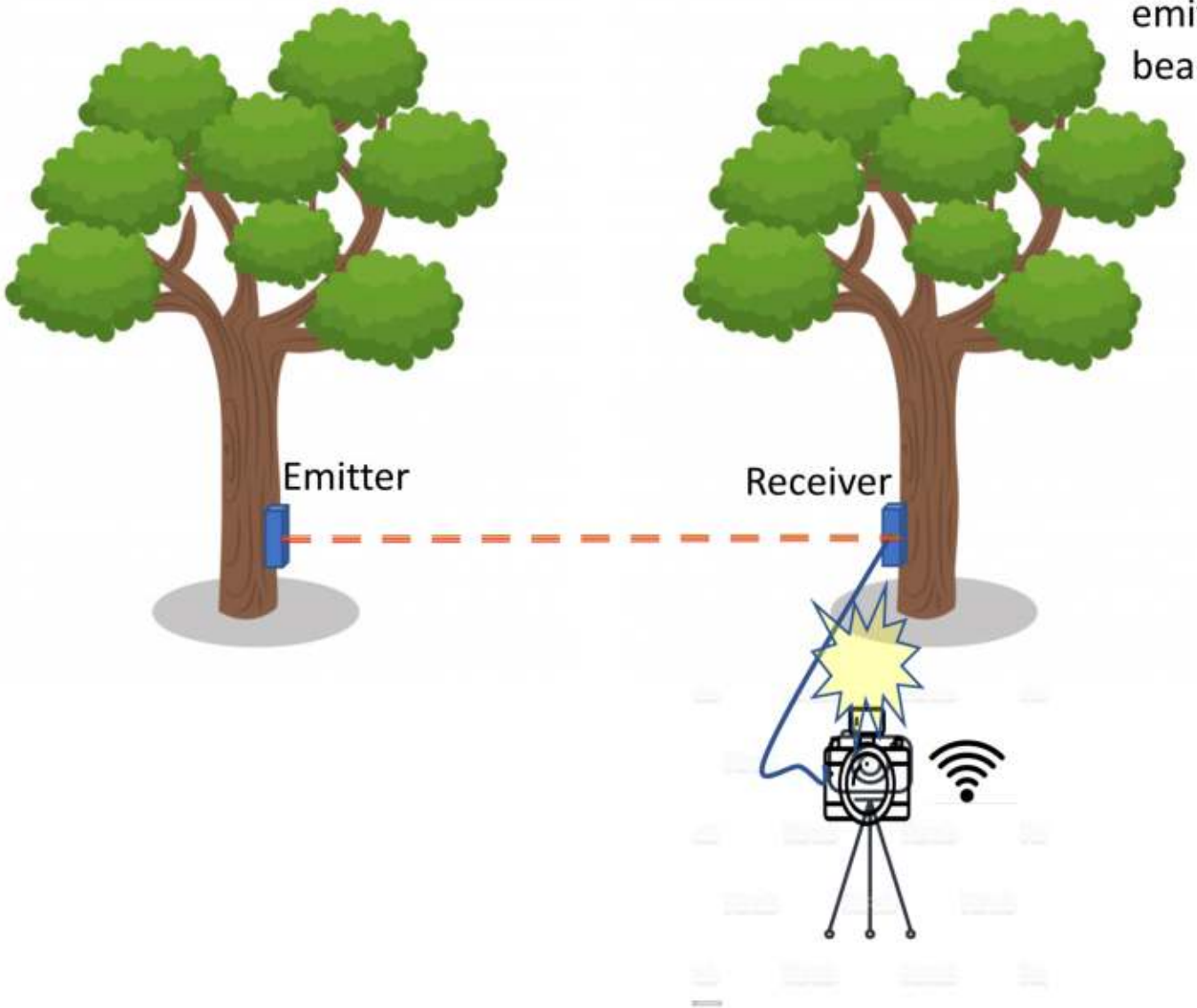
Laura Lerone, Giuseppe M. Carpaneto and Anna Loy (2015)**.** *Why Camera Traps Fail to Detect a Semi-Aquatic Mammal: Activation Devices as Possible Cause. Wildlife Society Bulletin*

Camera traps type



Camera traps type – Active Infrared Sensor

Active infrared sensor emitted a single infrared beam.



Camera traps type – Active Infrared Sensor

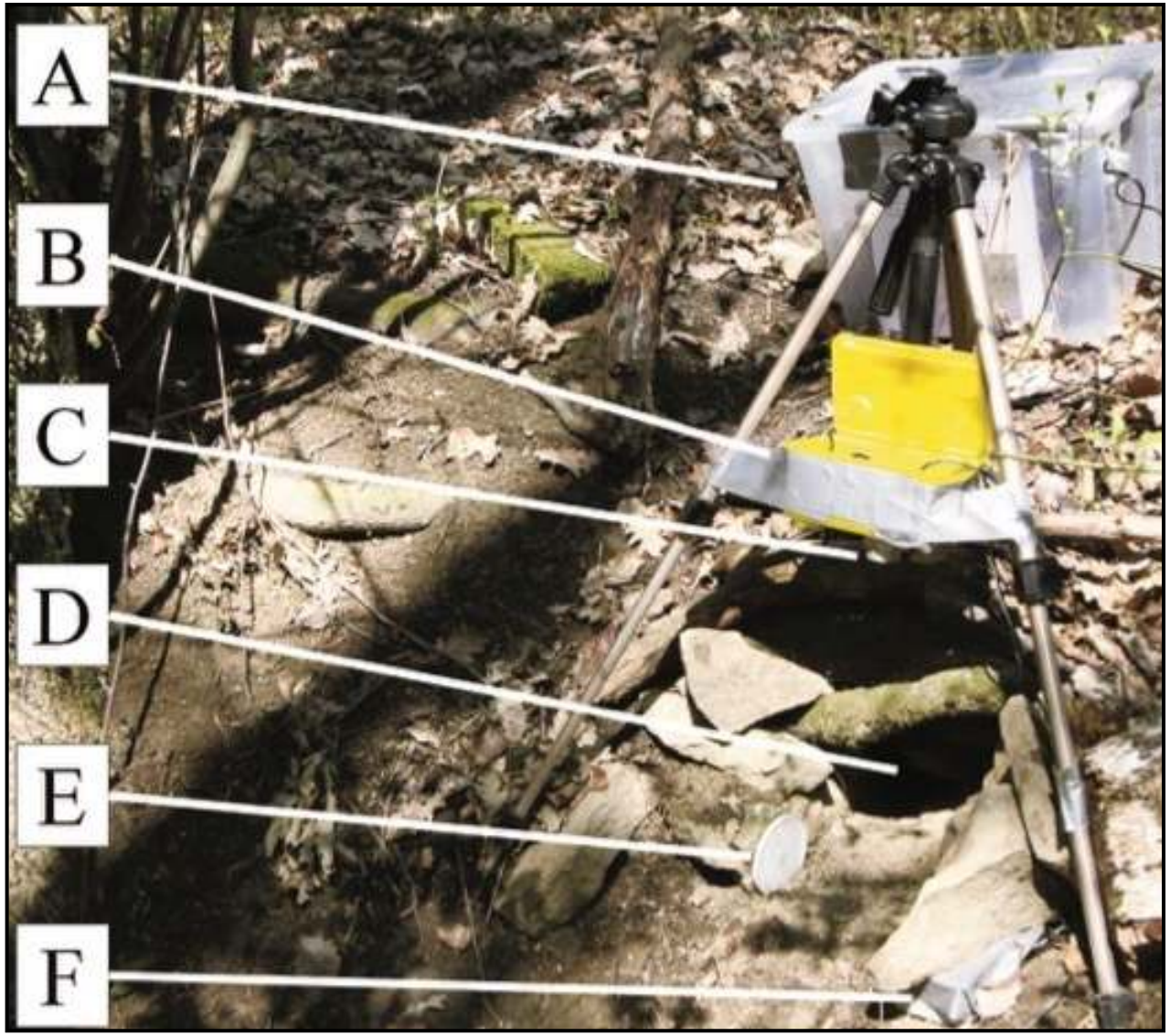
ADVANTAGES

- The height of the beam can be adjusted to the target animal
- Emitter and receiver are separate, better placed of the camera
- The beam can be up to 50 mt
- Changes in temperature hardly affect the detection

DISADVANTAGES

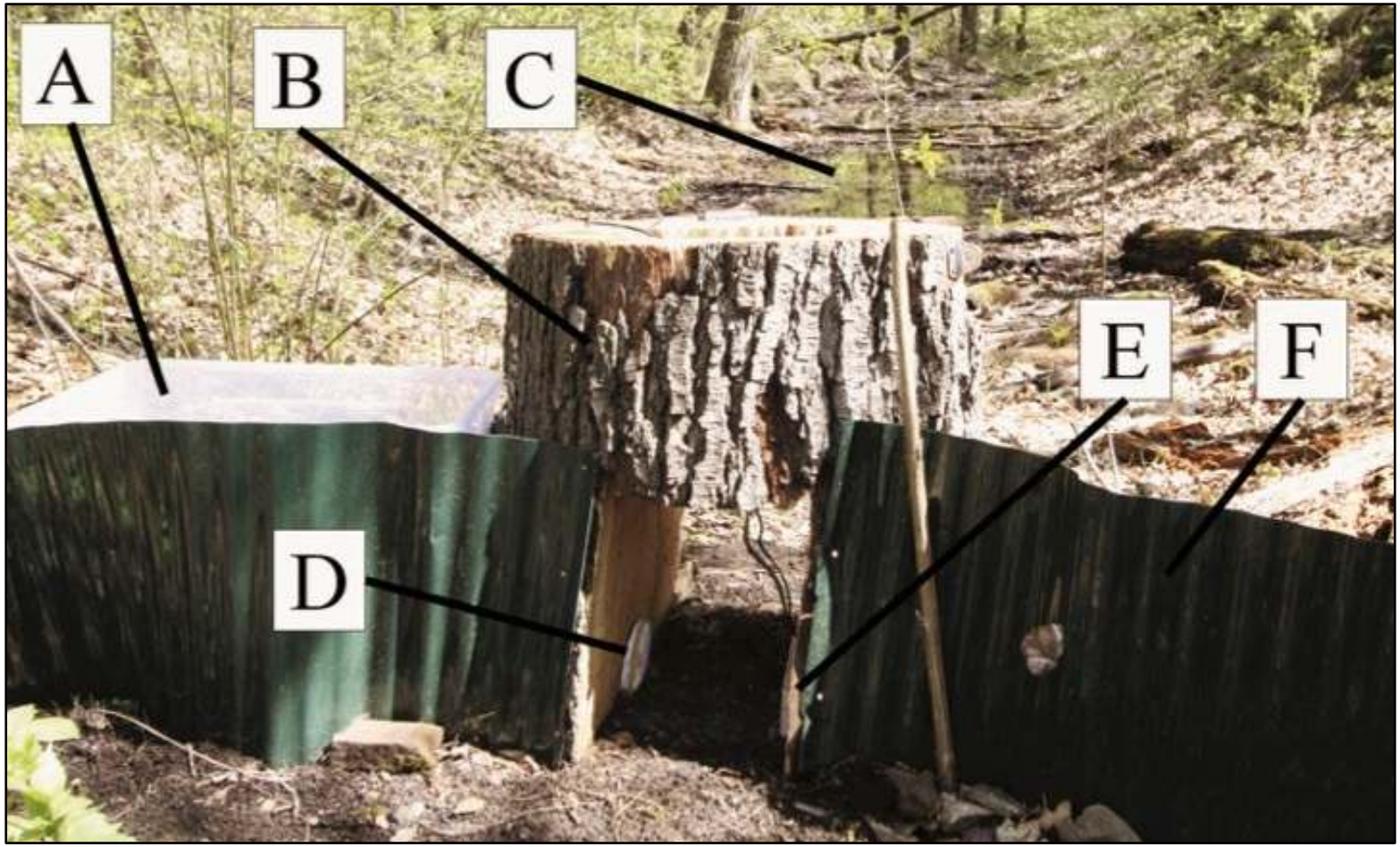
- Equipment is expensive and not widely available
- It takes long time to line up the different component
- Low detection rate
- Snow, rain, vegetation do cause many false trigger

Camera traps type – Active Infrared Sensor



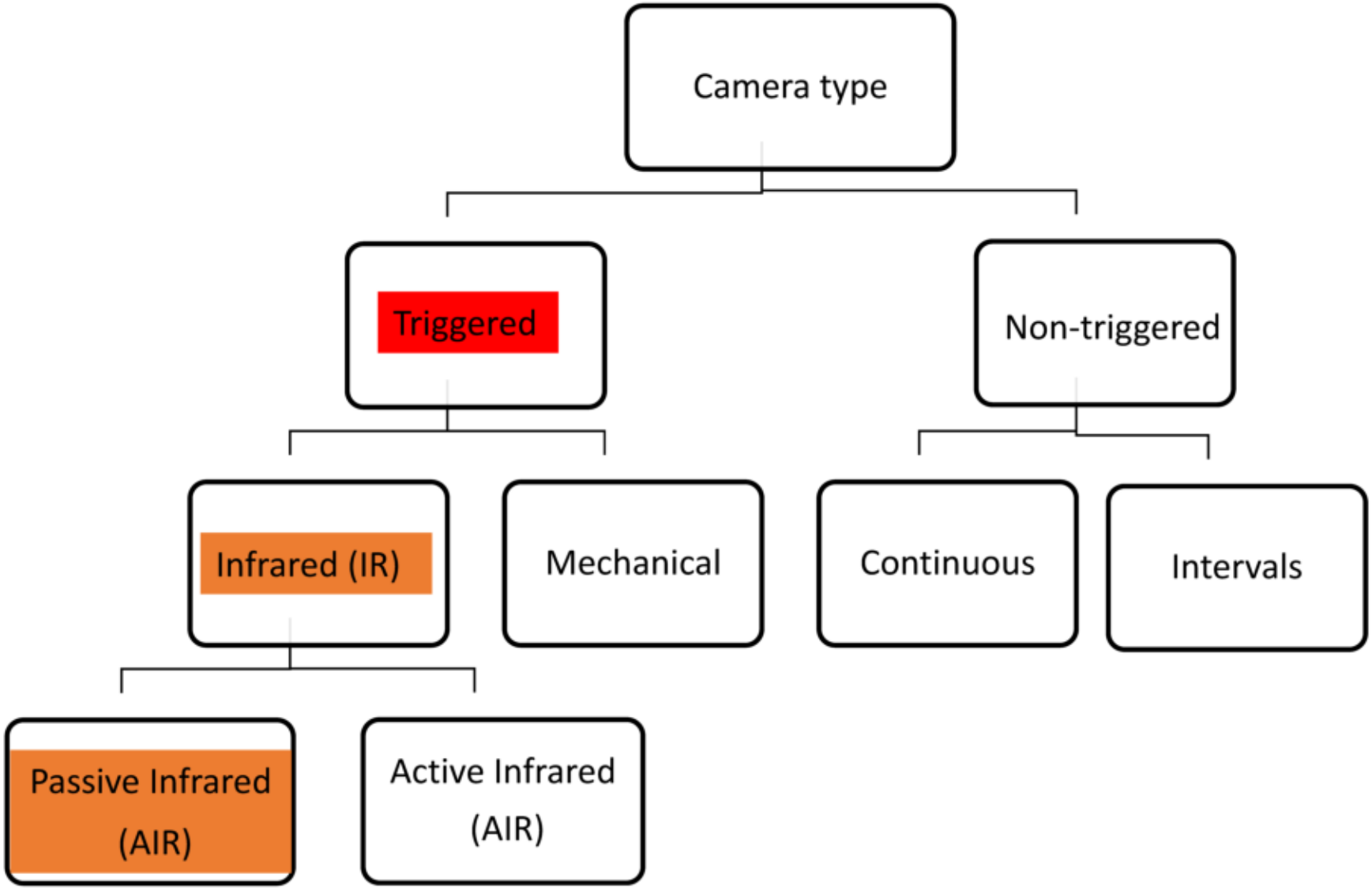
Camera Trap with Active Infrared Sensor AIR

Camera traps type – Active Infrared Sensor



Camera Trap with Active Infrared Sensor AIR

Camera traps type



How Camera Trap Work

Infrared Led Flash

Camera lens

Day/Night sensor

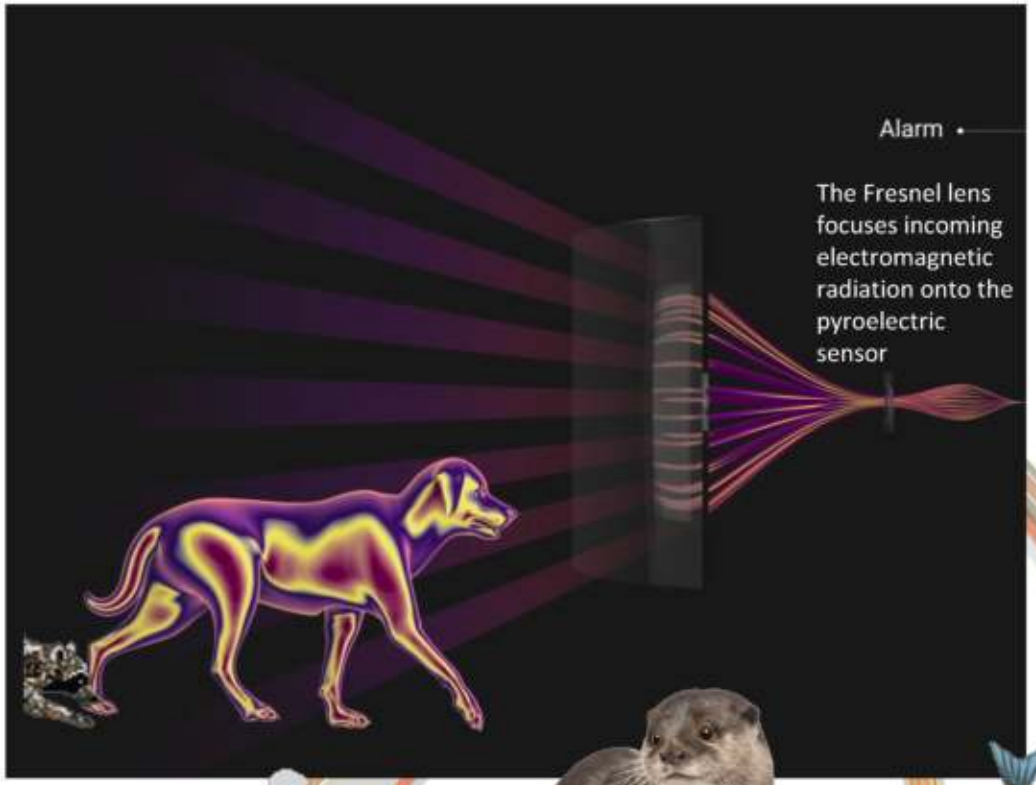
Test

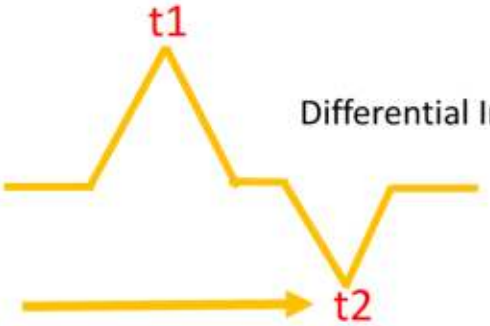
PIR

How Camera Trap Work

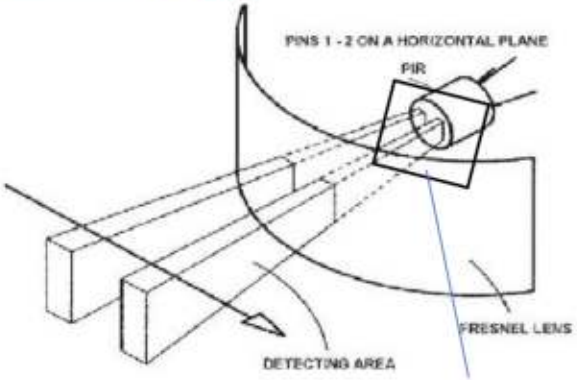
EURASIAN OTTER WORKSHOP

How PIR Sensor Work





Differential Infrared

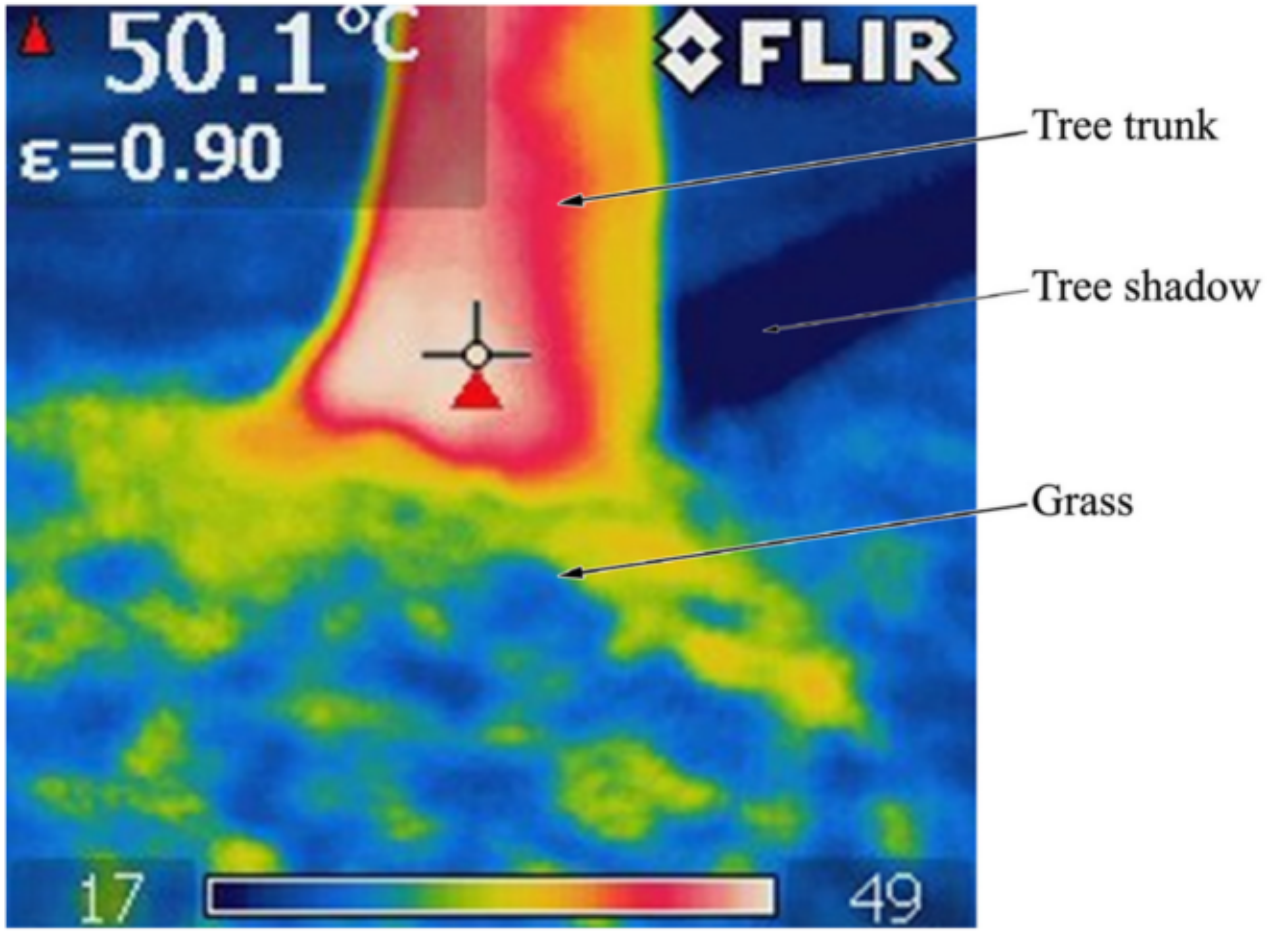


Infrared filter

Pyroelectric sensor

6–14 μm wavelength

How Camera Trap Work

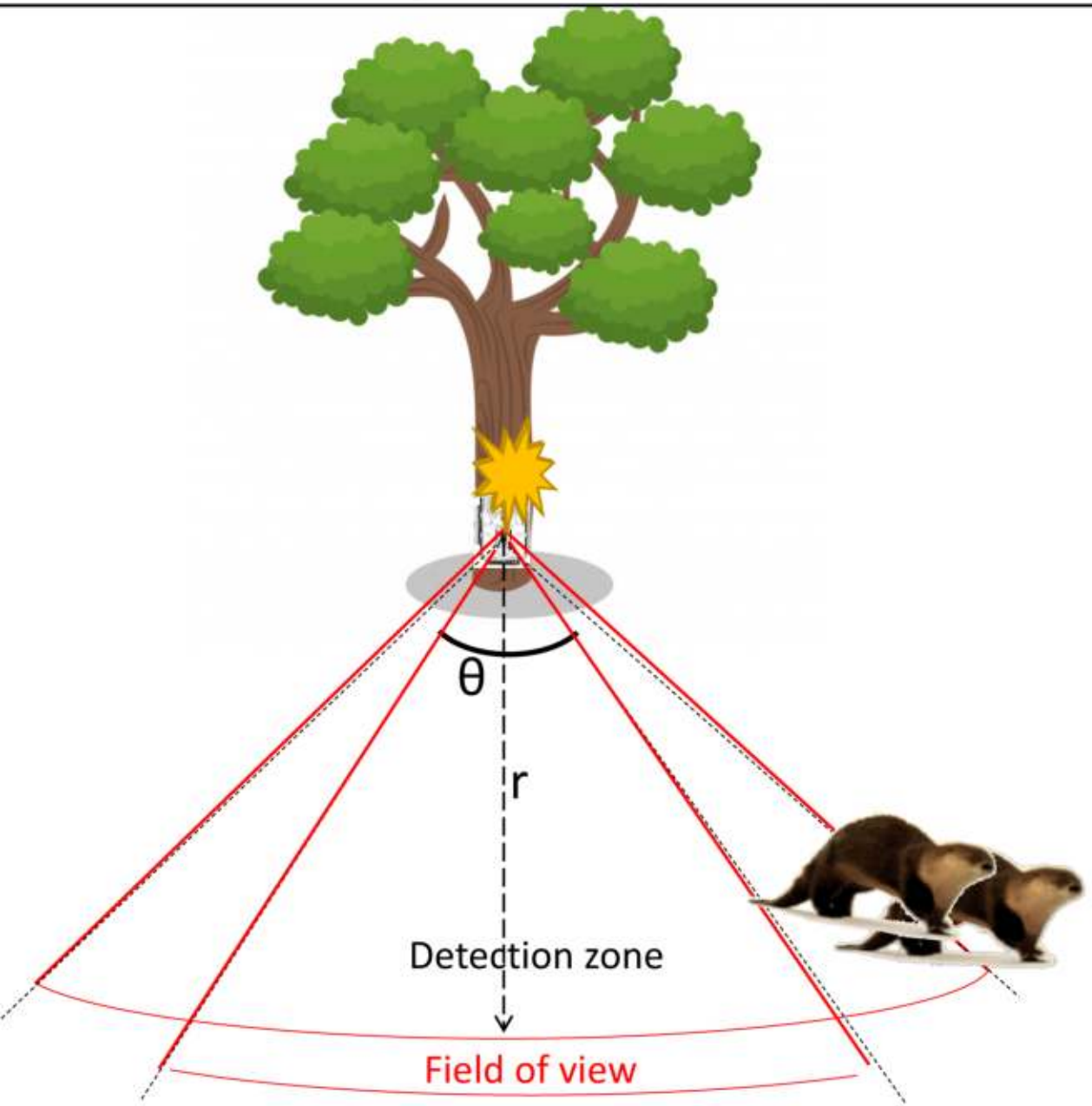


Thermogram of the base of a tree and surrounding grass

Thermal eterogenity can affect the efficacy of the PIR sensors

Welbourne DJ, Claridge AW, Paull DJ, Lambert A. How do passive infrared triggered camera traps operate and why does it matter? Breaking down common misconceptions. Remote Sensing in Ecology and Conservation. 2016;2(2):77–83.

How Camera Trap Work



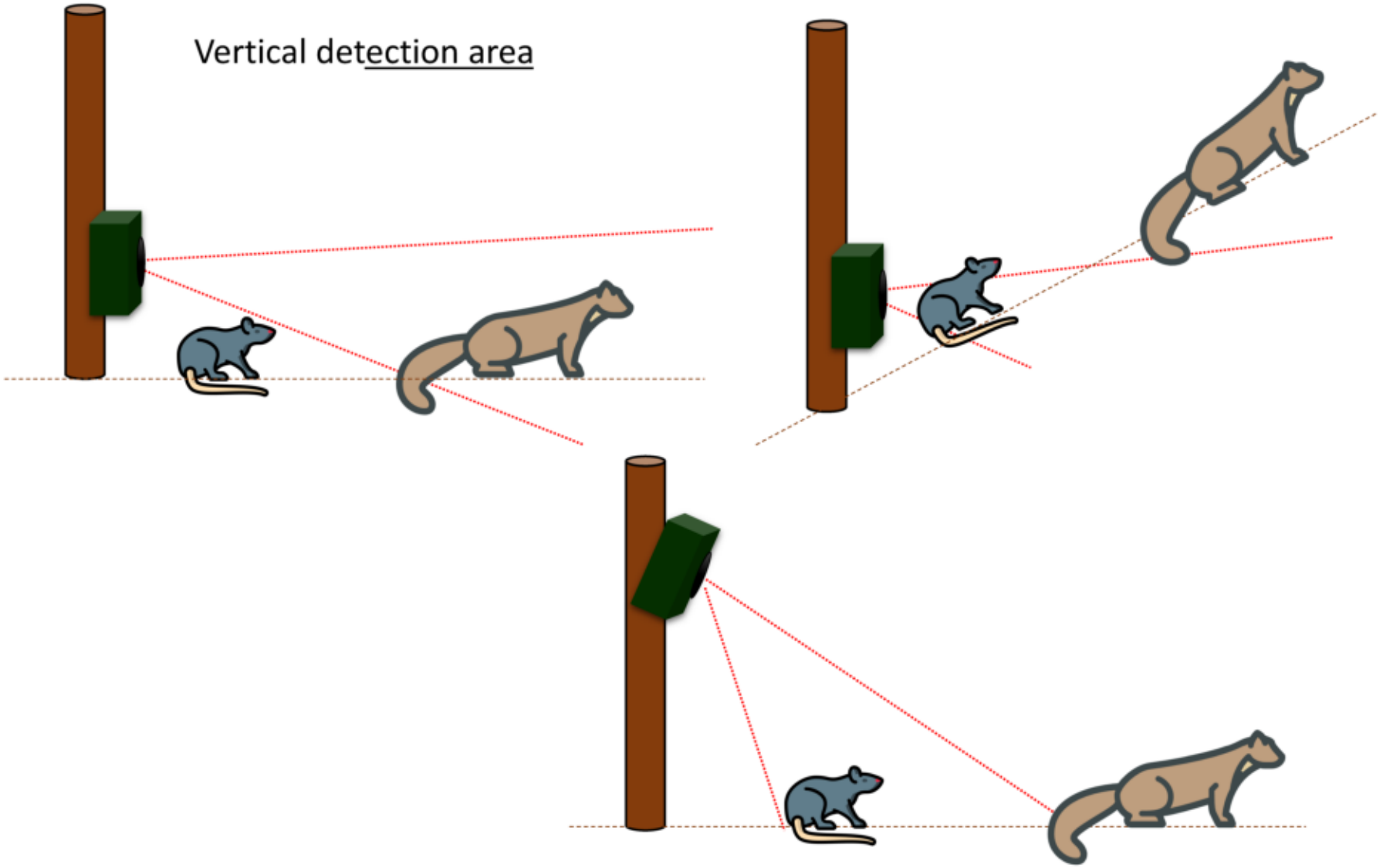
How Camera Trap Work

The animal is into the *detection zone and into the field of view*. 35.1° detection angle and 34.9 ° *field of view*

How Camera Trap Work

Model	Detection width @ 9.1m	Detection angle	Field of view (FOV) width	FOV angle	Detection range	Detection zone area m^2
Reconyx HC500	6.7	40°	6.7	40°	30.5	324.1
Bushnell Trophy Cam	14.3	75°	7.0	42°	15.8	164.3
Scoutguard SG550	7.3	44°	7.3	44°	15.2	89.1
Leaf River IR-5	6.4	37°	6.1	36°	17.7	100.9
Scoutguard SG580M	7.6	45°	7.3	44°	11.6	52.7
Scoutguard SG565	11.3	53°	7.6	45°	9.1	38.6
Moultrie I65	6.1	36°	5.8	35°	10.7	35.8
Moultrie I35	6.7	40°	6.7	40°	9.4	31.1
Recon Viper	2.4	15°	6.1	36°	11.0	15.8
Cuddeback Capture IR	2.1	14°	6.7	40°	11.0	14.7
Predator Traileye IR	7.6	45°	7.3	44°	14.9	87.5
Stealth Cam Unit	11.6	63°	7.0	42°	11.6	73.7
Wildgame Innovations X6C	9.8	56°	7.0	42°	16.2	127.5
Uway Nighttrakker NT50	11.0	62°	7.0	42°	13.7	101.7
Primos Truth Cam X	11.3	53°	7.0	42°	13.7	87.0
Spypoint IR-8	8.5	50°	6.4	37°	13.7	82.0
Primos Truth Cam 60	2.4	15°	7.6	45°	21.0	57.9

How Camera Trap Work



How Camera Trap Work

Trigger speed o Trigger time

A speed shot is considered < 1 s high probability of animal detection

One of the most important and critical camera function

How Camera Trap Work – Trigger speed

Here you can see the *trigger speed problem*
Model with trigger speed at 1 s for video shot

How Camera Trap Work – Trigger speed

Camera Type	Picture Trigger	Recovery	Video Trigger	Recovery	Price
RECONYX MR5	0.22 s	1.9 s	0.29 s	6.8 s	499.95
RECONYX MS8	0.22 s	1.7 s	0.31 s	7.1 s	599.95
BROWNING STRIKE FORCE PRO	0.3 s	1.2 s	0.44 s	1.8 s	159.95
BROWNING SPEC OPS EXTREME	0.41 s	0.8 s	0.52 s	0.8 s	179.95
BROWNING RECON FORCE EXTREME	0.43 s	0.8 s	0.52 s	0.8 s	189.95
SPYPOINT FORCE 11D	0.05 s	0.50 s	0.58 s	0.7 s	149.95
BROWNING DEFENDER 850	0.48 s	0.8 s	0.6 s	0.7 s	229.95
BUSHNELL AGGRESSOR TROPHY CAM NO GLOW	0.15 s	0.69 s	0.72 s	1.8 s	199.95

How Camera Trap Work

Table 4. The average detection times from first detection to first image of 21 camera trap models (data courtesy of TrailcamPro).

Model	Average Time
Reconyx HC500	0.197 s
Reconyx HC600	0.203 s
Leupold RCX-1	0.937 s
Leupold RCX-2	0.963 s
Spypoint IR-8	1.133 s
Bushnell Trophy Cam Black Flash	1.300 s
Bushnell Trophy Cam	1.344 s
Wildview Extreme 5	1.377 s
Scoutguard SG580M	1.449 s
Primos Truth Cam 35	1.557 s
Uway NightXplorer NX50	1.567 s
Moultrie M-80	1.581 s
Moultrie M-100	1.648 s
Stealth Cam Archer's Choice	1.760 s
Scoutguard SG565	1.858 s
Stealth Cam Unit	2.165 s
Bushnell Trophy Cam Black Flash XLT	2.438 s
Stealth Cam Sniper Pro	2.607 s
Moultrie D55 Incandescent	2.674 s
Moultrie D55 IR	2.681 s
Stealth Cam Rogue IR	4.206 s

How Camera Trap Work - Flash

White Flash
Flash IR
Black Flash/No Glow

Samples Type

Target species

STROBE FLASH
BRIGHT WHITE FLASH WHEN ACTIVATED AT NIGHT

INFRARED or RED GLOW FLASH
VISIBLE RED GLOW WHEN ACTIVATED AT NIGHT

BLACK FLASH or NO GLOW
NO RED GLOW WHEN ACTIVATED AT NIGHT

How Camera Trap Work - Flash

White Flash

How Camera Trap Work - Flash

Flash IR Low Glow

How Camera Trap Work - Flash

Flash IR No Glow

How Camera Trap Work - Flash

Flash IR No Glow

How Camera Trap Work - Batteries

Batteries

ALKALINE AA CELL
ALKALINE D CELL

Lower cost.
Easy to find all over the world.
The voltage starts with 1.6 V but it decrease almost immediately.
Battery life is affected by temperature.
At 0°C battery life is reduced at half the time

LITHIUM AA CELL

Higher cost
Longer life
Hold the voltage 1.8 V very well

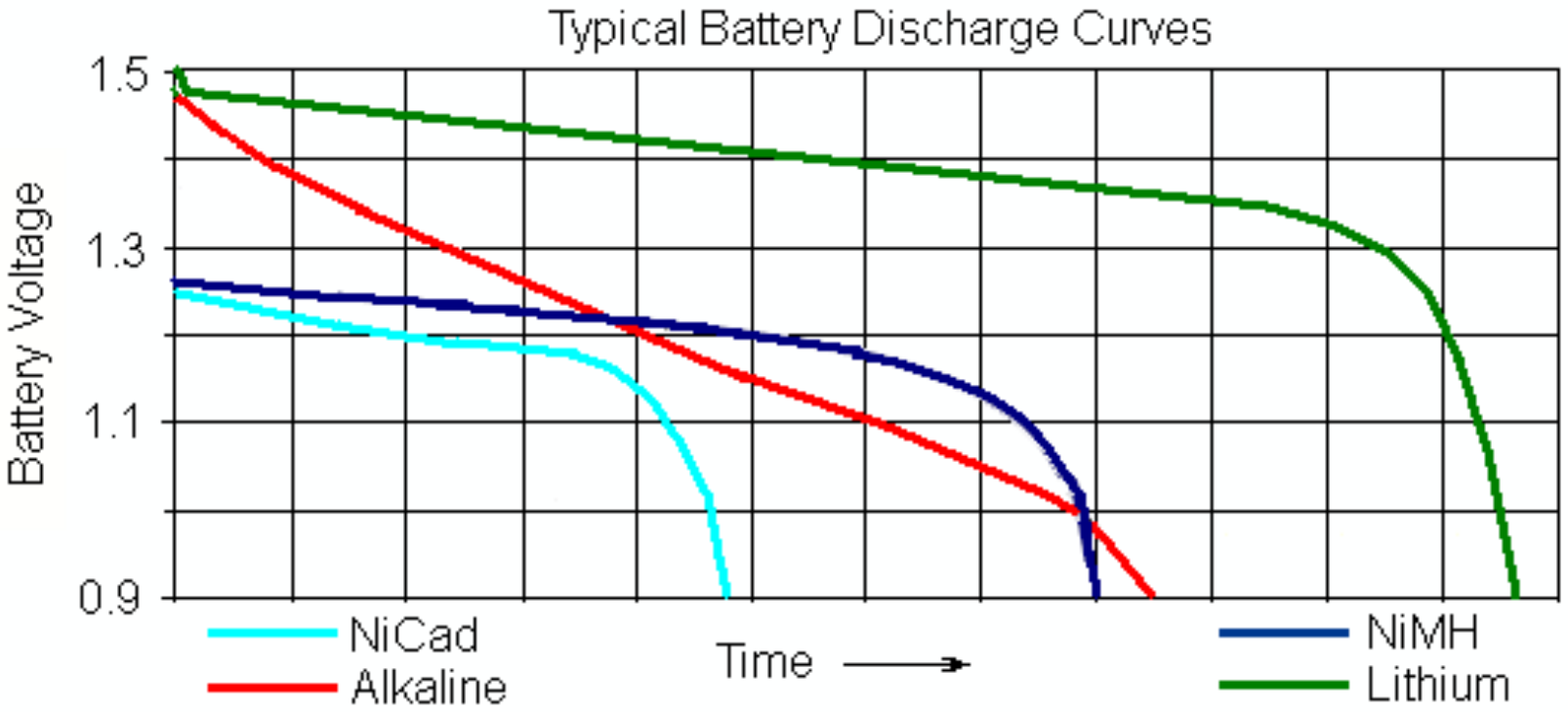
RECHARGEABLE
LI-ION AA CELL

Higher Cost.
Good life
Very recently not easy to find
Hold the voltage very well
Ecological

How Camera Trap Work - Batteries

RICARICARIBILI Ni-MI
AA CELL

The most used recheargeable batteries.
Low battery life



http://www.boat-project.com/tutorials/aa_atteries.htm

How Camera Trap Work

Some early studies suggested that camera-trapping can be an optimal method in the case of otter

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Thank You