Nuovo mondo e vecchie malattie: la citizen science fa riemergere la cherato-congiuntivite infettiva (e non solo questa....) fra tahr e camosci in Nuova Zelanda

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ITALIA
NUOVA
ZELANDA


KASHMIR
CHINA
BHUTAN
NEPAL
INDIA

Introduction to New Zealand

In 1904 the Duke of Bedford gave the New Zealand Government six tahr selected from his herd at Woburn. Donne (1924) records that the Duke intended to send eight animals but two escaped just prior to shipment. These six tahr, three of each sex (although in an appendix Donne states that there were 2 males and 4 females) left England in April, 1904, and reached Wellington by the end of May. During the voyage one male escaped and was lost overboard but the remainder were in good condition when they arrived, and after a quarantine period were liberated in the Mt. Cook area. In 1909 the Duke of Bedford presented New Zealand with a further eight tahr (six male and two female) and these animals were also released near Mt. Cook. Donne (1924) records that three more (adult male, female and a young female) were released by the Government Tourist Department in the Lake Rotorua district, but these did not become established, while in 1911 another three (one male and two female) were liberated at Waihou on the West Coast. Thomson (1922) states that three tahr were liberated on the Franz Josef Glacier in 1913 but these are probably the same animals which Donne recorded as released at Waihou. In 1919, four tahr were obtained from the Wellington Zoo and released on the Sealey Range where tahr were already established.

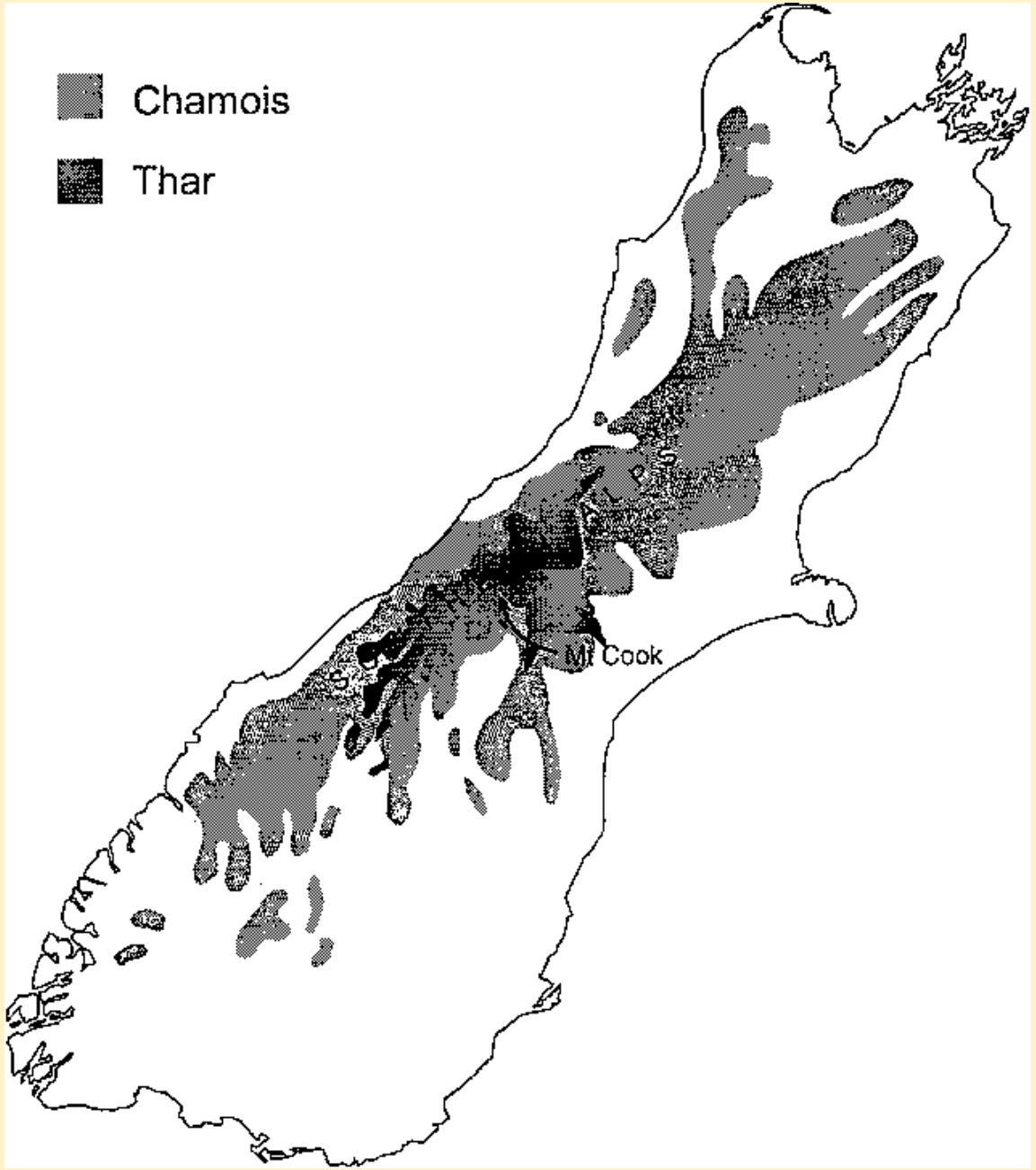
Tahr
6 + 8 +3 +4 (1904-1919)

Chamois
8 + 2 (1907-1914)

Introduction to New Zealand

The first enquiries about the possibility of the introduction of chamois were made in 1888 by Sir Julius von Haast and G. M. Thomson. The following year a sum of money was made available by the Government for the cost of shipping chamois to New Zealand. However, no chamois were introduced at this time, probably because of the difficulty in procuring animals (Thomson, 1922). In 1907, as the result of a chamois drive in Austria, eight chamois were selected and transported to New Zealand. The eight consisted of two males and six females (two of which were carrying young), all aged between two and three years. After a period of quarantine the chamois were released near the Hermitage. Mount Cook.

A later introduction was made in 1914 when three tame chamois were shipped to New Zealand from Austria. One died on the voyage out and the remaining two were liberated in the Mount Cook region.



PEST

Forest Research Institute, Whakarewarewa, Rotorua, Neuseeland

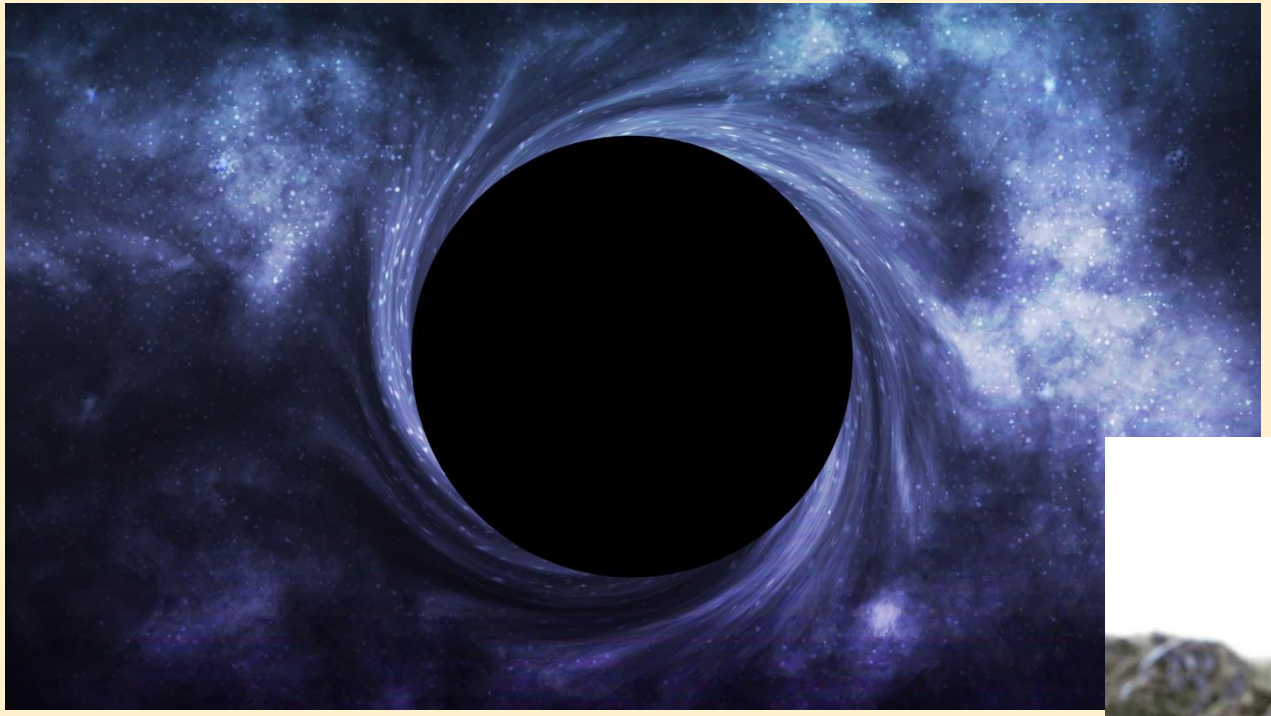
Untersuchungen über Krankheiten der Gemse (Rupicapra rupicapra L.) und des Thars (Hemitragus jemlaicus Smith) in den Südalpen von Neuseeland

Von M. J. Daniel und A. H. C. Christie

NO IMAGENES

Zeit des Ausbruches	Gebiet	erkrankte Tierarten	Schwere des Ausbruches	Diagnose der Krankheit
Frühjahr/ Sommer 1936	Hooker Valley	Gemsen; ferner 1 Hase und 1 Kaninchen	Schwerer Ausbruch. Einige hundert Gemsen jeden Alters wurden tot oder sterbend gefunden	Diagnostische Abteilung Tierforschungsstation Wallaceville
Sommer 1940	Lake Heron	Gemsen	Schwerer Verlauf. Etwa 25% aller Altersstufen waren auf einem oder beiden Augen blind	Autoren (Augensymptome)
Sommer 1940	Waitaha, Westland	Gemsen	Schwerer Verlauf. Etwa 70% aller abgeschossenen Tiere waren völlig blind. Gemsen jeden Alters waren befallen	Autoren (Augensymptome)
Sommer 1947/48	Upper Rangitata	Gemsen	Schwerer Verlauf. Bei vielen geschossenen Tieren fortgeschrittenes Stadium der Krankheit, Mortalität 50% im Gebiet	Autoren (Augensymptome)
Sommer 1960	Shotover River, Südland	Wildziegen	Isolierter Ausbruch. Etwa 20% der geschossenen Tiere waren auf einem oder beiden Augen blind	Diagnostische Abteilung, Tierforschungsstation Wallaceville
Sommer 1961	Copeland River, Westland	Gemsen	Leichter Verlauf. Etwa 5% der geschossenen Tiere waren auf einem oder beiden Augen blind	Autoren (Augensymptome)
Sommer 1961	Dunstan Range, Südland	Thare	Zwei Böcke, die etwa 70 km südlich ihres normalen Standortes geschossen wurden, hatten getrübte Augen	Autoren (Augensymptome)

Tabelle 1 Angaben über bekanntgewordene Kerato-Conjunctivitis-Ausbrüche bei Gemsen, Tharen und Wildziegen in den Südalpen von Neuseeland.



New Zealand
TAHR
FOUNDATION


NZ HUNTER How To

THE PINKEYE PROJECT

WRITTEN BY FRANCESCO FORMISANO LUCA ROSSI

On February 16th 2022, I launched the Pink Eye Project in New Zealand with my mentors Luca Rossi and Paolo Tizzani. Barbara Moroni and Kaylyn Pinney have most recently reinforced the core research group

Overall, the partners and supporters of the project are the Tahr Foundation, the University of Torino, Italy, an international interest group on diseases of mountain-dwelling wildlife GEESFM (Groupe d'Etudes sur l'Ecopathologie de la Faune Sauvage de Montagne based in Lyon, France), and the Autonomous University of Barcelona, Spain.

Although chamois and tahr are abundant in New Zealand and since their introduction have been subject to hunting and population control plans as non-native species, they have only occasionally been the object of study as far as transmissible diseases are concerned. The information available in the official literature is scarce and mostly outdated.

In Europe, Infectious Kerato-conjunctivitis (IKC) or 'Pink Eye' has been the subject of numerous field and laboratory investigations that, over time, have clarified its clinical features, epidemiology, and etiology, as well as the impact at the population level. Outside Europe, the knowledge on IKC in native wild ruminants is as scarce as in New Zealand.

While there are very few citizen science projects reporting abnormal mortality episodes in wild animals due to limitations such as the appeal of the topic for the average citizen, a large body of evidence shows that interest groups can be useful for collecting this type of information. In this case, local hunters will represent the foundation of this research development.

A survey has been prepared to collect information on individual cases and/or outbreaks of IKC observed in chamois and tahr since the year 2000 and is accessible from the Tahr Foundation website. Respondents are asked to fill out a digital form and to contribute, where possible, photos and videos. All material will be validated by a panel of four veterinarians with expertise in IKC in wild ungulates.

The research updates are posted regularly on the Tahr Foundation's dedicated website page. All information is graphically summarised to allow the hunters to understand the evolution of the project and the quality of the data archived.

The second step of this research will dig a bit deeper into the characterization of the "pink-eye" pathogen, if there are enough cases reported. Samples will be collected in the field from the conjunctival sac of both healthy and IKC affected chamois and tahr and analysed according to host, sex, age, geographical origin, season of collection, and any associations to outbreak or individual cases. Potential contributors will have access to precise instructions via pre-recorded video for their harvest, conservation, and correct submission of the eye swabs.

The biggest challenge of this type of research will be to collect a sufficiently large amount of data and samples from the hunters through this survey.

Regular communication planned with the Tahr Foundation and the research group is the best strategy to keep the hunting community informed, motivated, and aware of the interest in this type of project, especially in terms of wildlife conservation and management.

We believe that this international research could help lay the groundwork for any future partnerships with recreational hunters, stimulating further interest in studies on New Zealand wild ruminants biology and health.

Hunters and local organisations could use the same research approach to enhance timely collect data of new disease outbreaks and to complete fast investigations in the field.

THE HISTORY

Sheep, goat and their wild relatives (belonging to the subfamily Caprinae) have an Achilles heel in the anterior part of the eye, which is the target of a microscopic pathogen named Mycoplasma conjunctivae. Depending on several factors, Mycoplasma may be harmless to the carrier animal or cause a potentially deadly eye disease commonly referred to as infectious Kerato-conjunctivitis (IKC) or "Pink Eye". The different outcome, from the healthy carrier state to the blindness related death, is determined by the unpredictable mix between the variable virulence of the Mycoplasma "strains" involved, their infectious dose, the immune response of the individual animal and the now famous herd immunity. In wildlife, IKC epidemics spreading over large territories at a speed of over 15 kilometres per year have been reported in Europe, involving the two recognised species of chamois (Rupicapra rupicapra and Rupicapra pyrenaica) and the majestic Alpine ibex (Capra ibex). Outbreaks of lower intensity and frequency are signaled in the Iberian wild-goat (Capra pyrenaica), European mouflon (Ovis aries musimon), Asian ibex (Capra sibirica) and Blue sheep (Pseudois nayaur).

I became familiar with IKC in 1981 when a severe epidemic broke out amongst chamois in a large, protected area and two nearby hunting estates in the Western Alps, Italy. Soon afterwards the epidemic spread to a neighbouring protected area in France. In six years, more than 12,000 chamois were exposed to IKC and 5 - 40% died according to zone, herd density and the implemented control strategies. The disturbing images of blind chamois having trouble walking, obsessively circling and eventually falling from cliffs deeply affected alpine hunters and the general public in an animal welfare sensu comunis shocking were the images of IKC resilient kids guiding their blind mothers. Emotions and the strength of nature forced us to reflect on our ignorance and powerlessness in the face of such events. **Decades later, I identified in this major IKC outbreak, and the research that stemmed from it,** the event that modified the attitude of the hunting milieu and conservation communities towards game animal diseases more than any other and their ultimate ecological significance as a natural regulatory factor.

Studies of individually marked chamois, captured by means of box-traps and flank-nets (originally a "kiwi" invention), helped in understanding that even blind animals may recover from the disease and that indiscriminate culling of all chamois with walking trouble results in greater population downturn compared with permitting IKC to run its course. Accordingly, current guidelines recommend a prudent approach to sick animals, and their culling on a welfare basis only (e.g., when legs or the backbone get broken in falling, or both eyes become ulcerated). Once the epidemic wave had vanished, European hunters adapted their culling plans to preserve the acquired herd immunity and allow the fastest possible recovery of the affected chamois populations. In other words, this means sparing adult females for a few years, since they suffered higher IKC-related mortality due to long-lasting habits and the greater social stress compared to bucks.

Frontline research is now focused in identifying the spillover source of major IKC outbreaks in chamois, whether only sheep and goats as previously hypothesised, or even other sympatric wild Caprines such as Himalayan tahr in New Zealand and the Alpine ibex in Europe, via eye-to-eye transport operated by flies over short distances. As known, the first IKC outbreak in chamois in New Zealand occurred 40 years after the introduction of a handful of individuals originating from the Alps: accordingly, room exists for supporting other hypotheses and we can now investigate current scenarios in due detail, with the support of advanced DNA-based tools now available. As "Citizens Scientists" in the authentic declination of three fashionable (though overused) words, hunters in New Zealand have the opportunity to aid in fine tuning the practicable IKC control options at the wildlife/livestock interface and lay the groundwork for future surveillance of transmissible diseases in wild Caprines in the South Island.

Luca Rossi, Wildlife Disease Specialist at the University of Torino

STAGE 1
Inflammation of the mucous membrane of the eye with excess of blood in the vessels.
Intense lacrimation – eyes water heavily.
Central zone of cornea swells.

STAGE 2
Rounded nodules of grey-white follicles in the conjunctiva. Vascular congestion (swelling with blood).
Mucus-purulent (pus, white blood cells, dead tissue – gunk) discharge, crusts and hair loss from the inside corner of the eye.

STAGE 3
The cornea becomes opaque, new blood vessels grow to the central area of the cornea.

STAGE 4
Cornea is perforated, loss of the eye. Rot.


Healthy eyes

Early pinkeye in a tahr

THE RESEARCH TEAM

FRANCESCO FORMISANO

Francesco is a veterinarian surgeon specializing in large animals. He co-owns a clinic in rural France focusing on agricultural livestock. Originally from Italy, Francesco completed his Masters degree in Veterinary Sciences at the University of Torino. His thesis entitled, "Contribution on the causes of mortality on wild ungulates in North-Western Italy" involved conducting 600 autopsies on wild ungulates from the Italian alps to determine their most frequent and fatal pathologies. Today, Francesco's professional interests and personal passion in sustainable hunting and conservation collide, culminating in a move to New Zealand to hunt and study the Himalayan Tahr under the "Attitude and Trails" banner - a cool attractive and educational hunting lifestyle project he started in 2017. Recognising the potential contribution of fellow hunters as citizen science, Francesco co-founded the Pink Eye Project with Luca Rossi and Paolo Tizzani to explore and discover improved management of mountain ungulates.

LUCA ROSSI

Luca has been a full professor at the Department of Veterinary Sciences, University of Torino for more than 20 years. He is a lecturer in veterinary parasitology, ecopathology and wildlife management with special expertise on mountain ungulates. His research is focused on transmissible diseases and parasites of wild Caprinae, from the field to molecular epidemiology. During his long academic life, he's been consultant of CIC, Anses and other conservation agencies on matters related to transmissible diseases of mountain wildlife. He's been co-chairman and is currently the Secretary of the GEESFM (Groupe d'Etudes sur l'Ecopathologie de la Faune Sauvage de Montagne). He is also member of the IUCN Caprinae Specialist Group.

PAOLO TIZZANI

Paolo Tizzani is adjunct professor at the University of Turin, Department of Veterinary Sciences. Paolo's research activity focuses particularly on the dynamics of diseases in wild ungulates. He has carried out studies at both national (Italy) and international (Europe, Africa, Asia and the Americas) level, on the interactions between pathogens, wildlife and the environment.

KAYLYN PINNEY

Kaylyn is the current chair of the New Zealand Tahr Foundation. She is also a PhD candidate at Lincoln University, New Zealand, Department of Pest Management and Conservation, focusing on the Waikaloo white-tailed deer. Her research interests include wild ungulate biology and management, and the role of citizens in sustainable management of ecosystems. Her goal is to see New Zealand's game animals managed sustainably as a valued resource and become universally appreciated as an important part of New Zealand's biodiversity, culture, and heritage.

BARBARA MORONI

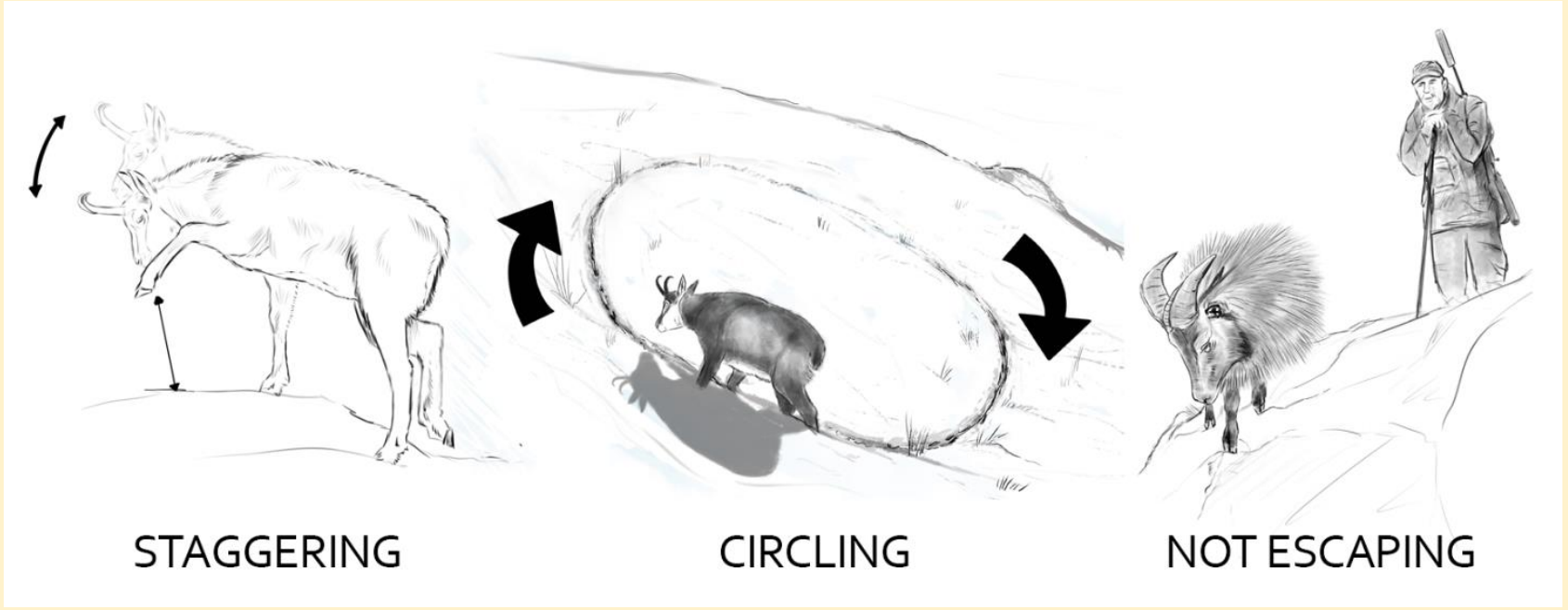
Barbara is a PhD candidate at the Veterinary Science Department of the University of Turin, Italy. Her research interests include parasitology and wildlife eco-pathology, with a focus on epidemiology and control of major parasitic diseases in domestic animals and wildlife. She is passionate about wildlife parasitology since her postgraduate internship in Finland, where she spent one year of research on gastrointestinal parasites in reindeer, after finishing her MSc degree in Veterinary Medicine.

EYE DISCHARGE

ULCERATED EYE

WHITE EYE

BLUE EYE



STAGGERING

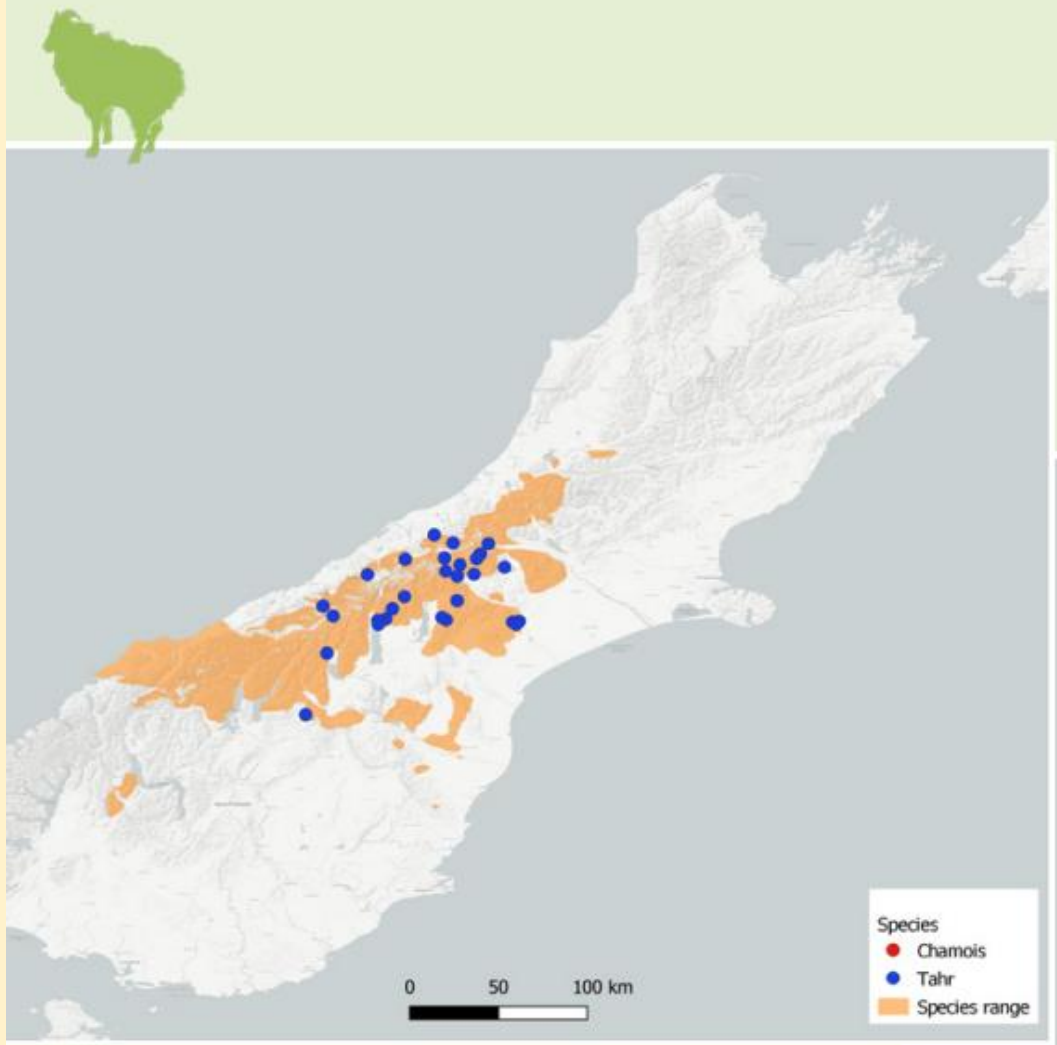
CIRCLING

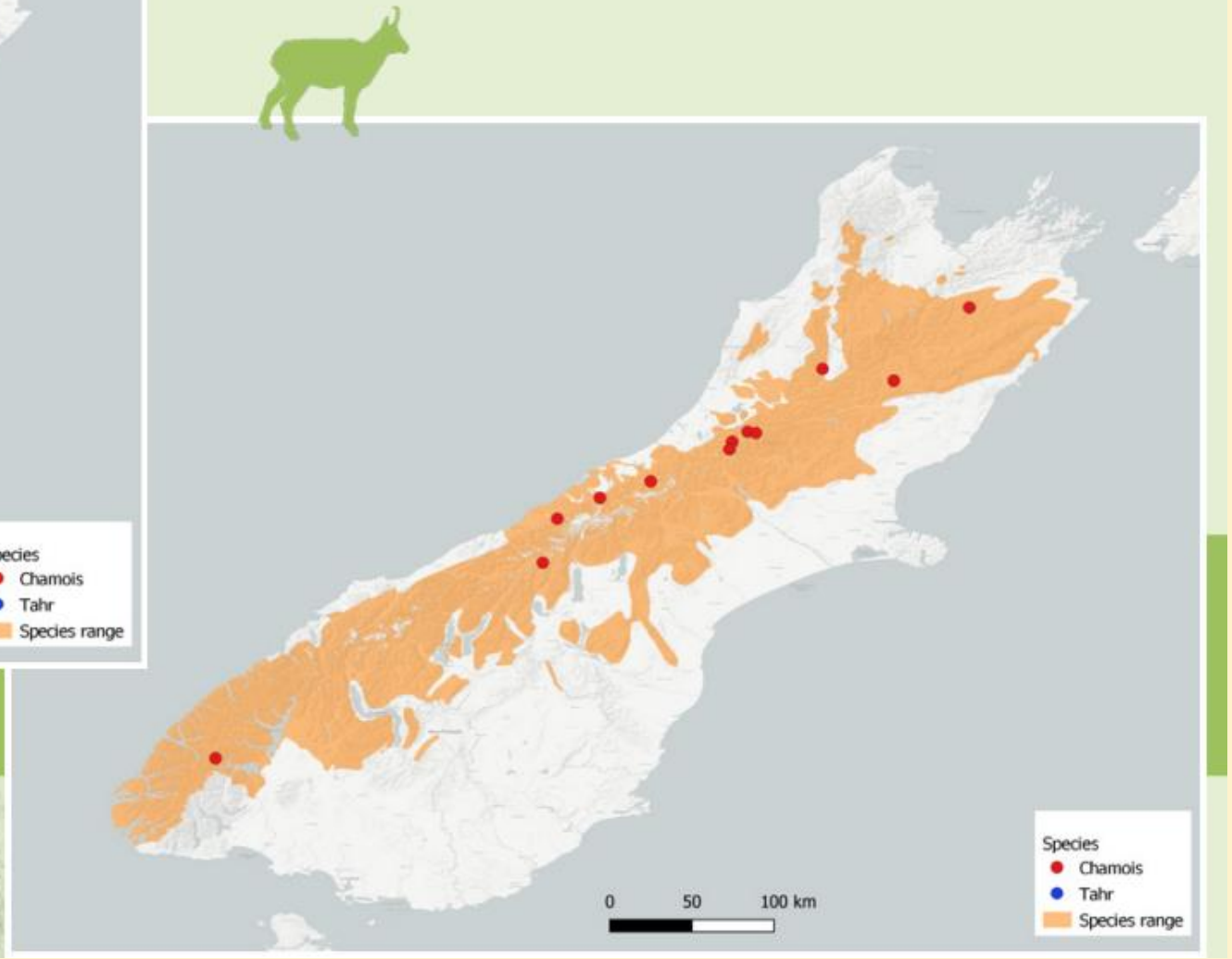
NOT ESCAPING

We received N= 42 questionnaires, 28 of which (67%) provided high-quality pictures. Thirty questionnaires referred to tahr (71%) and 12 (29%) to chamois. A total of 43 tahr and 24 chamois, with clinical signs compatible with IKC, were reported. Interestingly, cases were more prevalent in males (64%), and in individuals older than 4 years (69% of the questionnaire).

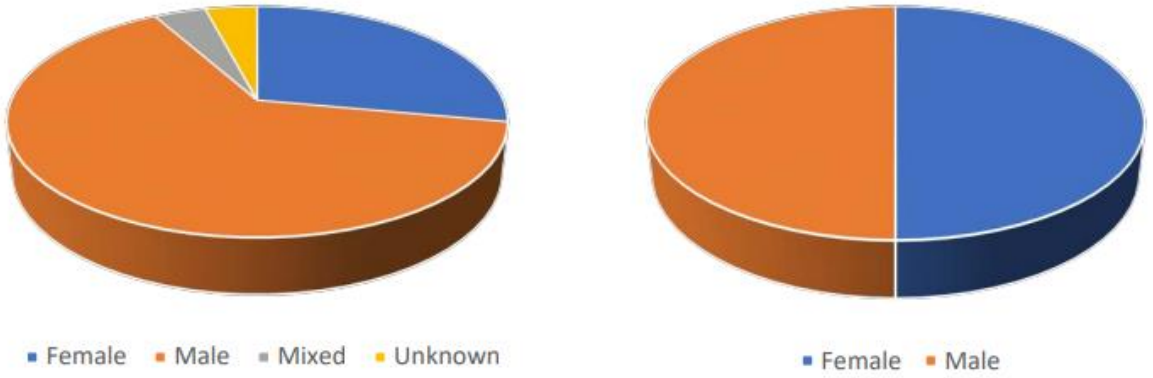
ENDEMIC

(No major outbreaks in the last 20 years)

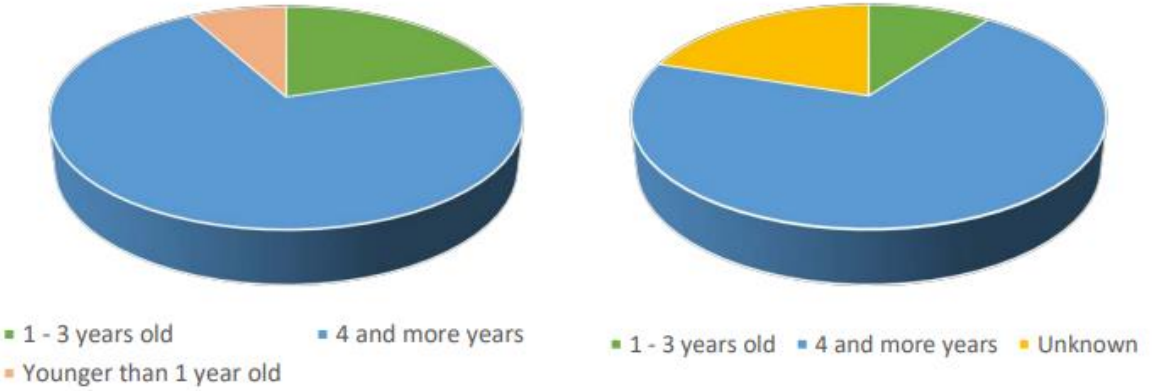

Species
Chamois
Tahr
Species range
0
50
100 km

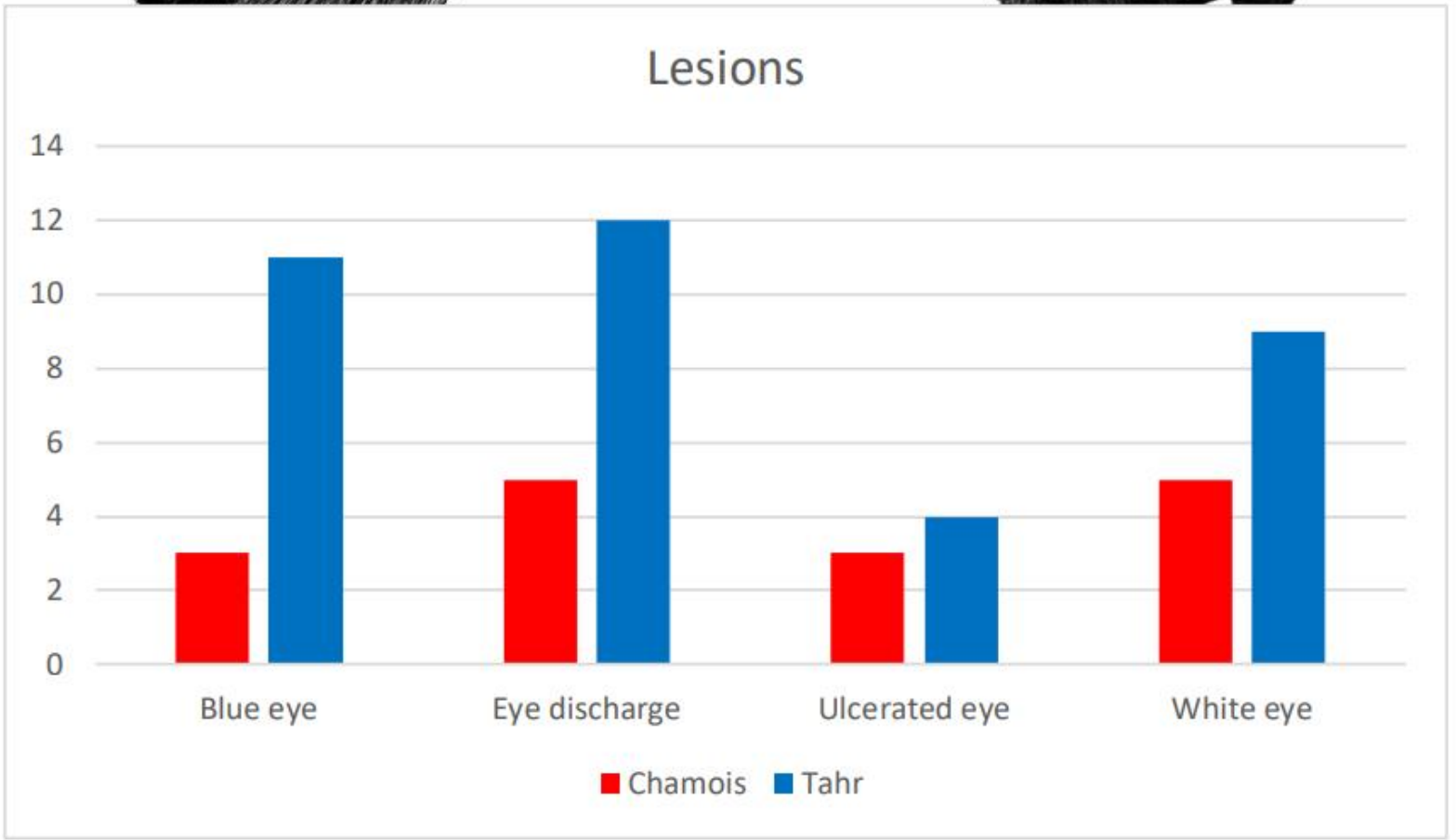

Species
Chamois
Tahr
Species range
0
50
100 km

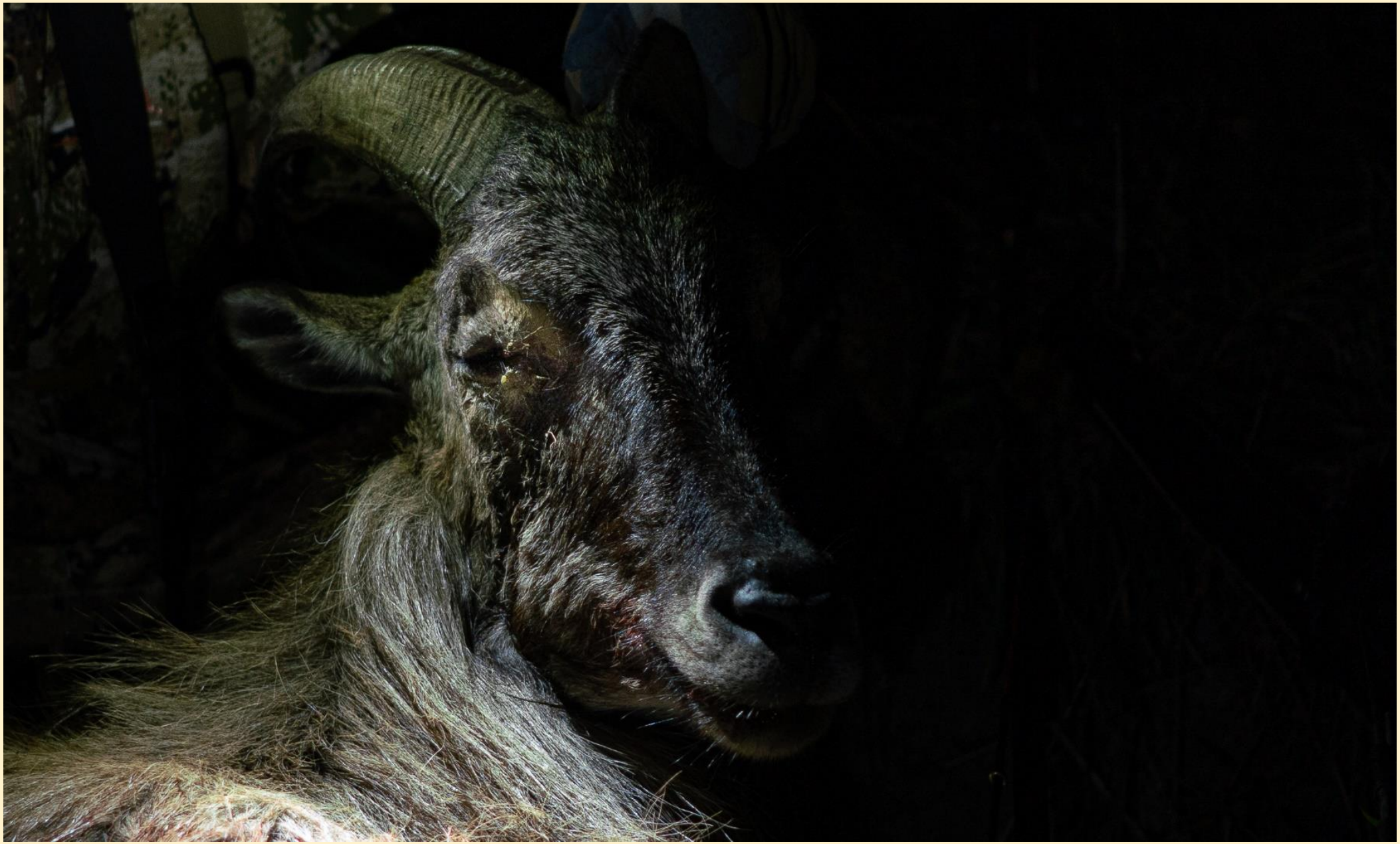
BY SEX


Female
Male
Mixed
Unknown
Female
Male

BY AGE


1 - 3 years old
4 and more years
Younger than 1 year old
1 - 3 years old
4 and more years
Unknown


Lesions
14
12
10
8
6
4
2
0
Blue eye
Eye discharge
Ulcerated eye
White eye
Chamois
Tahr



HORN-ROT

CITIZEN SCIENCE

GRACIAS POR VUESTRA ATENCION