CHAMOIS HORN ROT RESEARCH PROPOSAL to NZDA

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Introduction:

My name is Francesco Formisano, and I am veterinarian surgeon specializing in large animals. I co-own a clinic in rural France focusing on agricultural livestock. Originally from Italy, I have completed my Master degree in Veterinary Sciences at the University of Torino: “Contribution on the causes of mortality in wild ungulates in North-Western Italy”. The study involved conducting 600 autopsies on wild ungulates from the Italian alps to determine their most frequent and fatal pathologies. Today, my professional interests and personal passion in sustainable hunting and conservation collide, culminating in a move to New Zealand for 2 years to hunt and study the Himalayan Tahr under the "Altitude and Trails" banner - a collaborative and educational hunting lifestyle project started in 2017.

The Problem:

The term “*horn rot*” is indeed used to describe a degeneration of the horns in animals like chamois and tahr, as reported by Steuart Laing and Bruce Banwell in their books: Chamois, A New Zealand Hunter’s Handbook, The Alpine Chamois, and Tahr, A New Zealand Hunter’s Handbook.

Although *horn rot* has been observed in a significant number of hunted animals in New Zealand since the 1990s, no studies have ever been conducted to understand the spread of the phenomenon or identify the pathogen responsible. During the Pink Eye project, launched in collaboration with the New Zealand Tahr Foundation (full report here: Pink_Eye_project_brochure_Final.pdf (nztahrfoundation.org.nz), several cases of *horn rot* in New Zealand chamois were reported. In addition to the reports collected during the Pink Eye project, using the so-called Citizen Science method, the research team received similar reports from hunters active in the French Alps.

Rationale:

At present, the lack of knowledge regarding the pathogen responsible for *horn rot* in chamois makes it challenging to provide clear recommendations on how to manage affected individuals, particularly since the disease’s contagiousness remains uncertain. This condition is affecting several specimens and altering a key phenotypic characteristic of the chamois—its hooked horns. The resulting degradation of trophy quality and thus individual and herd value may reduce interest among hunters, potentially complicating efforts to monitor and manage wild chamois populations.

Technical Resource, Expertise and Experience:

Throughout my career, I have maintained strong professional relationships with my former professors, Luca Rossi, Paolo Tizzani, Pier Giuseppe Meneguz, all of whom are experts in wildlife health and disease dynamics. Our mutual interest in mountain ungulates led us to co-found with Barbara Moroni and Kaylyn Pinney the *Pink Eye Project*, (see link to report below) a collaborative initiative aimed at improving the management of these species. Recognizing the potential for hunters to contribute as citizen scientists, we focus on combining field data with scientific analysis to better understand disease transmission and its impact on wildlife populations.

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

Pier Giuseppe Meneguz PhD, graduated in Veterinary Medicine in 1979. He practiced professionally in wildlife management until 1996, gaining practical expertise which he later taught at the University of Torino, where he was a professor of Wildlife Resource Management and Strategies and Tools for Wildlife Planning until 2024. Author of numerous scientific publications and a selective big game hunter, he has always nurtured an interest in all forms of wildlife utilization as a renewable natural resource.

Luca Rossi is Full Professor at the Department of Veterinary Sciences, University of Torino since more than 20 years. He is 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. He's been co-chairman and currently the Secretary of the GEESFM (Groupe d'Etudes sur l'Ecopathologie de la Faune Sauvage de Montagne), a dynamic association engaged in promoting interdisciplinary research and visions on mountain wildlife health and conservation. He is also member of the IUCN Caprinae Specialist Group.

Barbara Moroni is a Veterinary Researcher at the Istituto Zooprofilattico Sperimentale of Piemonte, Liguria and Valle d'Aosta (Turin, Italy) and her main research interests include parasite epidemiology and wildlife eco-pathology. She pursued her PhD at the Veterinary Science Department of the University of Turin, (Italy) and is currently a second-year resident for the European College of Veterinary Parasitology. She is passionate about wildlife parasitology since her postgraduate internship in Finland, where she spent one year doing research on gastrointestinal parasites in reindeer, after finishing her MSc degree in Veterinary Medicine.

Methodology:

In my exchanges with local French hunters, I have observed, through their photographic documentation, cases of *horn rot* like those seen in New Zealand. This suggests that there may be commonalities in the environmental/climatic conditions (or other casual agents/factors) across alpine regions. By involving multiple alpine countries, we aim to compare and analyse the data to identify potential shared factors at the origin of this disease. The involvement of the hunting community as citizen scientists will be invaluable, providing real-time observations that contribute to a broader understanding of the spread and impact of these diseases.

The term **Citizen Science** literally refers to an approach that aims to involve "ordinary people" in scientific research. The basic principle is that anyone can contribute, based on their knowledge, to gathering data or information about a particular phenomenon.

This type of approach is widely used in ecological studies and can serve, for example, to broaden knowledge about the presence and distribution of a species by reporting one's observations according to the guidelines established by an institution, for example:

- High Country Citizen Science Project – Glacier National Park, USA

https://www.nps.gov/rlc/crown/high-country-citizen-science-project.htm;

- HerbiLand Project – Mont Blanc, France

https://blog.creamontblanc.org/?p=4868&lang=en&

- iNaturalist Project, Bighorn Institute – Palm Desert, USA

https://www.bighorninstitute.org/inaturalist-project;

- Citizen Science in Galicica National Park – North Macedonia

https://www.pont.org/citizen-science-in-galicica-national-park/;

- Hybridization between Alpine Ibex and Domestic Goat in the Alps: A Sporadic and Localized Phenomenon? – Austria, Germany, Italy, Slovenia, Switzerland

https://iris.unito.it/retrieve/00149d98-79e5-4d03-a534-fef2ff7d3b5d/2022%20ibridi%20ibex.pdf.

The reports collected and submitted by citizens undergo a validation process to ensure their accuracy and reliability. The authors have already successfully applied this approach for the health monitoring of a population of Tahr and Chamois in New Zealand, with excellent results in improving knowledge about the distribution of infectious keratoconjunctivitis in these ungulate populations.

Objectives:

The *horn rot* research has both short-term and long-term objectives.

In the short term, it aims to understand the existence, distribution, and incidence of the phenomenon in the Alpine Chamois population, and to determine whether and which epidemiological, population, and environmental factors may contribute to the occurrence of *horn rot*.

As a more ambitious and long-term goal, the research seeks to investigate, through laboratory tests, the possible presence of pathogens as the cause of the phenomenon.

Operation:

This proposal focuses on the short-term objectives which, if achieved, may serve as a foundation for a more ambitious and complex study centred on the long-term goals.

This project will be simultaneously launched in Italy and France, in collaboration with the Italian delegation of the *CIC (International Council for Game and Wildlife Conservation)* and the *ANCGB (National French Association of Big Game Hunters)*. This transnational approach allows us to gather a diverse dataset from different alpine regions, which is crucial for identifying common environmental and pathological factors that contribute to disease outbreaks, such as horn rot, in wild ungulates.

The data will be collected via an online questionnaire following the same schema proposed in Italy and France on their relative platforms, accessible to all hunters through the website of the New Zealand Deer Stalkers Association (NZDA). The project will be introduced through an informative section that includes a detailed explanation of the study objectives, along with a comprehensive guide to completing the survey.

This questionnaire could be shared not only with NZDA members but also with NZ hunters. The survey will contain a series of targeted questions aimed at understanding the distribution, incidence, and impact of horn rot, while also gathering as much information as possible to identify the risk factors (individual, epidemiological, and environmental) that may have contributed to its occurrence. The collected data will then undergo statistical analysis to identify the factors that are effectively responsible for the appearance and distribution of horn rot.

Using Power BI software, the research team will generate quarterly or biannual updates, which will be published on the dedicated project page of the New Zealand Deer Stalkers Association (NZDA) website. Additionally, key posts will be developed by the researchers, in collaboration with NZDA, to engage hunters and provide regular updates on significant findings and ongoing progress of the research.

Hunters participating in the survey will become familiar with this citizen science approach to data collection, gaining insights into how wildlife populations can be monitored in the event of disease outbreaks and related issues. Their presence in the field is highly valued, and this approach emphasizes the responsibility they carry in contributing to an efficient data collection system. Both professional and recreational hunters play a crucial role in integrating hunting activities with effective wildlife monitoring.

Costs:

Since it is uncertain whether a single year of investigation will be sufficient, the cost estimate of **NZD$1500** allows for two years of subscription to Jotform (Forex at 0.56 Euros – NZD).

Jotform is the platform that enables the creation of the online survey, with the added functionality of file uploads for data collection. Should sufficient data be collected in the first year a decision to not renew the subscription for Year 2 can be made.

The Power BI software subscription is covered by the Italian researchers and available for NZ use already.

Timeline of project:

This project commences on the date of approval of funding. This project will run for 12 months, until there are enough data to publish. Should there be insufficient data, we will continue running this project for a second year.

Reporting:

Reporting will be done every three months with a brief update (approx. 150 words), through the NZDA dedicated webpage. A final report in electronic format, complete with graphics, figures and statistics will be distributed at the project end. A brochure will also be produced for public download on the webpage, which details all that we have discovered with this citizen science project.