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Ten Years of Monitoring for Tuberculosis in Free-living European Bison (*Bison bonasus*) in Poland

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Introduction

The European bison, or wisent (*Bison bonasus*), stands as a symbol of conservation success and ecological resilience. Once on the brink of extinction, this majestic species has been the focus of extensive conservation efforts, particularly in Poland, where significant populations thrive in the Białowieża Forest and other protected areas. However, the resurgence of the European bison has been accompanied by challenges, notably the emergence of diseases such as Tuberculosis (TB). For the past decade, Polish wildlife authorities, alongside various research institutions, have conducted comprehensive monitoring to assess and manage the incidence of tuberculosis among free-living European bison. This initiative has been critical not only for the health of the bison population but also for understanding the dynamics of disease transmission in wildlife and its potential implications for domestic livestock and human health [1].

The monitoring program initiated in Poland began in earnest in the early 2010s as part of a broader initiative to manage wildlife health and conservation. The impetus for this monitoring stemmed from increasing concerns regarding the health of free-living bison populations and the potential threats posed by zoonotic diseases. Bovine tuberculosis, caused by the bacterium Mycobacterium bovis, is a chronic disease that can affect a wide range of mammals, including cattle and wildlife. Its presence in wildlife populations raises significant concerns, as it can lead to increased mortality rates, impact conservation efforts, and pose risks to agricultural industries and public health. To address these concerns, a multidisciplinary approach was established, involving veterinary experts, wildlife biologists, and ecologists. The monitoring program employed a combination of field surveys, diagnostic testing, and epidemiological assessments. The primary objective was to establish a baseline understanding of the prevalence and distribution of tuberculosis in the bison population, identify potential reservoirs or vectors of infection, and evaluate the effectiveness of management strategies implemented over the years [2].

Description

The diagnostic methods used to detect TB included tuberculin skin testing, serological tests, and, in some cases, post-mortem examinations. Tuberculin skin testing, a common method for diagnosing TB in cattle, involves injecting a small amount of tuberculin into the skin and monitoring for a reaction. This method was adapted for use in bison, providing a valuable tool for identifying infected individuals within the population. Additionally, serological tests allowed researchers to assess the presence of antibodies associated with Mycobacterium bovis, providing further insights into the disease dynamics within the bison herd. Over the course of the monitoring program, a range of findings emerged that contributed to our understanding of tuberculosis in free-living European bison. Early results indicated a relatively low prevalence of the disease compared to domestic cattle populations. However, sporadic cases of tuberculosis were identified, raising alarms about the potential for outbreaks within the bison population and the risks associated with interspecies transmission. These findings underscored the need for ongoing monitoring and proactive management to mitigate the spread of the disease [3].

The data collected over the years also revealed patterns in the spatial distribution of tuberculosis cases. Certain regions within the Białowieża Forest and surrounding areas exhibited higher incidences of infection, often correlating with factors such as population density, habitat conditions, and interactions with domestic livestock. These findings highlighted the importance of landscape ecology in understanding disease dynamics and reinforced the need for integrated management approaches that consider both wildlife and agricultural health. In response to the monitoring results, management strategies were adapted and refined. This included targeted interventions aimed at reducing the risk of disease transmission between bison and domestic livestock. Efforts were made to improve biosecurity measures on farms located in proximity to bison habitats, emphasizing the importance of maintaining healthy wildlife populations while safeguarding livestock health [4].

Collaboration among various stakeholders, including governmental agencies, non-governmental organizations, and academic institutions, has been instrumental in the success of the monitoring program. This collaborative approach fostered a sense of shared responsibility for wildlife health and conservation, enabling the pooling of resources and expertise to address complex challenges. Regular meetings and workshops facilitated knowledge exchange and the development of best practices for disease management in free-living bison populations. As the ten-year mark of the monitoring program approached, an evaluation was conducted to assess its overall impact and effectiveness. The findings indicated a notable improvement in the health status of the bison population, with a decline in the incidence of tuberculosis cases compared to earlier years. This success can be attributed to the combined efforts of wildlife managers, researchers, and local communities in implementing proactive monitoring and management strategies [5].

Conclusion

Looking to the future, the experience gained from ten years of monitoring tuberculosis in European bison in Poland provides valuable lessons for wildlife health management globally. The importance of interdisciplinary collaboration, the integration of traditional ecological knowledge with modern scientific techniques, and the engagement of local communities are all critical components of successful conservation and disease management programs. As European bison continue to roam the forests of Poland, the ongoing commitment to monitoring and protecting their health stands as a testament to the resilience of nature and the dedication of those who strive to safeguard it.

In conclusion, the past decade of monitoring tuberculosis in free-living European bison in Poland serves as a powerful reminder of the interconnectedness of wildlife health, biodiversity conservation, and agricultural practices. It emphasizes the necessity for vigilance, collaboration,

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and adaptive management in addressing the challenges posed by zoonotic diseases. Through sustained efforts, we can continue to protect the majestic European bison while ensuring a harmonious coexistence with the landscapes they inhabit and the communities that share their home.

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Conflict of Interest

None.

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