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Bridging Science, Practice, and Community Engagement for Human–Bear Coexistence

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LIFE BEAR SMART CORRIDORS

HSIN-CHIEN TSAI

Formosan Wild Sound Conservation Science Center



MONDAY 15:45 – 15:59 · MOVEMENT ECOLOGY AND DEMOGRAPHY

From Protection to Active Coexistence: The First Quantitative Density Estimate and Range Expansion of Endangered Asiatic Black Bears (Ursus thibetanus formosanus) in Eastern Taiwan

Hsin-Chien Tsai, Po-Jen Chiang, Jamie Bolam, Chium Tse Huang, Ching Hua Yang, Ho Tsung Chu, Ming Chuan Li, Kun Sung Wu

The Formosan black bear *(Ursus thibetanus formosanus)* is an endangered subspecies endemic to Taiwan. While historically restricted to remote mountain ranges, recent observations suggest a population expansion into Zhuoxi Township in Eastern Taiwan, leading to increased human-bear conflicts. This study provides Taiwan's first rigorous black bear density estimates by integrating Indigenous participatory monitoring with Spatial Mark-Resight and Spatially Explicit Capture-Recapture models to guide conflict mitigation. We employed a three-tiered approach: (1) Semi-structured interviews (n=38) to document local Traditional Ecological Knowledge (TEK) from Indigenous communities regarding bear trends; (2) Systematic camera trapping (2021–2025), which evolved into 2*2 km monitoring grid in late 2024 to track distribution; and (3) Density estimation using a 4*4 km grid (n=17 stations) in 2025. We utilized high-hanging honey baits to elicit standing behavior, enabling individual identification via unique chest markings from camera trap images. Results from TEK and biological monitoring were highly consistent. 84% of residents perceived an increase in bear abundance over the last decade. The camera trap Relative Abundance Index (RAI) doubled from 0.38 to 0.77 events per 100 trap days (2021–2024). In the 2025 survey, 13 unique individuals were identified and utilized for density modeling. SECR estimated a density of 14.1±7.3 bears/100 km², while SMR models further supported these findings with estimates ranging from 11.6 to 24.6 bears/100 km². These results are significantly higher than historical estimates. These findings confirm that while the species remains endangered, local populations in Eastern Taiwan are recovering and expanding into the human-wildlife interface. Conservation must shift from passive protection to proactive coexistence, integrating Indigenous partnerships and conflict mitigation to ensure the sustainable recovery of this iconic species.

ANDREA CORRADINI

Fondazione Edmund Mach



MONDAY 16:25 – 16:32 · HABITAT RELATIONSHIPS AND BEHAVIOUR – SPEED TALKS

Intrinsic and extrinsic factors associated with haematological parameters in brown bears in the Greater Yellowstone Ecosystem

Andrea Corradini, Agnieszka Sergiel, Craig Whitman, Mark Haroldson, Matthew Gould, Elise Loggers, Cecily Costello, Kerry Gunther, Stephen Smith, Courtney Cass, Frank T. van Manen

Understanding how individual traits and environmental factors influence physiological state is essential for predicting species responses to changing environments and long-term persistence. Haematological parameters provide integrative measures of health and physiological condition and can reflect variation in both intrinsic traits and environmental context. In the Greater Yellowstone Ecosystem of North America brown bears have experienced substantial ecosystem-level changes in recent decades, including density-dependent demographic processes, dietary shifts, and increased use of human-modified landscapes. We used long-term research and monitoring data (2000–2024) to examine sources of variation in haematological parameters in free-ranging brown bears. Using an extensive dataset comprising 378 complete blood counts from 257 adults (86 females, 171 males), we evaluated the relative associations of individual traits (sex, age, percent body fat, diet) and external factors (density, human modification) with 14 haematological parameters. Parameter-specific linear and generalized mixed-effects models were fitted to assess patterns across different physiological axes. We found contrasting patterns in the correlates of haematological parameters. Oxygen-transport–related parameters were more strongly associated with intrinsic traits, whereas immune-related parameters showed greater associations with environmental variables, particularly elevation and population density, which were significant predictors of leukocyte profiles. Together, these findings suggest that different components of haematological variation reflect distinct physiological and ecological correlates. The study findings support the use of haematology as an integrative indicator of physiological variation in wildlife and provides important insight into how intrinsic condition and environmental context are reflected in blood-based metrics within complex, changing ecosystems.