Doctoral student sheds light on Asian bird's migration patterns

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Despite their large size, Great Bustards are strong, steady fliers. Credit: B.S. Chun

(Phys.org) —An Arizona State University biologist and her team have found that the Asian subspecies of great bustard, one of the heaviest birds capable of flight, covers migratory routes of more than 2,000 miles, travelling to and from its breeding grounds in northern Mongolia and wintering grounds in Shaanxi province in China.

The research study, which is available online and will be published in the next volume of the Journal of Avian Biology, is the first of its kind to

monitor the movement of this rarely studied subspecies through satellite telemetry and to connect a breeding population of Asian great bustards to their wintering grounds.

Mimi Kessler, a doctoral candidate in biology at the School of Life Sciences, joined ASU because the "New American University" approach with its emphasis on use-inspired research, global engagement and social embeddedness was consistent with her own plans to pursue community-based, international research. She has spent more than two years on Eurasian grasslands, studying habitat use, population genetics, causes of mortality and migration routes of the Asian great bustards.

"We attached GPS transmitters to these birds that collect location data," Kessler says. "These transmitters relay the datasets to a satellite system, so we are able to remotely monitor the movement of these birds very closely, something that has never been done before."

Great bustards are large birds found in grasslands from Spain to Mongolia. Males of the Asian subspecies can weigh up to 35 pounds, but females only weigh up to 11 pounds. The significant size difference between males and females makes bustards the most sexually dimorphic avian species on Earth.

Despite their large size, studying and monitoring these birds is no easy feat. Known for their elusive nature and wariness toward humans, Asian bustards are rarely seen with the naked eye. Kessler and her colleagues use spotting-scopes on hillsides to scan valleys in Mongolia, but it may take the team months to capture and tag a single bird.

Kessler (on the far left) and her team monitor bustard movements across the wide valley below. Credit: S. Monhdalai

"The process of capturing these birds requires us to be extremely alert and careful of every footstep and sound we make," Kessler says. "The work is so painstaking that it becomes an obsession. Members of our team often dream about capturing a bustard. And when it does finally happen, it's a real adrenaline rush."

Kessler says great bustards across Eurasia exhibit a range of migratory behavior corresponding to the severity of winter weather. Great bustards found in Spain may travel only about 10 miles annually whereas those in western Russia travel about 600 miles one way to warmer wintering regions.

The Asian subspecies, however, is the marathon runner of the great bustard family.

"In Mongolia, winter temperatures can drop 30 to 50 degrees below zero," Kessler says. "We found that the Asian great bustards travel for an

average of two months, covering 1200 miles to reach wintering grounds in Shaanxi province in central China. It's a remarkable journey."

The team also found that the birds tend to migrate in a solitary fashion, making multiple long stopovers during their journey. The routes and wintering grounds are subject to change every year, leaving researchers no choice but to track each tagged bird individually.

Kessler says the findings are not only the first of their kind, since research regarding Asian great bustards is scarce, but also offer an insight into the challenges the Asian bustard subspecies and conservationists face.

"Asian great bustards are a threatened species in Mongolia," Kessler says. "They face several dangers, including poaching for sport or sale of meat to exotic food markets in China. The birds have a low reproductive rate; adults raise just one or two chicks to maturity every 10 years, making hunting unsustainable. Bustards are also less maneuverable due to their large size which makes collisions with power lines and overhead cables a serious threat."

Modern agricultural techniques also endanger the subspecies. Heavy machinery, used for tilling land and harvesting crops, can destroy nests and crush chicks, as the birds often nest in agricultural fields. Pesticides kill protein-rich insects that bustard chicks rely on for rapid growth to be able to migrate, come fall.

"Rapid development in Central Asia combined with climate change and low reproductive rate could make these birds could disappear," Kessler says. "We need to take immediate measures to conserve them."

Kessler's solution: implementing conservation strategies that span international borders, as well as working within local communities to

raise awareness about the subspecies while providing educational and employment opportunities. She trains and supports Mongolian undergraduate and graduate students, and hires locals as team members. Her team is also active in programs with rural school children.

"Local people are the stewards of their environment and ultimately decide whether a species will remain in the environment around them or not," Kessler says. "Our goal is to learn from the locals and share the results of our research. We want our work to lead to a brighter future for local communities and these unique populations of great bustards."

Provided by Arizona State University