

Although he was the first European to make note of the astonishing horns of the Pamir argalis, the legendary 13th-century Venetian traveler Marco Polo apparently never saw a live specimen of the sheep that would later be named in his honor. At the time of Polo's travels, incredible herds roamed the green pastures in the wide valleys of the High Pamir Mountains in central Asia, known as the "Roof of the World." Lacking wood at these high altitudes, herders used the huge curled horns (the largest of any wild sheep) to build corrals for their livestock—yaks, sheep, and goats. It is likely that Polo saw only the horns and bones of his namesake sheep.

# MARCO POLO

## SHEEP: King of the Pamir Mountains

By Stefan Michel

*"There are great quantities of wild sheep of huge size. Their horns grow to as much as six palms in length."*

—Marco Polo (1273)



Marco Polo's account was considered an exaggeration in Europe, and it was not until 1838, when Lieutenant J. Wood obtained a specimen at Zorkul Lake on the Tajik-Afghan border that the animal locally called "arkhar" became known to science.

The name *argali* is Mongolian in origin and means ram or sheep. Of the nine subspecies of argali currently recognized, Marco Polo sheep is one of the largest. Mature rams can reach up to 240 pounds. The sheep's size may be an adaptation to its harsh environment. A large body has less surface area (relative to volume) than a smaller one, so less body heat is lost

through the surface. Therefore, animals living in extreme cold tend to be larger than members of the same species living in warmer climates.

It is amazing that this wild sheep can subsist in the high mountain deserts, where cold temperatures and extremely low precipitation limit growth of vegetation. They feed on the plains, where surface water and springs enable the growth of mountain meadows, and on scarce tussock grasses at the hillsides. In winter, they depend on dwarf shrubs locally called "teresken," an extremely slow-growing but nutritious plant. It can take 20 or more years for this sagebrush-like shrub

to gain a couple of inches in height.

### Ram Tough

Two factors determine horn size in Marco Polo rams—competition for mates and predation by wolves.

During mating season, argali gather in large agglomerations of up to two or three thousand animals. The males fight to collect harems of females, standing on their hind legs and butting each other with their huge horns. The impact can be heard over long distances.

The larger the horns a ram possesses, the greater his chance of increasing the size of his harem—and the number of



▲ Those with the largest horns dominate the breeding season and pass those traits on to their offspring.

offspring he fathers. This trend is passed on through the generations, gradually resulting in increased horn size, up to physiological limits.

On the other hand, mating season is extremely exhausting for males, and those with heavier horns may tire more quickly and become easy prey for wolves. This factor may restrict horn sizes from increasing even further.

After mating season, the herds sepa-

rate by gender. Males move to higher elevations to seek protection from wolves, humans, and horseflies, while females prefer the grassy valleys, where they give birth to lambs in May and June. There is only a short time for ewes and lambs to put on weight before the start of winter, the hardest season for these animals. By late winter, body reserves are exhausted and almost no accessible vegetation remains.

The riskiest time in the life of a Marco Polo sheep is its first winter, when it is still small and inexperienced. During particularly snowy winters, hundreds of sheep die from malnutrition or fall prey to wolves.

### Tug of War

According to Soviet scientist G. N. Sapozhnikov, in the 1970s there were still more than 70,000 argali roaming the plains of the Eastern Pamirs in Tajik Socialist Soviet Republic. This number has been challenged as it was not based on scientific estimates, but extrapolated from local counts. It is not unlikely, however, given the enormous size of the area inhabited by argali at that time, and its unrestricted movement over the state boundaries into China and Afghanistan.

Whatever the true population size was at that time, it is undisputed that the numbers soon declined due to human influence. Until 1987 Marco Polo sheep were legally hunted for subsistence by the Kyrgyz herders inhabiting the Pamirs, as well as to provide meat for border troops

▼ A group of Marco Polo sheep rams relax on a bare patch on a snowy slope in the eastern Pamir Mountains.



BETH WALDIAURORA PHOTOS



BETH WALD/AURORA PHOTOS

◀ Adapted to extreme conditions, Marco Polo sheep are right at home in the Pamirs.

and the general population. At the same time, domestic livestock breeding intensified, exceeding the ecological capacity of the scarce pastures.

In 1988 the argali was included in the Red Book of the Tajik Soviet Socialist Republic, a listing of the region's endangered species.

After the dissolution of the Soviet Union, Tajikistan was shaken by heavy economic problems and civil war. The Pamirs region was cut off from food supplies, even as refugees migrated to the already-troubled region. Weapons and ammunition were easily available, and thus hunting of wild animals for meat became common—both by civilians and the chronically undernourished military. Entire herds were wiped out with automatic weapons.

As livestock numbers dwindled, distant pastures were abandoned, opening up undisturbed areas for wild ungulates. But with gas and coal supplies cut off and houses lacking insulation, people have been forced to harvest the Marco Polo sheep's prime foraging material—teresken—for fuel. The extremely slow growth rate of teresken means its disappearance will spell disaster for the wild sheep.

Some protection came from an unlikely source—private hunting concessionaires. Using funds generated by trophy hunting, some concessionaires protected their hunting grounds from intrusion by poachers and supplied locals and border guards with some basic foodstuffs and coal. Meanwhile, other hunting companies used the services of local poachers as hunting guides without providing protection or making any investment in the local econ-

omy, thus contributing to the exhaustion of their hunting areas.

In autumn 2008, the government of Tajikistan issued a hunting ban on Marco Polo sheep and other species that share its habitat. While at first glance this seems like a positive, protective measure, it has actually led to problems for the Marco Polo sheep. As hunting concessionaires—who would previously sell 40 to 60 Marco Polo hunting permits per year—were deprived of this income, they had to eliminate or reduce their protection and anti-poaching activities. As a result, poaching increased, limited only by the availability of animals and the demand for sheep meat on the black market.

### **I** Renewed Hope

In December 2009, a wildlife survey was organized as a joint effort of the Committee for Environmental Protection under the government of Tajikistan and the Tajik non-governmental organization (NGO) "Nature Protection Team," financed by the German Technical Cooperation (GTZ). Six teams consisting

of experts from scientific institutes, state agencies in charge of nature protection, NGO collaborators, and game managers from hunting concessions searched the roughly 3,100-square-mile survey area.

Amazingly, the survey found more than 23,500 Marco Polo sheep in more than 500 herds, as well as almost 2,500 ibex. The researchers also had the luck to see 50 wolves, one lynx, and a snow leopard. These numbers are the highest ever directly observed—that is, not extrapolated from smaller area counts.

This good news should not divert our attention from the factors threatening the long-term conservation of Marco Polo sheep. One concern is the uneven distribution of the animals. In some areas large aggregations were observed, while other suitable and formerly inhabited areas were nearly empty. In some of these abandoned habitats, researchers found evidence of poaching. In others, intensive livestock grazing or collection of teresken for fuel left the landscape unable to support wild sheep.

The growth of domestic livestock herds during recent years has reduced the available habitat for Marco Polo sheep. Sustainable use in trophy hunting, and even regulated harvesting for meat, may provide economically and ecologically viable alternatives to extensive growth of domestic livestock herds, which are much less adapted to the harsh environment of the High Pamirs.

So there is reason for hope—and need for action—to ensure that Marco Polo sheep can survive in the incredible, large herds once described by Marco Polo.

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