Newsletter #30

November 6, 2023

Greetings

New video

We have added a new video at [(2) Mountain Goats - Fire on the Trail - YouTube]
One of our trail cameras revealed how mountain goats reacted to a forest fire that burned across a very important goat trail. We are relieved to see that mountain goat traffic on the trail was normal, despite the forest fire.

Maddy's research update

Maddy Wrazej reports that the field work on her research project in Banff and Yoho parks has ended. Now she and her team are processing all the information – some 1.4 million camera images plus DNA analysis of fecal pellets. Click on the link to view a number of camera images from the project including photos of predators. Thanks Maddy for the link.
https://docs.google.com/document/d/128fzlSHwJGbCqjf-g19PTVCMpoRiPcjV9BKm448JPUA/edit

Stress responses in mountain goats

When a mountain goat becomes aware of a predator, fear triggers stress hormones that increase vigilance and the ability of the goat to move quickly to escape. When the predator threat ends, the stress hormones fade away and the goat goes back to normal activities. Stress responses are a necessary adaptation to avoid danger. But if a goat suffers too much stress or stress too often, the stress hormones may persist. The result is a lasting change in brain chemistry and behaviour.

Research often describes three stages of stress response – acute, chronic and demographic. **Acute** is the normal response to danger. Stress hormones are generated

during a threat and subside when the threat ends. The mountain goat's response matches the danger.

Chronic stress response is when stress hormones are persistent. The level of stress hormones goes up at the first hint of danger but never completely fades after danger is past. The animal is hyper vigilant and the response no longer matches the danger. Our McKendrick Mountain Report #7 shows mountain goats responding to backcountry skiers with panic far in excess of the actual threat.
(2) McKendrick Report 7 Jan15 2023 - YouTube
The goats could have stopped 100 meters downslope and been safe. But instead, the herd kept running for one-half a kilometer down a very steep slope.

A **Demographic** stress response involves the presence of stress hormones in the body that may affect an entire herd's health and ability to reproduce. A demographic response may result in fewer kids or poor body condition. Chronic stress builds so much that the goats may abandon old habitat and move to new. The move is usually from the best habitat to another habitat of lower quality. The habitat may be smaller in area, making it easier for predators to find the goats.

We would like to add two more levels of stress response. The first response is known in the literature as predator inspection. We call it the **Curiosity** response. Our directors specialize in visiting mountain goat herds in very remote alpine areas where the goats have not seen humans for generations. The goats become aware of us at long distances, and then travel up to one kilometer to inspect us close up. See (2) Mountain Goats On a Wild Ridge - YouTube The goats actively watch us to determine if we are a threat. When their curiosity is satisfied, the goats usually return to normal activities. Rather than displaying fear, the goats act as if they are engaged in heart-pumping fun. But at the same time, levels of stress hormones keep the goats ready to bolt if we pose a threat.

A second level of stress response we need to add is **Hunter** response. Mountain goats seem to know when they are being hunted. Their response is a form of chronic stress response. They flee at the first sight of humans, even at one or two kilometers distance. The goats respond far beyond what is necessary for safety. The goats cannot distinguish hunters from hikers, so the response is the same whether the person is carrying a gun or a trekking pole. We have not discovered how goats know they are being hunted, but mountain goats have an excellent sense of smell. Mountain goats are also very social. They know every member of their herd by sight and scent. A kill site may include both the scent of the dead goat, known to the herd, mixed with the scent of the human hunter and the association is established.

Mountain goats see **humans** as predators or potential predators. So the stress responses listed above apply to encounters between mountain goats and humans as well as with natural predators such as wolves and bears. Human behaviour resembles predator behaviour in many ways, even if the humans are tourists with no intention of harming the goats. Then there is the appearance of humans.

Humans are unique in the eyes of mountain goats, completely unlike any other wildlife that goats encounter in the alpine. Humans walk on two legs rather than four. Humans wear sunglasses that make it appear that they have very large unblinking eyes. Humans appear at random, sometimes in large groups and they do not stop to forage. Instead, humans walk at a steady pace like a wolf. Humans may smell odd. Literature suggests that the smell of milk in adults or coffee may be alien to wildlife noses. Humans often travel with dogs that look and smell like wolves to a mountain goat. Is it possible that people travelling in alpine can cause more severe and sustained stress responses in mountain goats than a wolf or grizzly?

Research suggests that wild ungulates such as mountain goats may experience higher levels of stress with human encounters than with large carnivores.
(PDF) Do wild ungulates experience higher stress with humans than with large carnivores? (researchgate.net)

Mountain goats and drought

The summer of 2023 was an excellent time to observe how mountain goats survive an extreme drought with high ambient temperatures for weeks at a time. Our field observations suggest that our local herds survived quite well. Some adaptations include:

- Seeking shade under trees or on north side of ridges
- Staying close to streams and snow fields
- Moving upslope to stronger and cooler winds

More rain showers fell in the alpine than at lower elevations – that helped. Last winter the snow pack was about 110% of normal. That provided normal seeps and stream flows in the alpine this past summer. If the snow pack is below normal this winter, the situation may be more dire next summer. Alpine plant growth this year was stunted and ended earlier than normal. That will reduce the amount of forage available to mountain goats this winter.

The photo below was taken in the summer of 2023 during a sustained drought. The grasses to the left are stunted and suffering from drought. The grasses to the right are close to water from a seep. In a normal summer, all the grasses would be green and tall like the grasses on the right.

Figure 1 Drought on left, wet ground on right

Until the next time

Jim

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