

## Helium Exploration Threatens Sage-Grouse Habitat

Helium, a commonly used non-renewable resource, has recently seen massive increases in value. With the increase in value has come increased investment, and Alberta is eager to be part of the rush. While helium could provide an economic boost to the province's economy, the rapid scramble for helium may cause irrevocable damage to sensitive habitats.

### Background

Helium, despite being the second most abundant element in the universe, is very rare on earth. The inertness and the low boiling point of the element mean that it is very safe to handle and can be cooled to extremely low temperatures without freezing, properties important for many manufacturing and operating procedures. Helium is used in everything from production of computer chips and fibre-optic cables to shielding for welding technology to MRI scans and asthma treatments. Demand for helium has only increased as science and technology continue to advance.

The majority of helium on earth comes from radioactive decay, which means helium creation takes place over millions of years. As a lighter gas, most free helium in the atmosphere will rise and be lost into space. The small amount of helium that remains, roughly 5.2 ppm or 0.0005 percent of Earth's atmosphere, would be too expensive to extract feasibly. As a result, the commercially available helium is below-ground, trapped under layers of rock.

Until recently, the United States was the biggest supplier of helium worldwide. The sale of their vast reserves, originally stockpiled for war, kept helium prices low relative to the supply. As these reserves were depleted, helium prices rose, and with them, interest in helium reserves elsewhere.

Historically, helium has been produced as a by-product of the natural gas industry, with some deposits of helium ignored as concentrations were too low to be worth extracting. However, the recent increase in helium prices has changed perspectives. The target has shifted to helium-rich deposits, and Alberta, with

the province's abundant and mostly untapped reserves, has drawn prospectors' attention.

### Helium exploration in Alberta

In May 2020, the Government of Alberta introduced a new helium-specific royalty rate, effective retroactive to April 1, 2020. It was set at 5 percent minus a 0.75 percent helium adjustment factor for an effective rate of 4.25 percent. This rate is comparable to Saskatchewan, currently leading the provinces in helium extraction, and was aimed at making Alberta more competitive on the helium market. With the new royalty rate, Alberta announced the intention to attract investment in the helium rush.

Investors are indeed expressing interest, particularly in the southeast of the province, where deposits of high concentration helium have been found. As the province itself recently stated in a news release, "Several small producers have expressed an interest in exploring the helium potential in southeast Alberta, with some production already underway." Unfortunately, these large deposits of helium coincide with some of Alberta's best remaining intact native grasslands, and overlap with prime sage-grouse territory.

### Implications for greater sage-grouse

Greater sage-grouse are found only in the grasslands of Alberta, Saskatchewan, and the United States. These large birds are known for their elaborate courtship rituals, called leks, and males will strut and dance on these communal breeding grounds. They are highly reliant on silver sagebrush, which forms the main diet of adults, and have specific habitat needs for mating, breeding and wintering. This habitat is rapidly disappearing along with the loss of native prairie.

The species is listed as "Endangered" under the Species at Risk Act (SARA). The sage-grouse population in Canada has been greatly reduced over the last century, and is suggested to have experienced a 90 percent reduction in range. In 2013, an emergency protection order was issued by the Government of Canada as the threat of extirpation became clear, aimed at

protecting critical sage-grouse habitat. While population decline has slowed and shown signs of recovery in recent years, the species remains at risk with fewer than 250 wild individuals estimated to remain in Canada. Alberta's 2020 spring count yielded a stable count of only 24 males and the entire Alberta population estimate is 72.

Greater sage-grouse are highly sensitive to habitat disturbance. Only an estimated 4000 km<sup>2</sup> of sage-grouse habitat remains in Alberta, and oil and gas development have already encroached on this range. Even at a distance of 3 km, sage-grouse are still affected by oil and gas developments, and prospecting for helium is expected to have similar results. Industrial development, conversion of sagebrush habitat and other human disturbances are the greatest contributors to sage-grouse decline, which makes protection of the remaining habitat so vital.

The discovery of helium deposits in southeast Alberta threatens further destruction on grasslands already heavily impacted by industrial activity. Helium, like natural gas, must be extracted from belowground, and this process involves high disturbance on the nearby landscape. Helium extraction in southeast Alberta could destroy the rare untouched prairie that remains, and even the reopening of previous roads and wells could damage recovering grasslands. These disturbances would further fragment sage-grouse habitats, imperilling the small remnant population of these incredible birds.

To protect sage-grouse and other vanishing prairie species, helium extraction must not be allowed to occur on critical habitat. New disturbances should avoid native prairie, and must limit damage to the landscape. In addition, Alberta needs a transparent process for reviewing helium licences, with a clear direction for the protection of critical habitat. The potential economic benefit to helium extraction cannot overshadow the damage left behind. Otherwise, considering the current rate of native prairie loss, greater sage-grouse and many other iconic prairie species will soon be lost.

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