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Sustainable sheep ranching through regenerative grazing in the western United States: the case of Shaniko wool company on carbon neutrality

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Abstract

Ranching has historically been one of the most economically and socially rewarding activities for many families in the Western United States. However, climatic and socioeconomic changes have brought public scrutiny to the environmental impact of ranching. Our Imperial Stock Ranch, with a 153-year legacy, has proactively addressed these challenges by adopting advanced sustainable practices to "make the land win" while producing commodities from dryland cropland and livestock grazing for local markets. In 2016, we achieved certification to the Responsible Wool Standard (RWS), becoming the first ranch globally to meet this leading standard for sheep and wool production. This milestone enabled us to partner with renowned fashion brands, providing sustainable wool that was even used in Team USA Olympic uniforms (2014, 2018, 2022 and 2024). In 2018, we founded Shaniko Wool Company (SWC) as a Farm Group to expand the supply of wool in the US that meets RWS global standards. SWC now includes ten ranches, collectively grazing over 1 million hectares across the country. To quantify the impact of our sustainable wool production, we collaborated with Oregon State University in 2019. By 2020, a program was developed to measure organic soil carbon and model greenhouse gas emissions for the entire farm group using the COMET Farm Model. This model indicates that the farm group can offset all emissions from our operations. For instance, the Imperial Stock Ranch alone has the potential to offset 2,809 tons of CO_2 annually, while the entire farm group can offset an estimated 91,444 tons annually. The future direction for our farm group involves certifying the entire group to sell carbon credits, creating a new income source alongside our existing production of food and fiber, sustaining humankind. Our commitment to sustainability not only benefits the environment but also strengthens the economic resilience of our ranching communities.

Ranch history

The family owned ranch; Imperial Stock Ranch is located in the high desert of Oregon's interior in the western United States. It was started by a young man who was born in a covered wagon as his family traveled west on the

Oregon Trail in 1852. He grew up in western Oregon where his family had settled, but in 1871, when he was 19 years old, he went east over the mountains into Oregon's dry interior to make his own start, filing on a homestead claim of 64 hectares (160 acres). He brought in cattle and sheep to graze the range lands and plowed enough land to establish grain and hay crops. He grew his operation from this modest beginning, and by 1900, he was Oregon's largest owner of land and livestock with a ranch of 13,000 hectares (32,000 acres). For 154 years, the Imperial Stock Ranch has been producing sheep, cattle, grains and hay on the same landscape. We recognize that we are temporary stewards of the land; that the land was here before us and will be here long after we're gone. We're aware of both our insignificance and our importance; and that the land provides sustenance for all life.

Stewardship

My husband's (late Mr. Carver) goal was always to "see the land win." He knew that the health of natural resources has a direct effect on your harvests, your bottom line, and your hope for the future. Working with local natural resource agency partners, by 1989, we had a written Conservation Management Plan for our whole operation that put the health of natural resources as the top focus; and we began implementing a host of changes. In our region of the high desert, we receive less than 200 mm of precipitation per year. Our plan considered both grazing management and crop management, with water conservation at the core.

Our plan included creating many off-stream water developments capturing, storing and safely releasing the water from rain and snow events, as well as natural springs. We changed the grazing strategy and were very strategic with the placement of supplements for the livestock. We created fencing to control grazing pressure and rest for plant communities. We converted thousands of acres of dry farm ground to no till, parking the plow forever, and keeping plants in all the fields every year.

Two creeks are born on our ranch, and in 1990, about when we were beginning this comprehensive mind shift on management, only two salmon returned to spawn in the local Buckhollow Creek. The first 15 miles of that stream start in our ranch, and this statistic was a huge wake-up call. Working with our agencies and other landowners in the basin, the Buckhollow Watershed Project (NRCS, 1994) was born as a collaborative, comprehensive, basin-wide approach to restoration. We hoped we would see a difference in our lifetime, but we did not know if it could happen that fast. We began to see changes after the first year. By 2010, just 20 years later, we saw thousands of salmon return to Buckhollow Creek showing a significant change.

Adaptation to changing market conditions

For 100 years, we always sold our wool harvest to the same company. However, in spring of 1999, changes in the market made the company stop buying the wool as they changed their operations to other countries. That would profoundly change our life. It was a time when tens of thousands of U.S. sheep producers were going out of the sheep business largely driven by this textile manufacturing shift. My husband said, "Find a new way to sell the wool, or sheep will be gone."

From that day forward, I took us from ranch to retail in our own branded products: wool yarns, and eventually, apparel, home fashions, and production yarn to brand partners. I built supply chain relationships to transform the raw (greasy) wool, and wholesale / retail relationships with brands and stores, eventually working with some of the most influential brands in North America and known around the world. But this did not happen overnight. This effort was made by pairing the wool with our heritage and the leading agricultural practices we had now been implementing for decades. I was busy telling our "sunlight story" of the land, grazing animals, and the gifts of creation. About how sheep transforms plant protein into the food, fiber and shelter that give us life. And how we are called to honor that. It resonated with authenticity. The provenance of the wool was critical to our effort and story, in yarn, home fashions, and apparel. We used every part of the harvest and then added value to the waste created at each step of the process. We shifted to this new model of marketing just as we had shifted our ways on the land.

After 13 years of hard work, we got a call from Ralph Lauren during the 2012 London Olympics, when there was a controversy over the Chinese-made Team USA uniforms. They were looking for an American yarn and to see if they could make the uniforms in the U.S. again. That all eventually led to an order that became the yarns for the 2014 Team USA uniforms for the Winter Olympics in Sochi, Russia. And then, Ralph Lauren told our story. This influenced others, and more brands came calling. That call too, changed our life.

I began my journey in textiles in 1999 in an effort to preserve sheep on our land. I had no idea that it would take me back to our collective history and simultaneously propel me into a future I could never have imagined. That it would become the vehicle that would connect me to the timeless traditions and skills of making textiles, take me to their roots, teach me, and deepen not only my agricultural experience, but my whole life perspective. This journey of taking our harvest direct to the market, shepherding it through every step, opened windows through which I gained clarity on things I had never even thought about before, bringing important and unforgettable people into my life. It built meaningful connections that erased the urban/rural divide for us, and bonded me to folks far across the country, and now the world, in a way I'd never been nor would have been otherwise. I began to know how important their work is. It helped me see our own work in agriculture with an even deeper purpose. I learned how much we needed each other; how we could learn from each other; and our lives became richer because of it. We began to rebuild the connections that were destroyed through globalization and the separation and isolation of individual steps in the textile supply system. With separation and isolation, the importance of place has been diminished, and with it, the motivation for stewardship. We're left with anonymity, which contributes to devaluing products, and breeds distrust in the marketplace. Perhaps the greatest consequence has been the degradation of natural resources and negative climate impacts.

Certification

Following our 2014 Olympic notoriety, we saw tremendous growth in our textile journey. Many brands were calling. One of those was Patagonia, who asked us to be third-party audited for our land and animal practices. Patagonia was part of an international working group that was developing a new global standard for sheep and wool production called the Responsible Wool Standard (RWS) (reference). When the RWS standard was launched in 2016, Imperial Stock Ranch became the first ranch in the world certified.

Expansion

In 2018, we established Shaniko Wool Company to scale the supply of American wool that met RWS certification, choosing a name that honored a story greater than our ranch alone. Shaniko Wool is a Farm Group supplying RWS certified wool. Together, we shear about 226,796 kg of wool each year and are grazing over 1 million hectares (2.6 million acres) in the western U.S. Shaniko Wool is continuing the strong relationships we had built within the U. S. textile industry in our own ranch's efforts since 1999; and my husband's legacy in resource stewardship. When Ralph Lauren called on us for wool for the 2022 Team USA Winter Olympics uniforms, they were made with Shaniko Wool.

Beyond the Standard

In 2019, we were criticized about the impacts of agriculture and in particular, livestock production. It was the motivation I needed to take the next logical step. What was our net footprint as ranchers? In early 2020, we responded to this increasing concern over the ecosystem and climate impacts of ranching, specifically sheep production. Working with a team of range and soil scientists from Oregon State University, we launched a measurement and research effort I called the Shaniko Wool Carbon Initiative. Up until now, we had our observations, and some monitoring, yield data, species counts, resource agency testimony, and certification to third-party standards in support of our work. But we had never formally "measured" or quantified our ecosystem deliverables. I did not even know if we could!

Our purpose was to determine the ecosystem and climate impacts of each ranching operation with carbon as a key performance indicator, plus collateral benefits. Science says that if soil carbon levels increase over time, additional positive benefits may include:

- Increases in soil organic matter
- Increased nutrient availability
- Improved water infiltration and water holding capacity
- Greater system biodiversity
- Improved habitats
- Resilience to extreme weather events
- Improved disease resistance
- Improved livelihoods

By 2023, we had baselined all 2.6 million acres.

Our research team is presenting our data and findings at this conference (Prado-Tarango *et al*. 2025), and I want to emphasize why this work is significant. When we began measuring, I was not sure what the sampling would reveal. However, I knew it would provide us with valuable information and a new tool to better understand our system. The primary purpose of this research is to offer actionable feedback to farmers and ranchers, enabling them to refine their management practices. What we have discovered has been overwhelmingly positive. Our operations are functioning as carbon sinks, with negative net greenhouse gas emissions. The methane produced by livestock is being fully offset by the carbon sequestration capacity of our rangeland ecosystems. These findings not only validate our observations but also provide robust evidence of our environmental impact. This data has proven instrumental in supporting the sale of our wool, instilling confidence in the companies that purchase it, and enhancing the marketability of our products. Additionally, our research has undergone auditing by ecosystem services organizations, resulting in the Shaniko Wool Farm Group being approved as a “project” capable of generating high-quality carbon credits. These credits can serve as offsets or insets, opening up a promising new revenue stream for family agriculture. The term "regenerative" is widely used today, but this research has provided concrete evidence that we are achieving regenerative outcomes. It transcends mere practices or approaches, offering quantifiable proof of success. For me, this has been the most meaningful work I have ever been involved in. It validates the vision my husband and I shared decades ago and the transformative changes we made to see the land thrive. Today, we are measuring that success and witnessing the results firsthand.

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