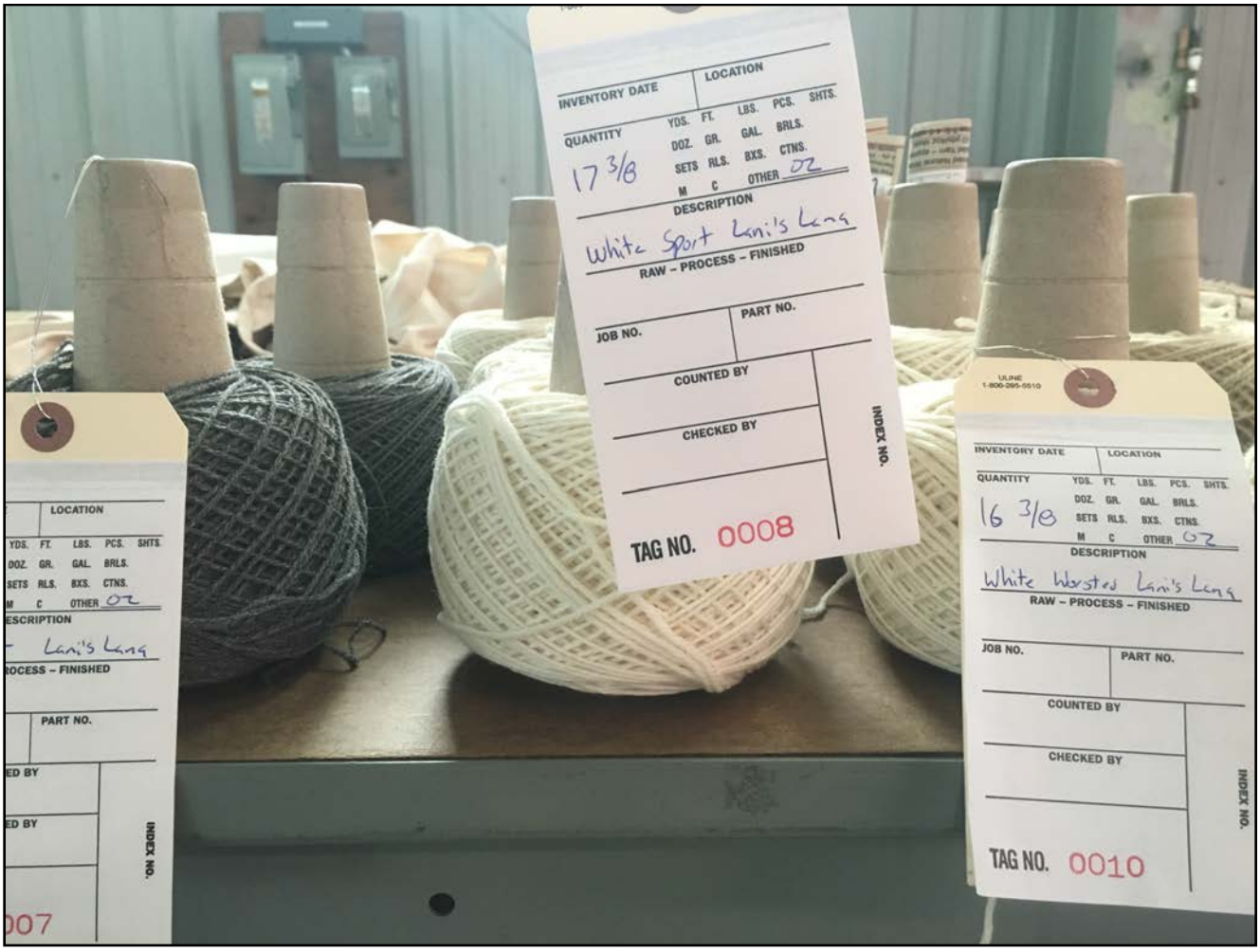
Growing Value for Wool Growers

An economic feasibility study and new business model

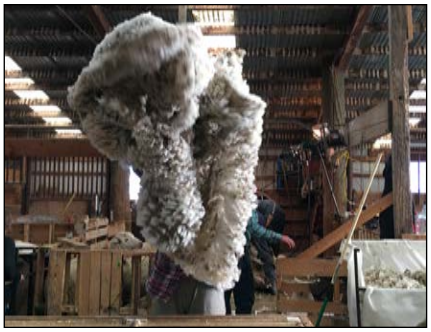
Stephany Wilkes - May 25, 2017

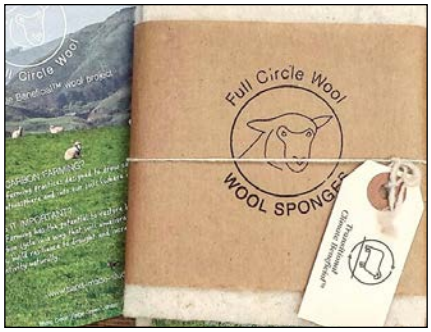


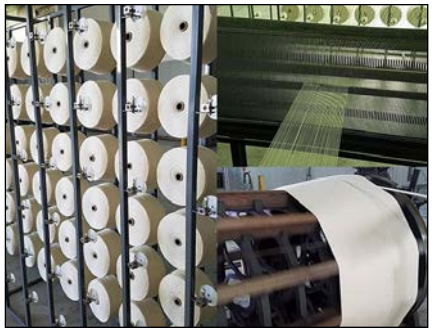
Executive Summary

American wool is typically a low-value commodity. The prices many wool producers realize barely cover their costs to pay shearers to remove the wool. In interviews conducted as part of this study, four wool producers said it "barely makes sense" for them to raise wool, that it "sometimes makes more sense to use wool as compost" than it does for them to pay to shear and sell or process it.

At the same time, consumer demand for natural fibers and ethically, locally, and domestically produced goods is on the rise. Consumers are demanding increased supply chain transparency and materials' traceability from textile manufacturers and retailers. It is logical to think that consumer values like these may create increased value for wool producers who provide domestically grown, traceable wool.







This feasibility study sought to identify finished products and programs that might increase the value of wool, and thus revenue to Northern California wool producers. This study also investigated whether consumer interest in regenerative agriculture practices would translate to higher prices for raw wool and/or finished wool products. To address these questions, this feasibility study contained three main areas of research:

1. **Demand Analysis** - Online surveys, in-depth interviews, and a review of secondary consumer research literature assessed attitudes toward, and purchase intent for, finished wool goods.
2. **Wool Program Performance** - Operational and financial observations were made of two existing wool programs. Both programs use wool produced on Northern California ranches which practice conservation methods. Coarse wool was made into wool batting, bedding (comforters and pillows), and felt, the latter which became products like wool sponges and yoga mats. Fine wool was spun into yarn, which was subsequently woven into twill fabric.

3. **Conservation Practice Implementation Costs** - The study used two sources of data to estimate the implementation costs of conservation practices, costs that premium wool prices should aim to cover. Conservation practices from the COMET-Farm Planner, a whole farm and ranch carbon and greenhouse gas accounting system, and the USDA National Resource Conservation Service (NRCS) were linked; NRCS California reimbursement rates for each practice were added; and estimates accounted for the fact that reimbursement rates may not fully cover costs to farmers and ranchers.

Findings from each of the three major study efforts are summarized in this section.

Through these complementary methods, this study:

- Learned more about what wool producers, consumers, apparel brands, and textile development partners most want and need;
- Identified premium wool prices and payment models that work well for wool producers, and payment structures that can help sustain the conservation work behind regenerative agriculture marketing stories;
- Discovered and tested new regional and domestic supply chain partners that process wool into finished goods (wool scouring, carding, and weaving);
- Identified gaps and challenges in both the regional and domestic supply chains that process wool into finished goods;
- Evaluated the costs of implementing conservation practices, which also provides a baseline for quantitative data on environmental effectiveness that can be used in marketing materials.

Demand Analysis Findings

This section highlights findings from the Demand Analysis research phase, which consisted of online surveys, in-depth interviews, and a review of secondary market and consumer research literature.

From online surveys with prospective customers:

- 100% of participants (43) expressed interest in purchasing locally sourced goods that support regenerative agriculture practices.
- Participants were most interested in purchasing fabric, as compared to yarn, batting, roving, and combed top, and hoped to spend between $10-$40/yard for fabric.
- Some participants noted that fabric quality, hand, width, weight, and U.S. manufacturing origin affect the prices they are willing to pay for fabric.
- In terms of quantity, 24 participants (56%) estimated they would purchase between 1-10 yards of fabric.
- In regard to fabric type, 34 participants stated interest in woven fabric, 16 in knit fabric, 11 in felt, and three in yarn. (Yarn is not fabric but threads, which are woven or knit together into fabric.)
- Most participants preferred a light to medium weight for wool woven fabric.
- Participants expressed interest in both dyed and undyed fabric, and the vast majority intended to dye the fabric themselves.

From in-depth interviews with study participants:

- Wool producers most need product marketing and distribution support, for both raw wool and finished products.
- Most wool producers feel their current work is not sustainable, fair, or just.
- Receiving a higher wool price in recognition of their regenerative agriculture efforts was described as “a game changer” by some Northern California wool producers;
- Apparel designers and manufacturers need a ready, domestic, fabric supply chain of reliable and consistent vendors.
- Fabric selection is the earliest product development stage at which most large retailers and small artisans typically begin their work. Most are not accustomed to considering either raw fibers and/or supply chain stages that precede the fabric or finished garments.

- Even though their work typically begins with fabric, apparel retailers and artisans describe their customers as demanding greater product traceability and transparency "*down to the fiber level"* and the *"exact farm and ranch location,"* and say they plan to respond to those demands.
- Consumers and retailers connected their desire for materials' traceability with skepticism of existing product labels, describing many "green" labels as based on self-reported, unverified, and thus meaningless data. Some wool producers, retailers, and artisans expressed skepticism and confusion about the meaning of regenerative agriculture phrases and labels. Education and clarification are needed.
- Though demand for U.S.-grown organic wool is growing, organic practices (like certified organic animal feed) and certification are expensive enough to be prohibitive for many, if not most, wool producers. In addition, wool producers cannot quickly benefit from adopting certified organic practices.
- Keystone markup, in which a product sells for at least twice the price for which it was purchased (i.e. with a gross margin of 100% of cost, or 50% of retail price) is standard in the fashion industry. Keystone markup creates a disincentive for fabric and garment manufacturers to pay higher prices for raw materials, because paying more for raw wool increases processing costs at every subsequent step in the supply chain.
- The ability for manufacturers to pay for a portion of premium raw wool prices in the form of donations to a regenerative fiber fund (and to realize tax benefits for the same) offsets higher costs created by keystone markup scenarios. Donations are one way to make premium raw materials accessible to manufacturers.
- Consumers, wool producers, and artisans have positive attitudes about Community Supported Agriculture (CSA) and prepayment models, which they perceive as a way to share risk more fairly.
- Though small-scale textile artisans *like* the idea of CSAs, prepayment models need adjustments in order to work better for them in practice. Adjustments to prepayment schedules, non-monetary ways for artisans to express intent to purchase fabric or other wool goods, and bridge financing for gaps between seasonal sheep shearing and fashion calendars can make prepayment models more feasible and less risky for apparel designers and artisans.
- Wool producers, processors, fabric mills, apparel brands, and designers expressed a strong need for expert support in textile design, development, and science. They need and rely on people who can provide consulting services and serve as

intermediaries between themselves and other supply chain partners. This need presents a potential source of consulting revenue with which to experiment in future fabric development efforts.

From the secondary market and consumer research literature:

- Wool is hot: natural fibers are increasing in popularity.
- The textile market is beginning to benefit from attitudes and behaviors of consumers in the the Lifestyles of Health and Sustainability (LOHAS) demographic segment, which has contributed to explosive growth in the organic and local food market during the past 10 years.
- When it comes to fiber, the organic label is not the only one that matters to consumers. Indeed, other labels, like those on animal welfare and fiber origin, matter more than the organic label.
- Consumers' and manufacturers' desires for traceability, and labels that describe the origin and characteristics of fiber, indicate both consumer education and revenue potential. There is opportunity for a trusted authority to design and/or certify the origins, attributes, and movements of wool from ranch to garment. Existing protocols and systems in the wool industry, like grower, classer, and bale identification numbers and standard labels, could provide a foundation for traceable wool systems.

Wool Program Findings

This section summarizes operational and financial observations of two existing wool programs. Both programs use wool produced on Northern California ranches which practice conservation methods. Coarse wool was made into wool batting, bedding (comforters and pillows), and felt, the latter which became products like wool sponges and yoga mats. Fine wool was spun into yarn, which was subsequently woven into twill fabric.

Full Circle Wool (Coarse Wool Program):

- The Full Circle Wool program is economically feasible as executed.
- Ranchers' wool was profitable for them, at a premium price of $2.50/pound for regionally sourced, regeneratively raised wool.
- Several profitability levers are available (namely in the form of product family configurations), which may create greater profitability than that described here.

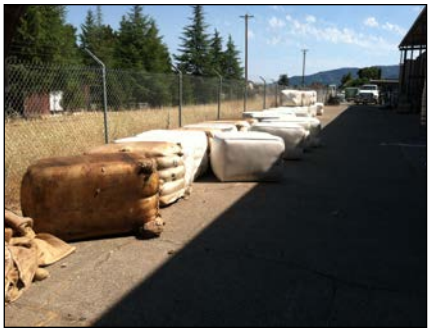
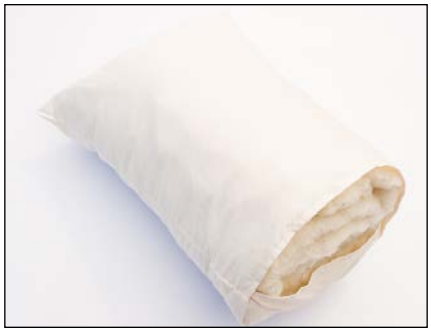
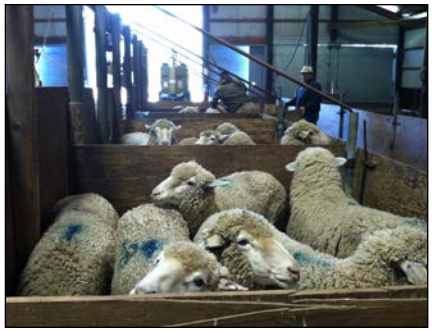
Community Supported Cloth (Fine Wool Program):

- The rancher whose raw wool became yarn woven into Community Supported Cloth (CSC) was profitable on yarn at 14%.
- Customer demand for fabric woven from regeneratively raised wool was positive and high. All CSC fabric sold during a pre-sale period and a wait list was created.
- Of the 43 people (100%) who, in pre-sale surveys, expressed interest in cloth, 22% (9 people) purchased cloth when it became available.
- The CSC program overall is not economically feasible as executed, in that cloth sales covered some but not all labor costs. All wool processing and fabric weaving labor was covered by fabric sales. The costs of administrative, marketing, and customer support work (key to sales success and business development) exceeded wool sales. Future fabric programs will require additional production volume and/or sources of income to fully cover labor costs.
- Consulting labor on regenerative agriculture methods, fiber sourcing and processing, and textile design and science was conducted with small and large textile brands as part of the CSC program, at no cost to these brands. In the future, this consulting service may provide an additional source of revenue.

Introduction

The purpose of the USDA Value Added Producers Grant (VAPG) that funded this economic feasibility study was to help agricultural producers in Northern California enter into value-added activities. To this end, the work described here sought to assess the economic opportunities and potential cash flow operations of new wool products and a Community Supported Agriculture (CSA) style market model on wool producers, fiber processors, and customers.

In the application for this VAPG planning grant, the primary hypothesis was that producers would receive revenue through profits realized from the sale of processed wool products, and that this revenue could be significantly more than that allocated to the increased value of raw wool.

Feasibility Study Background

The textile industry commits a multitude of sins, of which consumers are increasingly aware: environmental destruction, damage to human health, and human rights abuses are just a few. Research shows that consumers are most familiar with the latter, which often enter the consciousness through tragedies like the 2013 Rana Plaza factory collapse in Bangladesh. Preventable catastrophes such as this force people to inquire about how and where their clothes are made, and to ask if the low cost of clothing is worth the impossibly high price it exacts on those who make it.

The textile industry's other problems, however, are getting more mainstream attention as well. A September 2016 Newsweek headline, "Fast Fashion is Creating an Environmental Crisis," described the piles of clothing waste created by low-quality garments (also known as "fast fashion") that doesn't last. Likewise, in April 2017, The

Economist ran a story titled "The environmental costs of creating clothes: People are buying more clothes than ever before—and chucking them out too."

Compared to garment manufacture and disposal, upstream stages in the textile supply chain—all of the steps and processes that take place before garment assembly, including the conditions under which fiber farming occurs (welfare for human laborers, livestock, and the land)—have remained invisible, ignored, or both. But this, too, is beginning to change.

Pushed by their customers, boutique designers and major brands have begun to demand greater transparency of the full supply chain, all the way back to the ranch. Certifications like the Responsible Wool Standard (RWS), for example, include aspects like animal welfare that reach all the way back to sheep handling and shearing, while designers like Alabama Chanin provide lengthy and detailed descriptions of their supply chain, from cotton seed to finished garment. Customers express thanks with comments like "*Thanks for giving us this information. As I hold these fabric layers in my hands and sew I will feel more connected to the whole process of my finished skirt.*"

And Alabama Chanin, though a pioneer, is hardly alone. During the interview phase of this study, an employee at a global apparel brand said: "You could have knocked me over with a feather when I heard Ralph Lauren was involved in the forest where their fibers come from." Her remark is not mere hearsay. In January 2017, Ralph Lauren stated publicly that "The company will trace the raw-material sources for its cellulose fabrics to ensure its suppliers are not harming the rainforests or violating human rights," and that this was part of a "broader initiative to establish a traceability, risk-assessment and verification framework for the raw materials that we use."

A Shift to Shared Value

The behavior of companies like Alabama Chanin and Ralph Lauren represents larger shifts in capitalism, efforts to reduce and eliminate growth-sapping strategies (practices that also harm people, communities, and the environment) and increase innovation. The competitive framework of shared value, established by Porter and Kramer, provides an orienting lens through which to view these changes. It is especially interesting because Porter and Kramer are not bleeding hearts, but widely acknowledged powerhouses in the world of competitive business strategy.

Porter and Kramer's shared value framework deserves more attention than it receives here, but the tenets that apply most directly to wool production are briefly

described. First, in a shared value view, societal needs define markets. (Healthy soil, clean water, and grazing access are societal needs in ranching communities.) The most important product demand question should be "Is this product good for our customer?" Companies should work to identify and regularly revisit the societal needs, benefits, and/or harms that are or could be embodied in the products they create. Products that cause social harm also create internal costs; reducing these internal costs increases productivity and may expand a market.

The concept of shared value focuses on results achieved and product benefits relative to costs, rather than measure only funds and efforts expended. It also describes the advantages of moving some activities closer to home, to reduce the total number of production locations. This reduces product complexity, shipping time (and time to market), shipping distance, and inventory costs.

Shared value thinking emphasizes the advantages of buying from capable, local suppliers, and makes explicit the connections between supplier health, product procurement, and product quality. Agricultural suppliers cannot continue to serve as such, or improve product quality and consistency, when underpaid. Increasing access to education about agricultural practices and providing funds for farmers to implement these (as Nestle has for its suppliers), strengthens corporate supply chains. Profitable and sustainable livelihoods for wool growers and ranchers--the textile industry's suppliers--should be a core consideration.

Agricultural practices at raw materials' points of origin can offset some of the environmental and ecological problems the textile industry creates later in its production cycles, costs that the industry itself has not historically had to bear (treating them as "externalities") but that humanity, increasingly, does. Though we all benefit from regenerative agriculture practices, ranchers alone bear the costs of implementing them: regenerative practices can only be adopted if they are economically viable for farmers.

Wool Market Challenges

Unfortunately, the wool market has experienced a worldwide decline during the recent decades (Peterson 2012). Wool—especially coarse wool—is a low-value commodity. Because low wool prices cannot sustain producers, wool is usually sold as a byproduct to meat and thus threatens the supply of raw materials. As one rancher in Sonoma put it, *"In making a product, it's lamb. The meat product is what we make our living off of. It would be great if wool was a diversified income enterprise... Consumers will pay more for a local*

product, but it's a challenge to even get a product out there. Is it worth the risk? I could put dairy replacement heifers out for organic milk and replace the sheep... Organic dairy is really profitable."

Today, farmers and ranchers today in Northern California have three options for the sale (or unpaid disposal) of their wool: 1) The international commodity market which sells to value-added textile processing centers, primarily overseas; 2) the hobby niche, hand-spinning, and knitting markets, and 3) compost and landfill.

In addition, wool producers bear all upfront financial costs (thousands of dollars, typically) and risk if they wish to process their raw wool into products to sell. They also bear all of the risk that products may not sell.

Fortunately, demand for wool and appreciation of natural fibers appears to be rising. Consumers are interested in the origin of products, including locally produced ones, and say they will pay more for wool products than comparable items made of synthetic fibers.

Study Goals

This study sought to better understand how it might be feasible to connect wool agriculture products to both the fashion world (designers) and consumer demand for ethically sourced, locally made products, and to determine if systems of wool payment, product development, and consumer demand might be able to come together in ways that increase revenue for wool producers.

To this end, the study described here observed wool programs that sought to shift economic and agricultural trends by supporting ranchers and farmers through the creation of products and consumer outlets that did not depend on low, international commodity market pricing. No VAPG funds were used to support either product research and development (R&D) or the implementation of any of the wool programs described here: VAPG funds supported only the study of these programs, not their implementation.

As stated in the application for the VAPG grant that funded this work, this economic feasibility study had the following goals:

- To determine if the creation and sale of processed woolen goods could increase revenue to wool producers;
- To build stronger connections between wool producers and end-users through a more robust regional supply chain;
- To test and evaluate a CSA model to generate start-up funding to build regional supply chains for woven and knit wool cloth, felt, and bedding products, and to cover the upfront costs that can be a barrier to producers' abilities to meet minimum order quantity (MOQ) volumes at processing facilities;
- To gauge hobbyist and small artisan willingness to participate in a CSA-style (prepayment) model for fabric;
- To evaluate the technical feasibility of developing a successful regional supply chain for selected products, for both high micron (coarse) and low micron (fine) wool producers in Northern California;
- To assess opportunities for direct sales to at least two major national and/or international brands, and at least three regional and boutique apparel brands, as well as opportunities for online sales;

- To examine the expansion of felt products into a larger number of goods, including products tailored to a new demographic market of restaurants that feature locally grown foods and are interested in adding locally sourced fiber products and textiles to their restaurant environment, including seat cushions, window or wall hangings, and felt cup sleeves;
- To examine the interest in viability of pooling raw wool by several of our producers in order to access larger processing facilities for wool scouring and carding;
- To conduct market research to assess opportunities for selling wool pillows and mattress toppers through a wider range of sales outlets in order to reach retail and wholesale buyers, other farmers' market outlets, and online sales, and open new geographic and demographic markets for wool bedding products.

Subsequent study sections detail each of these study goals and the way in which each was addressed.

Research Methods

To assess the technical and economic feasibility of creating value-added wool products, the feasibility study was organized into three main areas of research, each of which contains distinct goals, methods, and data.

Demand Analysis

The primary goal of the Demand Analysis effort was, of course, to assess demand for regionally grown and produced wool products in general, and to understand which products and attributes were most important to fiber hobbyists, boutique apparel designers, and garment manufacturers. Product attributes included price, origin, color, weight, and more.

To achieve this goal, online surveys were sent to participants to assess demand for various wool products; extensive, one-on-one interviews were conducted with providers at all points in the wool supply chain; notes from informal conversations with potential and actual textile supply chain partners were read and discussed; and secondary literature in market and consumer research was reviewed and integrated as appropriate.

Wool Program Performance

This study identified two existing programs that produced wool products within the Northern California region: Full Circle Wool and Community Supported Cloth (CSC). Because these wool products were already available in the market, potential revenue from sales returns to producers could be calculated and/or estimated. To this end, the primary researcher evaluated complete financial and performance data from both programs, from the point of raw wool purchase through to product sale and consumer response.

Both wool programs were implemented previously and independently, without the use of any VAPG funds. These programs provided data on consumer demand, price preferences, product attributes of interest, and supply chain partners and gaps. These methods enabled comparisons between customer intent and actual sales for the same products. Each program also tested the feasibility of premium payments for regional wool in the form of a nonprofit donation to a regenerative fiber fund administered by Fibershed, a 501(c)(3).

In addition, the CSC program tested the a CSA-style prepayment model, in which customers paid for goods during a pre-sale period, to be received months later. This

payment model was designed to offset risk to mill weaving the fabric, and to pay for mill labor.

Finally, both wool programs included tests of three economic models to fund conservation and healthy soils practices, intended to create a means of cost sharing with ranchers:

1) a premium price for raw, regeneratively raised wool;
2) direct donations to a regenerative fiber fund; and
3) a percentage of final product sales (3% of sale price, at point of sale).

Conservation Practice Implementation Costs

In order to obtain a higher, premium price for regeneratively raised wool, ranchers must have implemented, or either expressed commitment or begun to implement, at least one established conservation practice appropriate to their land context. Implementing regenerative agriculture practices imposes costs on ranchers, so premium wool prices aim to cover the rancher's share of these costs.

To estimate costs ranchers might incur to implement established conservation practices, the study began with the 2017 California reimbursement rates from the USDA NRCS; conservatively estimated that NRCS reimbursement rates may not cover 100% of implementation costs; and used ranges to estimate how much a rancher may owe based on a non-reimbursed percentage (i.e. percentage of costs not covered by NRCS funds).

Using the common data attribute of conservation practice code (i.e., CPS-380), the study linked NRCS reimbursement data to COMET Farm Planner practice data. The latter tool estimates the environmental benefit of each conservation practice. Together, this data creates a cost-benefit assessment tool that ranchers and others can use to evaluate cost per practice in light of conservation benefits.

This same data can also provide the foundation of fiber traceability and meaningful, quantitatively robust marketing stories. A clothing label could, for example, describe which practices on the ranch on which a garment's fibers were grown, and thus the conservation benefit created by practices on that particular ranch. Quantitative data like this can provide a welcome contrast to unverified "eco benefits" and greenwashing that so prevalent in marketing to the LOHAS segment.

Study Constraints

Each observed wool program *exclusively* used regionally sourced, regeneratively raised wool (or regenerative wool, for short). **Regenerative wool** is harvested from sheep raised on farms and ranches that have implemented at least one of the established conservation practices identified by the USDA Natural Resources Conservation Service (NRCS). Some practices, like compost application, windbreaks, and reduced or eliminated tillage build soil health. Other practices rebuild stream (riparian) health, improve fuel efficiency, and increase species diversity. See the Appendix for a comprehensive list of conservation practices.

Transitional wool comes from farms and ranches that have committed to implement--but have not yet fully implemented--at least one conservation practice, which requires time and money.

The rationale for studying regenerative and transitional wool was to provide a basis on which to assess consumer interest in regional and regenerative products; to determine if people will pay more for products that result from such practices; and to determine if ranchers can realize premium wool prices for their conservation efforts.

This study did not compare regenerative wool with standard, market-price wool, though market-price data can easily be obtained for comparison purposes from commodity markets and weekly, historical wool price data from the American Sheep Industry Association (ASI).

Demand Analysis

To evaluate demand for value-added wool products, the Demand Analysis portion of this study relied on three sources: two primary sources—community surveys and interviews—and one secondary source, a review of relevant consumer and market research literature. The structure and results from each of these is included in the following three subsections.

Online Survey Results

While secondary market and consumer research is helpful and convenient, it is more important to understand, where possible, product demand in the local community and region within which wool products are created and sold. This sort of data would enable researchers to understand if there is demand for raw wool and/or finished wool goods created in regenerative ways; what finished products people need and want; and the small business and craft activities and material culture these goods should support.

In mid 2016, two online surveys were created to assess demand for regeneratively grown wool in general, and for wool fabric in particular. The Regenerative Wool Demand questionnaire sought to understand community interest in finished products that might be created from raw wool, and to ensure finished products matched customer needs. This questionnaire focused on four types of value-added goods that could be developed with regenerative wool: cloth, yarns, batting, and roving/combed top.

A second survey, the Regenerative Wool Fabric questionnaire, sought to assess demand for woven fabric produced from regenerative wool; to understand the kinds of goods community members want to make with fabric; and to learn more about the types of materials people need in order to create what they want.

Survey Sample

The Regenerative Wool Demand survey was completed by 21 people in the Fibershed community. The Regenerative Wool Fabric survey was completed by 24 people in the Fibershed community.

Responses to the question *"Please describe your business (i.e. animal rancher and wool producer, designer, fabric retailer, etc)."* were open ended and free form, rather than multiple choice. This created a wide range of responses, in participants' own words. The responses were aggregated during analysis into the clusters shown in the table below. In both surveys, the majority of participants identified as artisans and/or designers.

Table 1: Online Survey Sample Composition

PARTICIPANT TYPE	REGENERATIVE WOOL DEMAND SURVEY (21 RESPONSES)	REGENERATIVE WOOL FABRIC SURVEY (24 RESPONSES)
Wool producer, rancher	4	1
Artisan, artist, designer, or manufacturer	13	16
Home sewer, hobbyist	1	6
Other	3	1

Two people participated in both surveys, for a total of 43 unique responses across both surveys.

Several questions between the two surveys were highly similar, if not identical. For questions shared between the two surveys, the total possible sample size is 43; for questions not shared between the two surveys, the total possible sample sizes are 21 and 24, respectively. In addition, some questions did not require answers, so the total number of respondents was lower than the sample size. The number of people who responded to each question is noted for clarity of interpretation.

While these sample sizes are small, they are meaningful because they have high veracity: they are drawn from the local target market, the group of people considered most likely to actually purchase and use products that might be created. As such, their input is considerably more important than that of people randomly selected from a larger population.

Online survey items most relevant to the feasibility study are summarized in this section. The full list of questions and responses can be found in the Appendix.

General Interest

The question *"Are you interested in purchasing locally sourced materials and goods that support regional and regenerative agriculture practices?"* sought to gauge general interest, as compared to other questions that distinguished between interest overall and interest in specific goods.

100% of participants (43) answered Yes to this yes-or-no question.

Product Interest and Purchase Intent

Across the two online surveys, several questions assessed demand for products that could be made from regenerative wool. Questions on more specific product attributes like yarn weight, batting thickness, and intended use(s) were also included and can be found in the Appendix.

Table 2: Wool Product Purchase Intent

QUESTION	NUMBER OF RESPONSES	YES	NO	OTHER
Are you interested in purchasing 100% Regenerative Wool cloth?	43 of 43	43 (100%)	0	1
Would you be interested in purchasing Regenerative Wool yarn?	19 of 21	13 (68.4%)	6 (31.6%)	0
Would you be interested in purchasing Regenerative Wool batting?	19 of 21	8 (42.1%)	11 (57.9%)	0
Would you be interested in purchasing Regenerative Wool roving or combed top?	20 of 21	9 (45%)	11 (55%)	0

Survey participants were most interested in purchasing cloth. The number of responses skewed high because the second survey focused exclusively on cloth and did not include questions on yarn, batting, roving, or combed top.

For the question "Are you interested in purchasing 100% Regenerative Wool cloth?" the "Other" refers to one respondent who answered yes, but noted they do not use cloth in their work, it does not directly apply to them.

Product Price Preference

Questions about price were open ended and free form, rather than multiple choice or selected from within a shared scale. This created a very wide range of responses, stated in participants' own words, as well as many "I don't know" and "No idea" answers, especially in regard to yarn, batting, and roving or combed top prices. The low response numbers for these items indicate a low number of responses, and not stated prices that fall outside the noted ranges.

To make participants' stated prices easier to analyze and understand, price ranges were created in $15 increments during data aggregation, using natural breaks. If a participant's uniquely stated price range fell into multiple study ranges, the range was counted in both ranges. For example, if a participant stated that they would pay $15-$40/yard for fabric, that response would be noted in both the $10-$25 and $25-$40 study ranges in the table below. This method counts *responses* of a particular *price*, not the number of people responding.

Table 3: Product Price Preference

WOOL PRODUCT	$10-$25	$25-$40	$40-$55	$55+
Fabric (by yard)	23	18	7	2
Yarn (by pound)	5	3	2	2
Batting (by pound)	3	0	0	0
Roving or combed top (by pound)	3	1	0	1

Fabric price preference was gauged in both surveys, and desired price ranges did not vary between the two groups of participants. For nine of the 21 people who volunteered price preferences for fabric in the Regenerative Wool Demand survey, four noted $40/yard as an upper limit, and most (five people) would prefer to pay $10-$30/yard.

In the Regenerative Wool Fabric survey, 18 of 24 possible people stated a price preference. Stated upper bounds were slightly higher for this group, with one person noting $80/yard, and two noting $60/yard and $50-$60/yard. Even so, $10-$35/yard was a more typical range (for 13 of 18 respondents), similar to the preferred ranges in the Regenerative Wool Demand survey sample.

Some participants noted that the price they were willing to pay for fabric depends on fabric quality, hand, width, weight, and U.S. manufacturing origin.

The price distribution reflected in Table 3 is reinforced by the spreadsheet of costs and sales targets for the Full Circle Program, found in the Appendix. People expect to pay more for more finished goods, and retail prices and profit margins reflect this potential.

Fabric Quantity

Participants in both surveys (a total sample size of 43 people) were asked "What approximate volume (in yards) would you be willing to purchase of 100% Regenerative Wool cloth? A total 41 participants responded to the question, 24 of whom (56%) estimated they would purchase between 1-10 yards of fabric.

Table 4: Desired Fabric Quantity

1-10 YARDS	10-20 YARDS	20-50 YARDS	N/A
24 (56%)	6 (14%)	5 (12%)	6 (14%)

Fabric Attributes

A total 43 participants were asked about their preferences on fabric structure, weight, weave, color, and finish. Of these, 40 responded. The open-ended question "Please describe the types of fabric you would be interested in purchasing including general type (knit, woven, felt), construction, fabric weight, finish type, color, etc." allowed free-form responses, rather than structured multiple choices. This created a wide range of responses stated in participants' own words.

In regard to **fabric type** (weave), 34 participants stated interest in woven fabric, 16 in knit fabric, 11 mentioned felt, and 3 stated yarn. (Yarn is not fabric, but makes up the threads that are woven or knit into fabric.) Woven fabric is more stable and structured with less stretch: it stretches only diagonally, on the bias, between the warp and weft. Knit fabric is stretchy, because it is not--like most fabrics--made up of criss-crossed warp and weft yarns, but by a single thread curling in on itself.

Some respondents added additional detail on attributes they would like woven fabric to have, which included:

- Twill and herringbone (both of which are weave patterns);
- Crepe, a fabric with a crinkled appearance, due to its crimped or grained surface;

- Gabardine, a worsted twill weave that, because of its weave, tends to resist wrinkles;
- Gauze, a very sheer, open-weave fabric, usually made of lightweight cotton or silk.

Participants expressed interest in both dyed and undyed fabric, but the vast majority stated they **intended to dye the fabric on their own:** 89.5% of respondents in the Regenerative Wool Demand survey, and 81% in the Regenerative Wool Fabric survey.

This reinforced a separate finding from qualitative interviews with wool producers and small artisans (only one of whom participated in one of the online surveys), which indicated an interest in natural dyeing as an activity as well as increased access to local natural dyes. Natural dyes and dye classes could support the interests and activities of people interested in purchased regenerative wool fabric.

Desired fabric weights for wool wovens were light to medium.

Based on this feedback, the CSC program recommended development of a lightweight, woven, undyed, wool fabric.

Interview Findings

In-depth qualitative, one-on-one, 90-minute interviews were conducted with 20 participants:

- Nine (9) large- and small-scale wool producers in California, most of whom are also artisans who produce their own value-added wool products;
- Three (3) employees at two large, global apparel brands;
- Two (2) small wool processing mills;
- Three (3) small or specialty textile brands and boutique designers;
- Three (3) Fibershed employees who speak regularly with people in all of the above groups.

These conversational, personalized interviews provided insight on each person and/or company's activities, product needs, and motivations. A complete list of interview questions is available in the Appendix.

In this section, interview findings (previously listed in the Executive Summary that begins this report) are followed by quotations from participants that further illustrate the summarized finding, in their own words.

Interview Finding #1: Wool producers most need marketing and distribution support, for both raw wool and finished products.

There is tremendous need and perceived value in marketing and distribution, more so than in manufacturing. This is what wool producers need and want the most help with. Overwhelmingly, wool producers want more help marketing and distributing their products: the number one, enthusiastic response from all of them. And "marketing" is a broad term for them, going well beyond advertising to sales opportunities and to helping facilitate those sales opportunities:

A wool producer and artisan in Vacaville, CA said: *"Definitely marketing. A marketplace website is a big part of our missing marketing right now. I need marketing. I don't need more raw materials. Marketing is a huge part of it. If we had more places to sell... I just want to add one, more opportunities for sales, like more pop-ups... I took in $600 at one at the Shed, a pop-up in Healdsburg. That probably does all fall into marketing, or opportunities for sales."*

A small flock owner in the Sierra Foothills who, for context, reduced his flock size due to the drought: *"Local processing and, more importantly, marketing capacity would help me. My goal is to run 600-800 ewes again. If we got to that point, I would not have time to market a finished product, but I'd sure like to see it marketed locally. Taking a page from Niman Ranch or Dakota Lamb, and using that to market fiber, which is bigger than one producer, that would help me. Marketing means not just sales but distribution. The marketing part... I feel like I do a good job telling our story, but it's getting product into someone's hands at a price valuable to me that is very challenging."*

Later on in our conversation, this same producer added (in discussing a wool pool) that *"There is a whole different time and skill commitment to market a finished product vs. a raw product. There's a need for more cooperation on that end of things, finding someone who knows how to market finished product. We enjoy marketing yarn and roving but getting $30-$40/week at the farmer's market is not a steady business. I think marketing is huge and that the value added is more complicated than anyone realizes. To me, it would be more important to incorporate marketing than processing. We're starting to get processing capacity in Northern California but a lot of us doing this as a part-time job don't have the time or skill. Moving a fence and selling yarn is totally different."*

A sheep and cattle rancher in Marin County, California: *"Access to more markets, more of a competitive marketplace. A lot of times there are only 1-2 options where to go with*

meat or wool and need at least 3-4 to make it competitive, for the price, so you're not just the price taker."

Interview Finding #2: Most wool producers do not feel that their current work is sustainable, fair, or just.

Wool producers do not have an incentive to continue growing wool on which they lose money. A wool grower in Potter Valley, California said: *"Sustainable, it's not, because every year, the prices seem to go up and we get a year older... If I were to sell all my fleeces at $20/lb would I be able to make expenses? No. It's fun for me, I like the fiber, but in terms of fairness, at a certain point, when the costs of alfalfa and vet bills and feed bills are so expensive, it starts to feel not fair. For working so hard for this fiber, it feels like I should be able to get more to pay for costs. It's difficult. "*

A sheep and cattle rancher: "*There's winter, rain, coyotes eating lamb... Risk is a big part. I don't think it's that fair. It's sustainable if you're willing to make big sacrifices with way of life and cost of living."*

Interview Finding #3: Receiving a higher wool price in recognition of regenerative agriculture efforts was described as "a game changer" by some Northern California wool producers.

The additional $.60/pound added as a premium to wool prices makes a huge difference to wool producers, who would like to have more choices about what ultimately happens to their wool (where it goes and how it is used). A fine wool producer in central California: *"Wool is secondary. The lamb meat market is where majority of income comes from. I take the first wool offer I get and I sell. If you try to hold onto it, the more fees you accumulate, storage fees, etc. Even if you try to get higher price, you won't always. Last year I got $1.49/lb. for wool. Not enough, it's a wash with the shearing costs. $2/lb would make it totally worth my while. Would make a big difference. If I could write my own check for wool, $3/lb would be great." (This $3/pound for regenerative wool is $1 greater than his desired $2/pound for standard wool).*

Interview Findings #4-5: Clothing designers and manufacturers need a ready, domestic, fabric supply chain of reliable and consistent vendors. Fabric selection is the earliest product development stage at which large retailers and small artisans typically begin their work. They are not accustomed to considering fibers and/or processing at supply chain stages that precede either fabric or finished garments.

Clothing designers and manufacturers begin with fabric samples, and aren't really buyers for raw wool or clips. Employees at two apparel brands said:

"Normally, you would pick a swatch from a mill book, or bring color inspiration in... Today, we pick our fabric out of a sample book and keep a consistent supply of fabric... And I have to pay for all fabric in advance."

"Normally we start with knits and yarn, or we just buy a finished garment. We need yarn and fabric ready to go. We need a spec, so we can tell the vendors to order it... We need an established supply chain."

Interview Finding #6: Even though their work typically begins with fabric, retailers and artisans describe their customers as demanding greater product traceability and transparency "down to the fiber level" and the "exact farm and ranch location," and say they plan to respond to those demands.

These needs are detailed by an employee at large outdoor apparel retailer:

"We have doubled down on wanting to know origin, traceability, the exact farm and ranch location. It's a huge opportunity. We went to China and did a big review of a hemp processing plant, and saw every stage, through yarn spinning, knitting, weaving, finishing... We have a relationship with a Texas organic cotton co-op. We know exactly where things are coming from now, and even work with mills in India and China that own organic cotton farms. I think we are very far ahead of the industry. It seems above-and-beyond compared to other places, but it feels like where we need to go. Customers are demanding more and more traceability. They've seen documentaries like The True Cost, and news stories after the factory collapse have infiltrated more to mainstream public knowledge. I feel like a lot of brands are committed to traceability down to the fiber level... Everyone here is so deeply committed to trying to change and do things in a responsible way. It is not all just stories, it's true. We are really trying."

An employee at another large global retailer stated much the same: "*Honestly, we have this north star. If we were in a perfect world, regenerative, like a sustainable farm that makes cotton for example, where the workers are paid fairly, not exposed to toxins, the fiber is amazing, and we can make a product that sells well and keeps us in business... Putting all*

of that together is really hard. Putting those pieces together is a constant headache. ***Every time you add responsibility you add price****, and that is what cost of business is and should be, but it's amazing how fast fast fashion was able to take over the world. Now we are climbing up the mountain to how it should be."*

An employee at another, large apparel retailer said: "*We started talking to different wool organizations to figure out what was the most responsible, and the decision we made was to work with the ranch, we nominated down to the ranch level, beyond the co-op level. The co-op level felt too broad. We want to know the exact ranch."*

And still another textile employee said, *"We are really excited to have data from a ranch."*

Interview Finding #7: Consumers and retailers connected their desire for ranch-level traceability to skepticism of existing product labels, describing many "green" labels as based on self-reported, unverified, and thus meaningless data. Some wool producers, retailers, and artisans expressed skepticism and confusion about the meaning of regenerative agriculture and conservation practices and labels. Education and clarification are needed.

The desire for intensive, detailed traceability seemed to be tied to deserved skepticism of existing labels, due to the fact that many are meaningless A boutique designer who produces naturally dyed, U.S. garments echoed this sentiment, and that it's necessary because labels are meaningless: "*We use third party, domestic suppliers who manufacture in China. And those third party suppliers don't know much about where fabric is made. It's a black box. The manufacturer checks the "green" box and self reports that they're sustainable or whatever. Nothing is checked at all, or verified."*

A desire for ranch-level traceability, however, may be at odds with the needs of ranchers, as it can create more work and bureaucracy for those with the least time to spare. Ranch-level traceability is understood to be not only risky, but costly as well. As one employee at a large apparel brand put it: *"We worked with one, super committed ranch and learned a lot. It is very expensive to implement new standards, and to have a change in practices and documentation that is not typical for that ranch. The audit process is expensive, you have to think about shearing and animal welfare during shearing... From a quality standpoint, it makes sense to have different wool ranches, to ensure a standard quality of yarn before we spin, so the first ranch introduced us to second ranch in Utah with huge micron range. The owner wants to be part of this, but he's very busy, and his son does not share these values. You have to understand risk from the ranch perspective. Not every*

rancher wants to be associated with a big brand because it's high risk for them, people can find them. It is a risk."

Interview Finding #8: Though demand for U.S.-grown organic wool is growing, organic practices (like organic animal feed) and certification are expensive enough to be prohibitive for many, if not most, wool producers. Wool producers cannot quickly or affordably benefit from adopting certified organic practices.

There is demand for organic wool in the U.S. A provider of batting and natural bedding said that: *"The certified organic part of our business has been growing for the past 5-6 years. It's also very high quality wool, but there's not a reliable or large enough source of certified organic wool in the U.S., so we import it from New Zealand. Some people are just very concerned with GOTS (the Global Organic Textile Standard) and feel it answers a lot of questions for their clients. So, even though they appreciate the domestic and sustainable story on our Eco Wool line, which is the domestic stuff, they gravitate toward the globally recognized certification. They each have their qualities for sure so we're happy to serve both needs."*

But **organic certification is expensive** ($3,000+ for a farm) and, with wool prices as low as they are, it's not clear that wool producers could recoup in wool sales what they might spend to obtain organic certification.

Aside from certification, **organic sheep practices cost more**, too. Just in terms of feed for sheep, one grower in Potter Valley, CA said: *"We are an organic farm, ever since it became OK for alfalfa to be GMO alfalfa. And the price of organic alfalfa is a pretty big price differential. So $20 per pound should be a fair price for a fleece, but I think I'm basically covering my costs. Unfortunately it is not a business that somebody would want to go into and think that they would make money on."*

But, reinforcing findings from secondary market research, the organic label is not the only one that matters, or even the one that matters most, for wool. As a natural batting producer explained: *"The bulk of our business is sourcing fiber from the Oregon and Northern California regions, and occasionally from elsewhere. But for the natural product line--and by that I mean natural and responsibly raised but not necessarily certified organic--that fiber is sourced from Roseburg, Oregon and the Northern California coast... And we run it into custom dimension batting. It is amazing quality that people are willing to pay a premium for."*

A boutique designer and artisan suggested fiber labeling similar to that of food: *"Joann's [Joann Fabrics] should look more like Whole Foods: straightforward, simple, like how "conventional" is cheaper, and organic costs more. It makes it easier to choose on pertinent factors in the moment."*

Interview Finding #9: Keystone markup, in which a product sells for at least twice the price for which it was purchased (i.e. with a gross margin of 100% of cost, or 50% of retail price) is standard in the fashion industry. Keystone markup creates a disincentive for fabric and garment manufacturers to pay higher prices for raw materials, even when manufacturers believe the raw material is of better quality and deserving of a higher price: paying more for raw wool increases processing costs at every subsequent step in the supply chain.

The higher price point that results from a premium raw wool price can make finished products (fabric and yarn) cost prohibitive for boutique designers and small scale artisans. Two wool producers, who also have some of their wool processed into yarn, said they cannot afford to set a wholesale price for their yarn. One said, *"If it costs me $30/skein, I can sell that yarn for $30/skein, but that's already really expensive. A yarn shop can't turn around and sell it for $50-$60 skein. Who can afford that?!"*

One boutique designer described how keystone markup on fabric limits her choice of materials: *"Our longterm goal is to have U.S.-woven fabric and U.S.-sourced natural dyes but, for now, the cost differential is vast. We pay $4.50-$20/yard currently, and U.S.-woven* ***starts*** *at $20/yard. If I get denim from a third party, it's $4-$9/yard, and U.S. denim, canvas woven, is $20-$40/yard. It makes the end product prohibitively expensive. Wholesale is double, so retail is double. If we could hit that volume and get discounts? Maybe. But, I would need to put those items in their own, higher priced category, even for the most entry-level U.S. fabric, which is equivalent in cost to the most premium fabric made overseas. Unless you have a very sensitive, caring person who wants to support things like Community Supported Cloth, a negative CO2 footprint, woven in the U.S., and things like that, it would make wholesale impossible. Our ideal price for U.S. fabric would have to be close to what we pay now, which is $5-$22/yard, and $22/yard is pushing it. Under $20/yard is essential to my business right now, as my top maximum."*

This designer's preferred price range was reflected in and reinforced by online survey price preferences as well (see Table 3: Product Price Preference above).

Interview Finding #10 : The ability for manufacturers to pay for a portion of premium raw wool prices in the form of donations to a regenerative fiber fund (and to realize tax benefits for the same) offsets higher costs created by keystone markup scenarios.

Higher raw material prices become more feasible as donations: *"Initially, the idea was a point-of-sale model (POS), like '1% a for regenerative supply chain,' in which you sell a regenerative wool hat, or hot pads, and 1% of sales go to a conservation fund. It's nice because it creates no rough spots for producers, but does not gain traction because many companies selling these goods are publicly traded: to capture POS donations would be a huge thing to do, for something that simple, and it only works if it's from large brands, at that scale. So POS won't work. What does work are environmental grants in lieu of POS sales or consulting fees. Donations and grants work for them."*

Donations to a regenerative fiber fund are both helpful and necessary, because implementing regenerative agriculture practices is often expensive: *"For the amount of money we brought in...we brought in as much as 25% of one regenerative practice (maximum of ~$9,000 with everything included above over $38,000 per compost application at Bare Ranch) but more likely closer to 12% (minimum of ~$4000 over $38,000 per compost application at Bare Ranch)."*

Estimated costs to implement conservation practices in California are included in the Appendix.

Interview Finding #11: Manufacturers and artisans describe their ability to accurately assess consumer behavior as a chicken-and-egg problem: consumers cannot choose to buy a product that is not available for them to choose.

As one boutique designer put it, *"There is nothing in front of them **to choose**. A price point might be accessible, but first you need options out in the marketplace." Similarly, a global apparel manufacturer spoke about an accessory they made of regeneratively raised, U.S.-grown wool: "If we can't sell it, though, it won't happen again. We need to prove demand. We did market research on competitors, consumer panels with specific consumer insights, and we've talked to internal teams on what people are buying, but you really have no idea how it plays out until retail."*

Interview Finding #12: Consumers, wool producers, and artisans have positive attitudes about Community Supported Agriculture (CSA) and prepayment models, which they perceive as a way to share risk more fairly.

A cattle and sheep rancher in Napa: *"The CSC project is awesome. It's an incredibly good way to go. I really believe in that kind of stuff: pre-pay, wool co-ops."*

A wool producer and artisan, who subsequently participated in the CSC project, said: *"I like those models, always have. Someone offered a CSA for natural dyes, for dye plants, I missed out on that one, it would have been good. The cloth one… I have to have a reason to do it, there has to be something in it for me, but if it benefits both of us, it's great… Am I willing to pay more for something in order to help the money also go to support that, or also to fund it before it has the funds? Yes. I think they're great. I'm all for them."*

A small producer in the Sierra Foothills has experimented with CSA offerings, for wool and lamb: *"We've done that to some extent. I think there's some opportunity there. It's a matter of scale, and the administrative efficiency of running that. We've done it on our own and also worked with established CSAs that do meat, and they've had to get to certain size to make their administrative costs make sense… I do think there is value in sharing risk with customers."*

As shown later in this study, in the story of the CSC project, **people did prepay for fabric** based on samples. Demand exceeded supply and a wait list had to be created.

Interview Finding #13: Though small-scale textile artisans like the idea of CSAs, prepayment models need some adjustments in order to work better for them in practice. Adjustments to prepayment schedules, non-monetary ways for artisans to express intent to purchase fabric or other wool goods, and bridging gaps between seasonal sheep shearing and fashion calendars can make prepayment models more feasible and less risky for more participants.

In particular, prepayment timing needs some adjustment to accommodate designers' spring and fall fashion seasons, both of which are anchored by fashion weeks in March and September, respectively. Designers show sample garments during fashion week and receive purchase commitments and deposits from retailers shortly thereafter. There is a roughly three-month difference between this fashion week activity in March and many flocks' late-spring shearing season in May.

In this scenario, designers would be asked to prepay months before wool is sheared and its quality known, and would then have to wait months more for fabric samples on which they could base their garment designs and subsequent purchases. Boutique

designers and small scale artisans cannot afford to prepay for fabric with such a lengthy long timeframe between prepayment, manufacture, and delivery.

Interview Finding #14: Wool producers, processors, fabric mills, apparel brands, and designers expressed a strong need for experts in textile design, development and science to provide consulting services and serve as intermediaries between themselves and other supply chain partners. This need presents a potential source of consulting revenue with which to experiment in future fabric development efforts.

One small flock owner said: *"I like the phrases. The proof is in what the definition is. An LCA (life cycle analysis) approach is important. My wool in the bag is pretty climate friendly. While it's on a ship to China, I don't think it is. Start-to-finish has to be included."*

A cattle and sheep rancher said: *"I think it sounds good, like putting a spin on something, being PC [politically correct]. I just learn from farmers. I don't know the language that goes with it. You don't overgraze because it's bad for the land. Being greedy is not good practice. The least amount of sediment is best practice. I ranch in terms of best practice, not PC. For me, something like "climate beneficial wool" doesn't mean anything. I know it should but it doesn't."*

A global apparel representative described internal organizational attempts to describe regeneratively raised wool: *"We're trying to do it on the garment label. We'll test it, and two people understand it. Then we show it to two more people and they're confused. People don't even know what the carbon cycle is."*

An individual hobby sewer interested in fabric asked: *"Could you clarify the exact difference between sustainable wool and regular wool we get from our local farmers? What must the farmer go through in order to qualify for these distinctions?"*

And an employee at a large apparel brand said: *"I would assume it means the wool is either repentive, or is the word regenerative? Like, things like more trees or cropland being planted, some sort of counteractive gesture being made, like the IKEA tree plant line. Or, like a certain conservation standard: crop rotation, reduced pesticides, that it was mindful of stuff like that."*

Literature Review

To assess broader, more general demand for value-added wool goods, the study included a review of the relevant literature. Secondary sources, namely literature from the field(s) of market and consumer research, shed some light on consumer preferences and expectations that pertain to the kinds of products considered as part of this study. As reflected elsewhere in this study, however, there is often a gap between consumer attitudes and intent and purchasing behavior.

The LOHAS Segment and Fiber Products

Approximately one quarter of consumers around the world have been identified as part of a growing segment interested in "lifestyles of health and sustainability" or LOHAS (LOHAS; Harding, 2010). The market power of the LOHAS segment has been most apparent in the dramatic growth of the organic food industry, which grew by 12.4% in 2010 alone, reached a global value of nearly US $60 million, and was forecast to grow 48% to US $88 million by 2015 (Datamonitor, 2011).

The question for the fiber and fashion industries is whether (and, if so, to what extent) the values held by consumers in the LOHAS segment influence clothing purchases. Organic cotton producers in the U.S. have formed marketing cooperatives to take advantage of the LOHAS type trends but, even more helpfully, the work of Peterson et al. examines wool specifically.

Peterson et al. note that some in the wool industry have taken advantage of LOHAS related trends. They cite the work of Marks 2007 when they note that "Sales of environmentally friendly or organic fiber products have grown by at least 30% over the past few years in the United States," and that the Australian wool industry has made gains in marketing organic products to LOHAS consumers, resulting in a 10–15% premium. By contrast, U.S. wool producers have been comparably slow to respond to the trend, and Peterson et al. mention that challenges in organic certification may be partly to blame.

Obtaining organic certification for wool is a much greater challenge than for cotton producers. The U.S. National Organic Program requires sick animals to be treated and removed from the organic herd, since not treating infected animals breaches animal welfare standards. Without an effective organic means of treating parasites, the cost for wool producers to enter the organic market remains prohibitively high.

Beyond Organic: Fiber Attributes and Label Opportunities That Matter To Consumers

Since it can be challenging for U.S. wool producers to obtain organic certification, it is important for them (and others in the textile industry) to identify other labels that matter to consumers. Peterson et al. reference a survey that found most U.S. consumers preferred wool to acrylic; distinguished wool products by geographic origin; valued organic certification less than combined environmental sustainability and animal welfare claims; and lowered their valuation for wool products in response to the information provided on wool attributes.

In another study that examined consumer interest in alternatives to organic labeling, researchers found that consumers were most interested in purchasing products that met standards for humane treatment of animals, followed by local origin and a living wage. The findings suggested that organic standards are not meeting many consumer concerns (Peterson et al. citing Howard & Allen, 2006). In a similar study, labor/workers' rights, animal welfare concerns, and environmental sustainability were each mentioned more often than organic attributes, when participants were asked to list concerns related to wool purchases (Sneddon, Lee, & Soutar, 2009). Environmental issues included local origin and the **"distance it travels"** (Peterson 2012).

Peterson et al. identified labeling on the origin of the fiber used in apparel products as a potential opportunity. The U.S. Federal Trade Commission (FTC) regulation allows for, but does not require, the modification of a label's fiber content information to include fiber origin (e.g., 60% Egyptian cotton), and labeling domestic fiber could be a way for consumers to support domestic fiber producers, similar to shoppers' support for local farmers for food products.

Similarly, Cao et al. found a preference for domestically produced wool fibres and textile products, but the percentages (42% for wool fibres and 58% for wool products) were not as high as those in Peterson, Hustvedt, and Chen's (2012) report.

In summary, a variety of wool labels matter to textile consumers and those that describe on-ranch practices are not the only ones. Distance traveled and fair wages are also important. For our purposes, labels that emphasize low-travel-distance, regional supply chains and attest to rancher profitability (as found in the Full Circle Wool and Community Supported Cloth programs described here) are well worth exploring.

Perceived Quality of Locally Sourced Textiles

Cao et al. conducted a study in which they prototyped and tested locally sourced, natural fibers and, from these, created naturally dyed, sustainable products that were subsequently evaluated by participants in a focus group style discussion. Wool was obtained from Dorset sheep in the university's animal science department, and mohair fiber from a local ranch. Goldenrod flowers, indigo, and black walnut were used to dye the fiber.

Some shortcomings of the Cao et al. study are a small sample comprised entirely of undergraduate textiles students, who are likely to have a higher than typical interest in the subject of garment production and sourcing. In addition, focus group participants were presented with an unusually high level of product development information, as compared to product information typically available to consumers. Fiber processing methods and equipment, for example, were shown to one group of participants who saw the wool and mohair at various stages of processing and were allowed to ask questions. The participants in group two were not exposed to the processing procedures and equipment, but researchers explained the background of the local production project to them.

In contrast to Peterson et al., Cao et al. found that the origin of wool didn't matter to study participants: All 12 participants said it did not matter to them whether wool fibers and products were locally or domestically produced. It is important to note, however, that the meaning of the word "origin" differed between the Peterson and Cao studies. In Cao et al., the distinction in fiber origin was not between domestic and overseas but between on-campus (hyperlocal), local, and domestic, a lesser degree of nuance than, say, "made in my state" and "made in China."

Value-Added Wool

People around the world are engaged in trying to add value to wool produced in their nations and communities, including in New Zealand and Norway.

A study by Pawson and Perkins emphasizes the degree to which added value depends on marketing, positioning, and story. They compared Merino (fine wool) marketing and strong wool marketing in New Zealand during a three-year, longitudinal, ethnographic study. Their primary data came from 20 interviews with farmers, stock and station agents, wool buyers, product manufacturers, retailers, and marketers, and secondary data from historical sources, wool industry gatherings, and retail outlet visits to evaluate wool products.

Pawson and Perkins describe the breakaway of the New Zealand Merino Company (NZMC) from the New Zealand Wool Board as critical to the re-valuation of fine wool. The NZMC used wool type to shift its position relative to the rest of the wool market, which worked: They essentially reinvented merino as a new form of fiber, and merino is, for many people, practically a synonym for wool (Pawson and Perkins citing Stanford Graduate School of Business 2013).

In order for the NZMC to accomplish this, they embraced multiple new business practices at odds with long-standing, wool industry beliefs: that it was not possible to differentiate between wool fiber categories, or to attain prices greater than the commodity price, or that value could be added through marketing and captured by growers (Pawson and Perkins citing Stanford Graduate School of Business 2013).

The wool apparel brand Icebreaker has innovated in all of these practices. Today, Icebreaker buys about 20% of New Zealand merino and has redefined relationships between farmers and manufacturer, and between manufacturer and consumers. Icebreaker has cultivated relationships with growers, which it displays publicly, and has introduced traceability and transparency via use of a garment's 'baa code', which tracks the origin of wool in the garment to particular wool stations.

Pawson and Perkins are clear about the fact that values have played a central role in the re-valuation of merino and the systems that Icebreaker has created: "The search for new market value in wool has been influenced by and created the potential to enhance productive landscapes and protect, conserve and regenerate indigenous environments." Culturally, it has involved "transparent producer–manufacturer–consumer relations and the potential of sustaining intergenerational ownership and management of farms, thus strengthening rural community."

A report produced by the Norwegian Research Council, titled Valuing Norwegian Wool, describes similar efforts in Norway. This project grew from a "desire to help Norwegian agriculture, wool based industry, and design to exploit the potential inherent in Norwegian wool as raw material, and in the Norwegian textile tradition." One problem is in the marketing of the origin of the raw wool in finished products, which is "inadequate and sometimes misleading." Even though fewer and fewer products are made of Norwegian wool, Norwegian consumers take it for granted that Norwegian producers use Norwegian wool," even when they do not.

At over 160 pages, Valuing Norwegian Wool is a substantial report that sheds light on numerous supply chain issues and contains several strong parallels to our situation in

California. As in California, scouring is a gap, a “missing link" in the Norwegian supply chain. Most Norwegian wool is scoured in England. The report found that some companies could not use Norwegian wool due to quality problems, like “vegetable matter, lack of whiteness, fineness, and elements of dead hair.”

And, as with local wool supply in California, fashion designers say Norwegian wool is a highly coveted product they would like to use more of, and complementary to their focus on environmental and sustainable products. This represents huge potential that could “contribute to greater awareness and profitability for the entire Norwegian wool based textile industry,” and a strong starting point where efforts might produce results quickly. The report sees strong opportunity in connecting Norwegian designers with producers and retailers of fabrics and yarns made of Norwegian wool.

Labeling, Choices, and Making Things Easy

Research provides some insights on product labels that consumers find meaningful and/or helpful. Some garment labels, like fiber content and brand, are mandatory, but this section mainly refers to voluntary labels that can supplement those that are mandated.

Hustvedt et al. studied consumer attitudes about wool product labels in the U.S., in regard to fiber origin and manufacture. Fiber origin labels were Australia, U.S. and U.S. states, with the latter option to assess consumer interest in *local and domestic* products over simply domestic. Manufacturing origin labels had two possibilities, the U.S. and China.

The study found that consumers are concerned with wool origin, and that the opportunity for state-based labeling and that the premium paid for such products could be high: Some participants “would be willing to pay more for the State and US origin attributes.” The average premium for using more local (i.e. switching from Australian to U.S.) fiber *more than tripled* when the product was labeled as manufactured in the U.S. than in China.

Hustvedt et al. also recognize the challenge due to a lack of traceability of fiber origin, and recommend labeling and marketing products as local on a small scale, with local manufacturing noted.

Cao et al. found labels lacked information and did not help people find or select locally made products. Two participants noted that textile product labels did not specify either local or domestic (state level) production, and that they had no basis of knowing beyond “Made in the USA.” They also said it was not convenient to identify locally

produced wool products when shopping. Labels about product origin should be included and easy to see and understand.

Three participants said that a movement that supported more local fiber production would have positive economic impacts on their community. They noted that, for local food, 'local' or 'locally produced' labels are used by natural food cooperatives, health food stores, and the like, but that these same labels are not available for fiber products. This makes it difficult for consumers to identify locally produced fibres.

The Valuing Norwegian Wool report also described confusion created by labelling issues. They found that "Norwegian wool as raw material is not highlighted in any particular way by those who use Norwegian wool," but also found Norwegian flags, nature, names, and sheep breeds used on products that did *not* contain Norwegian wool. Indeed, the report found that Norwegian wool labels could mean any one of five different things:

1. Wool from Norwegian sheep breeds
2. Wool from sheep that live in Norway
3. Products made of wool and capitalized on in Norway, regardless of the origin of the wool
4. Products made of wool by Norwegian companies, regardless of the origin of the wool
5. Products based on traditional Norwegian patterns

Norwegian consumers were surprised to learn that sweaters and folk costumes from Norwegian suppliers were not made of Norwegian wool, and consumers cannot demand missing information that they do not realize is missing.

Consumers, however, aren't the only people interested in product labels: Farmers want to know more about where their wool goes and the supply chain. They prefer their wool be used in fashionable and heritage products "rather than squandered on non-origin, generic products." When sheep farmers were asked whether a Norwegian wool label would increase pride and the prioritization of wool production, 83% responded that such attention and labelling would be positive.

Much like U.S.-grown wool, Norwegian wool suffers from a lack of marketing and consumer obsession with softness, dominated by Merino marketing as described above: "Designers are often demanding softer and thinner yarn than is made of Norwegian wool,

and the lack of marketing is not creating the awareness amongst designers and consumers that could create added value."

Wool Program Performance

A primary hypothesis of this study was that producers would receive revenue through the profits derived from the sale of *processed wool products*, and that this revenue could be significantly more than that allocated to the increased value of raw wool.

In order to tackle this hypothesis, processed wool products that fit this description had to be identified. After these products had been created and sold, potential revenue from sales returns to producers could be calculated. To this end, the study identified two wool programs in Northern California that sourced regionally produced wool, paid wool producers a premium price, and processed wool into finished products sold in the market. This study observed these programs in detail between September 2016 and March 2017.

Full Circle Wool purchased coarse, raw wool at a premium price from two ranchers in Sonoma and Marin counties; processed the wool into batting within the U.S.; manufactured some of the batting into twin and queen sized comforters, pillows, and felt sponges; and began to sell these products in addition to batting.

In the Community Supported Cloth (CSC) project, the Bare Ranch had its fine, raw wool processed into combed top, which was spun into yarn. In late 2016, home hobbyist sewers, artisans, and boutique designers purchased pre-sale fabric based on samples. The production yardage quantity of fabric was then woven at Huston Textile Mill and delivered to customers in April 2017.

Both wool programs used only regionally sourced, regeneratively raised wool. All ranchers involved received premium prices for their wool. The full premium price was $2.50 per pound, and the transitional wool price was $1.90 per pound. By contrast, spring 2016 market prices for standard wool in the same micron ranges was $1.35 and $1.55 per pound, respectively.

The detailed results of each program--including upfront costs, expenses, sales targets, profit, and so on--can be found in Appendices X-Y and in the following sections.

Full Circle Wool (Coarse Wool Program)

Overview

Full Circle Wool, a small business based in Bodega, California, purchased coarse, raw wool at a premium price from two ranchers in Sonoma and Marin counties. Full Circle Wool then processed the wool into batting; manufactured some of the batting into twin and queen sized comforters, pillows, and felt sponges; and began to sell these finished products as well as batting.

First, Full Circle Wool purchased regionally sourced, regeneratively raised, raw wool from two ranchers, both of whom are beef cattle and sheep ranchers. One is a fourth-generation rancher in Tomales, California with a flock of 600 Dorset, Suffolk, and Perendale sheep that produce approximately 2,700 pounds of wool annually. The ranch has implemented regenerative practices that include pasture seeding, windbreaks, prescribed grazing, compost applications, silvopasture techniques, and riparian restoration.

The second participating rancher has consistently kept 400 sheep for the past 10 years, a flock of predominantly whiteface Dorset ewes crossed with Suffolk and Columbia. This flock produces over 2,000 pounds of coarse wool per year, and the ranch has completed and begun to implement a soil conservation plan.

The coarse wool from both ranches is well suited to batting and finished bedding, strong and springy with excellent loft.

Wool revenue typically pays these ranchers very little after they pay for shearing. Full Circle Wool purchased both ranchers' wool at a substantially higher price than their wool would normally receive in the commercial commodity market. Typically, their coarse wool would sell for approximately $1/pound, with $1.60/pound considered a high price. As described earlier, Full Circle Wool purchased one rancher's wool for $2.50/pound, while the other rancher received a transitional price of $1.90/pound. The ranchers' wool was pooled to meet minimum order quantities (MOQs) at domestic processing facilities.

Wool Processing Costs

Table 5 provides a summary of wool purchase, processing, and related costs. See the Appendix for detailed costs and calculations on a per-product and program wide basis.

Table 5: Coarse Wool Product Development Costs

ITEM or PROCESS	COST
5,355 pounds of raw wool, paid to ranchers at an average, premium price of $2.15/pound	$11,520.15
Freight to scouring facility, and from scouring to carding	$2,900
Yield loss to recover in sales: After skirting and scouring, 5,355 pounds raw wool yielded 3,400 pounds batting, a 36% loss x $2.15 per pound average. Yield loss is normal and range varies.	$4,203.25
Processing (scouring and carding)	$8,703.47
Total purchase and processing costs (includes storage, tarp)	$23,203.47

All wool processing took place in the U.S. and within California, the sole exception being scouring in Texas. The wool was carded into batting in Union City, California, and some batting was processed into felt in Vacaville, California. Finished bedding was sewn in Bodega, California.

A regional manufacturer of felt at commercial scale—a gap in the existing Northern California supply chain—could be an important addition to scaling successful products. The felt production business in Vacaville, California is not an industrial scale operation: the artisan who creates felt several pounds at a time does not want to (and cannot healthfully) work at a level that would, for example, enable thousands of sponges to be rapidly produced from batting. As shown in the spreadsheet included in the Appendix, industrial felt production is not *required* to make profitability or other benefits possible, but it could limit production of a consistent, higher-margin product that may sell well.

Lack of large-scale scouring capacity is another gap in the northern California textile processing infrastructure and, as a result, many California mills and textile manufacturers send wool to Bollman Industries in San Angelo, Texas. Bollman is one of the few remaining wool scouring facilities in the U.S. It is not clear if California, with its water challenges, is the best situated or environmentally beneficial place for a scouring facility, though much scouring can be accomplished with gray water: the cleanest water is not required to scour the dirtiest wool.

Processing wool domestically and in the West increased the speed of operations, reducing time between raw wool purchase, processing, and delivery of finished batting, as compared to sending products overseas for processing. This enabled Full Circle Wool to being making and selling finished products sooner. In addition, moving activity closer to home and using fewer major production locations reduced not just energy usage but complexity: shipping creates complexity in terms of logistics, management, and quality control.

In regard to yield recovery, wool brokers usually advise wool growers to price their wool based on clean (not grease) weight, because the grower tends to lose money if they use a greasy weight price: When paying a grease weight price, the buyer has to guess what the clean yield will be, and will thus guess low to avoid being caught short. In this case, by contrast, Full Circle sought to pay ranchers a premium price for grease weight wool, and did not guess low to avoid being caught short. Full Circle took on the risk and cost of yield loss which, once known, could be recovered later, as a portion of the retail price per item. Spreading this yield recovery cost over the total number of retail items both shares and reduces the cost, in a way that is not especially burdensome to any single buyer.

Finished Products and Potential Sales

Some batting was sold as-is to home hobbyists and small artisans for craft purposes, as for a milliner who used it to make felt for the hats she makes and sells. Full Circle Wool made twin and queen sized comforters, pillows, felted wool sponges, and felted yoga mats with some of the batting as well, which are currently being sold online and at farmers' markets.

Table 6, below, is a summary, and sales projections are estimated, not actual. At the time of this writing, Full Circle products have only recently entered the marketplace, so actual sales data is not yet available. See the Full Circle spreadsheet in the Appendix for detailed pricing, profit margins, break even, sales targets, commissions, and so on. All costs (processing, labor, etc.) are recovered in the stated retail prices.

Table 6: Coarse Wool Product Sales Estimates

FINISHED PRODUCT	POTENTIAL SALES
Queen sized comforters (377 pounds batting)	$29,400
Twin sized comforters (251 pounds batting)	$23,100
Pillows (100 pounds batting)	$3,500
Felt sponges (72 pounds batting)	$9,153.25
Batting (2,375 pounds)	$47,200
Total potential retail sales	$112,353.25
Break even (the point at which sales cover expenses)	$88,246.14
5% sales commission (covers some labor cost)	$5,617.66
Donations to regenerative fiber fund	$952.44
Profit	$28,469.24

The estimates in the summary table above are somewhat conservative, yet realistic. They assume that just 800 pounds of batting, of a total 3,175 pounds available, will be used annually to create finished, higher-margin products like bedding and sponges. Full Circle plans to sell the majority (2,375 pounds) of batting as such, preferably by the roll (one roll is 40 pounds). With its current available labor, Full Circle can produce a maximum 10 comforters per week (using an average of 35-40 batting pounds per week), and a maximum of 82 sponges per week (using approximately four batting pounds per week).

This rate of production—using 44 pounds of batting per week to create finished products, from a total 800 pounds—would require 18 weeks worth of labor, not quite four months. Spreading this 18 weeks worth of labor across the calendar year would make production more feasible for workers, but does set a potential limit on product sales, albeit a limit the business may deem reasonable or even desirable. Creating more products, more quickly, will also increase labor costs. Batting is a lower-margin product, so using more

than the 800 pounds allotted to create higher-margin products like comforters could increase profitability.

Business income also depends on how quickly products are made and sell. The forecast numbers in the Appendix may take one year to realize, or more.

Batting is the only inventory held, and wool in this form is a lever the business can pull: Batting is a core material that itself can be developed into a broad mix of value-added products, and at a wide range of price points attractive to a large market of people. Batting enables the creation of more expensive items with healthy profit margins--like comforters--as well as inexpensive wool sponges. A high-volume, low-risk product like sponges creates an affordable entry point to natural fibers for buyers who might be skeptical: sponges are small, do not take up a lot of space, are something that everyone can use, and are accessible at a retail price point of $12 ($6/each).

With local labor available to make felt (for sponges, yoga mats, crib liners, placemats) and finished bedding, no inventory (with its associated risks and costs) besides batting need be held because all finished products can essentially be made on an as-needed basis.

Results and Benefits

A technically and economically feasible, potentially profitable new business, Full Circle Wool, was created. This business expanded the total pool of economic and social value beyond itself. First, it created profitability on coarse, raw wool for ranchers, recognizing their work in creating both healthy raw materials and soil. This is important, because marginalized suppliers cannot continue to serve as such, if they cannot remain productive, improve the quality of their land, or refine their raw materials (which depend on the animals, who depend on the land). A reliable, consistent supply chain is important to textile product development. Full Circle considered longer term supply and profits, not just shorter term profits that typically do not consider the need for capable, quality suppliers, or account for the risk of not having these suppliers.

One of Full Circle's goals was to sell finished products at a rate that would enable it to make a return back to a regenerative fiber fund, from which ranchers (including Full Circle's suppliers) will benefit. This fund increases access to practices that increase land and livestock productivity. The tax deductible donation is also valuable to the business.

To this end, Full Circle experimented with premium wool prices in two different ways:

- **Added value on greasy wool,** a $0.60/lb additional cost on top of market value for greasy wool. This was paid directly to ranchers and returned money to the ranch quickly, during or soon after shearing. Ranchers saw an immediate return on the value of their wool and received funds right away. The downside to this model is that, in a typical textile supply chain (in contrast to Full Circle), this higher raw material cost subsequently adds cost at every step of the product supply chain: $0.60/pound eventually becomes at least $2.40/pound of product, giving most traditional textile buyers an incentive not to pay a higher raw materials cost--*even if they believe the raw materials are higher quality and worth it*. But, this is the most effective model for the producer, getting them money and immediate return.
- **Added value on textile products,** in this case, $.30 per pound of batting, a point-of-sale (POS) model. These POS funds are paid directly to a regenerative fiber fund, hosted by Fibershed to administer to ranch partners. It also provides a venue for consumer education in packaging and product story. This model is not as effective at raising money for producers or for conservation practices, but raises more consumer and public awareness by tying an exact percentage of product sales to regenerative fiber systems.

In addition, domestic and local processors and laborers also benefited from the expanded, total pool of value: the felt maker, carding factory, and sewers, as well as the package designer and packaging maker.

All in all, this program benefited nontraditional communities (i.e. communities that usually do not realize economic benefit, like rural areas) in an advanced country.

Significantly, Full Circle Wool began to redesign the way in which raw materials are procured. In contrast to most businesses, it did not seek to purchase the cheapest available fiber, but paid a premium for typically undervalued raw materials based on beneficial land practices and larger shared value. The business plan shows how the business can recover this initial, premium outlay over time, even through reasonable, accessible retail prices.

Societal needs (increased and fair farm income, healthy soil, increased soil carbon sequestration, renewable materials, products safe and healthy for human use) defined the markets involved in production and consumption. Products are good for customers and for their customer's customers, as in the case of artisans using batting to create other products, or stores selling wool sponges to their customers. Reduced social harm also

reduces internal costs, like wasted materials. Certainly, wool that becomes compost rather than value-added products creates an internal cost to the rancher's business.

Full Circle Wool further developed and strengthened the local cluster of environmental textile production, which involves ranchers and farmers, processors (mills), natural dye growers and processors, and hobbyists and designers. Full Circle Wool recognized and built a business around an existing, available local supply chain: sheep and wool growers, a carding business, and a felt maker. Their activities strengthen the supporting cluster of other businesses, not just themselves. While not calculated, this strengthening tends to create multiplier effects (Porter and Kramer 2011).

Full Circle Wool could be further strengthened by even a small marketing and sales force, which complements wool producers' need for marketing and distribution assistance.

In addition, Full Circle retail prices may be able to increase, though this may limit accessibility to customers within the region. The study evaluated products from a similar regional business, which sells wool that makes some of the same claims that Full Circle does. This company's wool comes from domestic wool suppliers in Northern California and Southern Oregon; is not certified organic, but restricts growers from using chemical pesticides, herbicides, antibiotics, and hormones; comes from wool growers who adhere to sustainability and cruelty free standards; and does not allow for carbonizing, chemical crimping, dipping, bleaching, harmful shearing, mulesing, or overgrazing.

Comforters from this company start at $55-$80 more per item than those from Full Circle; queen sizes start at $85-$115 more per item; the least expensive pillow at $18 more per unit; and batting is more expensive and sold out.

Going forward, Full Circle Wool would rather set-up beneficial relationships than serve as a product maker itself, and work to get regionally grown, regenerative wool into the hands of partners and manufacturers. Full Circle Wool envisions learning from its product development and sales, and connecting wool growers with natural bedding and furniture, batting, and felt makers.

Community Supported Cloth (Fine Wool Program)

Overview

The Community Supported Cloth (CSC) program processed Rambouillet wool from Modoc County, California into wool twill fabric. There are numerous reasons to explore fabric manufacture and sales in the Northern California market. Fabric is a more usable material for a larger group of people (including home sewers, small artisans, designers, natural dyers, and fabric shops) than more niche products like yarn, roving, or batting. In addition, both artisans and big brands evaluate and choose fabric based on swatches and samples, prior to garment prototype and manufacture.

Over the course of the past two years, the Bare Ranch has begun to implement conservation and soil health practices through a plan developed in cooperation with the Carbon Cycle Institute and Fibershed. This plan focuses on the production of regenerative wool on approximately 4,500 mostly irrigated acres of the historic Ranch, located within Washoe (Nevada), Modoc and Lassen (California) counties. The Bare Ranch lies within the Great Basin and its climate is typical for the region, with an average annual precipitation of just 9-12 inches. Fine-wool sheep like the Rambouillet breed thrive in high desert environments like these, and their soft wool is well suited for next-to-skin yarn and fabric.

Some of the conservation practices implemented at Bare Ranch so far include prescribed grazing, compost creation and application, not disturbing high-carbon soils, riparian (stream) restoration, decreasing erosion, and increasing species diversity and wildlife habitat.

In May 2016, the Bare Ranch flock was sheared, producing 5,255 pounds of wool. The raw wool was purchased by and shipped to Chargeurs, a mill in South Carolina that scoured the wool and combed it to create combed top, a preparation in which all fibers are aligned prior to spinning. Chargeurs is the only remaining U.S. manufacturer of combed top. The yield loss from scouring and combing was 59%, leaving 2,176 pounds of combed top.

In June 2016, Chargeurs sold and shipped the combed top to Jagger Brothers, a yarn spinner in Maine. Jagger spun the combed top into yarn sufficiently fine (2/24 weight) to either be woven into fabric, or industrial knit. In September, the yarn spun at Jagger Brothers was shipped to California, where it was subsequently woven into fabric at Huston Textile. Huston Textile is a newly established weaving mill in Rancho Cordova, California. It was founded and is owned by Ryan Huston, a U.S. veteran who served in Iraq.

In October 2016, test development of fabric samples began, based on feedback and preferences in the community wool and cloth surveys described in the Demand section earlier in this study. Leslie Terzian of Tangle Blue wove samples of varying constructions and weight, which were then laundered to enable the Huston Textile and Community Supported Cloth teams to select the best finished quality for industrial, production weaving. Myrrhia of Myrrhia Knitwear and Tara St. James of Study NY knit the first machine knitted samples.

Production weaving began in November 2016, when Ryan Huston created the first fabric yardage for the CSC program. The CSC program launched at the 2016 Fibershed Wool Symposium in the same month, and pre-sale fabric reservations began. Customers could evaluate sample yardage and pre-pay for fabric that would be woven and shipped months later, and they did. By December 2016, one month after the launch, 50% of the fabric had sold, prepaid. The undyed, wool twill fabric entered production weaving on April 3, 2017 and shipped in mid April, 2017 for delivery to customers who had prepaid for their fabric in the preceding months.

In total, 103 people and/or businesses ordered and prepaid for all available 731 yards of wool fabric. People who purchased 10 yards or more paid a discounted rate of $45/yard, while those who purchased fewer than 10 yards paid $55/yard. The majority of orders were for 2-4 yards of fabric. The wool producer, whose raw wool became yarn and was sold to a mill for development into cloth, was profitable at 14%. Weaving labor at Huston Textile was covered in the per-yard production cost.

The costs associated with the stages described here are summarized in the table below. A complete spreadsheet of detailed costs is included in the Appendix.

Table 7: Fine Wool Product Development Costs

FABRIC DEVELOPMENT STAGE	COST
Pre-production (sample) costs	$5,823.96
Production costs (scouring, combing, spinning, freight)	$11,802.78
Delivered yarn cost	$12,745.61
Cloth production (weaving and labor)	$12,783.20
Total production cost	$27,226.47
Total cost loom state	$33,032.49
Fabric sales	$35,225
Excess (for regenerative fiber fund donations, other)	$2,192.51

Pre-production Phase

The goal of the pre-production phase is to account for as many unforeseen issues as possible, upfront, so that these can be calculated into the total cost of a fabric, garment, or program. In the textile industry, there are typically a few research and development (R&D) stages before a final fabric is produced. Sample garments using the fabric sample may be created; fabric finishes may change; wash tests may be done to see how a fabric holds up, washes, and dries, etc. A pre-production fabric sample should be perfect, because the fabric at this stage will be the standard for production.

The pre-production costs for CSC were somewhat high, at $5,823.96, because both yarn and fabric were being tested. A more typical expectation is $3,500. It is safe to assume that the same level of pre-production effort will not be required each time, especially where the same or similar things (yarn, weaving style) are reused. As with many things in life, subsequent efforts tend not to require as much time and effort as they do the first time.

Risk Management

In a typical industrial textile supply chain, big brands (large corporations) hold the most power and expose themselves to the least amount of risk. They pay for completed

garments at the end of the manufacturing process, for example. Up until that point, production risks are largely borne by supply chain partners like fabric mills. A large manufacturer may, for instance, order fabric based on a sample. The fabric mill may produce more fabric than may ultimately be needed (and purchased) by the cut-and-sew vendor, which leaves the fabric maker holding inventory that later sells at a discount. This also produces surplus, waste fabric, to say nothing of the energy wasted in creating fabric that was not really needed.

As mentioned earlier, keystone markup is another hallmark of the traditional textile supply chain, in which the selling price of a product is twice the cost required to produce the product. This adds cost to the product supply chain by increasing the price at every stage: $0.60/pound of raw wool means the spinner pays $1.20 for it, which becomes at least $2.40/pound of finished product. Keystone markup creates a strong disincentive to increase or pay more for raw material costs.

These aspects of the conventional textile model, among others, are far too risky for small businesses like Bare Ranch and Huston Textile. If it were to follow them, Bare Ranch would not be paid for its raw wool upfront and would incur all of the costs and risk of product development, from raw wool through yarn stage, and hope that it would be able to sell enough yarn at a sufficiently high price to cover all of these costs. If Bare Ranch could not do so, it would experience financial distress.

Likewise, in the conventional model Huston Textile would incur all the costs and risk of purchasing a large quantity of yarn, and hope it would be able to sell enough fabric later on to cover all of its yarn, labor, and other costs. Otherwise, Huston Textile would find itself with a large quantity of fabric in inventory that it needs to sell, quickly, to recover costs up to that point.

To reduce financial risk to Bare Ranch, Huston Textile, and to the project in general, the Community Supported Cloth organizers took five steps:

1. Fibershed, a nonprofit organization, supported the pre-production development, marketing, sales, and customer correspondence and support costs, essentially making Huston Textile (a very early-stage business) more of a commission weaver. This significantly reduced risks to Huston Textile.

2. As described earlier, in the Demand Analysis section, two pre-launch surveys were conducted before any fabric was designed or made. This enabled the CSC team to better

understand consumer desire and intent to purchase; what type of fabric consumers most wanted; and the attributes prospective purchasers most wanted the fabric to have.

3. Three rounds of pre-production fabric prototypes (smaller quantities of fabric) were created and tested.

4. A CSA-style, prepayment model was used, in which fabric buyers prepaid for yardage based on fabric samples. This way, Bare Ranch and Huston Textile would be paid in full in advance of cloth manufacture, not after, reducing the financial risk of both. The Brooklyn Fashion Design Accelerator (BFDA) bought yarn that they machine knit into their own fabric directly from Bare Ranch, another form of prepayment. For these reasons, the project was named Community Supported Cloth.

5. Buffer was incorporated into yardage estimates and cost calculations.

Prepayment

As described earlier, a CSA-style, prepayment model provided another way to mitigate risk, and attitudes about prepayment models are positive, which was also reflected in successful sales. Expectations on fabric style and attributes, and on production and turnaround time, were clearly communicated throughout by the project team.

Some aspects of the prepayment model could use adjustment to work more smoothly for artisans and boutique designers. Designers are asked to commit before they know if they have buyers themselves. The prepayment schedule should be more in sync with the fashion industry cycle, which is a Spring or Fall cycle anchored by fashion week shows (and is also out of sync with shearing season, when raw material becomes available and wool producers desire payment). Designers and brands participate in fashion shows and receive garment orders in the weeks following. With finished CSC fabric shipping in April, payments were due before designers had received their post fashion week orders, making prepayment riskier for them than intended.

These issues can, in the next round of fabric production, be addressed by finding ways to align the shearing and fashion calendars or, barring that unlikelihood, mitigate discrepancies by creating a less financially risky way (such as a smaller deposit and signed Memorandum Of Understanding (MOU), or similar) to enable participation while keeping shearing and fashion calendars on their existing schedules.

Fabric and Financial Buffers

The CSC project included buffer of approximately 90 yards. Huston estimated they could make 820-850 yards of fabric with the amount of yarn available. As with all manufacturing, however, it was not expected that all yardage would be perfect, and only best quality yardage would be sold. Fibershed paid for 822 yards of CSC production (beyond the sales target of 731 yards), and built the 822 yard cost into the 731 yards as a buffer. This meant that any yardage sold over 731 yards would be pure "profit," as 822 beautiful yards of first-quality fabric would create an additional ~90 yards to sell at full retail price.

In sum, extra, high quality yardage was produced and could create another $4,000-$5,000 in sales. This is not accounted for in either actual sales data or costs, but represents possible additional profit over estimates that future fabric planning should consider, if not rely on. This smaller, extra quantity could be sold direct, for people on the waiting list from the pre-sale period, and/or as re-orders from happy customers. Huston Textile could take whatever overage from production there was and sell the yardage direct to customers.

Consumer Intent and Behavior

Survey and sales data, combined, **created a unique opportunity: to see if the people who participated in pre-sale surveys (described above) and said they were interested in purchasing actually did purchase,** when presented with the opportunity; and/or if people who gave price preferences exceeded (spent more than they wanted) their stated limit in order to make the purchase, and how many yards they purchased.

Of a total 43 (100%) people who stated, in pre-purchase demand surveys, that they were interested in purchasing cloth, 9 (22%) actually purchased some when fabric became available. We do not have any information as to why people who expressed interest in purchasing cloth did not do so at a later date, when cloth became available. We do not know, for instance, if they were simply not aware the opportunity (though, being part of the community who was aware enough to participate in surveys prior to product creation, it's reasonable to expect at least some of them did). We do not know if they did not need cloth at the time, if the price was not affordable, or if the type of fabric was not something they needed, though the fabric created did match the desires stated in the survey.

As we noted in that same document, this statement/calculation does not consider management or marketing costs. Producers are profitable; the brokers/marketing folk are not paid. Hundreds and hundreds of admin and management and communication hours not recovered in sales of fabric and wool products, which is to be expected in the first year. Taking this operation to a larger scale will require adjustments, as the feasibility study will examine in detail, including the costs of project management and marketing being taken into account. The people who did this work were paid, but were not paid by the projects. But the goal was not to pay people who helped producers, but to focus on producer profitability and revenue potential.

Shared Values, Benefits and Results

New businesses were created: a raw-wool-to-yarn business for Bare Ranch, and a new weaving mill, with regenerative wool fabric as its first production cloth.

Conservation Practice Implementation Costs and Funding

Ranchers incur costs to implement conservation practices and, by extension, to raise wool in a regenerative manner. One of our study questions seeks to determine *How much greater value do regenerative aspects need to add to wool price, to make up for the effort and materials' costs ranchers put incur in adopting conservation practices?* In order to tackle this question, we began with 2017 NRCS reimbursement rates for established conservation practices; conservatively estimated that these reimbursements did not cover 100% of costs; and then, given these, created formulas that enabled us to determine how much additional money would have to be obtained from raw wool and/or wool product sales.

We began with a list of established Conservation Practice Standards (CPS) in the NRCS COMET-Farm Planner. Using the numerical CPS code, we mapped each conservation practice to its corresponding NRCS Environmental Quality Incentives Program (EQIP) code. Together, this data enabled us to obtain the 2017 NRCS basic California reimbursement rate for each practice.

The NRCS employs two types of reimbursement rates: Basic (standard) and Socially Disadvantaged, which is a higher rate of reimbursement. Socially disadvantaged farmers include beginning farmers, members of certain racial and ethnic groups, people of limited resources (low income), and U.S. veterans. We opted to use the basic reimbursement rate

for two reasons: First, because none of the ranchers who provided wool for the programs evaluated in this study is socially disadvantaged, and second, because the basic rate is the lower of the two (i.e. reimburses less), and thus makes our estimates more conservative.

Ranchers who receive reimbursement at the basic NRCS rate tell us that it usually does not cover all of the costs they incur in implementing conservation practices, and that--depending on the practice--they typically receive 50-85% reimbursement of the total implementation cost. Together, the NRCS basic reimbursement rate for conservation practices, the estimated actual reimbursement and remaining costs, and a rancher's acreage and practice selection enabled us to create formulas (and a reusable tool for any rancher interested in implementing these practices) that enabled us to determine how much additional money a rancher would have to obtain from raw wool and/or wool product sales.

Take, for example, a farmer with a small, irrigated, 10-acre, non-organic farm and 80 sheep. After an on-farm visit from someone from her local Natural Resource Conservation District (NRCD), the farmer decides she is interested in implementing two of the 10 practices that might work well for her land: cover crops (CPS-340) and mulching (CPS-484). For 2017, the basic reimbursement rate for cover crops is $61.91 per acre, and $188.28/acre for mulching with natural materials. The farmer will start with cover crops on four of her 10 acres ($247.64) and will mulch two of her 10 ($376.56), a total NRCS reimbursement of $624.20. If we assume the actual implementation costs to the farmer are 50-85% of the reimbursed costs, we can estimate non-reimbursed costs to the farmer may ranger from $312.10 to $530.57. These are the costs the farmer may wish to attempt to cover with grant funds, a higher wool price, or a combination. While not exhaustive, they provide a reasonable baseline with which to begin.

This spreadsheet is available in the Appendix.

Donations to a Regenerative Fiber Fund

Prepayment was not the only economic model employed during the course of the CSC project. For some companies, donations provided a needed way for them to circumvent keystone markup, which makes the use of more costly materials prohibitive. Donations played a role within the framework of shared value, and contributed to regenerative systems that improve soil health, community health, and the continued supply of regionally sourced fiber from which the fabric is made.

Donations (i.e. one payment for wool and the premium wool payment as a nonprofit donation) are a method that work for partners. In addition, donations provide a way for a larger number of textile brands and partners to support regenerative fiber and fabric manufacture, rather than limit participation to companies that need to purchase wool or fabric.

For the CSC program, three different donation models to fund on-ranch conservation practices, through a regenerative fiber fund administered by Fibershed, were tested. Each is summarized below:

1) Add Value on Greasy Wool (Regenerative Wool Premium on Raw Wool)

What: $0.60/pound additional cost on top of market value for greasy wool

Who: Paid directly to Bare Ranch, whose sheep produced the regenerative wool

Why: This model directs cash to the ranch as soon as possible, so that the ranch can implement conservation practices. The rancher benefits from immediate return on the value of their wool and can put money in the bank right away. The downside to this model is that it adds costs to the product supply chain by increasing the price at every subsequent stage, especially in traditional keystone markup scenarios, in which $0.60/pound becomes at least $2.40/lb of product cost.

Funds Raised: $3,153 total: $1,186.72 from the CSC program and $1091.09 from the Study NY knitting yarn program.

Effectiveness: Based on the CSC data, this is the most effective model for the producer, as they realize immediate return.

2) Add Value on Textile Programs (Regenerative Wool Premium on Textile Products)

What: 3% overall added into textile sales price

Who: Paid directly to a Healthy Soils Fund (hosted by Fibershed to administer to participating ranch partners) by the customers who prepaid for CSC fabric.

Why: These funds enable Fibershed to build regenerative fiber systems and allows for consumer education through a POS (point-of-sale) model. This model also served as a trial for Huston Textile to incorporate into their business model, which could eventually provide a tax deductible donation for them.

Funds Raised: $1,065 total. This number could increase to between $2,700-$6,000, from sales of production overrun fabric yardage.

Effectiveness: This model is less effective at raising money for wool producers, but raises more consumer and public awareness by tying an exact percentage of product sales to regenerative fiber systems at the POS. It also creates funds for Fibershed to advance future regenerative wool programs, including those underway at Bare Ranch, which provided the wool for the CSC program.

3) Direction Donation to a Regenerative Fiber Fund

What: Either an $8 tree donation (per linear foot of tree planted area) or a $50 donation for compost (per cubic yard of compost application). In late February 2017 a donation button was added to the website, but no one has yet chosen this option yet.

Who: Online supporters and CSC customers donate directly to a Regenerative Fiber Fund.

Why: Donations allow for a greater variety of supporters to fund regenerative fiber systems, including apparel brands that either cannot or will not pay premium prices for raw wool and/or implement POS donation models, as well as people who want to support the creation of regenerative products, but could not afford or did not need fabric or fiber goods, or did not know how to sew or dye. Donation options also provide for continued community engagement when products sell out, as happened with fabric.

Funds Raised: **~$325** ($309 after PayPal fees)

Effectiveness: Based on the CSC data, this model was the least effective at bringing in funds for regenerative fiber systems.

Despite varying effectiveness, this study recommends all three economic models be maintained, for the reasons stated above. Each donation approach enables Fibershed and ranchers to identify the most effective ways to bring in capital to fund future practices.

Discussion

This study identified several ways in which the creation and sale of processed wool goods increased revenue to producer members, namely:

- Premium prices on raw wool, paid directly to ranchers;
- The development of yarn and cloth using fine wool (in which yarn was profitable for the rancher);
- The creation of batting, bedding, and felt sponges using coarse wool, with a feasible plan to achieve profitability on the same.

Additional study findings, opportunities, risks, and recommendations, in the context of stated study goals, are discussed in this section.

Product and Income Opportunities

The revenue generated by these inaugural, experimental wool programs did not cover all operating costs, particularly administrative and marketing costs. This is not unusual for small businesses in their first months in operation. Study observations point to opportunities that may increase income to cover operating costs.

Fabric sales data indicates, for instance, that fabric sold best when paired with a natural dye class, in which the purchased fabric would be dyed. Subsequent sales efforts should experiment further with offerings that pair fabric and other fiber products with experiences of interest to customers, and ideally opportunities that address societal needs. These might include fiber-focused retreats in natural landscapes; mill and regenerative ranch tours; wool grading and classing workshops that illuminate traceability and trust while educating people about raw materials; natural dye planting, harvesting, and dyeing workshops; citizen-science style soil sampling and testing; pasture and grazing management workshops; and meet-the-sheep field trips. These offerings are already popular and typically well paid and attended; many sell out and have wait lists.

Besides increasing sales, these efforts strengthen local and regional networks and clusters of related businesses: the yarn maker, the spinning teacher, the natural dyer, and the weaver, to name just a few. This amplification of effort also shines light on additional product opportunities. Dye plants can be grown in strip cropping, an established conservation practice, and subsequently sold on their own or with undyed fabric and yarn. As one interview participant and fabric purchaser said, *"Could you get someone to do a dye*

plants, or dyed products? I want dried coreopsis petals, dried onion skins, walnut husks, someone to give me Fibershed dye materials. I want to just buy it and have it. I'll do the dyeing, I just need the dye materials."

Regenerative Value Chain Consulting

In the case of both wool programs, a great deal of consulting, administrative, and marketing labor was conducted, at least some of which could probably be recovered in the form of consulting fees or similar. In study interviews, apparel brands were asked if they might pay for textile consulting services. Companies were aware of the amount of free consulting labor they receive which, they pointed out, they did not get from others:

"The consultancy format exists for us. We consulted with Temple Grandin on some humane, animal welfare stuff, and Temple does ***not*** *work for free. We were lucky to get her at all because she is quite in demand. We are willing to give financial support to build a supply chain we feel good about, is how we've put it. We're members of Textile Change,* ***we pay dues and fees*** *to be part of that, and that give us access to things as well. Rebecca is amazing. She does consulting all the time. We fund the Fibershed grant program, but she offers really valuable time and resources to brands like ours all the time. She is so giving of her time. I have huge respect for her. I will work with her on something, then the Marketing department contacts her for a story, then someone else calls her, and in one week it's 7 hours of phone calls she's done for us."*

The wool programs covered in this study also received informal feedback from textile processing and manufacturing partners, who expressed surprise at *"how smoothly and quickly the program is moving along."* Comments like these are a testament to multiple, unseen emails and phone calls, and to the work of program members who shielded wool producers and supply chain partners from questions and logistics management. This is another sign that management, administrative, and consulting functions are critical to the success of wool product implementation, and should be tested as a potential source of revenue.

Trusted Authority and Certification

Similarly, potential income may result from a trusted authority, like Fibershed or a group of producers, providing, labeling, and/or certifying desired materials' traceability and supply chain relationships. Fibershed is already a trusted leader and information authority on fiber systems, and much of the fundamental data needed to create and label a more transparent supply chain already exists in the wool classing and baling system, which includes wool grower ID, classer ID, wool grade and quality labels, shearing crews, bale numbers, wool testing in the lab, and so on.

A trusted authority is not only important to materials traceability but, as found during this research, to trusted, authentic, data-driven marketing, storytelling, and product labeling. Already stretched wool producers most want help with product marketing and distribution, work that can also alleviate the efforts of artisans and apparel brand struggling to tell regenerative agriculture stories on their own.

More work is needed on how to most effectively tell the complex story of regenerative agriculture, and to make labels clearer not only in terms of attributes but of place, which affects purchase decisions. Creating and licensing marketing materials--such as well produced videos, tested garment tags, and stock photos --present an income opportunity: they can be used and/or licensed by other parties that want to bring regionally sourced, sustainable products to market but may not be able to afford associated marketing and labeling costs.

Mutually Beneficial Support

This study observed potential, mutually beneficial relationships--in which a larger program carries or subsidizes the smaller--that may create additional income. This arrangement is similar to the way in which popular products often compensate for or carry niche ones.

This study, for example, included two groups of customers with distinct needs: 1) home hobbyists and small artisans who buy smaller quantities of fabric yardage and can thus afford a higher price point, and 2) larger businesses who purchase in volume (sometimes confined to a keystone markup context). The latter cannot easily afford to

double or triple their current supply costs, and they need a reliable, consistent, and predictable domestic supply chain of fabric from which they can order.

By funneling producers' regeneratively raised wool to larger domestic manufacturers, there may be opportunities for large runs of fabric to subsidize smaller ones. As study participants noted during interviews and related conversations, larger U.S. fabric mills have expressed interest in having regenerative, traceable wool fabric in their sales portfolios and fabric sample books, and being able to tell these stories as part of their own company and/or product stories.

These larger, domestic fabric mills can create fabric at a price point closer to that (~$20/yard) with which smaller designers can afford to work. One such mill, for example, estimated that it would cost $7,000 for them to make approximately 300 yards of fabric, based on a 500-pound minimum order quantity (a minimum that a large scale manufacturer planning a commercial scale garment run would easily meet).

This 500-pound minimum, however, is high for an entity that only wants around 30-35 yards of fabric for research and development, testing, and sampling, or for small garment runs. There is a clear need for smaller scale mills, exactly like Huston Textile, to develop yardage in these smaller quantities. This example also illustrates a need to connect larger brands--which want smaller runs--to other, smaller resources: the CSC team could help to find a non-competitive designer or artisan at the 30-35 yard volume who could pay ~$23.33/yd for 265 yards of fabric. Future business models for fabric should incorporate these considerations, partnerships, and market needs.

Specific technical, supporting relationships were not explored as part of this study, but were uncovered. More work is needed to determine if large volume runs at domestic (but not regional) mills can generate profit sufficient to cover more operating costs and/or subsidize smaller, niche, or specialty product lines, and if these non-regional trade-offs are worthwhile and beneficial in the broader sense.

In these scenarios, however, it is important to consider the risk of sunk costs on research and development toward products that may not, ultimately, be made and sold: What if small-batch test work is done and a producer's wool is not made into a product? The consequences may be manageable if a partner paid for consulting and sampling, but the producer's wool would have to move elsewhere. This is less risky for fine wool that tends to find a buyer, regardless, but is more difficult for coarser or more unusual wool types. Likewise with sample costs: The costs of making sample prototypes are a risk to mitigate,

because samples do not guarantee a purchase, though not having samples practically ensures no purchase will be made.

Technical Feasibility of a Regional Supply Chain

Per stated study goals, this research evaluated the technical feasibility of developing a successful regional supply chain for selected products, and did so for both high micron (coarse) and low micron (fine) wool producers. The programs studied established stronger connections between wool producers and end-users through a more robust regional supply chain.

Both of the wool programs included in this study identified and used new regional supply chain partners. Full Circle Wool used a previously unidentified local carding factory to create batting, a local artisan to create felt, and local sewing labor to create finished bedding. The CSC program created fabric at a new local textile mill. More steps in the supply chain were regional (and all were domestic) than is typical for modern textile development.

That said, it is not yet technically feasible to use a 100%, completely regional, Northern California supply chain to develop all of the wool products reviewed here, due to specific gaps. First, as noted earlier, there is no large-scale scouring facility available to clean wool and siphon off lanolin. Some local, small wool mills provide (or soon will) scouring, but not in the capacity required to expediently, consistently, and affordably process thousands of pounds of wool.

The study did not identify a regional producer of industrial felt, which could be advantageous to developing larger runs of felt sponges, yoga mats, place mats, crib and mattress pads, and more at scale, from coarser wool. Indeed, this is not just advantageous but a requirement to supply larger felt customers who need more than a small quantity of felt products: some small artisans do not wish to churn out the same product, over and over.

In regard to fabric development specifically, Mendocino Wool & Fiber, a new wool mill in Northern California, is not yet open. When it is, it will address some gaps in the regional supply chain: smaller batch scouring capacity (not commercial), a French comb to process fine wool into combed top, and a spinner that can spin yarns finely enough to become fabric, in a weight comparable to that received from Jagger Bros. in Maine for the

initial CSC program. This new business will, however, need time to hone and perfect these processes to achieve production quality.

Of course, shifts to different supply chain partners inevitably change production costs. An estimate to create wool batting (for a second round of the Full Circle program) in a 100% regional way, at Mendocino Wool & Fiber, is $11.55/lb for finished wool batting (scouring and carding). If correct, that $11.55 per pound estimate means that it would cost Full Circle Wool approximately $64,200 to buy, process, and transport an eventual yield of 4,000 pounds of batting, in comparison to the $23,203 spent to process wool that yielded 3,175 pounds, as described in this study.

Expected savings on reduced freight distance amount to a few thousand dollars, which does not nearly offset an additional $41,000 in processing costs. With this processing cost, batting would have to sell for no less than $16.10/lb just to recoup basic costs, as compared to the $7.31/lb. needed to cover processing costs today. These costs create risk for the Full Circle Wool business, which would have to sell thousands of pounds of batting for at least $16/lb.--and more at retail--just so the business could cover labor (some of which is paid via sales commission based on retail price) and POS donations to a Regenerative Fund, and that is still without any profit. Increased costs of this scale are a difficult sell for a small business and its customers.

The same cost comparisons would have to be made for fine wool to be combed and spun into yarn for fabric, and the impact this would have on the ability of the textile mill to purchase yarn, as well as the eventual retail price of fabric.

Wool programs finding existing and new potential supply chain partners created an encouraging development. These efforts should be strengthened and amplified, as they benefit the region as a whole. Any fledgling or untested infrastructure partner, however, presents an inherent risk to product development, quality, and delivery. As we regional and domestic supply chains are rebuilt from scratch, due diligence standards and processes should be put in place to evaluate and vet potential infrastructure partners. These standards could include questions like:

- Is a prospective partner an established, legal business entity? Of what sort?
- Can the business handle the quantity, type, etc. of wool required? What equipment do they have? What products can the business make? What condition is the equipment in? How many shifts is the business running? Is there a backlog or a wait?
- Does the partner have customer support in place to handle communication with customers, or will they need help?

- Is the business stable? Does it have any known cash flow issues or similar risks? Will it be around for a while or is there a risk the business might close? How might typical risks to new business be mitigated in product and business planning?
- Are there potential conflicts of interest or competitive concerns with the cluster of partners involved in a particular project? If a textile mill makes its own house brand of jeans, for example, will an apparel brand that makes its own jeans not want the mill to make denim for a test garment? If multiple mills want to provide fabric made from regenerative wool, will two, similar partners who are also competitors be amenable to using fabric woven at the same mill?

A simple tool or checklist to guide new partner considerations can identify items for discussion and risk mitigation, and enable the greatest program success for all parties involved.

The connecting work of administration, interpersonal management, and communication proved absolutely critical to re-creating a domestic supply chain; to establishing and nurturing these new supply chain connections; and in bringing products to market. It required textile science expertise, industry experience, and a knowledge of how to speak to apparel brands and mills, not just marketing. Future business plans should account for how to scale these efforts.

Right now, for example, other producers with fine wool say, *"I want to do a fabric program, too."* There is not yet a clear answer to this question, given existing regional capacity and the skills required on the product development side. A program of this nature requires a full-time textile consultant and marketing person, minimally. One person could perhaps manage two such established programs at a time, but no more than that.

In addition, many wool producers do not really want to be (because they cannot afford and do not have the time to be) involved in fabric manufacture, sales, or marketing: They want to move wool into product, but need help.

Wool Brokers In the Regenerative Wool Supply Chain

More work is needed to determine how wool brokers and raw wool sales fit into and benefit from the models described in this study. Undercutting wool brokers is a possible, unintended consequence of moving wool directly from producers into finished products. Wool brokers are an established part of the raw wool supply chain, and wool producers like and have strong, long lasting relationships with them. Producers appreciate the continued exposure to international markets that brokers, like Roswell Wool, give them. As one producer put it, *"Roswell is a co-op basically, and they broker all of our wool. They do a good job. I'm happy as I can be. They expose my wool, give me a chance at an international scale, a chance I would not have had before. I wouldn't be exposed to international sale at all without Roswell."*

Ideally, regenerative and conservation practices would become an attribute of all wool, however that wool is sold. Regenerative attributes, or a standard regenerative label, could be included in raw wool auction catalogs. Acknowledging and describing ranch practices at this scale may help wool producers who still want to sell raw wool through brokers and realize a higher price. The context of keystone markup, on the other hand, presents a challenge to raw wool sold at auction by brokers. Producers and wool brokers benefit from higher raw wool prices, but purchasers have no incentive to pay them, because higher costs carry through the supply chain. It is also unclear how donations and premiums to a regenerative fiber fund would be handled: This may create more administrative and accounting work for wool brokers.

The Prepayment Model

This study tested and evaluated a CSA-style prepayment model to generate start-up funding to build regionally based supply chains for woven and knit wool cloth. The prepayment model was not applied to felt and bedding products, as the business owner did not have a need for, and thus did not think to apply, it.

As described earlier in this document, the prepayment model was successful for most participants. In the future, it can be made even more robust by stronger systems, like software for product orders, payments, and accounting, to reduce administrative labor costs, streamline operations, and reduce friction.

This study corrected a hypothesis stated in our original application: We learned that the producer does not need to maintain ownership throughout the product cycle in order to be profitable. We suspected that "producers could capture a significant increase in revenue if we can develop a viable model, such as the textile CSA, for maintaining producer ownership through the sale of processed goods." This is not necessarily beneficial to producers, however, who want money for raw wool at or soon after shearing. In the fabric scenario, for example, it was helpful that Chargeurs bought raw wool from Bare Ranch and sold it to Jagger Bros. The wool producer managed the materials, from start to finish, and owned and benefitted from yarn sold to the fabric weaving mill, but did not technically maintain literal ownership throughout the process.

A related lesson from the prepayment model is that there is no better indicator of consumer intent than money down. Product efforts should not rely too heavily on what consumers say they will or will not buy. As seen in this study, what people say they will buy and what they actually buy can be very different things. In the case of fabric, things worked out well: people purchased fabric with the attributes that groups of previously surveyed people recommended, even if the majority of those who informed product design did not ultimately make purchases. Future demand analyses should, where possible, evaluate product and/or test product sales and remain skeptical, not assigning too great a weight to statements of customer intent or anticipated behavior.

To make prepayment work better for more people, subsequent efforts should identify ways to finance the holding of raw material, to make it easier for designers to buy the sorts of materials they want to work with, with the stories they want to tell and promote.

Direct Sales to Apparel Brands

While not a major focus, this study assessed opportunities for direct sales to global, regional, and boutique apparel brands. Study NY directly purchased 175 yards of CSC fabric, and a global outdoor retailer is slated to purchase over 6,000 pounds of raw wool at a regenerative, premium price to produce a test garment to be sold nationwide, during the fall 2018 season. The study did not explore further opportunities for online fabric sales, though Full Circle Wool has recently (April 2017) established an Etsy shop to sell its products.

A related goal was to conduct market research to assess opportunities for selling wool pillows and mattress toppers through a wider range of sales outlets. Researchers spoke with a regional manufacturer and supplier of natural bedding products, as well as a boutique bedding manufacturer interested in supply chain transparency and a regenerative agriculture story for its products.

In both cases, the keystone markup model and the availability of less expensive, standard wool proved challenging. The manufacturers acknowledged that an ample domestic supply of standard wool is available at low prices, which keeps finished product prices low and accessible to a higher number of customers. Currently, for example, this company's supplier buys scoured, U.S.-grown wool for $3.85-$4/pound. Full Circle batting would require at least $7.31/pound just to cover its own wool purchase, scouring, and other basic costs. This bedding company's supplier is also vertically integrated, which limits the bedding company's own quality control, freight, and management costs. The bedding company's supplier purchases scoured wool and produces finished comforters, creating just one partner for the bedding company to manage.

In addition, in the case of the boutique bedding manufacturer, their product family and customer demand influences their decisions about fiber. This company primarily sells organic cotton products, is branded in a way that heavily identifies the company with cotton, and has a lot of vegan customers. (Vegan customers often refuse to purchase products that contain any animal product, wool included.) For all of these reasons, the company pays a premium for pima and organic cotton. Its emphasis on cotton, however, may also create, or reinforce the existence of, a customer base that does not ask for wool products. Given the availability of inexpensive wool and customer preferences for cotton, it is difficult for this company to justify paying a premium for wool when wool products have low demand (though it is possible a stronger story around wool and its benefits could increase demand for the same).

Felt Product Expansion

This study also sought to examine the expansion of felt products into a larger number of goods, including products tailored to restaurants that feature locally grown foods and are interested in adding locally sourced fiber products and textiles to their restaurant environment. These products (seat cushions, window or wall hangings, and felt cup sleeves) have not been produced up to this point.

One new, San Francisco restaurant expressed interest in felted seat cushions and placemats, which were prototyped by a local felt artisan. Ultimately, the price point and product attributes (namely, the need for frequent washing given the restaurant context) informed the restaurant's decision to refrain from purchase.

Beneficial outcomes resulted, however: The felt artisan prototyped a new product (seat cushions), which have since become a high-selling item for her own business. She admits she was not excited at the prospect of "mass manufacturing seat cushions" in the quantity the restaurant would have needed. This experience reinforces the previously described need for industrial felt making, as well as further felt product refinement and washability testing.

A related goal was to explore making coarser wool into products where it has not been used at all, to replace synthetics. As noted, Full Circle Wool is making sponges and yoga mats, but actual sales data is not available: product sales have just begun, as of this writing. Other members of the Fibershed team continue to explore the possibility of felt use in novel products, like reusable air filter masks.

Wool Pools

The study examined the viability of pooling raw wool by several of producers in order to access larger processing facilities for wool scouring and carding. Full Circle Wool did this when it procured large quantities of wool from two ranches and combined them into batting. The wool for the CSC project was of sufficiently large quantity that pooling was not required.

In study interviews, participants did not describe a great need or desire to pool raw wool. Many wool producers are also artisans, and do not sell raw wool. Some are also familiar with the risk that wool pooling presents. Pooling can reduce the overall quality and thus the price of the pool: The highest price received for pooled wool is that of the lowest quality wool in it.

For partners and product development, however, wool blending is a strategy to achieve some consistency where there is normally a lot of variability, which is in the wool clip from one year to the next. A wool clip is not consistent, even from the same flock on the same ranch, from one year to the next, and manufacturers desire consistency from one

year to the next. They achieve this through wool blending, which points to potential opportunity in wool pooling.

In the words of one big retailer: *"Wool varies every year from every site in terms of micron and what's available. What if there is a lot of rain and it becomes unsuitable from one year to the next? Synthetics are easier. With wool you need a blend, a range of microns. We need next to skin, and you can't even get that range of micron from one ranch, there is variation in that range. I went to visit most giant wool centers in China, and what they go through in blending tops before even producing yarn is over and above, but it really ensures uniformity. We cannot risk low quality, so... it helps to have a range to blend, to make a more uniform yarn, which is easier on the spinning. And, we tend to offer same materials season after season. Blending helps, too, because you can have a wider range of microns to get to a finished product, which is easier on you."*

Interestingly, wool producers expressed greater interest in wool pooling specifically for product blending, which presents a potential opportunity for new products. This was expressed by one survey participant as: *"I would be interested in my small farm's product--Gotland fleeces--being part of a larger wool pool that becomes yardage: twill, other woven, jersey, etc. I make felt myself. The issue is for* ***small*** *farms to be able to contribute"their 20 fleeces."*

This attitude of welcome experimentation complements the existence of a new local wool mill that scour and spin yarn at a lower required minimum order size, and a new weaving mill that can produce smaller, non-commercial quantities of yardage for both product R&D, and to benefit a larger number of producers.

While wool pooling may be helpful, it could affect the ranch-level traceability that big retailers desire, creating a potential market disadvantage for pooled wool. To mitigate this, pooling should be carefully managed so contributing ranches can be identified. As one person at a big retailer in our interview sample put it, *"But maybe a co-op model with traceability... then there is relief for the brand, from having to have mix of microns, etc. Ideally that would be good for everybody."*

Including more producers' wool in finished products is important for regional product inclusivity and robustness. The wool programs described in this study are already widely perceived as promising, and other wool producers see that and want to be included. As one producer, feeling a bit left out, noted: *"Right now, it's just all about this one person."*

Scaling Regional, Regenerative Wool

In order to scale and ensure the availability wool products, the supply of regional, regenerative wool needs to scale, and funding models must continue to support it. Later efforts should also design and/or identify new models that may also help, like education to and partnerships with Resource Conservation Districts (RCDs). These can provide a means by which different parties with different needs can participate and fund regenerative agriculture development.

Today, ranchers already employ conservation practices: their existing work just needs to be formally noted as such. This, of course, raises the question of regenerative wool certification, how ranchers can obtain it, and what all of these words mean. Defining all of this is important for future work.

The California Wool Inventory, previously created by Fibershed, can provide a baseline, existing regional inventory of regeneratively raised wool. This wool inventory can identify ranchers who are already known to employ conservation practices and, based on the size of their annual wool clips, estimate the quantity of regenerative wool that might be available for future product development, and from which producers may be able to recognize greater revenue. With these estimates in hand, an estimate of community economic and/or social impact, as well as land areas to study in order to obtain measures of conservation benefits, could subsequently be derived.

Conclusion

This study has described and demonstrated numerous, positive economic benefits for wool producers in the form of higher purchase prices, three profitable fiber businesses, and new product revenue for local artisans. This work creates a template for new partners who want to copy and scale wool programs of the sort described here, and do so in ways that benefit the land and regional economies.

Producers want to see their wool in finished products, but they cannot do all of the partnership, business development, relationship building, administrative, certification, education, textile science, product design, fabric testing, sales, payment management, customer support, supply chain partner evaluation and check-in, and quality control on their own. These operational pieces are complex. There is the sourcing side — raw,

regeneratively raised wool — and the operations side, from the time raw wool arrives at the scouring mill to the time it is delivered as a finished product to a customer.

Sourcing and operations present two very different challenges. This study addressed and discussed the sourcing component through conservation plans, premium prices for regenerative wool, and donations to a regenerative fiber fund, and addressed the operations component by creating **value-added** products like fabric and bedding, which could occupy a growing proportion of producers' businesses.

The wool businesses profiled here do not own scouring lines, spinning mills, or weaving looms. Instead, they have identified the best regional and domestic processors they could find and worked with them to create value-added products. Fibershed provided administrative, customer service, and marketing support, so that all of these businesses could provide the labor and expertise to craft high-quality, finished wool products. All of this happening in Northern California, after generations of outsourcing and cheap labor drivers, is very difficult and, operationally, represents an incredibly impressive effort accomplished in a short period of time.

References

1. Cao, Huantian, Crescent Scudder, Christine Howard, Karen Piro, Hillary Tattersall, and John Frett (2014), "Locally produced textiles: product development and evaluation of consumers' acceptance," International Journal of Fashion Design, Technology and Education, 7(3), 189-197.
2. Gam, Hae Jin, Yoon Jin Ma, and Jennifer Banning (2014), "Socially Responsible Apparel Labels: Effects on Fashionable Shoppers," Family and Consumer Sciences Research Journal, 42(3), 292–305.
3. Hebrok, Marie, Ingun Grimstad Klepp, Tone S. Tobiasson, Kirsi Laitala, Marit Vestvik, and Madeline Buck (2012), "Valuing Norwegian Wool," Professional Report No. 5-2012, National Institute for Consumer Research (SIFO), 163 pages.
4. Hustvedt, Gwendolyn, Kathryn A. Carroll, and John C. Bernard (2013), "Consumer ethnocentricity and preferences for wool products by country of origin and manufacture," International Journal of Consumer Studies, 37, 498–506.
5. Kramer, Mark R. and Marc W. Pfitzer (2016), "The Ecosystem of Shared Value," Harvard Business Review, October 2016, 14 pages.
6. Pawson, Eric and Harvey Perkins (2013), "Worlds of wool: Recreating value off the sheep's back," New Zealand Geographer (2013) 69, 208–220.
7. Peterson, Hikaru Hanawa, Gwendolyn M. Hustvedt, and Yun-Ju (Kelly) Chen (2012), "Consumer Preferences for Sustainable Wool Products in the United States," Clothing and Textiles Research Journal, 30(1), 35-50.
8. Porter, Michael E. and Mark R. Kramer (2011), "Creating Shared Value: How to reinvent capitalism--and unleash a wave of innovation and growth," Harvard Business Review, January-February 2011, 17 pages.
9. Woods, Timothy, Matthew Ernst, and Debra Tropp (2017). "Community Supported Agriculture – New Models for Changing Markets," U.S. Department of Agriculture, Agricultural Marketing Service, April 2017. Web.

Appendix

Carbon Farm Practice Name (COMET Planner practice name; multiple NRCS/EQIP practices appear to have been rolled up under the COMET Planner practices, so these are elaborated in other columns because costs and pay rates differ for each.)	CPS (Conservation Practice Standard) Number, format CPS 123	NRCS/EQIP Practice Name	NRCS/EQIP Scenario Name	EQIP practice code (the COMET Planner cites these practice codes, so this is the link between the EQIP/NRCS table and COMET)	2017 Cost (source: state level NRCS) - We used the basic rate, which is higher, not the disadvantaged farmer rate, so if someone qualifies as that, these practices could cost less to implement	Unit of cost (per foot, acre, etc.)	Notes	Rancher Implementation Costs (to be entered by rancher)	Implementation Costs Reimbursed (by NRCS, other; to be entered by rancher)	Premium Wool Target Price (column I less J)
Cropland Management:										
Conventional Tillage to No Till	329	Residue and Tillage Management, No-Till	No-Till/Strip-Till	329	$14.70	acre (ac)				
	329	Residue and Tillage Management, No-Till	No Till Adaptive Management	329	$2,671.40	Ea (Each)				
Conventional Tillage to Reduced Till	345	Residue and Tillage Management, Reduced Till	Residue and Tillage Management, Reduced Till	345	$15.62	acre (ac)				
	345	Residue and Tillage Management, Reduced Till	Mulch till-Adaptive Management	345	$3,150.75	Ea (Each)				
Nutrient Management - Improved Nitrogen Fertilizer Management	590	Nutrient Management	NM Nitrification/Urease Inhibitors, variable rate, grid/zone soil sampling, soil nitrate/plant tissue test (Non-Organic/Organic)	590	$24.30	acre (ac)				
	590	Nutrient Management	NM grid/zone soil sampling, variable rate, soil nitrate/plant tissue test (Non-Organic/Organic)	590	$17.49	acre (ac)				
Nutrient Management - Replacing Nitrogen Fertilizer with Soil Amendments	590	Nutrient Management	Basic NM with Manure Injection or Incorporation	590	$16.50	acre (ac)				
	590	Nutrient Management	Basic NM with Manure and/or Compost (Non-Organic/Organic)	590	$4.36	acre (ac)	Think this is the new compost addition; it wasn't in the 2015 list.			
Conservation Crop Rotation	328	Conservation Crop Rotation	Basic Rotation Organic and Non-Organic	328	$4.74	acre (ac)				
	328	Conservation Crop Rotation	Specialty Crops Organic and Non-Organic	328	$25.28	acre (ac)				
	328	Conservation Crop Rotation	Specialty Crops, Small Farm	328	$821.73	Ea (Each)				
Cover Crops	340	Cover Crop	Cover Crop - Basic and organic/non-organic	340	$61.91	acre (ac)				
	340	Cover Crop	Cover Crop Adaptive Management	340	$2,001.67	Ea (Each)				
	340	Cover Crop	Cover Crop Multiple Species Organic and Non-Organic	340	$72.73	acre (ac)				
Stripcropping	585	Stripcropping	Stripcropping - wind and water erosion	585	$1.28	acre (ac)				
Mulching	484	Mulching	Natural Materials	484	$188.28	acre (ac)				
	484	Mulching	Wood Chips	484	$837.43	acre (ac)				
	484	Mulching	Hydromulch	484	$0.04	square foot (sq ft)				
	484	Mulching	Erosion Control Blanket, Steep Slopes	484	$0.12	square foot (sq ft)				
	484	Mulching	Plastic	484	$0.03	square foot (sq ft)				
	484	Mulching	Geotextile	484	$0.19	square foot (sq ft)				
	484	Mulching	Natural Materials, Heavy	484	$518.67	acre (ac)				

Carbon Farm Practice Name (COMET Planner practice name; multiple NRCS/EQIP practices appear to have been rolled up under the COMET Planner practices, so these are elaborated in other columns because costs and pay rates differ for each.)	CPS (Conservation Practice Standard) Number, format CPS 123	NRCS/EQIP Practice Name	NRCS/EQIP Scenario Name	EQIP practice code (the COMET Planner cites these practice codes, so this is the link between the EQIP/NRCS table and COMET)	2017 Cost (source: state level NRCS) - We used the basic rate, which is higher, not the disadvantaged farmer rate, so if someone qualifies as that, these practices could cost less to implement	Unit of cost (per foot, acre, etc.)	Notes	Rancher Implementation Costs (to be entered by rancher)	Implementation Costs Reimbursed (by NRCS, other; to be entered by rancher)	Premium Wool Target Price (column I less J)
Combustion System Improvement (Improved Fuel Efficiency of Farm Equipment)	372	Combustion System Improvement	Combustion System Improvement IC Engine Repower, <= 25 bhp BHP	372	$229.61	BHP (brake horsepower)				
	372	Combustion System Improvement	Combustion System Improvement IC Engine Repower, >25 bhp BHP	372	$166.06	BHP (brake horsepower)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, < 12 HP	372	$1,011.22	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 12-69 HP	372	$4,439.65	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 70-124 HP	372	$5,569.86	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 125-174 HP	372	$11,066.08	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 175-224 HP	372	16,751.78	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 225-274 HP	372	$23,194.77	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 275-399 HP	372	$19,820.06	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, 400-499 HP	372	$26,545.16	Ea (Each)				
	372	Combustion System Improvement	Combustion System Improvement Electric Motor in-lieu of IC Engine, >= 500 HP	372	$37,387.90	Ea (Each)				
	372	Combustion System Improvement	Electric Motor in-lieu of IC Engine, >= 500 HP	372	$48,041.42	Ea (Each)				
	372	Combustion System Improvement	Mobile IC System Replacement, 25-160 bhp	372	$282.32	BHP (brake horsepower)				
	372	Combustion System Improvement	Mobile IC System Replacement, >160 bhp	372	$319.81	BHP (brake horsepower)				
Cropland to Herbaceous Cover:										
Conservation Cover - Retiring Marginal Soils	327	Conservation Cover	Introduced Species	327	$100.62	acre (ac)				
	327	Conservation Cover	Conservation Cover Native Species	327	$139.16	acre (ac)				
	327	Conservation Cover	Conservation Cover Orchard or Vineyard Alleyways	327	$70.82	acre (ac)				

Carbon Farm Practice Name (COMET Planner practice name; multiple NRCS/EQIP practices appear to have been rolled up under the COMET Planner practices, so these are elaborated in other columns because costs and pay rates differ for each.)	CPS (Conservation Practice Standard) Number, format CPS 123	NRCS/EQIP Practice Name	NRCS/EQIP Scenario Name	EQIP practice code (the COMET Planner cites these practice codes, so this is the link between the EQIP/NRCS table and COMET)	2017 Cost (source: state level NRCS) - We used the basic rate, which is higher, not the disadvantaged farmer rate, so if someone qualifies as that, these practices could cost less to implement	Unit of cost (per foot, acre, etc.)	Notes	Rancher Implementation Costs (to be entered by rancher)	Implementation Costs Reimbursed (by NRCS, other; to be entered by rancher)	Premium Wool Target Price (column I less J)
	327	Conservation Cover	Conservation Cover Pollinator Species	327	$451.72	acre (ac)				
	327	Conservation Cover	Conservation Cover Monarch Species Mix	327	$670.14	acre (ac)				
	327	Conservation Cover	Conservation Cover Introduced with Forgone Income	327	$299.72	acre (ac)				
	327	Conservation Cover	Conservation Cover Native Species with Forgone Income	327	$346.27	acre (ac)				
	327	Conservation Cover	Conservation Cover Pollinator Secies with Forgone Income	327	$563.42	acre (ac)				
	327	Conservation Cover	Conservation Cover Monarch Species Mix with Forgone Income	327	$1,124.31	acre (ac)				
Forage and Biomass Plantings - Full Conversion	512	Forage and Biomass Planting	Non-Native Standard Seeding with Fertilizer	512	$108.37	acre (ac)				
Forage and Biomass Plantings - Partial Conversion	512	Forage and Biomass Planting	Forage and Biomass Planting Non-Native Standard Seeding no Fertilizer	512	$74.55	acre (ac)				
	512	Forage and Biomass Planting	Forage and Biomass Planting NonNative High Seeding Rate no Lime	512	$155.04	acre (ac)				
	512	Forage and Biomass Planting	Forage and Biomass Planting NonNative, High Seeding Rate with Lime or similar amendment	512	$213.51	acre (ac)				
	512	Forage and Biomass Planting	Forage and Biomass Planting Organic, Nonnative Species	512	$210.99	acre (ac)				
	512	Forage and Biomass Planting	Forage and Biomass Planting Small Acreage NonNative High Seeding Rate no Lime	512	$259.98	acre (ac)				
Herbaceous Wind Barriers	603	Herbaceous Wind Barriers	Cool Season Annual/Perennial Species	603	$0.07	LnFt (linear feet)				
Vegetative Barriers	601	Vegetative Barriers	Seeded Barrier	601	$0.01	no (number?)				
Vegetative Barriers	601	Vegetative Barriers	Vegetative Planting	601	$5.72	no (number?)				
Riparian Herbaceous Cover	390	Riparian Herbaceous Cover	Riparian Broadcast Seeding	390	$1,025.54	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Plug Planting	390	$20,028.78	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Combination Broadcast Seeding and Plug Planting	390	$10,141.56	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Pollinator Cover	390	$1,937.73	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Broadcast Seeting with Foregone Income	390	$1,724.87	acre (ac)				

Carbon Farm Practice Name (COMET Planner practice name; multiple NRCS/EQIP practices appear to have been rolled up under the COMET Planner practices, so these are elaborated in other columns because costs and pay rates differ for each.)	CPS (Conservation Practice Standard) Number, format CPS 123	NRCS/EQIP Practice Name	NRCS/EQIP Scenario Name	EQIP practice code (the COMET Planner cites these practice codes, so this is the link between the EQIP/NRCS table and COMET)	2017 Cost (source: state level NRCS) - We used the basic rate, which is higher, not the disadvantaged farmer rate, so if someone qualifies as that, these practices could cost less to implement	Unit of cost (per foot, acre, etc.)	Notes	Rancher Implementation Costs (to be entered by rancher)	Implementation Costs Reimbursed (by NRCS, other; to be entered by rancher)	Premium Wool Target Price (column I less J)
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Plug Planting with Foregone income	390	$20,494.43	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Combination Broadcast Seeding and Plug Planting with Foregone Income	390	$10,894.60	acre (ac)				
	390	Riparian Herbaceous Cover	Riparian Herbaceous Cover Pollinator Cover with Foregone Income	390	$2,366.99	acre (ac)				
Contour Buffer Strips	332	Contour Buffer Strips	Introduced Species, Forgone Income (Organic and Non-Organic)	332	$305.91	acre (ac)				
	332	Contour Buffer Strips	Native Species, Foregone Income (Organic and Non-organic)	332	$302.75	acre (ac)				
	332	Contour Buffer Strips	Wildlife/Pollinator, Foregone Income (Organic and Non-Organic)	332	$412.32	acre (ac)				
Field Border	386	Field Border	Field Border, Native Species	386	$91.86	acre (ac)				
	386	Field Border	Field Border, Introduced Species	386	$68.39	acre (ac)				
	386	Field Border	Field Border, Pollinator	386	$134.90	acre (ac)				
Filter Strip	393	Filter Strip	Filter Strip, Native species	393	$122.88	acre (ac)				
	393	Filter Strip	Filter Strip, Introduced species	393	$132.90	acre (ac)				
Grassed Waterway	412	Grassed Waterway	Base Waterway	412	$1,061.06	acre (ac)				
	412	Grassed Waterway	Waterway with Checks	412	$1,651.54	acre (ac)				
Cropland to Woody Cover:										
Tree/Shrub Establishment - Farm Woodlot	612	Tree/Shrub Establishment	Reforestation, <1 ac, Hand planting, Per Tree	612	$1.43	ea (each)				
	612	Tree/Shrub Establishment	Reforestation, <1 ac., Hand planting, Browse protection, Per Tree	612	$2.54	ea (each)				
	612	Tree/Shrub Establishment	Reforestation, 1 acre or more, Hand planting	612	$340.23	acre (ac)				
	612	Tree/Shrub Establishment	Reforestation, 1 acre or more, Hand planting, Browse protection	612	$562.83	acre (ac)				
	612	Tree/Shrub Establishment	Medium Density, Mechanical Planting	612	$157.32	acre (ac)				
	612	Tree/Shrub Establishment	High Density, Mechanical planting	612	$334.41	acre (ac)				
	612	Tree/Shrub Establishment	Conservation, Hand Planting	612	$163.55	acre (ac)				
	612	Tree/Shrub Establishment	Conservation, Hand Planting, Browse protection	612	$449.53	acre (ac)				

Carbon Farm Practice Name (COMET Planner practice name; multiple NRCS/EQIP practices appear to have been rolled up under the COMET Planner practices, so these are elaborated in other columns because costs and pay rates differ for each.)	CPS (Conservation Practice Standard) Number, format CPS 123	NRCS/EQIP Practice Name	NRCS/EQIP Scenario Name	EQIP practice code (the COMET Planner cites these practice codes, so this is the link between the EQIP/NRCS table and COMET)	2017 Cost (source: state level NRCS) - We used the basic rate, which is higher, not the disadvantaged farmer rate, so if someone qualifies as that, these practices could cost less to implement	Unit of cost (per foot, acre, etc.)	Notes	Rancher Implementation Costs (to be entered by rancher)	Implementation Costs Reimbursed (by NRCS, other; to be entered by rancher)	Premium Wool Target Price (column I less J)
	612	Tree/Shrub Establishment	Conservation, 1 gal pots, Hand planting, Per seedling	612	$6.51	ea (each)				
	612	Tree/Shrub Establishment	Native Seed, Hand Plant	612	$347.74	acre (ac)				
	612	Tree/Shrub Establishment	Floodplain Stabilization	612	$3,684.87	acre (ac)				
	612	Tree/Shrub Establishment	Conservation, 1 gal pots, Hand planting, Per seedling, Protected	612	$19.21	ea (each)				

Climate Beneficial Wool Demand Survey

* Required

1. **1. What is your name (and business name if applicable)? ***

2. **2. What is your email address? ***

3. **3. Where are you located? ***

4. **4. Please describe your business (i.e. animal rancher and wool producer, designer, fabric retailer, etc). ***

5. **5. Please describe the products you make/sell (i.e. raw wool, fabric, pillows, sweaters, etc) ***

6. **6. Were you familiar with the Climate Beneficial Wool program before you received this questionnaire? ***

7. **7. Are you interested in purchasing locally sourced materials and goods that support regional and regenerative agriculture practices?** *
   Mark only one oval.

   - Yes
   - No

Wool Cloth Demand

In this section, we would like to learn more about your interest in the added-value goods with the longest and most complex supply chain: cloth. It is important to note that this is also the largest category with the widest variety in this questionnaire.

For example: you can list knits, wovens, and/or felt. That is helpful. :)

To be even more helpful, we appreciate if you can share with us your preferred textile construction (i.e. for weave: twill, herringbone, basket, etc; for knit: rib, plain, target gauge, etc; for felt: thickness, pressed, etc), weight (can be related to product type, physical samples, general description, etc), color/pattern (heather, striped, marled, etc), and any specifics that would help you source the Climate Beneficial Wool materials you need.

8. **8. Are you interested in purchasing 100% Climate Beneficial Wool cloth?**
   Mark only one oval.

   - Yes
   - No

9. **9. Please describe the types fabric you would be interested in purchasing including general type (knit, woven, felt), construction, fabric weight, finish type, color, etc.**

10. **10. What price range (per yard) would you be willing to purchase 100% Climate Beneficial Wool cloth for? If you are unsure, please provide general pricing range (per yard) and fiber types for your current fabric purchasing.** *

11. **11. What approximate volume (in yards) would you be willing to purchase 100% Climate Beneficial Wool cloth?**
Mark only one oval.

- 1-10 yards
- 10-20 yards
- 20-50 yards
- 50-100 yards
- 100+ yards
- N/A

12. **12. Would you be interested in purchasing natural yardage (no dye and no super wash process)?**
Mark only one oval.

- Yes
- No

13. **13. How much volume would you be interested in purchasing of natural yardage (no dye and no super wash process)?** *
Mark only one oval.

- 1-10 yards
- 10-20 yards
- 20-50 yards
- 50-100 yards
- 100+ yards
- N/A

14. **14. Would you purchase natural yardage with the intent to naturally dye?**
Mark only one oval.

- Yes
- No

Skip to question 15.

Wool Yarn Demand

In this section, we are interested in the needs of both hand knitters and weavers in our community, as well as those that create cloth by machine. The more information you can provide on the pricing, type and amount of Climate Beneficial Wool yarn that you would like to source, the better.

As noted in the section 1, we have supported the development of a mechanized knitting and weaving yarn. The development spec is as follows: 2/24s nm, worsted, 6 TPI, ~6,000ypp. Please let us know if this is a yarn spec that you are interested in learning more about for your products.

15. **15. Would you be interested in purchasing Climate Beneficial Wool yarn?**
Mark only one oval.

- Yes
- No

16. **16. Please describe the types of yarn you would be interested in purchasing including type, sizing, # of plies, weight, color, etc.**

17. **17. What price range (per pound) would you be willing to purchase 100% Climate Beneficial Wool yarns for? If you are unsure, please advise the general price range and fiber type for your yarn purchasing.**

18. **18. What approximate volume (in pounds) would you be willing to purchase 100% Climate Beneficial Wool yarns?**
Mark only one oval.

- ◯ 1-10 lbs
- ◯ 10-50 lbs
- ◯ 50-100 lbs
- ◯ 100+ lbs
- ◯ N/A

19. **19. Would you be interested in purchasing natural yarns (no dye and no superwash)?**
Mark only one oval.

- ◯ Yes
- ◯ No

20. **20. How much volume would you be interested in purchasing of natural yarns (using no superwash process and no dye additives)?**
Mark only one oval.

- ◯ 1-10 lbs
- ◯ 10-50 lbs
- ◯ 50-100 lbs
- ◯ 100 lbs+
- ◯ N/A

21. **21. Would you purchase the natural yarns with intent to naturally dye?**
Mark only one oval.

- ◯ Yes
- ◯ No

Wool Batting Demand

In this section, we are interested in the needs members of our community that would like to purchase wool batting. The end product examples for use with batting are bedding, mattresses, pillows, wet felting, etc. Please provide as many details as possible for end use and desired thickness, weight, etc. Also, for certain applications, you need white and for others you may need colored. Please identify as many desired details as possible.

In the next month, we will have natural white wool batting using Climate Beneficial Wool. If you are interested in learning more about this product, please fill out the questions below.

22. **22. Would you be interested in purchasing Climate Beneficial Wool batting?**
Mark only one oval.

- ◯ Yes
- ◯ No

23. **23. Please describe the weight and thickness of batting you would be interested in purchasing.**

24. **24. What price range (per pound) would you be willing to purchase 100% Climate Beneficial Wool batting for?**

25. **25. What approximate volume (in pounds) would you be willing to purchase 100% Climate Beneficial Wool batting?**

Wool Roving/Combed Top Demand

In this section, we are looking for artisans/producers who would like to purchase Climate Beneficial wool roving/combed top. Please help identify as many desired details as possible including color, volume and pricing.

26. **26. Would you be interested in purchasing Climate Beneficial Wool roving or combed top?**
Mark only one oval.

- ◯ Yes
- ◯ No

27. **27. What price range (per pound) would you be willing to purchase 100% Climate Beneficial Wool roving or combed top for? Please specify roving vs. combed top.**

_____

_____

_____

_____

_____

28. **28. What approximate volume (in pounds) would you be willing to purchase 100% Climate Beneficial Wool combed top or roving?**
Mark only one oval.

- ◯ 1-30 lbs
- ◯ 30-100 lbs
- ◯ 100+ lbs

Fulling/Finishing Event

In this section, we are looking for Fibershed members and friends that are interested in participating in the production of the cloth program. Today, in our region, the only mechanized loom capable of producing small to mid scale customized runs of textiles is Huston Textile out of Rancho Cordova. However, as of today, we have not found a partner for wool textile laundering and finishing here in our region. As we continue our search, we are also interested in learning if our community would be interested in hand-finishing/laundering yardage in a communal event. This would not be a sustainable model for mid to large scale production runs but could be a model for smaller scale textile projects.

29. **29. Would you be willing to attend an event to finish 100% Climate Beneficial Wool yardage?**
Mark only one oval.

- ◯ Yes, I would be willing to attend as a participant and prosumer (willing to purchase the yardage from the event).
- ◯ Yes, I would be willing to attend as a participant only.
- ◯ No, this does not sound like my cup of tea.

30. **30. Is there any other way you can participate for this type of event? (i.e. advance planning, operations volunteer day-of, funding, etc)**

_____

_____

_____

_____

_____

Final Comments & Questions

We are adding this section for any of those yearning, burning things we missed on our questionnaire. Are there questions we forgot to ask? Potential add-value products for Climate Beneficial Wool you would like

to see? Clarifications you need? Overall excitement for the program you'd like to share? People/companies you'd like to refer us to that may be interested?

31. **Please use this comment space for anything we missed.**

The Fibershed team thanks you for your time and consideration!

Climate Beneficial Cloth Demand Survey Questions

* Required

1. **1. What is your name (and business name if applicable)? ***

2. **2. What is your email address? ***

3. **3. Where are you located? Please provide your shipping address for Community Supported Cloth sample. ***

4. **4. Please describe your business (i.e. animal rancher and wool producer, designer, fabric retailer, etc). ***

5. **5. Please describe the products you make/sell (i.e. raw wool, fabric, pillows, sweaters, etc) ***

6. **6. Were you familiar with the Climate Beneficial Wool program before you received this questionnaire? ***

7. **7. Are you interested in purchasing locally sourced materials and goods that support regional and regenerative agriculture practices?** *
   Mark only one oval.

   - ◯ Yes
   - ◯ No

Wool Cloth Demand

In this section, we would like to learn more about your interest in the added-value goods with the longest and most complex supply chain: cloth. In particular, we would like to know if you are interested in participating in the Community Supported Cloth program.

By completing this questionnaire, you will be sent a representative swatch of the 100% Climate Beneficial Wool woven textile to review in the month of November and updates on the program development.

On November 19th, we will be taking cloth reservations (2 yard minimum) ahead of the actual production for 2017. Think of it as a kickstarter for regional and regenerative textiles. At this moment, the Community Cloth Program will be sold loomstate with a prescribed recipe for washing at home. This is due to the fact that there is no textile finishing available in our Fibershed at this moment. If, before production completes, we can secure an industrial finishing partner to scour and frame the wool textile, we will offer it as an additional option for the program at an additional cost. However, if you are looking to purchase in small volumes and plan to naturally dye the yardage on your own, you may be interested in the loomstate option. Please help us learn more about your material needs below and shape the future of our Community Supported Cloth program.

8. **8. Are you interested in purchasing the 100% Climate Beneficial Wool Community Supported Cloth?**
   Mark only one oval.

   - ◯ Yes
   - ◯ No

9. **9. Please describe the types fabric you would be interested in purchasing including general type (knit, woven, felt), construction, fabric weight, finish type, color, etc.**

10. **10. What price range (per yard) would you be willing to purchase 100% Climate Beneficial Wool cloth for? If you are unsure, please provide general pricing range (per yard) and fiber types for your current fabric purchasing.** *

11. **11. What approximate volume (in yards) would you be willing to purchase 100% Climate Beneficial Wool cloth?**
Mark only one oval.

- ◯ 1-10 yards
- ◯ 10-20 yards
- ◯ 20-50 yards
- ◯ 50-100 yards
- ◯ 100+ yards
- ◯ N/A

12. **12. Would you be interested in purchasing natural yardage (no dye and no super wash process)?**
Mark only one oval.

- ◯ Yes
- ◯ No

13. **13. How much volume would you be interested in purchasing of natural yardage (no dye and no super wash process)?** *
Mark only one oval.

- ◯ 1-10 yards
- ◯ 10-20 yards
- ◯ 20-50 yards
- ◯ 50-100 yards
- ◯ 100+ yards
- ◯ N/A

14. **14. Would you purchase natural yardage with the intent to naturally dye?**
Mark only one oval.

- ◯ Yes
- ◯ No

15. **Would you prefer to purchase loomstate (with detailed recipe for wet finishing at home) or industrial finished (for added cost and if available)?**
Mark only one oval.

- ◯ Loomstate
- ◯ Industrial Finished
- ◯ I don't know

Final Comments & Questions

We are adding this section for any of those yearning, burning things we missed on our questionnaire. Are there questions we forgot to ask? Potential add-value products for Climate Beneficial Wool you would like to see? Clarifications you need? Overall excitement for the program you'd like to share? People/companies you'd like to refer us to that may be interested?

16. **Please use this comment space for anything we missed.**

The Fibershed team thanks you for your time and consideration!

Wool Producer Interview Questions
Tell me a little about yourself, in your own words. Can you share a sort of abbreviated autobiography with me?
Where do you live? What is the climate and context of your place like?
What is your wool operation like, in terms of sheep breed(s), flock size, wool attributes, and products? How many sheep do you have? What is your wool like?
What do you do with your wool, today? Do you sell it in raw form, for example; make products out of it yourself; etc? Why do you do what you do?
Sub question to #5. If the producer sells their wool in raw form: You mentioned you sell your wool raw. What are your reasons for doing so? Do you sell your entire clip that way, or just some of your wool? How do you decide to whom you will sell, i.e. How do you select a buyer for your wool (if you do choose)? How much do you sell your wool for? Are you happy with the price you receive? With the selling process? Why/why not? For things you do not particularly like, what would like to see/happen/receive instead? Why?
Sub question to #5. If the producer does NOT sell their wool in raw form: You mentioned you do not sell your wool raw. Why not? What informs your decision not to sell wool in this form?
Have you ever/do you have your own wool processed in any way? By "processing" we mean scouring, carding, combing, spinning, and so on. If so, which processes? Why? If you process your wool, where do you send it for processing (or do you DIY)? How much does that cost? How do you decide where to send it? Are you happy with the processing prices? With the results? Why/why not? What else do you think about this?
Do you make/have made and/or sell products made from your own wool? If yes, which? What are they like? Tell me about them. What do you like about your products? What would you like to change about them?
How much does it cost you to create each of your products? How long is the cycle from growing wool, to making a product from that wool, to selling it, to realizing revenue? Put simply: How long does it take you to realize income from your various efforts? What are barriers and/or deal breakers on revenue return to you (i.e. is there a time too long; a shared cut too high, etc.)?
What do your customers ask you for/have they asked you for? What are some of the questions people ask you most frequently, and who asks them?
How do you go about selling your products? Tell me about that. What do you like? Dislike? Want to change? Can you speak to challenges, pros/cons, benefits/drawbacks? How much time would you say selling takes? Do you feel the income you realize from these efforts is fair? Sustainable? Do you feel like selling products is no/low/medium/high risk? Why?
Are there things (products) you'd like to see your wool become, but hasn't yet? If so, what are they? What do you like about those things? Why do you think your wool would work well for them?
In the past, have you tried to make your wool into certain products, or do certain things with it, that did NOT work well? Why?
What would help you? What would help a lot/somewhat/a little/not at all? Why?
What are your wool production costs? Benefits? Margins?
I realize this is a very personal question, but do you have an ideal income level, or a target amount of revenue that you'd like to bring in purely from sheep and wool operations and products? Please feel free to give a total figure or simply say "X% more than I make now," whatever you are comfortable with.

Wool Producer Interview Questions
What is your ideal world scenario? What do you wish wool production was like, vs. how it is now? What would you change/keep? Why?
What kinds of support or support systems, if any, do you have in place? What kinds of support would you like to have? Why did you describe what they did? How would these things help you?
On the other hand, what do you NOT need or want, or wish to avoid? What are the things that get in your way?
Have you heard about systems or examples of things (anything out in the world, not necessarily related to wool) that you would like to emulate, or that you think could apply to your work? Have you heard about a product, approach, or practice that makes you think, “Huh. That’s a neat idea! Maybe that could work for me"?
Please describe your land or pasture management practices.
Below is a list of various land/pasture management practices. For each practice, please check the box that best applies to you: whether that practice is currently in place on your land, is not in place but is of interest to you (“interested”), or is not a practice you’re interested in (“not interested”). In the text box below this question, please describe why you answered the way you did.
Have you heard the phrase "carbon farming"? What does that phrase mean to you, or what do you think it means? Explain the term if needed. What's your opinion of that?
Have you heard the phrase "climate beneficial wool"? What does that phrase mean to you, or what do you think it means? Explain the term if needed. What's your opinion of that?
Let's say that implementing certain carbon farming practices could result in a higher price for your raw wool and/or wool products. How much greater value (per pound or per item) would you want the CBW label to add? How much more money do you guess you would need to make your carbon farming investment worthwhile? We may wish to have an estimate of time and/or costs on hand to help people think through this, though it's also interesting to see what they THINK it would take, and how close to reality that is, as that would inform messaging efforts and system design.
What incentive(s) (internal, external, both), if any, might make you consider adopting Cabon Farming practices and offering CBW?
Pre-payment models are programs like subscriptions, in which you pre-pay for something upfront and receive something later. Early CSA models for fruits and vegetables worked this way: CSA members paid upfront for the season or year's harvest, sharing the farmer's risk that the harvest may be slim. What are your perceptions and opinions of pre-payment programs like these?
Would you ever want to participate in a pre-payment model, or offer your wool or products in a pre-payment format?
Have you ever worked with a textile or other company in a consulting type role, in which you advised them about products they might be able to make from your wool? If so, please tell me about that experience. What did you like/dislike? What did/did not work for you?
Are you familiar with the idea of wool pools? If so, what do you think about them? Have you/would you ever participate in a wool pool? Why or why not? What does a wool pool that is beneficial to wool producers look like?
Are you familiar with the idea of wool co-ops? If so, what do you think about them? Have you/would you ever participate in a wool co-op? Why or why not? What might a co-op that is beneficial to wool producers look like?
Is there anything else you'd like to tell us, or think we should consider, that we haven't already asked about? Please note it in this text box.
What are you most proud of?
What are the easy parts of what you do?

Wool Producer Interview Questions
What are the hard parts of what you do?
What aspects of your journey have surprised you the most?
What keeps you up at night?

Corporate Partner and Artisan Survey Questions
Tell me a little about yourself, in your own words. Can you share a sort of abbreviated autobiography with me?
What company do you work for, and what is your role there? What is your job like? What decisions do you have to make?
What are you most proud of, professionally or otherwise?
What are the easy parts of your job?
What are the hard parts of your job?
What aspects of your professional journey have surprised you the most? Of your current position? Of your industry?
Are you doing what you wanted to be doing in terms of working with textiles? Is that OK/not OK?
What keeps you up at night?
What do you think about the textile industry in general? What things would you like to see it start doing, stop doing, and/or continue doing? Why? What is your ideal scenario for your industry? Do you see your industry landscape shifting? If so, how?
Can you walk me through the steps of how a new product gets designed, prototyped, manufactured, and sold? How long does it take? Who is involved? How is fabric selected? Who makes the fabric? What factors are considered in fabric selection? How do you decide if a product will/will not do well?
In the process you've just described, when does each party get paid? In your opinion, which entities do or do not bear the most risk? Why is that?
Does your company make any wool products? If so, what are they? Please tell me more about them. Researcher: Get product links and names wherever possible, for future reference.
Do you know if your company buys wool in raw form (unscoured, in the bale)? Why/why not?
(If appropriate to this person's company and/or role) Do you know/care how much it costs to create yarn, that is woven into fabric? Does your company bear any portion of these costs?
(If appropriate to this person's company and/or role) Do you know/care how much it costs to create unfinished fabric? Does your company bear any portion of these costs?
(If appropriate to this person's company and/or role) Do you know/care how much it costs to create industrially finished fabric? Does your company bear any portion of these costs? Where is your finished fabric made? How is it finished?
Do you know/care how much it costs to create a fabric sample? If so, how much?
Do you know how much it costs to create a product sample, start to finish? If so, how much? What factors contribute to these costs?
Your company has products in the market, but are there other products you'd like to see out in the world? Why? What would these be like?
Have you/has your company launched any products in the past that did NOT work? What were these, and why do you think they didn't work? What happens to products that don't sell well? Does anything else change as a result, like design process?
Are there products (textile or otherwise) that you wish you'd have made, or would like to emulate or riff on? Why? What are some of your personal favorite products? Why?
In your opinion and experience, what are the quality risks in product development?

At how many points in product creation is it possible for product changes (in design, in fabric selection) to happen? What does it cost at each stage?
What are the gaps in product design and development? These can be anything you think, in your opinion and experience. What role, for example, does lack of infrastructure (a gap) or domestic service providers play in product design? In product availability? Freight and transporation costs? Wait times? Cost? Risk?
Fibershed R&D Partner Scenario
Does your company care about domestic manufacturing? Do you care about it, personally? Why/why not? Has your company sought local and/or domestic partners? Why/why not?
Does your company care about natural fibers (wool, hemp, cotton, etc.)? Why/why not? How about you, personally?
Now I'd like to get your input on a hypothetical scenario. Let's say there were an organization that could help your company source more responsibly produced, sustainable fabric, and/or raw materials, and that they could suggest product designs for which these fabrics might be best suited. Based on this brief description, is this something your company needs or would use? Why or why not? If not, what WOULD be something more helpful/appropriate to your needs? Can you describe it?
Have you ever worked with any external textile consultants on product design or development? If so, what is that like? How do you find companies that do this, and choose to work with them? What do you need to know in advance, before the engagement begins? What are the benefits and drawbacks of working with external consultants? How do you prefer/like to interact with them? By contrast, what do you NOT need or want from them?
At your company, who pays for external consultants? If there is budget for it, whose budget is it?
How much would you expect to pay for textile consulting services? Of the kind described in our initial scenario?
What barriers to participation (in textile consulting) does your company have? What would make it easier for them to engage in an R&D partnership like this?
What barriers to sustainable development does your company have? What, if anything, would make it easier for them to engage in an R&D partnership that emphasizes sustainable sourcing and fabrics?
CBW Story Scenario/Messaging
Now I'd like to get your input on another scenario. Let's say you were looking at wool fabric samples, and some of the samples were noted as "certified Climate Beneficial." What would you expect the words "climate beneficial" to mean? Is your expectation the same as what you would LIKE it to mean? Would the "certified" language mean anything to you? If so, what?
Let's say I told you that "climate beneficial wool" is wool that is carbon negative, a carbon sink in itself and produced/grown on a ranch that uses practices to sequester as much carbon as possible. What would you think about a CBW fabric sample? What would your company think? Would anyone at your company care? Why or why not? What questions would you have about CBW?
Is the CBW story one that you think would resonate with your company? With your customers? Why or why not? Do you have any incentive to offer clothing made from CBW fabric to your customers? If so, what are those incentives?
In your opinion, would your company pay more to use CBW fabric in a product? If you had to guess, how much more? Would your customers pay more for a product made from CBW fabric, and tagged as such? How much more?
What impact, if any, does the story of a fiber's background have on the fabric purchase/selection decision (as compared to non-CBW purchase decisions)? Are some or all of these things also true for all types of fiber, or for some types of fiber (local, CBW, organic, US grown, etc.)? What does your company care about? What confuses them (terms, stories)?

Pre-payment scenario
Now I'd like to get your input on one final scenario. Let's say you were looking at fabric samples. Some of the samples are made in a U.S. mill, usually in small batches. Would your company pre-pay for some or all of its fabric order, to share risk with the fabric maker? Why or why not?
What would your company need to know, in order to convince them to pre-pay? Would this be different from how fabric is usually ordered/made, for your company? How so? What would it take for your company to participate in a pre-payment model (to move away from more traditional ways of doing things)?
If your company were willing to pre-pay, how much do you think they would agree to pre-pay? Total dollar amount? Percentage of cost? How much?
Is there anything else you'd like to tell us, or think we should consider, that we haven't already asked about? Please note it in this text box.

Full Circle CBW Program - Batting and Bedding

THESE COSTS ARE ESTIMATES AND FORECASTS

		pounds	$/cost	$/Total	Notes
Raw Wool Purchase					Grease weight
	Loren Poncia	2780	2.5	$ 6,950.00	Full CBW price paid
	Jim Jensen	2200	1.9	$ 4,180.00	Transitional CBW price
	Dan Macon	150	1.6	$ 240.00	
	Sharon Harston	250	0	$ -	
	Hazel Flett	250	0	$ -	
Total Raw Wool		5630		$ 11,370.00	Wool purcahse outlay
Incoming Weight (lbs)		5630			
	Scouring and carding Loss $ 4,794.50	2230	2.15		Lost money due to yield loss (5630 raw - 3400 yield x $2.15). True cost per pound of raw wool is probably higher, because it does not include this loss due to yield. The $2.15 wool price used here is an average of $2.50 CBW and $1.90 transitional.
	Batting yield	3400			
	Batting to Hazel	225			
	Final batting yield	3175			Available to make products
Freight					
	Glen Raven logistics, to and from Bollman			$ 2,300.00	
	Delivery of batting from Yan's, Union City			$ 600.00	
Processing					
	Scouring at Bollman			$3,306.47	Texas
	Carding at Yan's			$5,397.00	Union City, CA
Storage					
	Rent			$200.00	
	Tarp			$30.00	
Total Batting Production Cost				$ 23,203.47	Does not include time/admin

Bedding Product Manufacture

COLORED AREAS ARE FORMULAS - DO NOT TOUCH

	labor cost ($*hr)	fabric cost ($*yd)	batting cost (freight and processing / total pounds, per pound, from W28, W29 and W30 respectively)	wholesale unit cost (formula, labor + fabric + batting)	current retail cost (actual)	Notes	mark-up rate (%)	Commission (5% per item based on retail price)	fibershed donation per unit (pounds of batting in product)	profit (per item) - Sale price less product cost, commission, donation	profit margin (profit / sale price) - here, current retail cost is used as sale price.	hourly wage rate (variable)	labor hours (variable)	hourly labor (formula)	fabric cost by yard (variable)	number of yards (constant by size)	fabric cost (formula)	total costs / batting yield in pounds = surcharge per pound	$ raw wool loss / batting yield in pounds	total yield loss and processing costs per pound of batting	pounds of batting in product unit (constant)	total yield loss and processing cost per pound	fibershed donation - $.30 per pound of batting	batting pounds per product unit (constant by size)	total fibershed donation per product unit
Twin Comforter	$ 40.00	$ 44.00	$ 26.45	$ 110.45	$ 275.00	Note that full sale price is assumed for each item. As time goes on, we should add an "actual sale price" column, between columns I&J, which will affect the profit and profit margin calculations.	148.97	$ 13.8	$ 0.90	$ 149.90	54.51%	$ 20.00	2.00	$ 40.00	$ 11.00	4.00	$ 44.00	$ 7.31	$ 1.51	$ 8.82	3.00	$ 26.45	$ 0.30	3.00	$ 0.90
Queen Comforter	$ 40.00	$ 55.00	$ 39.68	$ 134.68	$ 350.00	Profit margin can be used to calculate sales prices and make us aware of thresholds: i.e. "A 15% profit margin is the lowest we can afford." (FWIW, a 15% profit margin is average for small businesses and a sound target.)	159.87	$ 17.50	$ 1.35	$ 196.47	56.13%	$ 20.00	2.00	$ 40.00	$ 11.00	5.00	$ 55.00	$ 7.31	$ 1.51	$ 8.82	4.50	$ 39.68	$ 0.30	4.50	$ 1.35
Pillow	$ 20.00	$ 11.00	$ 8.82	$ 39.82	$ 70.00		75.80	$ 3.50	$ 0.30	$ 26.38	37.69%	$ 20.00	1.00	$ 20.00	$ 11.00	1.00	$ 11.00	$ 7.31	$ 1.51	$ 8.82	1.00	$ 8.82	$ 0.30	1.00	$ 0.30

Program Sales, Margins and Profit

Product units, sales, and potential profit by item. Assumes 1/3 of total batting pounds used per each of 3 products. This is a convenience division that may not be accurate. Making more of the products with the highest profit margins may be more desirable, for instance.

	pounds of batting (portion of total available)	pounds per item	possible units	possible units x wholesale price	possible units x retail price	These are all potentials, and optimistic, as product prices that are NOT full retail are not taken into account (but, the product retail cost is reasonable, lower than that of best regional comp).	labor cost (part of product cost, shown here for visibility)	Marie commission (5% per item based on retail price)	fibershed donation totals ($.30 per pound of batting in product)	profit (revenue minus cost of goods sold, sales commission, and donations)	program profit margin
						Wholesale price includes labor cost. Commission is in addition to that labor cost and payment.	$ 14,111.11	$ 4,850.69	$ 317.50	$ 52,879.70	
Twin Comforter Line	1058.33	3.00	353	$ 38,965.99	$ 97,013.89						
Queen Comforter Line	1058.33	4.50	235	$ 31,675.25	$ 82,314.81		$ 9,407.41	$ 4,115.74	$ 317.50	$ 46,206.32	
Pillow Line	1058.33	1.00	1058	$ 42,140.99	$ 74,083.33		$ 21,166.67	$ 3,704.17	$ 317.50	$ 27,920.68	
Program Totals	**3175.00**		**1646**	**$ 112,782.23**	**$ 253,412.04**		**$ 44,685.19**	**$ 12,670.60**	**$ 952.50**	**$ 127,006.71**	**50.12%**
Employee Wages						Product labor + sales commission (not in addition to)	**$ 57,355.79**				

Additional Operating Expenses

Marketing materials	$ 1,000.00	Placeholder figure for logo design, brochure printing, and product tags
Pack and ship materials	$ 115.66	

	Total	$ 1,115.66
Program Break Even		$ 149,771.96

The point at which sales exactly cover expenses (defined as raw wool, processing, freight, labor, sales commission, marketing, and pack and ship materials), of a possible $216,370.37 in sales (see G36).

Yarn and Fabric Program

Cloth Prototype Stage (Using test, Non-CBW, but comparable yarn, and production Lani's Lana yarn)

R&D stage	Description	Cost	Notes
Sampling 1	Jagger Bros. yarn	$105.45	Fibershed covered all preproduction development
Sampling 1	Wool Weaving Trials with Available Jagger	$400.00	
Sampling 1	Wool/Cotton Weaving Trials @ Huston Textile with Available Jagger Yarn	$200.00	
Sampling 2	Sample Weaving with various 2/24s constructions	$850.00	
Sampling 3	Sample Weaving and Washing with various 2/24s constructions	$950.00	
Pre-production yarn	2/24s Pre-production Yarn	$894.00	Paid to wool producer
Pre-production yarn	2/24s Pre-production Shipping for Yarn	$64.00	Paid to wool producer
Pre-production weaving	Preproduction Weaving with Huston Textile	$1,721.44	
Pre-production finishing	Industrial Finishing Trials + Shipping at Geltman Industries	$314.87	
Pre-production finishing	Plane Flight for Huston Textile to visit Geltman	$324.20	
Pre-production total		**$5,823.96**	Not typical; usually two rounds of sampling, not three. $3500 would be more typical.
Production Stage			
Production yarn	2/24s production yarn for both CSC and StudyNY program- 650 lbs	$12,306.21	Paid to wool producer
Production yarn	2/24s Production Shipping for 650 lbs	$439.40	Paid to wool producer
		$ 12,745.61	
Production weaving	Production Yardage Weaving with Huston Textile	$12,783.20	Yardage with weaving labor included, paid to weaving mill
Production fabric finishing	Production Yardage Finishing @ Geltman Industries	$279.66	
Production fabric finishing	Production Yardage Shipping	$250.00	
Fabric shipping and handling	Packaging (information packet, wrapping, etc)	$0.00	Donated by rancher
Fabric shipping and handling	Labor	$0.00	
Fabric shipping and handling	Shipping orders to customers/postage and tax	$0.00	Paid by customers
Fabric shipping and handling	PayPal fees for processing customer order payments	$728.60	
Production total		**$27,226.47**	
Total cost loomstate		$33,032.49	From Krystle
Sales Stage			
Total projected sales	**From 103 prepaid buyers**	**$35,225.00**	
Excess		**$2,192.51**	For regenerative fiber fund, other