

KANSAS WOOD SUPPLY



MBA Practicum

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Disclosure

This report is submitted in accordance with the formal requirements for the course, MBA Practicum, in the College of Business Administration at Kansas State University. This report was prepared as part of an academic exercise under the guidance of Professor Chad Jackson and contains information only and not advice. Please note that this report was prepared by students and recommendations are implemented solely at the responsibility of the owner of the report.

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Executive Summary

Kansas Woody Supply is a wood excavating and supply business that's main focus is to provide landowners the ability to clear their lands of unwanted woody biomass at an affordable cost to them. To provide this service to landowners at the most affordable cost, Kansas Wood Supply has looked at methods to provide financial assistance to the landowners and alternative means of revenue for the company.

Based on our feasibility study for this woody supply business, we do not believe it is economically possible to provide the excavation side of this business at no cost to landowners. However, we have found a means for the landowners to receive governmental financial assistance to help offset their costs while still maintaining a revenue for this business. The Environmental Quality Incentive Program is sponsored by the United States Department of Agriculture and its purpose is to provide financial aid to landowners that wish to clear their land of unwanted woody biomass to create better means for their agricultural land. Along with this financial assistance, we also have identified a way for this business to lower costs by becoming Certified Tree Care Professionals, which keep worker's compensation and insurance costs low.

We have identified selling the woody biomass after we excavate it from the land as a possible revenue generator. There is not a current market for this in Kansas that we could find, however we do have two companies that would be interested in purchasing the biomass in mass quantities, one of which that would be willing to locate a plant in Kansas to make it economical for them, this company is Biochar Now. Biochar Now has indicated they would be interested in purchasing anywhere from 15,000 to 75,000 tons of ground woody biomass.

This study includes a survey of landowners, interviews from a land excavating company, a Kansas landowner, and potential biomass purchasers. Along with that qualitative information, we have also included a quantitative study on the costs that would be associated with this business and the projected revenue for the next 5 years. Based on the information that was given to us from these various avenues, we have concluded that the best possible outcome for this business is to charge a fee of \$75/hr to landowners to clear their land of woody biomass, which would be the lowest offered price of any excavation company, and then to set the price of the biomass to Biochar Now at \$45/ton, which is also well within the parameters of their suggested price range.

As you will see, our final recommendation to move forward with this business falls in congruence with all of the information gathered throughout this study. We believe that we have made informed and conservative projections for a wood supply company in Kansas to become a profitable business that will produce over \$40,000 in Net Income in year 1 and grow to over \$100,000 by year 5. And will also aid in the efforts to control the overpopulation of woody biomass in Kansas.

Description of Engagement Letter*

We were engaged to explore the feasibility plan for Kansas Forest Service company. Specifically, we were asked to evaluate the 5 years profitability analysis of this feasibility plan, and to make some recommendations.

The scope of our project includes four activities:

- The first activity will be to gather information on the core pieces of equipment, identify any additional costs that will be required and put together an understanding on what the initial capital investment will be along with operating costs. We will then take those costs and back into a possible price point at which the pre-processed wood would be sold to the wood product companies. This will give us numbers to provide a 5-year profitability analysis.
- The second will be conducting surveys of landowners that would potentially let us clear their land and what the cost, if any, would be associated with this.
- The third activity will involve identifying all potential sources of revenue.
- The fourth activity will include us providing a brief business overview with an industry and market analysis to the Kansas Forest Service to help it fulfill its goal of enticing a wood supply business into the Kansas region.

**Signed Engagement letter, appendix e*

Project Description

The purpose of this project is to help the Kansas Forest Service develop a feasibility plan for a potential wood supply company so that it can promote the Forest Products Industry in Kansas to entice companies in the wood products industry to expand into Kansas. This project will result in a business overview and profitability analysis to use when communicating with people to potentially start this business.

This project includes an overview of this business, activities conducted, and related analysis. Based on our assumptions, we have provided a feasibility analysis of this business depending on the approximate costs and revenues to start and run a wood supply company in Kansas. We will do the research of the geographic environment in the state of Kansas and we will also do a survey of local landowners, so that we can better understand the scope of this project and the realistic opportunity this business presents.

Company Description

The Kansas Forest Service serves rural landowners, communities, rural fire districts, forest and arboriculture industries, and citizens of the state through its Conservation Tree and Shrub Planting, Fire Management, Community Forestry, Rural Forestry, Marketing and Utilization, and Forest Health programs. The company's mission statement is "Care of Natural Resources and Service To People Through Forestry." This mission statement is a compass to guide and direct Kansas Wood Supply. Recently, one of the goals of the Kansas Forest Service is to promote the forest products industry in Kansas. To achieve this goal, the Kansas Forest Service has identified a potential wood supply business in Kansas.

This wood supply business' main focus is on excavating the overpopulated woody biomass in Kansas, and doing so in the most cost efficient way to landowners. It is very important to negotiate in good faith with landowners, and create a good relationship with them. This business is not designed to generate the majority of the revenue from charging the landowners to remove and clear their biomass, but from selling the biomass to wood product companies.

Like all business opportunities, this business is designed to be profitable, however another benefit of this company is that it is geared to aid in the growing problem of overpopulated forest areas in Kansas by excavating unwanted or unneeded woody biomass.

Industry & Market Analysis

Kansas is located in the Midwestern part of the United States, and its climate reflects this location. The climate in the eastern part of Kansas is cool to cold in the winter and hot, often humid summers. This climate is very suitable for plant growing. In addition, according to the <<Kansas' Forests 2010 resource bulletin>> "Kansas has a strong agricultural tradition that predates its statehood, and agriculture continues to be a significant contributor to the state's economic well-being." Today, "Kansas is one of the most productive agricultural states, producing high yields of corn, wheat, sorghum, and sunflowers." Of Kansas' 52 million acres, 2.4 million acres are forests that provide wildlife habitat, recreation opportunities, clean water, and wood products for consumption, construction, and fuel. Based on U.S. Bureau of Economic Analysis, there are 2.8 million people in Kansas, and with \$122.7 billion GDP in 2008. The state of Kansas is very suitable for development of a forest business.

The market analysis for this business needs to be looked at from two different angles. The first is the market of landowners that possess the woody biomass that we would like to excavate. From the <<Kansas' Forests 2010 resource bulletin>>, "Almost all of Kansas' forest, 95%, are privately owned. Of these private acres, 96% are owned by families, individuals, and other unincorporated groups, collectively referred to as family forest owners." Based on the Kansas county map, Kansas has 105 counties. There is 52 million acres in Kansas, so the approximately average landowner owns 700 acres. In the specific counties we are looking at, the landowners have roughly 70 million tons of woody biomass on their land, and about 2 million of that is Eastern Red Cedar (see appendix d). Eastern Red Cedar is a growing problem in Kansas and is viewed as being overpopulated in this region. With this business model being designed to excavate this overpopulated area, it makes it a win-win between this business and private landowners that wish to have it excavated. This information has led us to believe the market size is enticing for this type of business model.

Furthermore, the possibility of success to negotiate with these private landowners to get their support is plausible. According to the results of the survey we conducted, 48% of the 115 survey respondents are willing to have woody biomass be excavated and 70% of them prefer the state agency or consultant to help them harvest their woody biomass.

The second market that we looked at for this business is the opportunity to sell the woody biomass that we excavate to wood product companies. This side of the business model was much more difficult to gather information on. Because Kansas has an abundant amount of corn, most business models in this area focus on ethanol as their primary source of bioenergy. In fact, the businesses we spoke with that would be interested in woody biomass would require a substantial amount of supply. Therefore, the amount of woody biomass we can supply is a primary concern for the potential venture.

Based on this information, the goal is to understand the economics behind a wood supply business. We analyzed and researched the associated capital and operating costs for this business, which allowed us to put together a feasibility study, which is located on page 27.

Methodology

In order to analyze the wood supply business, we took a few steps to better understand the industry; the customers from the supply side and the customers from the sales side. Also, we looked at the major costs that would be directly associated with getting this business started.

After speaking with the Kansas Forest Department and other land excavating companies, we identified seven pieces of machinery that would be required for this business.

1. *Mobile Grinder (grinds trees to needed size) – Biochar Now only*
2. *Wood Harvest Machine (cuts trees)*
3. *CAT 267B (clears brush)*
4. *4WD Pick-up truck*
5. *Chip Van (stores woody biomass) – Biochar Now only*
6. *Low boy (transports equipment)*
7. *Two Semi-Tractors (pulls, tows, and hauls the trailer)*
8. *Log Truck (transports cut logs) – AWF only*

This gave us a better understanding of the business and the steps that it takes from a supply chain perspective. We then looked at the crew size we would need to operate these pieces of machinery and the compensation that would be required. Along with these two major costs we added in the insurance expenses that come with operating this heavy machinery, liability coverage and workers compensation. After narrowing in from a cost perspective, we then moved to the amount of supply that we would have in the Eastern Region of Kansas and who our customers would be.

The forest areas in Kansas are 95% owned by private landowners that, on average, own about 700 acres. In the specific regions in Kansas that we are focusing on (see appendix d), there are about 750 landowners per county, which are all potential customers for this business. Based on research done by the USDA, and the map seen in appendix d, these landowners have roughly 70 million tons of woody biomass on their land, and about 2 million of that is Eastern Red Cedar. When looking at that large of a landscape, we decided to calculate how many tons of woody biomass we could cut and grind in a given timespan, operating at full capacity. This gave us, from an operational standpoint, how much wood we could supply and sell in a given year. This information, along with our cost structure in place, gave us an idea of what we needed to charge to clear and gather the wood and then how much would need to charge per ton to sell the woody biomass to the wood product companies to make this a sustainable business. After gathering all of this information we moved to conducting a survey from a sample of these landowners to better understand their wants and needs. This allowed us to make more realistic projections and gave us a better understanding of how we could approach obtaining and selling the woody biomass. Included in this business plan is a SWOT analysis to give an understanding of what we believe will be this businesses best opportunities and what will be its biggest hurdles that will need to be overcome to be successful.

Timeline

For us to execute this project in a timely manner, we constructed a timeline chart that would allow us to prioritize our time to meet our objective.

The timeline for this engagement went as follows:

Sept. 22	Engagement Confirmation
Sept. 23 - Oct. 5	Researching Associated Costs & Surveying Landowners
Oct. 6	Progress Update
Oct. 13 - Oct. 29	Profitability & Feasibility Analysis
Nov. 3	Progress Update
Dec. 9	Final Report Submitted
Dec. 9 - Dec. 16	Final Results Presentation

Interview Analysis

The interviews conducted were focused on gathering information from companies that currently excavate woody biomass, landowners that have used the Environmental Quality Incentive Program (EQIP) program and paid to clear biomass off their land and potential buyers of woody biomass. These interviews gave us great insight to what costs would be associated with clearing land and what price point we would be competing with if we decided we would have to charge the landowners to clear their land. The interviews with the landowners led us us to the EQIP program which is a potential partnership and avenue to find landowners and clear their land at a more reasonable cost to them. Finally, the interviews of potential buyers of the wood supply gave us the information we needed on how much supply these companies would need on a yearly basis and what they would be willing to pay for the supply.

Interview Highlights: These highlights are a summation of conversations with 5 specific landowners and 13 current businesses (4 land excavating companies and 9 potential buyers of the biomass). For complete transcripts of the most beneficial interviews see appendix c.

- Land excavating companies charge by the hour to clear land (\$85-\$175), and do not do anything with the biomass after cutting and shredding the wood
- Employees that operate this type of machinery are paid by the hour as well (\$13-\$20)
- The EQIP program provides financial assistance to landowners to help keep their land in optimal shape for their agricultural needs and signs contracts with these landowners for up to ten years.
- There are very few companies that need to pay for woody biomass, most can obtain it at no cost or even be paid to take it.
- The companies that will pay for the biomass, pay by the ton (\$30-\$65), this price range is for both ground biomass and tree logs.
- The two potential buyers of the woody biomass that we found would like to purchase anywhere from 10,000-75,000 tons a year. One company would use this biomass to produce biochar and the other is a producer of wood flour and wood shavings to produce a variety of wood products from pet bedding to using it for biofuel.

Survey Analysis

The survey that we conducted was sent via email by the Kansas Forest Service to 300 landowners in the specific regions in Kansas that this project is analyzing. We had a 38% response rate, which is enough for us to create assumptions, however, with over 750 landowners per county we do believe that further research of landowners and their view on this business model would be beneficial and may depict more accurate results.

The main objective of this survey was to gain an understanding of how many landowners:

1. Believe their property is overpopulated with woody species.
2. Would be willing to have a business come in and excavate at least a portion of their wooded acres. And
3. If they are willing to have the woody biomass excavated, would they be willing to pay for this service, have someone take it with no cost association, or would they want to be compensated for their land to be harvested.

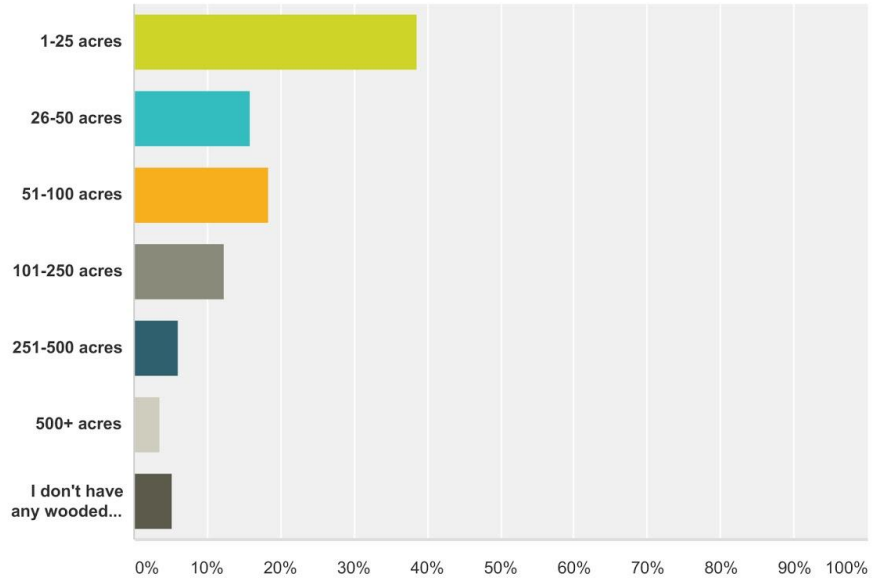
This survey gave us data to use in our feasibility analysis.

Key Findings:

- 25% of the survey respondents feel their property is overpopulated with woody species
- 48% of landowners that have woody biomass on their property would be willing to have it excavated and would not expect compensation
- 70% of landowners that are interested in harvesting their woody biomass, would prefer to use a professional

Q1 How many wooded acres do you operate? Include both woodlands and grasslands with woody species.

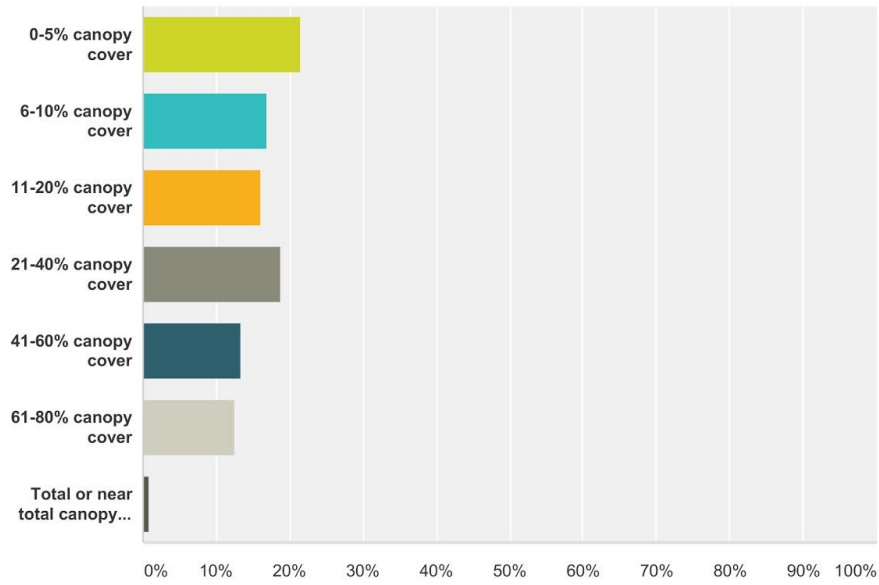
Answered: 114 Skipped: 1



Answer Choices	Responses
1-25 acres	38.60% 44
26-50 acres	15.79% 18
51-100 acres	18.42% 21
101-250 acres	12.28% 14
251-500 acres	6.14% 7
500+ acres	3.51% 4
I don't have any wooded acres	5.26% 6
Total	114

Q2 How much of the property which you operate is covered with woody species?

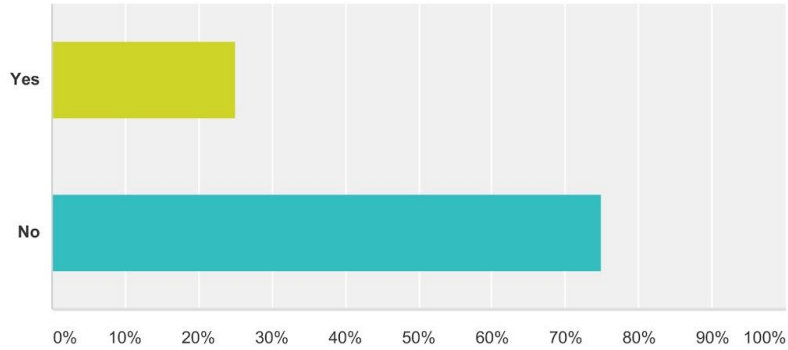
Answered: 112 Skipped: 3



Answer Choices	Responses
0-5% canopy cover	21.43% 24
6-10% canopy cover	16.96% 19
11-20% canopy cover	16.07% 18
21-40% canopy cover	18.75% 21
41-60% canopy cover	13.39% 15
61-80% canopy cover	12.50% 14
Total or near total canopy cover	0.89% 1
Total	112

Q3 Do you feel the property which you operate to be over populated with woody species?

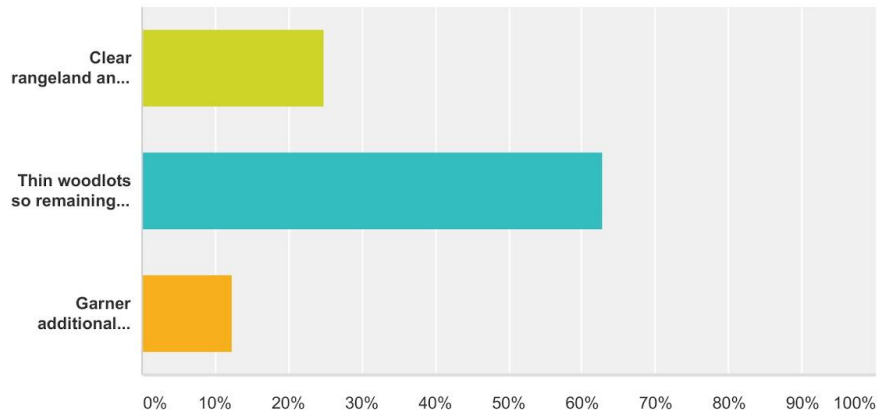
Answered: 108 Skipped: 7



Answer Choices	Responses	
Yes	25.00%	27
No	75.00%	81
Total		108

Q4 What would be your primary objectives in harvesting woody biomass from your acreage?

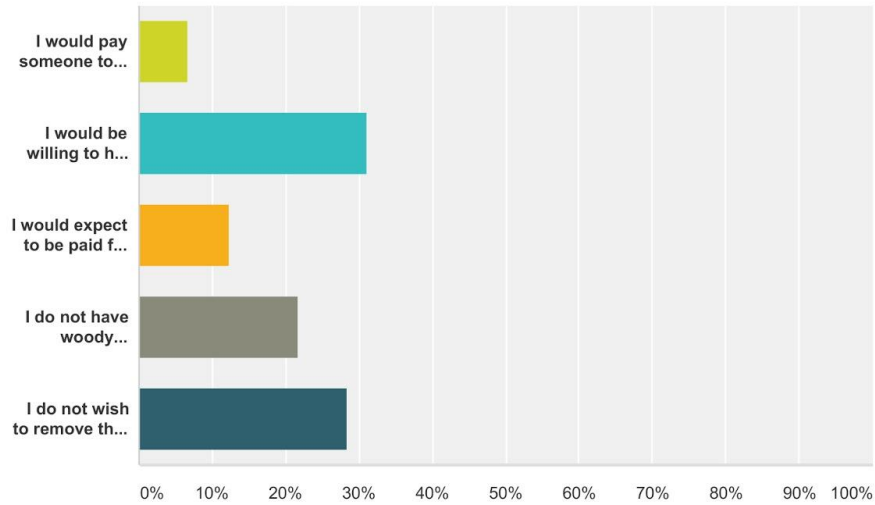
Answered: 97 Skipped: 18



Answer Choices	Responses	
Clear rangeland and CRP of woody plants so more grass will grow.	24.74%	24
Thin woodlots so remaining trees will produce better timber.	62.89%	61
Garner additional income.	12.37%	12
Total		97

Q5 What value do you perceive in harvesting woody biomass (trees and brush) from GRASSLAND?

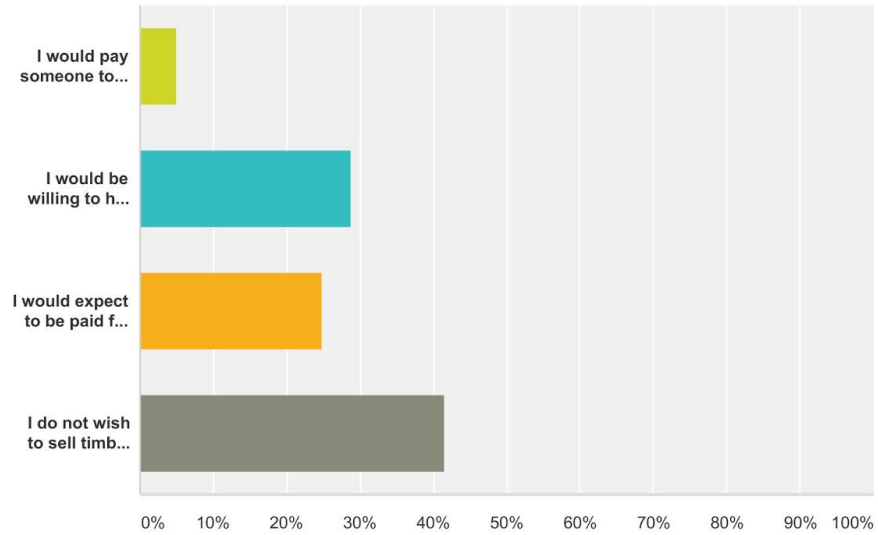
Answered: 106 Skipped: 9



Answer Choices	Responses
I would pay someone to harvest the invasive plant biomass (such as red cedar, hedge, locust, elm, etc.) just to get rid of it.	6.60% 7
I would be willing to have someone harvest the invasive plant biomass (red cedar, hedge, locust, elm, etc.) for free just to get rid of it.	31.13% 33
I would expect to be paid for the invasive plant biomass (red cedar, hedge, locust, elm, etc.) harvested.	12.26% 13
I do not have woody encroachment on my grasslands.	21.70% 23
I do not wish to remove the woody species on my grasslands.	28.30% 30
Total	106

Q6 What value do you perceive in harvesting woody biomass from WOODLOTS?

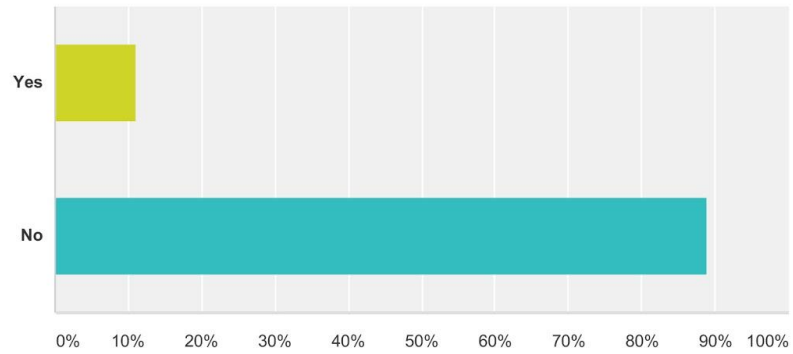
Answered: 101 Skipped: 14



Answer Choices	Responses	
I would pay someone to harvest low quality woody material just to get rid of it.	4.95%	5
I would be willing to have someone harvest low quality woody material for free just to get rid of it.	28.71%	29
I would expect to be paid for any woody material harvested.	24.75%	25
I do not wish to sell timber from my woodlands.	41.58%	42
Total		101

Q7 Have you sold woody biomass in the past?

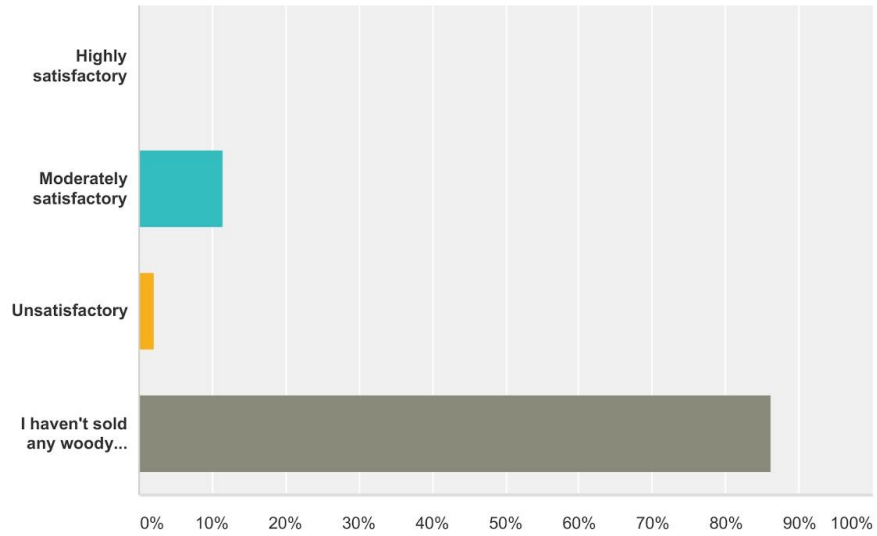
Answered: 109 Skipped: 6



Answer Choices	Responses	
Yes	11.01%	12
No	88.99%	97
Total		109

Q8 If you have sold woody biomass in the past, how would you describe your level of satisfaction with the sale? Please add comments describing your experience and recommending how the experience could be made more satisfactory.

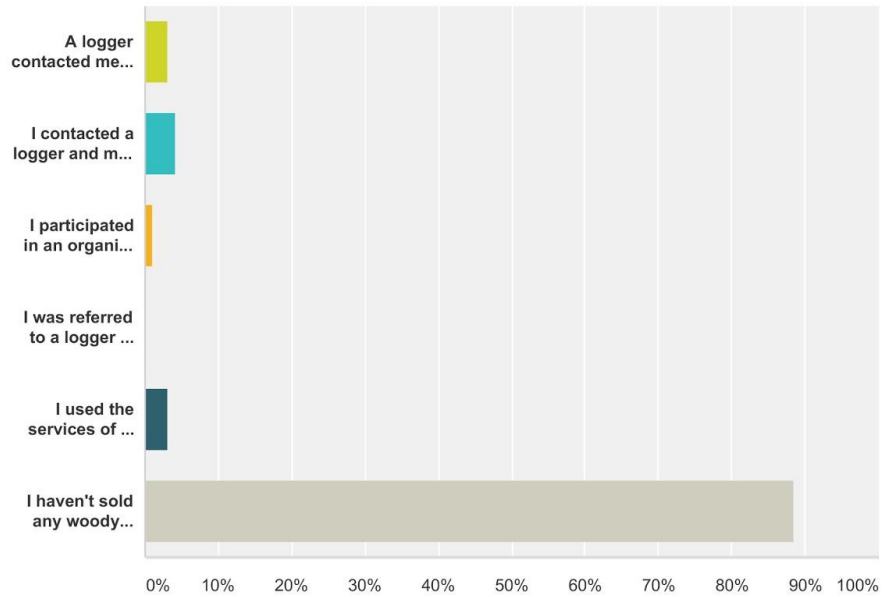
Answered: 95 Skipped: 20



Answer Choices	Responses
Highly satisfactory	0.00% 0
Moderately satisfactory	11.58% 11
Unsatisfactory	2.11% 2
I haven't sold any woody biomass.	86.32% 82
Total	95

Q9 If you sold woody biomass in the past, how was the transaction concluded?

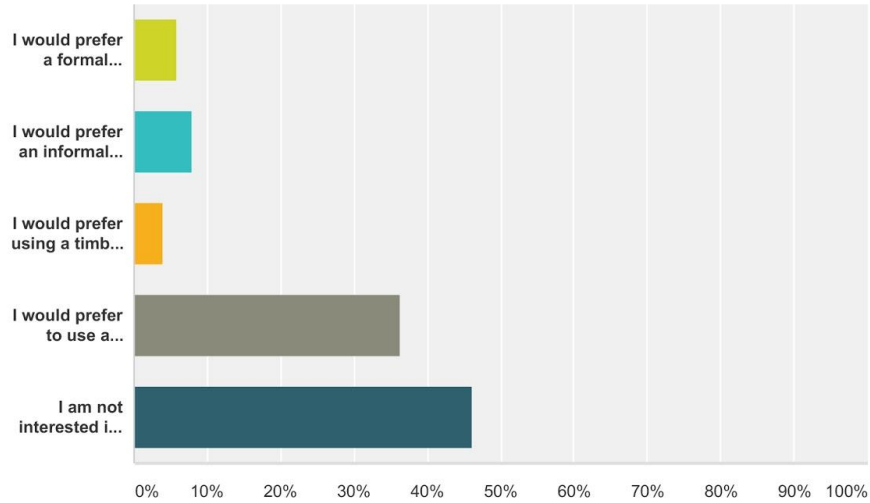
Answered: 95 Skipped: 20



Answer Choices	Responses
A logger contacted me and I made an informal agreement.	3.16% 3
I contacted a logger and made an informal agreement.	4.21% 4
I participated in an organized sale by sealed bids	1.05% 1
I was referred to a logger by friends and/or neighbors.	0.00% 0
I used the services of a professional forester (state agency or contractor).	3.16% 3
I haven't sold any woody biomass.	88.42% 84
Total	95

Q10 What method would you prefer for harvesting and marketing your woody biomass?

Answered: 102 Skipped: 13



Answer Choices	Responses
I would prefer a formal solicitation of bids.	5.88% 6
I would prefer an informal arrangement with a logger.	7.84% 8
I would prefer using a timber marketing firm/professional.	3.92% 4
I would prefer to use a professional forester (state agency or consultant).	36.27% 37
I am not interested in harvesting or marketing my woody biomass.	46.08% 47
Total	102

SWOT Analysis

The main competitors of this business from an excavation side are K.C. Arborist Tree Care Company, Grade-A Tree Care Company, Hendrickson Tree Care Company, and Kansas Tree Care. All of these companies offer the service of excavation and charge by the hour ranging from \$85-\$175 an hour. From a landowner perspective, these companies all offer the same service to them, which is to excavate or clear their land of woody biomass. We analyzed the SWOT of these competitors to give a more clear vision and to help our company make future analysis. The strength of this business is that the main revenue stream will not be from charging the landowners but from selling the woody biomass, so this business will be able to charge a lower rate to clear the land. The weakness of this business is that the main focus on the tree removing service area, which is lacking the comprehensive compare with our competitors. The opportunities of our business is none of these competitors currently sell the woody biomass, this business would be taking advantage of revenue they are not exploiting. The threat of our business is that there may be a probability to increase our cost due to we are the later to enter this industry in the state of Kansas.

<p>Strength:</p> <p>Revenue is from selling the woody biomass, charging the landowners at a lower price.</p>	<p>Weakness:</p> <ol style="list-style-type: none"> 1. The competitors are all offer the plant health care service, tree removing service, and tree preservation service. 2. They all focus on the State of Kansas of the service area.
<p>Opportunity:</p> <p>None of these competitors currently sell the woody biomass, this business would be taking advantage of revenue they are not exploiting.</p>	<p>Threat:</p> <p>We are the new entry, the barriers for us is very high, and so there must be an incremental of the cost.</p>

Obtaining Woody Biomass

Environmental Quality Incentive Program

The United States Department of Agriculture (USDA) has a division called Natural Resources Conservation Services (NRCS) that provides financial and technical assistance to American ranchers and farmers to help conserve the environment and agricultural operational land. The NRCS has developed the Environmental Quality Incentive Program (EQIP) to provide financial assistance to help plan and implement conservation practices that help preserve agricultural land to improve soil, water, plant, animal, air and related resources. This program takes applicants that need financial assistance to keep their land in optimal shape for their agricultural needs and signs contracts with these landowners for up to ten years (see appendix b). The EQIP program provides an opportunity for this wood supply business to partner with the USDA and provide this service to landowners at the most reasonable cost to them. With the example in appendix b, this landowner has been given financial aid to excavate his land over the course of five years to the amount of \$10,386. By charging the landowner at an hourly rate of \$75, this business would be excavating the woody biomass for 138 hours at no cost to the landowner.

If this relationship is successful, the USDA would continue to suggest this business as the excavator to make the process as streamlined as possible. If this business is able to gain a partnership with the USDA and capitalize on the EQIP program, landowners could be frequently seeking out this business specifically to work with, which would prove beneficial for landowners and this business model.

Tree Care Industry Association

The Tree Care Industry Association (TCIA) is the foremost business management resource for tree care companies, providing tree care professionals with tools you can use every day to increase profits, lower training costs, retain quality employees, and stay a step ahead of continually evolving regulatory issues. Becoming a member of the Tree Care Industry Association gives this business resources to information on best practices and would keep us informed on the most up to date information within the industry. Along with a TCIA membership comes the ability to become a Certified Tree Care Safety Professional. The CTSP program allows one or more key employees at a given company to become certified tree care safety experts, thereby empowering and encouraging a culture of safety within that organization. The CTSP program helps you protect employees/coworkers; prevent accidents and save lives; plus lower costs, improve morale, and increase production. CTSP workshops are a requirement of the certification. This membership is a great marketing tool to potential customers that the crew coming has had training and is well versed with the equipment and safety procedures. This association membership is also a great way to get connected with potential business partners from the landowner side of the business and wood product companies across the country that couple be potential buyers.

Selling Biomass

After doing research of companies in Kansas and the surrounding areas, there is limited companies looking to pay for woody biomass. In Kansas the biofuel industry is overrun by companies that have focused their business on producing ethanol using corn. Of the companies that are in constant need for wood supply, they have structured their business plan to be seen as a dumping site for unwanted trees and brush and they are provided their supply by landowners that simply want to get rid of the excess trees and are willing to either give it away or pay to get rid of it. However, we were able to speak with the following two companies that would be interested in purchasing Eastern Red Cedar.

American Wood Fibers: Clarks, NE

AWF is a "total wood waste utilization" company that is supplier of wood flour and wood by-products. AWF has 10 locations across the United States, the closest is in Clarks, NE. They do a variety of things with their wood supply and are interested in purchasing wood by the log. A good amount of their wood supply is either given to them free of charge or they act as a dump for landowners and charge a fee. However, if the trees were supplied to them by the log, they would be willing to purchase the woody biomass at a price of about \$65/ton. This would include shipping the loads to their plant in Clarks. AWF could potentially purchase up to 10,000 tons of Eastern Red Cedar per year.

Biochar Now: Loveland, CO

Biochar Now is a company located in Loveland, CO that produces biochar to be used for specialty agriculture, reclamation, oil and gas, odor control, and bio-fillers. Biochar is similar to charcoal in that it is produced from heating wood and eliminating oxygen. Biochar is made to increase soil fertility for agricultural use and is environmentally friendly. Biochar Now would be interested in purchasing ground Red Cedar in large quantities, starting at 15,000 tons a year but scaling to almost 75,000 tons a year. Currently they purchase their wood for around \$30/ton, however, if the biomass could be sold to them already ground, they would be open to spending more on the front end to take out a step in the process on their end. Biochar Now would be interested in bringing a division to Kansas if a wood supply company was to be established and could produce enough woody biomass to make it economical.

Feasibility Analysis

For the feasibility analysis, we focused on three main points, the cost analysis, the revenue projection, and the projected income statement. For the cost analysis, we needed to first analyze the six main machine costs and the expenses that are related with their use, then we analyzed the labor cost and then any other associated costs, we then compiled these costs in order to get a total cost. For the revenue projection, we simply forecasted the amount of tons we could sell per year in order to calculate the revenue of each year. Finally, for the projected income statement, we used the projected revenue and total costs in order to calculate the net income for each year.

Cost Analysis

We analyzed the cost of each machine (acquiring cost and usage cost), the cost of labor, and the cost of others. Below are the main functions we used to calculate these costs.

Equations
Depreciation = (Purchase Price - Salvage Value) / (Life in years x scheduled hours)
Repair and Maintenance (\$/PMH) = Depreciation * Repair and Maint. (%/Depr.)
Labor Cost = Labor Rate + Per Diem
Total Variable Cost (\$/SMH) = Total Variable Cost (\$/PMH) x Utilization (%)

Moreover, we assume the working time is 8 hours per day, 5 days per week, and 45 weeks per year. Thus, the annual working time is 1800 hours.

1. Pick-Up Truck

The main function of the pickup truck is pulling the trailer and the low boy. Due to its functionality and the real situation, we plan to purchase one truck and estimate the cost to be \$30,000. Then, we assume they have the salvage value of \$2,000 and 12 years usage time. Finally, we assume the repair and maintenance cost equals 40% of the depreciation cost.

Machine Information	
Purchase Price (\$)	30,000
Salvage Value (\$)	2,000
Life in Years	12
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	40
Expected Utilization (%)	80

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$	1.30
Insurance (\$/SMH)	\$	-
Total Fixed Costs (\$/SMH)	\$	1.30

Fuel and Lube (\$/PMH)	\$	3.50	
Tires and Tracks (\$/PMH)	\$	8.00	
Repair and Maintenance (\$/PMH)	\$	0.52	
Total Variable Cost (\$/PMH, \$/SMH)	\$	12.02	\$ 9.61
Total Machine Cost (\$/SMH)	\$	10.91	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$10.91
Day	\$87.29
Week	\$436.44
Year	\$19,640

2. Mobile Grinder

The mobile grinder costs around \$240,000 to acquire and we assume the salvage value is around \$20,000. Moreover, we assume the usage time is 10 years and the maintenance cost equals 50% of the depreciation.

Machine Information	
Purchase Price (\$)	240,000
Salvage Value (\$)	20,000
Life in Years	10
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	50
Expected Utilization (%)	85

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$ 12.22
Insurance (\$/SMH)	\$ -
Total Fixed Costs (\$/SMH)	\$ 12.22

Fuel and Lube (\$/PMH)	\$ 8.00	
Tires and Tracks (\$/PMH)	\$ 12.00	
Repair and Maintenance (\$/PMH)	\$ 6.11	
Total Variable Cost (\$/PMH, \$/SMH)	\$ 26.11	\$ 22.19
Total Machine Cost (\$/SMH)	\$ 34.42	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$34.42
Day	\$275.33
Week	\$1,376.67
Year	\$61,950

3. Wood Harvest Machine

The main function of wood harvest machine is cutting the trees. It costs around \$275,000 and we assume the salvage value is \$30,000. The usage time is around 10 years and the maintenance cost equals 50% of the depreciation.

Machine Information	
Purchase Price (\$)	275,000
Salvage Value (\$)	30,000
Life in Years	10
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	50
Expected Utilization (%)	85

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$ 13.61
Insurance (\$/SMH)	\$ -
Total Fixed Costs (\$/SMH)	\$ 13.61

Fuel and Lube (\$/PMH)	\$ 8.00	
Tires and Tracks (\$/PMH)	\$ 12.00	
Repair and Maintenance (\$/PMH)	\$ 6.81	
Total Variable Cost (\$/PMH, \$/SMH)	\$ 26.81	\$ 22.78
Total Machine Cost (\$/SMH)	\$ 36.40	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$36.40
Day	\$291.17
Week	\$1,455.83
Year	\$65,512.50

4. CAT 267B

The main function of CAT 267B is clearing the brushes. It costs around \$30,000 and we assume the salvage value is \$1,000. The usage time is 12 years and the cost of maintenance equals 35% of the depreciation.

Machine Information	
Purchase Price (\$)	30,000
Salvage Value (\$)	1,000
Life in Years	12
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	35
Expected Utilization (%)	70

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$	1.34	
Insurance (\$/SMH)	\$	-	
Total Fixed Costs (\$/SMH)	\$	1.34	
Fuel and Lube (\$/PMH)	\$	3.00	
Tires and Tracks (\$/PMH)	\$	8.00	
Repair and Maintenance (\$/PMH)	\$	0.47	
Total Variable Cost (\$/PMH, \$/SMH)	\$	11.47	\$ 8.03
Total Machine Cost (\$/SMH)	\$	9.37	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$9.37
Day	\$74.97
Week	\$374.86
Year	\$16,868.75

5. Low Boy

The main function of Low Boy is transferring the equipment. It costs around \$35,000 and we assume the salvage value is \$1,000. The usage time is 15 years and its maintenance cost equals 40% of the depreciation.

Machine Information	
Purchase Price (\$)	35,000
Salvage Value (\$)	1,000
Life in Years	15
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	40
Expected Utilization (%)	70

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$	1.26	
Insurance (\$/SMH)	\$	-	
Total Fixed Costs (\$/SMH)	\$	1.26	
Fuel and Lube (\$/PMH)	\$	3.00	
Tires and Tracks (\$/PMH)	\$	8.00	
Repair and Maintenance (\$/PMH)	\$	0.50	
Total Variable Cost (\$/PMH, \$/SMH)	\$	11.50	\$ 8.05
Total Machine Cost (\$/SMH)	\$	9.31	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$9.31
Day	\$74.49
Week	\$372.74
Year	\$16,761.33

6. Chip Van

The main function of chip van is hauling the ground woody biomass. It costs around \$50,000 and we assume the salvage value is \$8,000. The usage time is 15 years and its maintenance cost equals 65% of the depreciation.

Machine Information	
Purchase Price (\$)	50,000
Salvage Value (\$)	8,000
Life in Years	15
Schedule hrs/yr (SMH)	1800
	0
Repair and Maint. (%/Depr)	65
Expected Utilization (%)	90

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$	1.56
Insurance (\$/SMH)	\$	-
Total Fixed Costs (\$/SMH)	\$	1.56

Fuel and Lube (\$/PMH)	\$	3.00	
Tires and Tracks (\$/PMH)	\$	8.00	
Repair and Maintenance (\$/PMH)	\$	1.01	
Total Variable Cost (\$/PMH, \$/SMH)	\$	12.01	\$ 10.81
Total Machine Cost (\$/SMH)	\$	12.37	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$12.37
Day	\$98.92
Week	\$494.62
Year	\$22,258

7. Semi-Tractor

The main function of semi-tractor is pulling and hauling the trailer. It costs around \$50,000 and we need two of them. Then, we assume the salvage value is \$10,000. The usage time is 10 years and its maintenance cost equals 40% of the depreciation.

Machine Information	
Purchase Price (\$)	100,000
Salvage Value (\$)	10,000
Life in Years	10
Schedule hrs/yr (SMH)	1800
Repair and Maint. (%/Depr)	40
Expected Utilization (%)	80
Calculate for Two	

Then, we can calculate the cost of each hour based on the above information.

Depreciation/hour (\$/SMH)	\$ 5.00	
Insurance (\$/SMH)	\$ -	
Total Fixed Costs (\$/SMH)	\$ 5.00	
Fuel and Lube (\$/PMH)	\$ 8.00	
Tires and Tracks (\$/PMH)	\$ 16.00	
Repair and Maintenance (\$/PMH)	\$ 6.00	
Total Variable Cost (\$/PMH, \$/SMH)	\$ 30.00	\$ 24.00
Total Machine Cost (\$/SMH)	\$ 29.00	

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$29
Day	\$232
Week	\$1,160
Year	\$52,200

8. Labor Cost

For the labor cost, we have 5 employees and pay each an average hourly wage of \$16. Then, we need to consider the cost of per diem: breakfast \$8, lunch \$10, and the dinner \$15, so the total is \$33 per day.

Labor Information	
Labor Rate (Person/hr)	16
Per Diem (Person/day)	33
# of Employees	5

Then, we can calculate the cost of each hour based on the above information.

Per Diem (Person/day)	\$ 33.00			
Labor Rate (Person/hr)	\$ 16.00			
Total Labor Cost (\$/SMH)	\$ 100.63	\$ 805	\$ 4,025	\$ 181,125

Finally, we can get the result of cost each hour, cost each day, cost each week, cost each year respectively.

Hour	\$100.63
Day	\$805
Week	\$4,025
Year	\$181,125

9. Other Costs

The other costs include the license cost and several insurance costs.

	Other Cost per hr	Other Cost per day	Other Cost per yr
Professional License	\$ 0.09	\$ 0.74	\$ 166.67
Worker's Compensation	\$ 19.20	\$ 96.00	\$ 21,600.00
General Liability	\$ 2.78	\$ 22.22	\$ 5,000.00
Inlan Marine Policy	\$ 0.14	\$ 1.11	\$ 250.00
Auto-Policy	\$ 1.11	\$ 8.89	\$ 2,000.00
Total Other Costs	\$ 23.32	\$ 128.96	\$ 29,016.67

10. Total Cost

For the total cost part, we just simply add up all the type of cost together in order to get the total cost per hour, per day, and per year.

Biochar Now Machines:

	Cost per hr	Cost per day	Cost per yr
Pick Up Truck	\$10.91	\$87.29	\$19,640.00
Mobile Grinder	\$34.42	\$275.33	\$61,950.00
Wood Harvest Machine	\$36.40	\$291.17	\$65,512.50
CAT 267B	\$9.37	\$74.97	\$16,868.75
Low Boy	\$9.31	\$74.49	\$16,761.33
Semi-Tractor	\$29.00	\$232.00	\$52,200.00
Chip Van	\$12.37	\$98.92	\$22,258.00
Total Machine Cost	\$141.77	\$1,134.18	\$255,190.58
Direct labor cost	\$80.00	\$640.00	\$144,000.00
Indirect labor cost	\$20.63	\$165.00	\$37,125.00
S,G&A	\$5.56	\$44.44	\$10,000.00
Total Other Cost	\$23.32	\$128.96	\$29,016.67
Total Cost	\$271.27	\$2,112.59	\$475,332.25

AWF Machines:

	Total Cost per hr	Total Cost per day	Total Cost per yr
Pick Up Truck	\$10.91	\$87.29	\$19,640.00
Log Truck	\$20.06	\$160.49	\$36,110.00
Wood Harvest Machine	\$36.40	\$291.17	\$65,512.50
CAT 267B	\$9.37	\$74.97	\$16,868.75
Semi-Tractor	\$29.00	\$232.00	\$52,200.00
Low Boy	\$9.31	\$74.49	\$16,761.33
Total Machine Cost	\$115.05	\$920.41	\$207,092.58
Direct labor cost	\$80.00	\$640.00	\$144,000.00
Indirect labor cost	\$20.63	\$165.00	\$37,125.00
S,G&A	\$5.56	\$44.44	\$10,000.00
Total Other Cost	\$23.32	\$128.96	\$29,016.67
Total Cost	\$244.55	\$1,898.82	\$427,234.25

Loan on Equipment:

Biochar Now: This loan was estimated based on 20% down payment, 6.5% interest rate and 15-year loan.

Wood Harvest Machine	\$275,000
Mobile Grinder	\$240,000
Semi-Tractor	\$100,000
Chip Van	\$50,000
Low Boy	\$35,000
Pick Up Truck	\$30,000
CAT 267B	\$30,000

Total Amount Bought on Loan	\$515,000
Total Amount Bought Outright	\$145,000

Down Payment	\$103,000
Annual Loan Payment	\$26,780

Total Upfront Cost	\$248,000
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AWF: This loan was estimated based on 20% down payment, 6.5% interest rate and 15-year loan.

Wood Harvest Machine	\$275,000
Semi-Tractor	\$100,000
Log Truck	\$60,000
Low Boy	\$35,000
Pick Up Truck	\$30,000
CAT 267B	\$30,000

Total Amount Bought on Loan	\$375,000
Total Amount Bought Outright	\$155,000

Down Payment	\$75,000
Annual Loan Payment	\$19,500

Total Upfront Cost	\$230,000
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Revenue Projection

For the revenue projection, we conservatively assumed the company can cut and grind 7,875 tons in the first year, this projection is based on the research that we have done on the Wood Harvesting Machine and how many tons of trees it would be able to collect in a day. From speaking with multiple salesmen and owners of this machine, we were given a wide range but all were in agreement that 50 tons/day would be optimal and 30 to 40 tons would be most realistic. We then decided on an amount of weeks we believe this business would be actively working in the first year, and based on bad weather days and the amount of jobs we decided 45 weeks of activity to be a practical assumption. We then projected a growth rate of 12.75% each year, which brings us to full capacity in year 5. The sale price we used was \$45 per ton for selling biomass, based on the price range of \$30-\$60 per ton that was given to us from Biochar Now and a charge price of \$75 per hour for collecting biomass because we want to be the most affordable excavating option for landowners and this hourly rate is just under the cheapest option we found in Kansas. These assumptions are below, which also give us our revenue projections.

tons/year	7,875	8,879	10,011	11,288	12,727
sale	45	45	45	45	45
Revenue selling biomass	\$354,375	\$399,558	\$450,501	\$507,940	\$572,703
hours/yr	1800	2,030	2,288	2,580	2,909
charge	\$75	\$75	\$75	\$75	\$75
Revenue collecting biomass	\$135,000	\$152,213	\$171,620	\$193,501	\$218,172
Total Revenue/yr	489,375	551,770	622,121	701,441	790,875

Then, we also predict the best-worst situations of the collection in order to carefully predict the profitability.

Tons Collected	tons/day	tons/week	tons/yr
worst	10	50	1,750
most likely	35	175	7,875
best	50	250	13,000

Later, we use the same method to predict the best-worst situations of selling biomass.

Selling Biomass	price/ton
worst	\$30
most likely	\$45
best	\$65

Finally, we use above forecasted data to calculate the breakeven point of each situation.

Breakeven Point	Cost	tons/yr	Selling Price
worst	\$426,432	1,750	\$243.68
most likely	\$426,432	7,875	\$54.15
best	\$588,151	13,000	\$45.24

Income Statement

We have provided four income statements: one supplying Biochar Now with collection sales, which includes revenue from charging landowners to excavate their land of the woody biomass, another supplying Biochar Now without collection sales, this would not involve a cost to the landowners for clearing their land. And then a scenario if we were to sell to American Wood Fibers, this would increase our revenue because we can sell to them at a rate of \$65/ton and then cut our costs because it would not require a Mobile Grinder but would need a Log Truck, which we estimated would cost \$60,000.

Assumptions	
hours/day	8
days/week	5
weeks/year	45
hours/year	1800
number of employees	5
Employee hourly rate	\$16
tax rate	35.00%
rate of increase	12.75%
sale price	\$45
tons/year	7875
charge\$	\$75
S,G&A	\$10,000

The following is the Income Statement supplying Biochar Now and charging to clear the land.

Woody Supply Business (Supplying Biochar Now)					
Income Statement (w/Collection Sales)					
	2016	2017	2018	2019	2020
Collecting Biomass	\$135,000	\$152,213	\$171,620	\$193,501	\$218,172
Selling Biomass	\$354,375	\$399,558	\$450,901	\$507,940	\$572,703
Total Revenue	\$489,375	\$551,770	\$622,121	\$701,441	\$790,875
Cost of Good Sold					
direct labor	\$144,000	\$162,360	\$183,061	\$206,401	\$232,717
manufacturing overhead	\$37,125	\$37,125	\$37,125	\$37,125	\$37,125
Net Cost of Good Sold	\$181,125	\$199,485	\$220,186	\$243,526	\$269,842
Gross Margin	\$308,250	\$352,285	\$401,935	\$457,915	\$521,033
Operating expenses					
Selling, General and Administrative expenses	\$10,000	\$11,275	\$12,713	\$14,333	\$16,161
Total machine variable cost	146,674	\$165,375	\$186,460	\$210,234	\$237,039
Depreciation and Amortization	\$56,317	\$56,317	\$56,317	\$56,317	\$56,317
Total machine expenses	202,991	221,692	242,777	266,550	293,355
Total Operating Expenses	\$212,991	\$232,967	\$255,489	\$280,884	\$309,516
Non-operating expenses					
Machine Loan Payment	\$26,780	\$26,780	\$26,780	\$26,780	\$26,780
worker's compensation	21,600	\$24,354	\$27,459	\$30,960	\$34,908
worker's license	\$167	\$167	\$167	\$167	\$167
General Liability	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Inlan Marine Policy	\$250	\$250	\$250	\$250	\$250
Auto-Policy	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total Non-operating expenses	\$55,797	\$58,551	\$61,656	\$65,157	\$69,105
EBIT	\$39,462	\$60,768	\$84,790	\$111,874	\$142,412
income tax expenses	\$13,812	\$21,269	\$29,676	\$39,156	\$49,844
net income	\$25,651	\$39,499	\$55,113	\$72,718	\$92,568

Furthermore, we also project the income statement supplying to Biochar Now without collection sales below.

Woody Supply Business (Supplying Biochar Now)					
Income Statement (No Collection Sales)					
	2016	2017	2018	2019	2020
Collecting Biomass	\$0	\$0	\$0	\$0	\$0
Selling Biomass	\$354,375	\$399,558	\$450,501	\$507,940	\$572,703
Total Revenue	\$354,375	\$399,558	\$450,501	\$507,940	\$572,703
Cost of Good Sold					
direct labor	\$144,000	\$162,360	\$183,061	\$206,401	\$232,717
manufacturing overhead	\$37,125	\$37,125	\$37,125	\$37,125	\$37,125
Net Cost of Good Sold	\$181,125	\$199,485	\$220,186	\$243,526	\$269,842
Gross Margin	\$173,250	\$200,073	\$230,316	\$264,414	\$302,860
Operating expenses					
Selling, General and Administrative expenses	\$10,000	\$11,275	\$12,713	\$14,333	\$16,161
Total machine variable cost	146,674	\$165,375	\$186,460	\$210,234	\$237,039
Depreciation and Amortization	\$56,317	\$56,317	\$56,317	\$56,317	\$56,317
Total machine expenses	202,991	221,692	242,777	266,550	293,355
Total Operating Expenses	\$212,991	\$232,967	\$255,489	\$280,884	\$309,516
Non-operating expenses					
Machine Loan Payment	\$26,780	\$26,780	\$26,780	\$26,780	\$26,780
worker's compensation	21,600	\$24,354	\$27,459	\$30,960	\$34,908
worker's license	\$167	\$167	\$167	\$167	\$167
General Liability	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Inlan Marine Policy	\$250	\$250	\$250	\$250	\$250
Auto-Policy	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total Non-operating expenses	\$55,797	\$58,551	\$61,656	\$65,157	\$69,105
EBIT	-\$95,538	-\$91,445	-\$86,830	-\$81,627	-\$75,760
income tax expenses	-\$33,438	-\$32,006	-\$30,390	-\$28,569	-\$26,516
net income	-\$62,099	-\$59,439	-\$56,439	-\$53,057	-\$49,244

As you can see, there is a major difference in net income between charging the landowners to collect the woody biomass and doing this service at no cost to them.

We can see there is a significant difference between with collection and without collection of biomass revenue. In the second income statement, we see an overall loss in net income, which leads us to conclude that it is not in the best interest to supply Biochar Now and not charge the landowners a fee to excavate their land. In conclusion, charging to collect the biomass is crucial for generating profit.

Below is the income statement supplying to AWF without collection sales.

Woody Supply Business (Supplying AWF) Income Statement (No Collection Sales)					
	2016	2017	2018	2019	2020
Collecting Biomass	\$0	\$0	\$0	\$0	\$0
Selling Biomass	\$511,875	\$577,139	\$650,724	\$733,692	\$827,237
Total Revenue	\$511,875	\$577,139	\$650,724	\$733,692	\$827,237
Cost of Good Sold					
direct labor	\$144,000	\$162,360	\$183,061	\$206,401	\$232,717
manufacturing overhead	\$37,125	\$37,125	\$37,125	\$37,125	\$37,125
Net Cost of Good Sold	\$181,125	\$199,485	\$220,186	\$243,526	\$269,842
Gross Margin	\$330,750	\$377,654	\$430,538	\$490,165	\$557,395
Operating expenses					
Selling, General and Administrative expenses	\$10,000	\$11,275	\$12,713	\$14,333	\$16,161
Total machine variable cost	162,709	\$183,455	\$206,845	\$233,218	\$262,953
Depreciation and Amortization	\$44,383	\$44,383	\$44,383	\$44,383	\$44,383
Total machine expenses	207,093	227,838	251,228	277,601	307,337
Total Operating Expenses	\$217,093	\$239,113	\$263,941	\$291,935	\$323,497
Non-operating expenses					
Machine Loan Payment	\$19,500	\$19,500	\$19,500	\$19,500	\$19,500
worker's compensation	21,600	\$24,354	\$27,459	\$30,960	\$34,908
worker's license	\$167	\$167	\$167	\$167	\$167
General Liability	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Inlan Marine Policy	\$250	\$250	\$250	\$250	\$250
Auto-Policy	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total Non-operating expenses	\$48,517	\$51,271	\$54,376	\$57,877	\$61,824
EBIT	\$65,141	\$87,270	\$112,221	\$140,354	\$172,073
income tax expenses	\$22,799	\$30,545	\$39,277	\$49,124	\$60,226
net income	\$42,341	\$56,726	\$72,944	\$91,230	\$111,847

The following is the income statement supplying AWF and charging to clear the land.

Woody Supply Business (Supplying AWF) Income Statement (w/Collection Sales)					
	2016	2017	2018	2019	2020
Collecting Biomass	\$135,000	\$152,213	\$171,620	\$193,501	\$218,172
Selling Biomass	\$511,875	\$577,139	\$650,724	\$733,692	\$827,237
Total Revenue	\$646,875	\$729,352	\$822,344	\$927,193	\$1,045,410
Cost of Good Sold					
direct labor	\$144,000	\$162,360	\$183,061	\$206,401	\$232,717
manufacturing overhead	\$37,125	\$37,125	\$37,125	\$37,125	\$37,125
Net Cost of Good Sold	\$181,125	\$199,485	\$220,186	\$243,526	\$269,842
Gross Margin	\$465,750	\$529,867	\$602,158	\$683,667	\$775,567
Operating expenses					
Selling, General and Administrative expenses	\$10,000	\$11,275	\$12,713	\$14,333	\$16,161
Total machine variable cost	162,709	\$183,455	\$206,845	\$233,218	\$262,953
Depreciation and Amortization	\$44,383	\$44,383	\$44,383	\$44,383	\$44,383
Total machine expenses	207,093	227,838	251,228	277,601	307,337
Total Operating Expenses	\$217,093	\$239,113	\$263,941	\$291,935	\$323,497
Non-operating expenses					
Machine Loan Payment	\$19,500	\$19,500	\$19,500	\$19,500	\$19,500
worker's compensation	21,600	\$24,354	\$27,459	\$30,960	\$34,908
worker's license	\$167	\$167	\$167	\$167	\$167
General Liability	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Inlan Marine Policy	\$250	\$250	\$250	\$250	\$250
Auto-Policy	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Total Non-operating expenses	\$48,517	\$51,271	\$54,376	\$57,877	\$61,824
EBIT	\$200,141	\$239,483	\$283,841	\$333,855	\$390,246
income tax expenses	\$70,049	\$83,819	\$99,344	\$116,849	\$136,586
net income	\$130,091	\$155,664	\$184,497	\$217,006	\$253,660

Recommendations

Kansas Wood Supply has a feasible business model that can be sustained and profitable. However, with an upfront investment of \$248,000 if selling to Biochar Now & \$230,000 if selling to AWF for the equipment needed, and over \$400,000 a year in total operating costs, we believe the main constraint is the amount of woody biomass this company would be able to collect. Given the survey of landowners and the amount that do not believe their land is overpopulated, it is very hard to project the amount of clients that would be interested in paying to have their land excavated of unwanted woody biomass. Along with this major constraint, we are also skeptical of the amount of woody biomass this type of machinery could produce in a given time frame. We conducted a significant amount of research on the Wood Harvesting Machine and there is almost no way to accurately project how many tons of biomass it will be able to produce in a day. There are many different variables that go into this other than getting customers to hire this business, weather conditions being the main unpredictable variable.

However, if this wood supply business were to create a partnership with the EQIP program and establish a client base that could provide a substantial and stable amount of work. This business model does project to be profitable. One major point to notice from the feasibility study is that this business model could be scalable. When looking at the income statements, you can see that it looks to be more beneficial to sell to AWF. The problem with this scenario is that AWF is not interested in purchasing more than 10,000 tons/year. A partnership with Biochar Now would guarantee a buyer for as much woody biomass as we could produce and once the business is established, an investment of another crew could project to drastically improve gross margins and overall profitability.

Appendix a. Survey Email

Good afternoon!

The Kansas Forest Service would appreciate your time to complete the included 10 question survey regarding woody biomass and related industry. Please find attached a letter from the State Forester Larry Biles regarding the survey and the multiple ways to complete the survey.

The quickest way to complete the survey is to follow this link:

<https://www.surveymonkey.com/s/DXCSV2P>

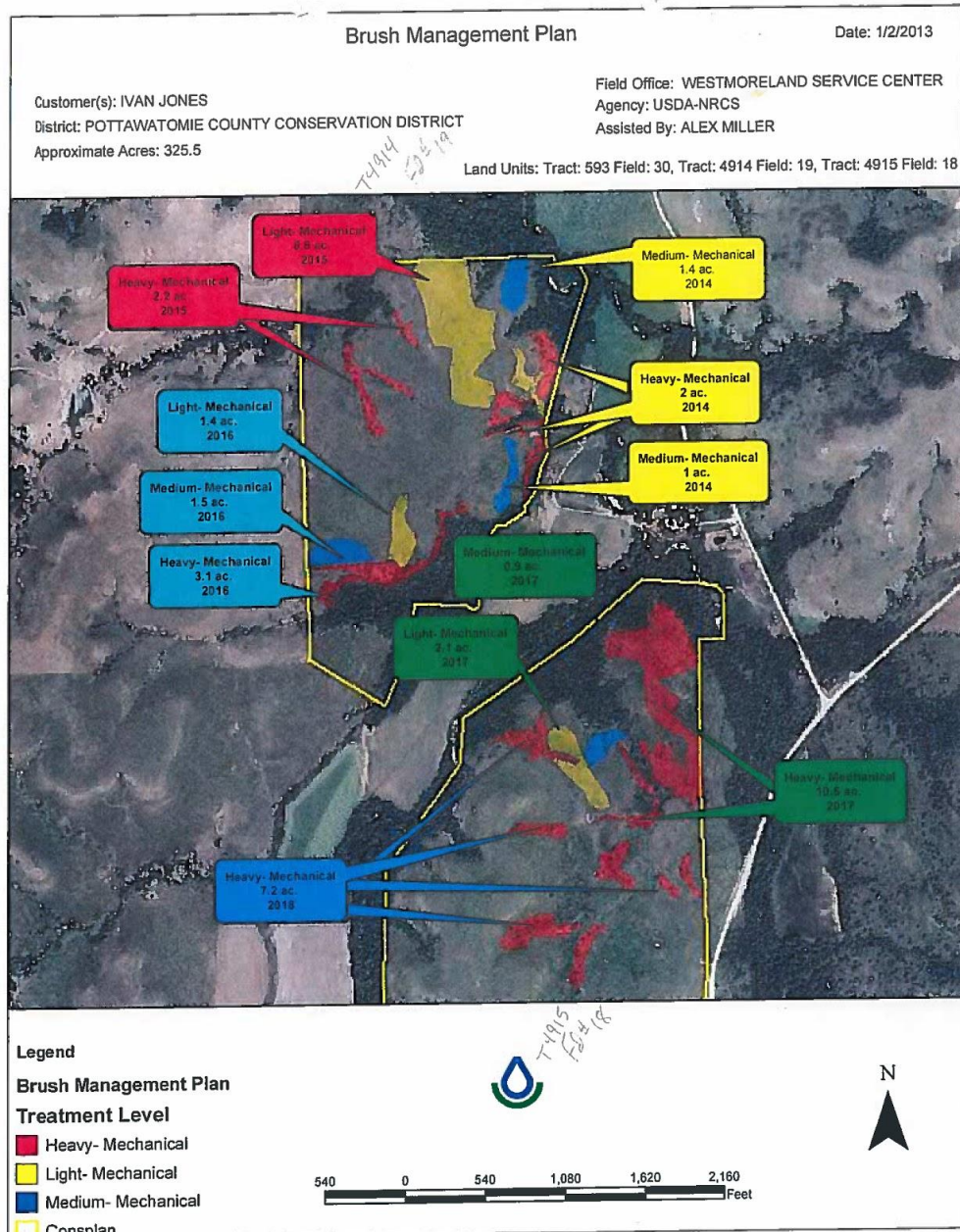
If you prefer a more traditional method, the survey is part of the attachment and can be completed and returned to me either by e-mail (dpaul@ksu.edu) or by mail (2610 Claflin Rd. Manhattan, KS 66502).

All other comments or questions can also be directed to me.

Thanks!

Darci Paull
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Appendix b. EQIP Program Example



US DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE		CONSERVATION PLAN OR SCHEDULE OF OPERATIONS		NRCS-CPA-1155 10/2012	
PARTICIPANT IVAN JONES	COUNTY AND STATE POTTAWATOMIE County, KS	PROGRAM AND CONTRACT NUMBER EQIP 2008 746215131FJ	SUBACCOUNT Grazing Lands Health- Westmoreland		
LAND UNITS OR LEGAL DESCRIPTION Farm:332 Tract(s):4914, 4915.		WATERSHED Bluff Creek	ACRES 290	EXPIRATION DATE 12/30/2020	

Total Cost-Share or Payment by Year							Total Contract Payment
Year	2014	2015	2016	2017	2018		
Amount(\$)	\$931	\$1,362	\$1,270	\$4,543	\$2,262		\$10,368

NOTES: A. All items numbers on form NRCS-CPA-1155 must be carried out as part of this contract to prevent violation.
 B. When established, the conservation practices identified by the numbered items must be maintained by the participant at no cost to the government.
 C. All cost share rates are based on average cost (AC) with the following exceptions:
 AA = Actual cost not to exceed average cost; FR = Flat Rate; NC = Non cost-shared; AM = Actual cost not to exceed a specified maximum; PR = Payment rates.
 D. By signing, the participant acknowledges receipt of this conservation plan including this form NRCS-CPA-1155 and agrees to comply with the terms and conditions here of.

Appendix c. Interviews

Land Excavation Company

Bushwackers – Land Clearing

How many acres can you do in a day? Up to 4 acres in a 10 hour day – ideal conditions

How many people do you have on staff to go to a site?

1 person per machine usually 1 more to manage/help with repairs

How much do you pay them? \$13 – \$15/hr – pay starts when they leave our office, \$47/day per diem

Do you charge to get to the sites? Travel costs hourly rate one direction (\$160)

How do you get your equipment to the site? What kind of mpg does it get?

Semi-truck (6mpg) and at least one pick-up to bring tools and use around the site

What insurance/licenses do you guys have to have? Costs? Personal Liability

What metrics do you use to calculate how much you charge? \$160/hr - \$175/hr

Average amount you charge per job? Jobs are usually between 1-10 acres but can be up to 50

Are there any costs that I might overlook that you can think of? Repairs - up to \$40K in a month

Landowner - Ivan & Vicki Jones

How many acres do you currently own/operate? Live on 650 and rent another 1,500

Do you feel that the land you own is overpopulated with woody biomass? No, but there are areas that could be cleared and be put to better use. That's why we found the EQIP program to help us pay to have the land cleared.

What is the EQIP Program? The USDA and NRCS have what is called the Environmental Quality Incentive Program. The program helps farmers afford to get land cleared to keep healthy land for crops or cattle.

How much did they help you? Over the next 5 years they will give us just over \$10,000 to help pay for us to bring in someone to clear the land.

How do they come up with an amount? They bring someone out to survey the land and come up with an amount per acre that they are willing pay. They they put together a plan over a few years on how much they will give each year and what it will go towards, whether it's light, medium or heavy areas of trees.

How do you decide who cuts the trees? We just hired someone we knew that had the equipment to do it and he just does it on the side. He charges by the hour (\$85).

Would you be interested in using a company that was recommended by someone from the EQIP program? Yes, I think a company that was recommended would be the first one we would think to use, especially if they already know about the EQIP program and could work with them to get us the best price and work in a professional manner. I do like to be able to pay someone I know at the same time so I guess it would just depend on how much of an advantage and how convenient it would be.

Wood Product Company (Possible Buyers)

American Wood Fibers: Clarks, NE

What types of wood do you buy and in what form? Eastern Red Cedar, Cottonwood. 8ft logs, 4-28" in diameter, delimbed

How much would you buy in a year? About 10,000 tons of Red Cedar, usually comes in loads of 23-27 tons

How much do you pay for the logs? \$65/ton, delivered to plant in Clarks, NE

Biochar Now: Loveland, CO

What types of wood do you buy and in what form? Any but cedar would be ideal

How much would you buy in a year?

15,000-20,000 tons - Minimum

60,000 - 75,000 tons - Maximum

How much do you pay for the biomass? Around \$30 but would be willing to pay more if this company would grind the wood because it saves them a step.

* If a wood supply company was to be established, Biochar Now would be interested in bringing a division to Kansas.

Appendix e. Signed Engagement Letter

September 16, 2014

Mr. Larry E. Biles
Kansas Forest Service
2610 Claflin Road
Manhattan, KS 66502

Dear Mr. Biles,

We would like to thank you for taking the time to sit down with us and talk about the possible business opportunity that you are looking at bringing into the state of Kansas. We are looking forward to doing all that we can with this project to help the Kansas Forest Service analyze the feasibility of this plan and hopefully bring to light any unforeseen hurdles and opportunities this business would have. After our initial meeting with you, we have outlined a plan that we believe is realistic to achieve in our time frame and also will be beneficial to you moving forward with this business.

The purpose of this project is to help the Kansas Forest Service develop a feasibility plan for a potential wood supply company so that it can promote the Forest Products Industry in Kansas to entice companies in the wood products industry to expand into our state. This project will result in a business overview and profitability analysis to use when communicating with people to potentially start this business.

The scope of our project is to research and analyze the business opportunity for a potential wood supply company in Kansas. The project will result in a feasibility plan that includes three key elements.

1. The first element is a business overview with an industry and market analysis of the wood supply industry in Kansas. The market analysis will include a survey of landowners to better understand the potential cost associated with clearing land as well as a review of existing research of the wood products industry.
2. The second element is a 5-year profitability analysis including the operating and startup costs; including any core pieces of equipment. This will result in a recommendation on pricing for the pre-processed wood product.
3. The final element will include an analysis of alternative sources of revenue and the potential financial impact on the firm.

The due date of our project will be December 9th, 2014, we will then give our advisors a presentation about this project. The presentation will include the feasibility of a wood supply business, a business overview and 5-year profitability analysis. At the end of our presentation, we will also offer our recommendation to Kansas Forest Service to help it reach its goal in bringing a wood supply business to Kansas to furthermore entice a wood supply product company to Kansas as well.

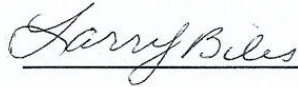
Thank you again for this opportunity and we look forward to working with the Kansas Forest Service to both learn and provide beneficial results that make a tangible difference in your ongoing success.

The proposed timetable for this engagement is as follows:

Sept. 22	Engagement Confirmation
Sept. 23 - Oct. 5	Researching Associated Costs & Surveying Landowners
Oct. 6	Progress Update
Oct. 13 - Oct. 29	Profitability & Feasibility Analysis
Nov. 3	Progress Update
Dec. 9	Final Report Submitted
Dec. 9 - Dec. 16	Final Results Presentation

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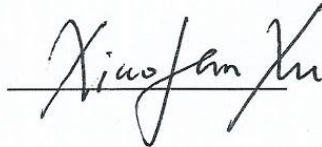
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