Home on the Market Range: A Land Feasibility Analysis for Large-Scale Bison Farming

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**Home on the Market Range**

**A Land Feasibility Analysis for Large-Scale Bison Farming**

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**ENVR 320 Research Colloquium Project, Spring 2017**

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**Abstract**
The current beef industry is unsustainable and destructive. Battling against increasing industrialization, new options are being assessed. Bison, being equal in carcass weight but different in land use, sustainability, and labor, seems like a positive option. However, is there enough land to support an equal number of bison? To answer this question, interviews and research materials were used to create a land feasibility analysis. It found that 69% of the focus area, mostly in the Dakotas, could convert and be as productive as current beef producers. Feedlots present an issue since they are acreage-efficient, but the final conclusion remains that land is not a barrier.

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**Methods**
In order to increase accuracy, five states were chosen as the focus area. Data was collected through interviews and government sites. This data was then manipulated into state-specific acreage calculations. A generic version is shown in Figure 1. And Table 1 shows the final acreages calculated. These were used to answer three questions: how many acres are currently used for beef, what is beef’s productivity, and how many bison could be grown using the same amount. After working the data, maps were made in GIS to graphically display the results.

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**Results**
Figures 2, 3, and 4 show the focus area under different conditions. Looking at the 102 counties, 70 would be more productive with bison than they currently are with beef. South Dakota and North Dakota seem to show the most potential and Nebraska the least.

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**Table 1.**  
After conducting interviews and calculations, these were the final numbers produced for acreage needed by one head for each state.

<table>
<thead>
<tr>
<th>State</th>
<th>Calf Cow Acreage</th>
<th>Feedlot Acreage</th>
<th>Bison Acreage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montana</td>
<td>15.867</td>
<td>.369</td>
<td>15</td>
</tr>
<tr>
<td>Nebraska</td>
<td>6.358</td>
<td>.453</td>
<td>17</td>
</tr>
<tr>
<td>North Dakota</td>
<td>20.867</td>
<td>.364</td>
<td>18</td>
</tr>
<tr>
<td>South Dakota</td>
<td>15.242</td>
<td>.364</td>
<td>12</td>
</tr>
<tr>
<td>Wyoming</td>
<td>17.17</td>
<td>.364</td>
<td>18</td>
</tr>
</tbody>
</table>

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**Figure 2.** is a map made from the current beef production found in the study area. It shows the average number of cattle per farm in each of the 102 counties. Figure 2 was made with data from the National Agriculture Statistics Service using ArcGIS.  
**Figure 3.** takes the same acreage used in Figure 2 and calculates the carrying capacity potential for bison. This can be used to discover which land is best suited for large-scale bison farming. Based on the map, South Dakota and Montana have the highest carrying capacity. Figure 3 was made with calculations derived from interviews and created through ArcGIS.

**Figure 4.** breaks the study area up into quartiles based on their productivity of bison over beef. The dark blue counties show those that have the most to gain by switching to bison with 84% being in North and South Dakota. Nebraska had the least with 0 positive transition counties. Figure 4 was made by comparing the two maps directly above and was created through ArcGIS.

**Conclusions**
Almost 70% of farms would have an increased production by switching to bison with an average increase of 9 head. North and South Dakota showed the most potential for large-scale bison farms. Feedlots, because they are acreage-efficient, would struggle to transition to anything besides beef. Land, so it seems, is not the barrier stopping this industry.