Alternative #1

Status Quo

\[
IDFVI_{t+2} = -26.44 + (0.54678 \text{ FVI}_t) + (0.34163 \text{ BCPI}_t) - (0.25416 \text{ PPI}_t) + (0.73536 \text{ IDFVI}_t)
\]

\[
$/AUM = \frac{IDFVI_{t+2}}{100} \times $1.70 \text{ base fee}
\]

Where:

IDFVI_{t+2} = Idaho Private Lease Index at time t + 2 (or, 2 years in the future)
FVI_t = 11 Western State Private Lease Rate Index at time t (or, present)
BCPI_t = US Cattle Price Index at time t
PPI_t = Prices Paid Index (cattle inputs) at time t
IDFVI_t = Idaho Private Lease Index at time t

*Indexed to the price of forage in 1993*
Alternative #2

Wyoming Model

$/AUM = (Idaho private grazing fee) \times (5\text{-}yr \text{ average BCPR}) \times (100\% \text{ adjustment factor})

Where:
- Private fee = Idaho 5-year average private grazing rate
- BCPR = 5-year weighted average Beef Cattle Parity Ratio
- Adjustment = costs of harvesting forage from isolated parcels

_measure of purchasing power of products sold versus inputs used_
Alternative #3
Calf Crop Share

$/AUM = (((A \times B) + (A \times B \times C)D)/2 \times E)
12 months

Where:
A = 550 lb Annual Steer Average ($/head)
B = Weaning Percentage Average
C = Heifer Weight Average Percentage
D = Average Heifer Discount
E = Calf Crop Index (based on UI average pasture costs)

*only variable that changes annually; remaining are static unless changed upon review of 5-year averages*
Alternative #4

Market Rate

$/AUM = future market rate

- Negotiated grazing fee established using the current public auction process
- No minimum bid or base fee is required
  - IDL would establish a target grazing rate, after taking into account LEV and ROA, to be selected on a regional basis after consultation with Callan and consideration of regional factors and department costs.
  - If no bid meets or exceeds the target grazing rate, IDL must determine whether the interests of the endowment are better fulfilled by: (1) not offering the property for lease, or (2) accepting a bid below the target on the principle that “something is better than nothing.”
  - In making such a decision, IDL will take into account costs incurred in not offering a lease, including the potential cost of fencing the property to exclude livestock.
Alternative #5

Revised Status Quo

\[
\text{IDFVI}_{t+2} = 13.85 + (FVI_t) + (BCPI_t) - (PPI_t) + (0.9967 \text{ IDFVI}_t)
\]

\[
$/AUM = \frac{\text{IDFVI}_{t+2}}{100} \times 1.70 \text{ base fee}
\]

Where:

\(\text{IDFVI}_{t+2}\) = Idaho Private Lease Index at time \(t + 2\) (or, 2 years in the future)

\(\text{IDFVI}_t\) = Idaho Private Lease Index at time \(t\)

removes highly correlated variables, and retains the 1993 base adjustment fee
Montana Model

Alternative #6

IDPLR multiplier \(= 0.70 \times \frac{IDPLR_t}{BCP_t}\)
\[= 0.70 \times \frac{$17.34}{$1.2008} = 10.11 \text{ (2016 example)}\]

$/AUM = BCP_t \times IDPLR \text{ multiplier}

Where:
- \(BCP_t\) = 11 Western States Beef Cattle Price at time \(t\)
- IDPLR multiplier = 70% of Idaho private lease rate (IDPLR), indexed at time \(t\)

*indexed to the price of beef cattle in 2016*
Table 1. Historic grazing rates as calculated by alternative (2011-2016).

<table>
<thead>
<tr>
<th></th>
<th>Alternative #1</th>
<th>Alternative #2</th>
<th>Alternative #3</th>
<th>Alternative #4</th>
<th>Alternative #5</th>
<th>Alternative #6</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Status quo</td>
<td>WY model</td>
<td>Calf-crop share</td>
<td>Market rate</td>
<td>Rev. status quo</td>
<td>MT model</td>
</tr>
<tr>
<td>2011</td>
<td>$5.13</td>
<td>$5.44</td>
<td>$6.97</td>
<td>NA</td>
<td>$5.35</td>
<td>$10.50</td>
</tr>
<tr>
<td>2012</td>
<td>$5.25</td>
<td>$5.68</td>
<td>$7.97</td>
<td>NA</td>
<td>$5.47</td>
<td>$10.85</td>
</tr>
<tr>
<td>2013</td>
<td>$6.36</td>
<td>$6.01</td>
<td>$8.00</td>
<td>NA</td>
<td>$6.57</td>
<td>$10.85</td>
</tr>
<tr>
<td>2014</td>
<td>$6.89</td>
<td>$7.24</td>
<td>$11.62</td>
<td>NA</td>
<td>$7.10</td>
<td>$11.55</td>
</tr>
<tr>
<td>2015</td>
<td>$6.77</td>
<td>$7.36</td>
<td>$12.02</td>
<td>NA</td>
<td>$6.98</td>
<td>$11.90</td>
</tr>
<tr>
<td>2016</td>
<td>$8.09</td>
<td>$7.27(^1)</td>
<td>$9.19</td>
<td>NA</td>
<td>$8.30</td>
<td>$12.15</td>
</tr>
</tbody>
</table>

\(^1\) Based on forecasted private lease rate, and beef cattle parity ratio for 2016.

Because past and future market rates for public leases are unknown, no attempt was made to estimate a market rate.
### Table 2: Effect of Grazing Fee and Discount Rate on ROA (nominal)

<table>
<thead>
<tr>
<th>Benchmark ROA (3.5%)</th>
<th>Alt #1 Status quo</th>
<th>Alt #2 WY model</th>
<th>Alt #3 Calf-crop</th>
<th>Alt #4 Market rate</th>
<th>Alt #5 Rev status quo</th>
<th>Alt #6 MT model</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Grazing rate</td>
<td>$12.15</td>
<td>$8.09</td>
<td>$7.27</td>
<td>$9.19</td>
<td>NA</td>
<td>$8.30</td>
</tr>
<tr>
<td>(b) IDL cash expenditures ($/AUM)</td>
<td>$4.59</td>
<td>$4.59</td>
<td>$4.59</td>
<td>$4.59</td>
<td>NA</td>
<td>$4.59</td>
</tr>
<tr>
<td>(c) Net income from grazing ($/AUM)</td>
<td>$7.56</td>
<td>$3.50</td>
<td>$2.69</td>
<td>$4.61</td>
<td>NA</td>
<td>$3.71</td>
</tr>
</tbody>
</table>

### Net Income Calculation: 2016 Actual Values ($/AUM)

- (a) Grazing rate $12.15
- (b) IDL cash expenditures ($/AUM) $4.59
- (c) Net income from grazing ($/AUM) $7.56

### Net Income Calculation: 2011-2016 Actual Values ($/AUM)

- (d) Grazing fee $12.15
- (e) IDL cash expenditures ($/AUM) $4.92
- (f) Net income from grazing ($/AUM) $7.23

### Land Expectation Value (LEV) Calculation: 2011-2016 Net Income Average Values ($/Acre; 1.8 million acres)

- (g) LEV @ 2% discount interest rate $52.76
- (h) LEV @ 3% discount interest rate $35.17
- (i) LEV @ 4% discount interest rate $26.38
- (j) LEV @ 5% discount interest rate $21.10
- (k) LEV @ 6% discount interest rate $17.59

### Return on Assets (ROA) Calculation: 2016 Grazing Net Income / Fair Market Value (LEV)

- (l) ROA with LEV @ 2% interest rate 2.0%
- (m) ROA with LEV @ 3% interest rate 3.0%
- (n) ROA with LEV @ 4% interest rate 4.0%
- (o) ROA with LEV @ 5% interest rate 5.0%
- (p) ROA with LEV @ 6% interest rate 6.0%

1. Assumed minimum grazing rate required to meet the recommended 3.5% nominal ROA (Becker-Wold et al. 2014).
2. Past and future market rates are unknown, as are likely increases in administrative costs.
Criteria A: Formula is consistent with fiduciary responsibility (Article 9, Section 8)

<table>
<thead>
<tr>
<th>Alternative #1: Status Quo</th>
<th>- Failed to meet benchmark rate of return for years analyzed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative #2: Wyoming Model</td>
<td>- Failed to meet benchmark rate of return for years analyzed</td>
</tr>
<tr>
<td>Alternative #3: Calf-Crop Share</td>
<td>+ Meets benchmark rate of return for some years and discount rates</td>
</tr>
<tr>
<td></td>
<td>- Rate corresponds closely with livestock prices, which fluctuates greatly</td>
</tr>
<tr>
<td>Alternative #4: Market Rate</td>
<td>+ Accepted bids required to meet benchmark rate</td>
</tr>
<tr>
<td></td>
<td>- Unknown administrative costs</td>
</tr>
<tr>
<td></td>
<td>- Difficult to set regional LEV/ROA benchmarks</td>
</tr>
<tr>
<td>Alternative #5: Revise Status Quo</td>
<td>- Failed to meet benchmark rate of return for years analyzed</td>
</tr>
<tr>
<td>Alternative #6: Montana Model</td>
<td>+ Meets benchmark rate of return</td>
</tr>
<tr>
<td></td>
<td>- Rate corresponds closely with livestock prices, which fluctuate greatly</td>
</tr>
</tbody>
</table>
Criteria B: Formula is a defensible process driven by market data

| Alternative #1: Status Quo | + Recognized process for deriving grazing rates  
|                           | - $1.70/AUM base adjustment factor is dated (1993)  
|                           | - Multicollinearity  
| Alternative #2: Wyoming Model | + Formula is driven by market data  
|                           | + Rate tracks closely with the Status Quo  
| Alternative #3: Calf-Crop Share | + Highly responsive to market data  
|                           | + Inputs track closely with livestock markets  
| Alternative #4: Market Rate | + Highly responsive to market data  
|                           | - Lessees could work together to set prices  
|                           | - Difficult to set regional LEV/ROA benchmarks  
| Alternative #5: Revise Status Quo | + Corrects statistical issues with the Status Quo formula  
|                           | - $1.70/AUM base adjustment factor is dated (1993)  
| Alternative #6: Montana Model | + Highly responsive to market data  
|                           | + Inputs track closely with livestock markets  
|                           | - Private lease rates vary significantly by region  

Criteria C: Formula optimizes management that supports long-term sustainability

<table>
<thead>
<tr>
<th>Alternative #1: Status Quo</th>
<th>+ Less likely to generate wide price swings that affect lessees’ management practices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative #2: Wyoming Model</td>
<td>+ Less likely to generate wide price swings that affect lessees’ management practices</td>
</tr>
<tr>
<td>Alternative #3: Calf-Crop Share</td>
<td>- Wide price swings could alter lessees’ management practices</td>
</tr>
</tbody>
</table>
| Alternative #4: Market Rate | + Greater ability to remove problem lessees  
- Wide price swings could alter lessees’ practices  
- Could erode ranch asset value appraisals |
| Alternative #5: Revise Status Quo | + Less likely to generate wide price swings that affect lessees’ management practices |
| Alternative #6: Montana Model | + Rest-rotation incentives and reduced rates encourage conservation  
- Transition to higher fees could offset incentives to conserve forage |
# Criteria D: Transparent formula that is practical and efficient to administer

<table>
<thead>
<tr>
<th>Alternative #1: Status Quo</th>
<th>+ Widely understood and accepted process; market data readily available</th>
<th>- Base adjustment factor lacks transparency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative #2: Wyoming Model</td>
<td>+ Market data readily available</td>
<td>+ Effective implementation in neighboring state</td>
</tr>
<tr>
<td></td>
<td>+ Straightforward formula</td>
<td></td>
</tr>
<tr>
<td>Alternative #3: Calf-Crop Share</td>
<td>+ Livestock market data are readily available</td>
<td>- Underlying indices lack transparency; requires frequent re-measurement</td>
</tr>
<tr>
<td>Alternative #4: Market Rate</td>
<td>+ Reflects perception of short term livestock futures</td>
<td>- Short term leases likely to increase administrative costs</td>
</tr>
<tr>
<td>Alternative #5: Revise Status Quo</td>
<td>+ Inputs are similar to Status Quo; market data readily available</td>
<td>- Base adjustment factor lacks transparency</td>
</tr>
<tr>
<td>Alternative #6: Montana Model</td>
<td>+ Widely understood data inputs; market data readily available</td>
<td>+ Straightforward formula</td>
</tr>
<tr>
<td></td>
<td>- Base year multiplier requires periodic review</td>
<td></td>
</tr>
<tr>
<td>Alternative #1: Status Quo</td>
<td>+ Predictable process with slow rate of change</td>
<td>- 2-year lag rate does not reflect real time markets</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------------------</td>
<td>--------------------------------------------------</td>
</tr>
<tr>
<td>Alternative #2: Wyoming Model</td>
<td>+ Predictable process with slow rate of change</td>
<td>+ Does not require base adjustment factors</td>
</tr>
<tr>
<td>Alternative #3: Calf-Crop Share</td>
<td>+ Rate corresponds closely to livestock price</td>
<td>- Potential for wide price swings</td>
</tr>
<tr>
<td>Alternative #4: Market Rate</td>
<td>+ Rate corresponds closely to livestock price</td>
<td>+ Predictable financial performance if using LEV/ROA targets</td>
</tr>
<tr>
<td>Alternative #5: Revise Status Quo</td>
<td>+ Predictable process with slow rate of change</td>
<td>- Difference from private lease rate is widening</td>
</tr>
<tr>
<td>Alternative #6: Montana Model</td>
<td>+ Rate corresponds closely to livestock prices and lease rates</td>
<td>+ Rate reduction provisions could increase willingness to pay</td>
</tr>
</tbody>
</table>
Common Issues

Data Limitations

- **Data availability**
  - access and consistency may vary from year to year
  - scale of resolution varies by variable (e.g., 11 western states BCP vs Idaho BCP)

- **Time lag**
  - data often not available until the following year
  - required notification period

- **Regional variation**
  - private lease rates, range conditions, target ROAs may vary significantly by region
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