POLICY ANALYSIS GROUP

Grazing Rate Review – Analysis of Alternatives (April 25, 2017)

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Alternative #1

Status Quo

$$IDFVI_{t+2} = -26.44 + (0.54678\ FVI_t) + (0.34163\ BCPI_t) - (0.25416\ PPI_t) + (0.73536\ IDFVI_t)$$

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

indexed to the price of forage in 1993

Where:

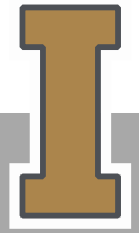
$IDFVI_{t+2}$ = Idaho Private Lease Index at time t + 2 (or, 2 years in the future)

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



Alternative #2

Wyoming Model

$/AUM = (Idaho private grazing fee) x (5-yr average BCPR) x (100% adjustment factor)

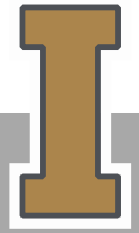
Where:

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

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

Where:

A = 550 lb Annual Steer Average ($/head)

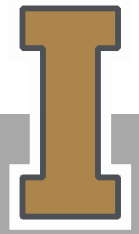
B = Weaning Percentage Average

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

$IDFVI_{t+2} = 13.85 + (\sout{FVI_t}) + (\sout{BCPI_t}) - (\sout{PPI_t}) + (0.9967\ IDFVI_t)$

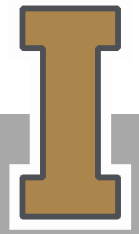
$\$/AUM = IDFVI_{t+2} / 100) \times \$1.70$ base fee

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

Where:

$IDFVI_{t+2}$ = Idaho Private Lease Index at time t + 2 (or, 2 years in the future)

$IDFVI_t$ = Idaho Private Lease Index at time t



Alternative #6

Montana Model

IDPLR multiplier = $0.70 \times IDPLR_t / BCP_t$

= $0.70 \times \$17.34 / \$1.2008 = 10.11$ (2016 example)

$/AUM = $BCP_t \times$ IDPLR multiplier

indexed to the price of beef cattle in 2016

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

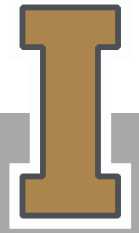


Table 1. Historic grazing rates as calculated by alternative (2011-2016).

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

[1] Based on forecasted private lease rate, and beef cattle parity ratio for 2016.

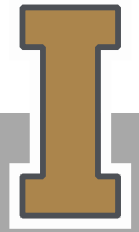
because past and future market rates for public leases are unknown, no attempt was made to estimate a market rate

Table 2. Effect of grazing fee and discount rate on ROA (nominal)

	Benchmark ROA (3.5%)[1]	Alt #1 Status quo	Alt #2 WY model	Alt #3 Calf-crop	Alt #4 Market rate[2]	Alt #5 Rev status quo	Alt #6 MT model
Net Income Calculation: 2016 Actual Values ($/AUM)							
(a) Grazing rate	$12.15	$8.09	$7.27	$9.19	NA	$8.30	$12.15
(b) IDL cash expenditures ($/AUM)	$4.59	$4.59	$4.59	$4.59	NA	$4.59	$4.59
(c) Net income from grazing ($/AUM)	$7.56	$3.50	$2.69	$4.61	NA	$3.71	$7.55
Net Income Calculation: 2011-2016 Actual Values ($/AUM)							
(d) Grazing fee	$12.15	$6.42	$6.50	$9.30	NA	$6.63	$11.30
(e) IDL cash expenditures ($/AUM)	$4.92	$4.92	$4.92	$4.92	NA	$4.92	$4.92
(f) Net income from grazing ($/AUM)	$7.23	$1.50	$1.58	$4.38	NA	$1.71	$6.38
Land Expectation Value (LEV) Calculation: 2011-2016 Net Income Average Values ($/Acre; 1.8 million acres)							
(g) LEV @ 2% discount interest rate	$52.76	$10.92	$11.55	$31.94	NA	$12.49	$46.54
(h) LEV @ 3% discount interest rate	$35.17	$7.28	$7.70	$21.29	NA	$8.32	$31.03
(i) LEV @ 4% discount interest rate	$26.38	$5.46	$5.77	$15.97	NA	$6.24	$23.27
(j) LEV @ 5% discount interest rate	$21.10	$4.37	$4.62	$12.77	NA	$4.99	$18.62
(k) LEV @ 6% discount interest rate	$17.59	$3.64	$3.85	$10.65	NA	$4.16	$15.51
Return on Assets (ROA) Calculation: 2016 Grazing Net Income / Fair Market Value (LEV)							
(l) ROA with LEV @ 2% interest rate	2.0%	0.9%	0.7%	1.2%	NA	1.0%	2.0%
(m) ROA with LEV @ 3% interest rate	3.0%	1.4%	1.1%	1.8%	NA	1.5%	3.0%
(n) ROA with LEV @ 4% interest rate	4.0%	1.9%	1.4%	2.4%	NA	2.0%	4.0%
(o) ROA with LEV @ 5% interest rate	5.0%	2.3%	1.8%	3.1%	NA	2.5%	5.0%
(p) ROA with LEV @ 6% interest rate	6.0%	2.8%	2.1%	3.7%	NA	3.0%	6.0%

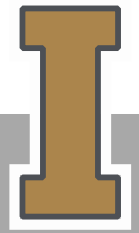
[1] Assumed minimum grazing rate required to meet the recommended 3.5% nominal ROA (Becker-Wold et al. 2014).

[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)

Alternative #1: Status Quo	- Failed to meet benchmark rate of return for years analyzed
Alternative #2: Wyoming Model	- Failed to meet benchmark rate of return for years analyzed
Alternative #3: Calf-Crop Share	+ Meets benchmark rate of return for some years and discount rates - Rate corresponds closely with livestock prices, which fluctuates greatly
Alternative #4: Market Rate	+ Accepted bids required to meet benchmark rate - Unknown administrative costs - Difficult to set regional LEV/ROA benchmarks
Alternative #5: Revise Status Quo	- Failed to meet benchmark rate of return for years analyzed
Alternative #6 Montana Model	+ Meets benchmark rate of return - Rate corresponds closely with to livestock prices, which fluctuate greatly



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

Alternative #1: Status Quo	+ Less likely to generate wide price swings that affect lessees' management practices
Alternative #2: Wyoming Model	+ Less likely to generate wide price swings that affect lessees' management practices
Alternative #3: Calf-Crop Share	- Wide price swings could alter lessees' management practices
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

Alternative #1: Status Quo	+ Widely understood and accepted process; market data readily available - Base adjustment factor lacks transparency
Alternative #2: Wyoming Model	+ Market data readily available + Effective implementation in neighboring state + Straightforward formula
Alternative #3: Calf-Crop Share	+ Livestock market data are readily available - Underlying indices lack transparency; requires frequent re-measurement
Alternative #4: Market Rate	+ Reflects perception of short term livestock futures - Short term leases likely to increase administrative costs
Alternative #5: Revise Status Quo	+ Inputs are similar to Status Quo; market data readily available - Base adjustment factor lacks transparency
Alternative #6 Montana Model	+ Widely understood data inputs; market data readily available + Straightforward formula - Base year multiplier requires periodic review

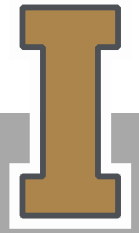
Criteria E: Formula is fair, predictable and certain for both parties

Alternative #1: Status Quo	+	Predictable process with slow rate of change
	-	2-year lag rate does not reflect real time markets
	-	Difference from private lease rate is widening over time
Alternative #2: Wyoming Model	+	Predictable process with slow rate of change
	+	Does not require base adjustment factors
Alternative #3: Calf-Crop Share	+	Rate corresponds closely to livestock price
	-	Potential for wide price swings
Alternative #4: Market Rate	+	Rate corresponds closely to livestock price
	+	Predictable financial performance if using LEV/ROA targets
	-	Potential for wide price swings
Alternative #5: Revise Status Quo	+	Predictable process with slow rate of change
	-	Difference from private lease rate is widening
Alternative #6 Montana Model	+	Rate corresponds closely to livestock prices and lease rates
	+	Rate reduction provisions could increase willingness to pay
	-	Potential for wide price swings

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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