Break-Even Efficiency Model:

$$R(1 - e_I)(P + T) = \sum_{i}^{I} MP_i$$

Where:

R = probability of a wolf/livestock conflict

e = Efficiency of mitigation practice, i, or combination of a mitigation practices combined (I)

P = Market price/head of the predated animal

T = Transaction cost/head (i.e. additional costs past the market value of the livestock animal

MP = Cost of Management practice, where i = :

    CF = Annual cost of turbo fladry installation and maintenance per head (adjust from per mile)

    CR = Annual cost of range-riding per head (adjust from range size)

    CC = Annual cost of carcass composting per head

To re-write the equation in terms of efficiency:

$$e = 1 - \frac{(\sum_{i}^{I} MP_i)}{R(P + T)}$$

Explanation and Intuition:

The purpose of the equation is to understand how efficient a mitigation practice, or combination of practices, would need to be for the cost of the mitigation practice/s to cover or break even with a potential lost income. A rancher may choose to consider employing one practice or a combination of practices, so the numerator in the above equation will not have that exact combination of practices every time, but rather the total annualized cost of the practice/s of interest. In the original equation, e, the term for efficiency is subtracted from one so that the term (1 - e) is the remaining probability of predation after accounting for the effectiveness of the practice.

Example:

(These are completely arbitrary numbers and simply serve the purpose of model explanation)

$R = 0.70$

$P = \$1600$

$T = \$300$

$CF = 1{,}205$

$CR = $ N/A

$CC = $ N/A

$$e = 1 - \frac{1205}{0.7 * (1600 + 300)}$$

$$e = 1 - \frac{1205}{1330}$$

$$e = 0.094$$

The mitigation practice, in this case, turbo fladry would have to be 9.4% effective to break even.

**This table is meant to show how varying levels of practice efficiency in conjunction with a specific scenario of potential lost income and mitigation practice loss can impact the ability to break-even as well as gain or lose money from practice efficiency

EFFICIENCY OF PRACTICE (%)	LOST INCOME ($)	COST OF MITIGATION PRACTICE ($)	GAIN ($)
0.05	1330	1205	-58.5
0.094	1330	1205	0.0
0.1	1330	1205	8
0.15	1330	1205	74.5
0.2	1330	1205	141
0.25	1330	1205	207.5
0.3	1330	1205	274
0.35	1330	1205	340.5
0.4	1330	1205	407
0.45	1330	1205	473.5
0.5	1330	1205	540
0.55	1330	1205	606.5
0.6	1330	1205	673
0.65	1330	1205	739.5
0.7	1330	1205	806
0.75	1330	1205	872.5
0.8	1330	1205	939
0.85	1330	1205	1005.5
0.9	1330	1205	1072
0.95	1330	1205	1138.5
1	1330	1205	1205

Break-even point