How to Optimize the Chance of Catching Metang in the HGSS Safari Zone

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Odds for Metang to be caught do not change when bait is thrown.
a = Odds of Capture (0.4159%)
However, Metang's Flee rate will change from its base rate of 60 to: 60*2//(**b**+2), where **b** is the number of thrown bait. The flee rate will always be rounded to the nearest integer (hence the //)

Metang's chance to flee is equal to: (flee rate + 1)/255

b = 0: Odds of flee per turn (base) (**23.92%**)
b = 1: Odds of flee per turn after one bait (**16.08%**)
…
b = 6: Odds of flee per turn after six bait (**6.27%**)

The functions below can be used to model the odds of throwing **z** bait without Metang fleeing. **y** is the number of bait already thrown, **p** is the probability of reaching the current turn.

$$0 > x, x >= z: p$$

$$b(y, p, z) = \begin{cases} \\ 0 <= x <= 6: t(y, p, z) \end{cases}$$

t(y, p, z) = **b**(**y** + 1, **p** * (1- **r**(**y**)), **z**)

r(y) = (((60 * 2) // (**y** + 2)) + 1) / 255

b(0, 1, 6) = 0.431434

The probability of throwing **6** bait without Metang fleeing is **43.14%**

The functions below demonstrate how the probability of catching Metang work. **x** will be the number of currently thrown balls, **p** will be the probability of reaching the current turn, **y** is the number of bait already thrown

$$0 > x, x >= 30: 0$$

$$f(x, p, y) \begin{cases} = \\ 0 <= x < 30: g(x, p, y) \end{cases}$$

g(x, p, y) = (**p** * **a**) + **f**(**x** + 1, **h**(**p**, **y**), **y**)

h(p, y) = (**p** * (1 − **a**)) * (1 − **r**(**y**))

f(0, 1, 0) = 0.017155 - Odds with balls only (**1.72%**)
f(0, **b**(0, 1, 1), 1) = 0.019173 - Odds to capture with one bait (**1.92%**)
f(0, **b**(0, 1, 2), 2) = 0.0208229 - Odds of capture with two bait (**2.08%**)
…

f(0, **b**(0, 1, 5), 5) = 0.023386 - Odds of capture with five bait (**2.34%**)
f(0, **b**(0, 1, 6), 6) = 0.023525 - Odds of capture with SIX FREAKING BAIT (**2.35%**)

METANG OPTIMAL # BAIT BY BALLS REMAINING

	0 BAIT	1 BAIT	2 BAIT	3 BAIT	4 BAIT	5 BAIT	6 BAIT
30 BALLS	1.7156%	1.9173%	2.0823%	2.2001%	2.2781%	2.3386%	**2.3525%**
29 BALLS	1.7154%	1.9156%	2.0768%	2.1897%	2.2627%	2.3181%	**2.3282%**
28 BALLS	1.7152%	1.9135%	2.0705%	2.1782%	2.2458%	2.2960%	**2.3022%**
27 BALLS	1.7150%	1.9110%	2.0634%	2.1653%	2.2273%	2.2721%	**2.2743%**
26 BALLS	1.7147%	1.9081%	2.0552%	2.1510%	2.2071%	**2.2463%**	2.2444%
25 BALLS	1.7143%	1.9045%	2.0458%	2.1351%	2.1850%	**2.2184%**	2.2124%
24 BALLS	1.7138%	1.9002%	2.0351%	2.1174%	2.1608%	**2.1882%**	2.1781%
23 BALLS	1.7131%	1.8951%	2.0229%	2.0976%	2.1343%	**2.1556%**	2.1414%
22 BALLS	1.7121%	1.8890%	2.0089%	2.0756%	2.1053%	**2.1204%**	2.1021%
21 BALLS	1.7109%	1.8817%	1.9929%	2.0511%	2.0736%	**2.0824%**	2.0599%
20 BALLS	1.7093%	1.8730%	1.9746%	2.0239%	2.0389%	**2.0413%**	2.0147%
19 BALLS	1.7072%	1.8625%	1.9537%	1.9935%	**2.0010%**	1.9969%	1.9663%
18 BALLS	1.7044%	1.8500%	1.9298%	**1.9598%**	1.9594%	1.9490%	1.9145%
17 BALLS	1.7007%	1.8350%	1.9025%	**1.9222%**	1.9139%	1.8972%	1.8589%
16 BALLS	1.6958%	1.8171%	1.8713%	**1.8803%**	1.8642%	1.8412%	1.7994%
15 BALLS	1.6893%	1.7957%	**1.8356%**	1.8337%	1.8097%	1.7807%	1.7356%
14 BALLS	1.6807%	1.7700%	**1.7948%**	1.7818%	1.7501%	1.7153%	1.6673%
13 BALLS	1.6695%	1.7393%	**1.7481%**	1.7240%	1.6849%	1.6447%	1.5941%
12 BALLS	1.6546%	**1.7026%**	1.6948%	1.6597%	1.6136%	1.5684%	1.5157%
11 BALLS	1.6350%	**1.6586%**	1.6338%	1.5881%	1.5355%	1.4860%	1.4316%
10 BALLS	**1.6091%**	1.6060%	1.5641%	1.5083%	1.4500%	1.3969%	1.3416%
9 BALLS	**1.5749%**	1.5431%	1.4845%	1.4196%	1.3565%	1.3007%	1.2451%
8 BALLS	**1.5297%**	1.4678%	1.3934%	1.3207%	1.2542%	1.1967%	1.1418%
7 BALLS	**1.4701%**	1.3777%	1.2893%	1.2107%	1.1423%	1.0844%	1.0311%
6 BALLS	**1.3915%**	1.2699%	1.1703%	1.0882%	1.0197%	0.9630%	0.9124%
5 BALLS	**1.2877%**	1.1409%	1.0343%	0.9518%	0.8856%	0.8319%	0.7853%
4 BALLS	**1.1506%**	0.9866%	0.8788%	0.8000%	0.7389%	0.6902%	0.6491%
3 BALLS	**0.9698%**	0.8019%	0.7010%	0.6310%	0.5784%	0.5372%	0.5032%
2 BALLS	**0.7310%**	0.5809%	0.4978%	0.4428%	0.4027%	0.3718%	0.3469%
1 BALL	**0.4159%**	0.3164%	0.2655%	0.2333%	0.2104%	0.1931%	0.1794%

SAFARI GAME FLEE RATES

	Stage	-6	-5	-4	-3	-2	-1	0
	Multiplier	2/8	2/7	2/6	2/5	2/4	2/3	2/2
FLEE RATE	60	15	17	20	24	30	40	60
Effective %		6.27%	7.06%	8.24%	9.80%	12.16%	16.08%	23.92%
FLEE RATE	90	22	25	30	36	45	60	90
Effective %		9.02%	10.20%	12.16%	14.51%	18.04%	23.92%	35.69%
FLEE RATE	120	30	34	40	48	60	80	120
Effective %		12.16%	13.73%	16.08%	19.22%	23.92%	31.76%	47.45%
FLEE RATE	150	37	42	50	60	75	100	150
Effective %		14.90%	16.86%	20.00%	23.92%	29.80%	39.61%	59.22%

Probability to throw **1** Bait Without Fleeing: **76.08%**

Probability to throw **2** Bait Without Fleeing: **63.85%**

Probability to throw **3** Bait Without Fleeing: **56.08%**

Probability to throw **4** Bait Without Fleeing: **50.59%**

Probability to throw **5** Bait Without Fleeing: **46.42%**

Probability to throw **6** Bait Without Fleeing: **43.14%**