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Drawing Systems and Statistics for the “Big 5”

Dr. Joe Schaffer

Wyoming Wildlife Task Force Member

Major Considerations

1. Scarcity vs. Equity
2. Types of Drawing Systems
3. Challenges of Statistical Modeling
4. Statistical Models Built on the 90/10 Allocation
5. Only Focused on Moose and Bighorn Sheep
6. The Primary Arguments You Will Hear



Scarcity versus Equity

- No system for drawing will address scarcity issues.
- Increasing populations, especially Moose and Bighorn, should be a priority focus of Wyoming.
- This effort focuses on finding equitable ways of awarding permits for a limited resource.
- It can get complicated very quickly...



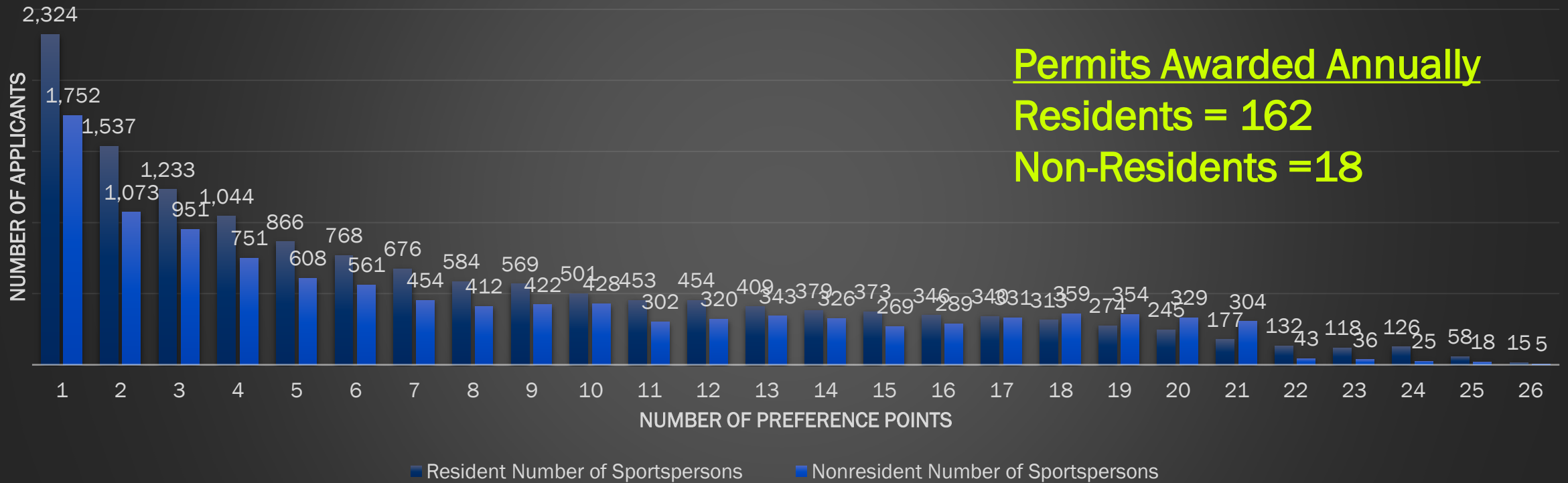
Drawing Systems

1. Preference Point System - In a drawing, the permits go to the applicants with the highest number of points. Intended to guarantee an applicant a permits at some point.
2. Pure Random System - In a drawing, the permits are randomly awarded to applicants. Any applicant has equal chance of drawing a permit.
3. Weighted Random System - Random drawing, but applicants who have applied in previous years but not drawn are given additional entries, thereby weighting their chances. Any applicant can draw in any year.
4. Hybrid Systems - Generally a mix of one or more of the above.



Preference Point System

Current Bighorn Sheep Applicants and Accumulated Preference Points



Resident Lifetime Drawing Probability – Preference Point Systems

- Assumptions
 - Applicants don't move
 - Applicants apply every year
 - Lifetime is ages 12-64
 - 53 years of entry
 - Dropout rates are constant for each year and for each preference point level
 - If the dropout rate for first year applicants was 15% in 2020, it stays at 15% for first year applicants in 2021, 2022, and so on
 - Dropout rate at 25 preference points drops to 0
 - Follows what is seen in the data
 - First year applicant numbers increase at a constant rate
 - 173 for Bighorn Sheep, 532 for Moose
 - Pool Cutoffs – After 18 years for Bighorn Sheep and after 14 years for Moose
 - Both pools are random draws – Follows what is seen in the data
 - High Point Applicants – 1 drawing in High Point Pool, 1 drawing in General Pool
 - Low Point Applicants – 1 drawing in General Pool



Cumulative Lifetime Probabilities

75/25 (Status Quo)	1 Year	10 Years	20 Years	30 Years	40 Years	53 Years
Bighorn Sheep	0.35%	1.94%	4.36%	9.56%	12.34%	14.52%
Moose	0.35%	2.20%	10.10%	15.63%	18.22%	20.08%

50/50	1 Year	10 Years	20 Years	30 Years	40 Years	53 Years
Bighorn Sheep	0.68%	3.79%	6.51%	10.57%	12.83%	14.66%
Moose	0.68%	4.34%	10.68%	14.97%	17.09%	18.66%

25/75	1 Year	10 Years	20 Years	30 Years	40 Years	53 Years
Bighorn Sheep	1.02%	5.66%	10.72%	14.48%	16.20%	17.65%
Moose	1.02%	6.41%	11.21%	14.24%	15.86%	17.13%



Preference Point Phase Out – No Aging Out

Assumptions:

- No new applicants
- No one moves, drops out, or dies until they draw.

	Number of Resident Applicants	Number of Permits Available for Residents	Number of Years to Phase Out
Bighorn Sheep	14,807	163	90.84 Years
Moose	23,364	320	73.01 Years



Preference Point Phase Out – Aging Out

Assumptions

- No new applicants
- No one moves, dies, or drops out voluntarily before 65

Applicants only drop out if they draw or reach age 65

- All preference points holders phased out in **53 years**
- Sheep phased out in **32 years**, Moose phased out in **52 years**

	Original Number of Resident Applicants	1 Year Out – Applicants Remaining	10 Years Out – Applicants Remaining	20 Years Out – Applicants Remaining	30 Years Out – Applicants Remaining	40 Years Out – Applicants Remaining
Bighorn Sheep	14,807	12,972	9,753	5,818	608	0
Moose	23,364	19,483	16,182	13,304	8,005	4,132



Resident Lifetime Probability Draws – Random Systems

Assumptions

- Applicants don't move
- Applicants apply every year
- Lifetime is ages 12-64
 - 53 years of entry
- Dropout rates are constant for each year and for each preference point level
 - If the dropout rate for first year applicants was 15% in 2020, it stays at 15% for first year applicants in 2021, 2022, and so on
- Dropout rate at 25 preference points drops to 0
 - Follows what is seen in the data
- First year applicant numbers increase at a constant rate
 - 173 for Bighorn Sheep, 532 for Moose



Cumulative Lifetime Probabilities

Random	Year 1	Year 10	Year 20	Year 30	Year 40	Year 53
Bighorn Sheep	1.10%	7.24%	10.57%	12.51%	13.81%	14.97%
Moose	1.10%	8.25%	11.58%	13.36%	14.47%	15.44%

Points	Year 1	Year 10	Year 20	Year 30	Year 40	Year 53
Bighorn Sheep	0.14%	4.33%	9.51%	13.49%	16.54%	19.62%
Moose	0.14%	5.40%	11.32%	15.47%	18.43%	21.21%

Points^2	Year 1	Year 10	Year 20	Year 30	Year 40	Year 53
Bighorn Sheep	0.01%	1.89%	6.54%	11.36%	15.79%	20.97%
Moose	0.01%	2.51%	8.35%	13.94%	18.61%	23.57%



How We Got to Our Recommendation

- We cannot guarantee everyone will eventually get a permit, especially true for non-residents.
- Phasing out takes too long and would require decades of monitoring two systems.
- People have preference points that they purchased and points are a significant source of revenue to WGF.
- Using weighted bonus points has the highest lifetime probabilities of drawing, but each year everyone still has a chance.
- Delaying implementation provides the high preference point holders time to draw under that system.





Thank You

Joe Schaffer

Email

jschaffer@lccc.wy.edu