Regional Berth Distribution

Summary

The individual championships in tennis, in both singles and doubles, begin with regional tournaments, from which the 16 participants in the state tournament are determined.

The current handbook declares, in 4.11.4(d), that "Each conference will be allowed an assigned number of singles and doubles participants. This number is determined on a percentage basis."

However, neither the size of the regional tournaments (traditionally 16 in singles and 16 in doubles), nor the process for determining this "percentage basis" is explained, leading to confusion and misunderstanding on the part of players, parents, coaches, and other stakeholders.

If adopted, this amendment would place language in the handbook describing in detail the process for distributing berths among the various conferences to the regional tournaments.

The amendment will also make a modification of the formula which has been used to determine this distribution, resulting in a more accurate distribution of berths among the conferences.

> *Note: For purposes of the individual tournament, the words "region" and "regional" do not refer to "East" and "West" as in the dual-team tournament and most other sports. In the individual tennis tournaments, in 2A, 3A, and 4A, there are four regional tournaments: East, Mideast, Midwest, and West. In 1A, because there are fewer schools overall fielding tennis teams, there are only two regionals, East and West.*

Background

The process for distributing regional berths was created administratively many years ago, but has never been published on the NCHSAA website. Each conference is given a number of berths in its regional based on the number of schools in that conference fielding tennis teams, relative to the number of teams in the region as a whole, using the following process:

1. The proportion of regional berths to which a conference is entitled is calculated using this formula:

The number of teams in the conference divided by **the number of teams in the region** multiplied by **16 (the number of available berths).**

2. Each conference receives an initial distribution based on the whole number portion of the value derived above.

3. The remaining available berths, up to 16 in each event, are distributed among the conferences in a "round-up distribution" as follows:

a. any conference which did not receive a berth in the initial distribution shall receive a round-up distribution of one berth,

b. the conferences which have the decimal remainder closest to the next whole number receive round-up distributions until the total field equals 16.

c. If two or more conferences have the same decimal remainder, and there are not enough berths available for all of them, those berths shall be distributed by random draw.

d. In succeeding years, if the same situation presents itself, the conferences that did not receive a round-up distribution in the prior year will receive priority consideration for a round-up distribution.

Examples

For purposes of illustration, here are four examples of how this process works, all drawn from the 2023 women's tennis season.

The 3A Midwest regional illustrates the rare situation where the initial calculation yields whole numbers for all participating conferences, and no round-up distribution is required.

3A Midwest Regional								
Conferences	Number of Teams	% of Region	x 16 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Mid Piedmont 3A	6	.250	4.00	4		4	4	4
Mid-State 3A	6	.250	4.00	4		4	4	4
Rocky River 2A/3A	3	.125	2.00	2		2	2	2
South Piedmont 3A	9	.375	6.00	6		6	6	6
Total	24	1.000	16	16	0	16	16	16

When the numbers line up perfectly, and each conference calculates to a number ending in .00, then each conference receives exactly the proportion of regional berths to which it is entitled.

Unfortunately, this is a rare occurrence. It happened only once, in this instance, in the fall 2023 women's season.

The 3A Mideast regional illustrates the common situation where conferences have a "decimal remainder" (a calculation ending in something other than .00), and the remaining berths are distributed by rounding up.

3A Mideast Regional								
Conferences	Number of Teams	% of Region	x 16 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
All American 3A/4A	5	.200	3.20	3		3	3	3
Central 3A	7	.280	4.48	4		4	4	4
Northern Lakes Athletic 2A/3A	2	.080	1.28	1		1	1	1
Sandhills 3A/4A	4	.160	2.56	2	1	3	3	3
The Big East 2A/3A	4	.160	2.56	2	1	3	3	3
United 8 3A/4A	3	.120	1.92	1	1	2	2	2
Total	25	1.000	16	13	3	16	16	16

Notice in this instance, the extra berths were awarded to the conferences with the largest decimal remainder, and that there were enough remaining berths such that the two conferences with identical decimal remainders each received a round-up berth.

The three conferences with the high decimal remainders received a slightly larger proportion of bids than they deserved, mathematically, and the three other conferences received a slightly small proportion of bids than they deserved.

This is the "problem of the fractions". When forced to round up (or down), as is almost always the case, some conferences benefit and other conferences are disadvantaged.

Here's an example of a regional where two conferences with the same number of teams were tied for the final berth available.

2A Mideast Regional								
Conferences	Number of Teams	% of Region	x 16 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Mid-Carolina 1A/2A	5	.217	3.48	3		3	3	3
Northern Lakes Athletic 2A/3A	4	.174	2.78	2	1	3	3	3
Southeastern Athletic 2A	5	.217	3.48	3	1	4	4	4
Super Six 1A/2A	4	.174	2.78	2	1	3	3	3
The Big East 2A/3A	3	.130	2.09	2		2	2	2
Waccamaw 1A/2A	2	.087	1.39	1		1	1	1
Total	**23**	**1.000**	**16**	**13**	**3**	**16**	**16**	**16**

In this case, thirteen bids were awarded in the initial distribution. The Super Six and Northern Lakes Athletic conferences each received a round-up bid, based on their calculated value of 2.78.

That left one bid remaining, and two conferences, the Mid-Carolina and the Southeastern Athletic each had five teams, and each had a calculated value of 3.48. The tie was broken by a random draw, and the Southeastern Athletic received the final berth.

However, that final berth is actually two berths: one in singles and one in doubles. Would it not have been more equitable to split that berth between the two conferences in question, with one receiving an extra singles berth, and the other the extra doubles berth?

Finally, here's an example of multiple conferences tied for the final available berths.

3A East Regional								
Conferences	Number of Teams	% of Region	x 16 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Big Carolina 3A/4A	5	.208	3.33	3		3	3	3
Coastal 3A	6	.250	4.00	4		4	4	4
Mideastern 3A/4A	3	.125	2.00	2		2	2	2
Northeastern Coastal 2A/3A	2	.083	1.33	1		1	1	1
Quad County 3A	8	.333	5.33	5	1	6	6	6
Total	**24**	**1.000**	**16**	**15**	**1**	**16**	**16**	**16**

In this case, three conferences were tied in terms of their decimal remainder, x.33. By random draw, the final available berth was awarded to the Quad County conference.

Again, would it not have been more equitable to split the berth, and award the singles berth to one conference, and the doubles berth to another? Granted, the third conference would be left out entirely, but that cannot be helped.

But, in this case, why should one conference get the benefit of the round-up in both draws?

Our Proposal

Our proposal is based on an observation, demonstrated by the examples above, that the current process is based on a fundamental error: **there are not 16 berths in the regional tournament; there are 32, sixteen in singles and sixteen in doubles.**

We propose, therefore, to amend the formula cited above, by changing the initial multiplier from 16 to 32. This, we assert, will yield a calculation that more accurately reflects the proportion of bids that each conference should receive.

We readily admit that our proposal does not eliminate "the problem of the fractions", and that some random draws will still be necessary (see the addendum).

However, we believe the formula we propose will be more accurate, and thus, more fair, mitigating "the problem of the fractions" to a great degree.

Proposed Reading

4.11.4 – Playoffs (Regionals-Individual Competition)

(d) Number of Entries - Each conference will be allowed an assigned number of singles and doubles participants. This number is determined on a percentage basis, <u>as</u> <u>follows:</u>

<u>(1) The proportion of regional berths to which a conference is entitled is calculated using this formula:</u>

<u>The</u> number of teams in the conference <u>divided</u> by the number of teams in the region <u>multiplied</u> <u>by</u> 32 (the number of available berths).

<u>(2) Each conference receives an initial distribution based on the whole number portion of the value derived above.</u>

<u>(3) The remaining available berths, up to 32, are distributed among the conferences in a "round-up distribution" as follows:</u>

<u>(i) Any conference which received zero or one berth in the initial distribution shall receive the round-up distribution necessary for that conference to receive two berths. No conference shall receive fewer than two berths.</u>

<u>(ii) The conferences which have the decimal remainder closest to the next whole number receive round-up distributions until the total field equals 32.</u>

<u>(iii) If two or more conferences have the same decimal remainder, and there are not enough berths available for all of them, those berths shall be distributed by random draw.</u>

<u>(iv) In succeeding years, if the same situation presents itself, the conferences that did not receive a round-up distribution in the prior year will receive priority consideration for a round-up distribution.</u>

(4) The number of berths assigned to each conference shall be divided into berths for singles and doubles as follows:

(i) If the total number of berths is even, then those berths shall be divided equally between singles and doubles.

(ii) If the total number of berths is odd, then those shall be divided between singles and doubles such the number of singles berths is either one more or one less than the number of doubles entries. NCHSAA staff shall make these determinations by random draw among all conferences in a regional with an odd number of berths, such that both the singles and doubles draws have 16 entrants each.

(5) NCHSAA staff shall post the number of qualifiers assigned to each conference, as well as the location, regional director, and other information relevant to the regional tournament, on the NCHSAA website at least three weeks prior to the end of the regular season.

(e) Each conference will determine who its qualifiers are to the individual regional tournament in the manner of its own choosing. ~~Refer to NCHSAA website for regional information and number of qualifiers~~. Conference qualifiers are expected to compete throughout individual tournament.

Renumber following paragraphs as (f) to (l).

Examples

Let's revisit the four examples cited earlier, and see how the amended formula would address the issues identified.

3A Midwest Regional								
Conferences	Number of Teams	% of Region	x 32 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Mid Piedmont 3A	6	.250	8.00	8		8	4	4
Mid-State 3A	6	.250	8.00	8		8	4	4
Rocky River 2A/3A	3	.125	4.00	4		4	2	2
South Piedmont 3A	9	.375	12.00	12		12	6	6
Total	**24**	**1.000**	**32**	**32**	**0**	**32**	**16**	**16**

In the 3A Midwest, where all the numbers all lined up perfectly, there's no change whatsoever.

3A Mideast Regional								
Conferences	Number of Teams	% of Region	x 32 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
All American 3A/4A	5	.200	6.40	6		6	3	3
Central 3A	7	.280	8.96	8	1	9	5	4
Northern Lakes Athletic 2A/3A	2	.080	2.56	2	1	3	1	2
Sandhills 3A/4A	4	.160	5.12	5		5	3	2
The Big East 2A/3A	4	.160	5.12	5		5	2	3
United 8 3A/4A	3	.120	3.84	3	1	4	2	2
Total	**25**	**1.000**	**32**	**29**	**3**	**32**	**16**	**16**

In the 3A Mideast, the All American and United 8 were unchanged.

The Central and the Northern Lakes Athletic each received an additional berth, and the Sandhills and The Big East each received one fewer. Note that these two conferences received six bids, three in singles in the current process, even though their calculated value was only 5.12. So, this adjustment is entirely justified by the math.

2A Mideast Regional								
Conferences	Number of Teams	% of Region	x 32 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Mid-Carolina 1A/2A	5	.217	6.96	6	1	7	4	3
Northern Lakes Athletic 2A/3A	4	.174	5.57	5	1	6	3	3
Southeastern Athletic 2A	5	.217	6.96	6	1	7	3	4
Super Six 1A/2A	4	.174	5.57	5		5	3	2
The Big East 2A/3A	3	.130	4.17	4		4	2	2
Waccamaw 1A/2A	2	.087	2.78	2	1	3	1	2
Total	23	1.000	32	28	4	32	16	16

In the 2A Mideast, The Big East was unchanged.

The Mid-Carolina and the Southeastern split the extra berth which, in the current process, was awarded to the Southeastern alone. So the Mid-Carolina got an extra singles berth, and the Southeastern got the doubles berth. Note that both conferences had a 6.96 calculated value, meaning that seven berths each is an almost perfect result.

The Waccamaw got an extra doubles berth on the strength of a 2.78 calculated value.

That left the Super Six and the Northern Lakes Athletic to draw for the final berth, which the Northern Lakes Athletic received. If the same situation were to take place the following year, the Super Six would get that extra berth.

3A East Regional								
Conferences	Number of Teams	% of Region	x 32 berths	Initial Distribution	Round-Up Distribution	Total Berths	Singles Berths	Doubles Berths
Big Carolina 3A/4A	5	.208	6.67	6	1	7	4	3
Coastal 3A	6	.250	8.00	8		8	4	4
Mideastern 3A/4A	3	.125	4.00	4		4	2	2
Northeastern Coastal 2A/3A	2	.083	2.67	2		2	1	1
Quad County 3A	8	.333	10.67	10	1	11	5	6
Total	24	1.000	32	30	2	32	16	16

Finally, in the 3A East, where we had a three-way tie for the final berth under the current process, that berth (really two berths) is divided by random draw between the Quad County and the Big Carolina, instead of both the singles and the doubles berth being awarded to the Quad County.

If the same situation were to occur the following year, the Northeastern Coastal would receive one of the two round-up berths automatically, and the final berth would be awarded by random draw to one of the two other conferences involved in the tie.

Summary

We assert that the proposed amendment will serve two purposes.

1. By placing a description of the process for distributing regional berths in the handbook, coaches, athletic directors, parents, and players will understand how these berths are assigned, and understand that math, not politics, is the reason that the berths are distributed as they are.

2. By changing the formula to reflect 32 berths, the conferences, and by extension, the student-athletes, will be treated more fairly when it comes to the opportunity to participate in the regional and state individual tournaments.

Addendum

So long as the regional tournaments are capped at 16 entries in each event, there is no perfect solution to "the problem of the fractions". Some form of rounding up and rounding down will be required.

In order to eliminate "the problem of the fractions", it is necessary to expand the regional draws, such that each conference receives a berth in each event for each school fielding a tennis team. That would yield regional draw of between 20 and 30 participants, which poses logistical problems regarding court space and time available.

We recognize that, with the change to seven or eight classifications starting in 2025-26, awarding regional berths based on conferences affiliation may become more problematic, and that this process may need additional modifications at that time.

We are monitoring the work of the bylaw implementation task force, and would like to be consulted regarding changes to the individual tournaments that may be necessary moving forward.