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# World Ranking Scheme Rules for International Orienteering Federation(IOF) Events

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Edition: January 2021

## About this document

This document brings together the rules and principles of the IOF World Ranking Scheme.

The document covers FootO, MTBO, SkiO and TrailO.

A point valid only for one or more disciplines is marked with the specific abbreviation(s) in the margin.

	<b>0.</b>	<b>Purpose of the IOF World Ranking Scheme</b>
	0.1	To raise the global profile of orienteering and of our athletes.
	0.2	To act as an incentive for Federations to put on high quality elite events.
	0.3	To act as motivation for athletes to compete in high quality elite events.
	0.4	To provide a valid way of comparing runners from very different Federations.
	0.5	To support the profile and importance of high level IOF events within and outside the global orienteering community.
	<b>1.</b>	<b>Aims of the IOF World Ranking Scheme</b>
	1.1	To encourage Federations to promote and develop orienteering by staging high quality international events.
	1.2	To harmonise event quality across Federations.
	1.3	To award rankings points which contribute to the World Ranking Lists.
	1.4	To provide a valid way of comparing competitors from very different nations on a common scale, taking into account the status and the form of the event.
	1.5	To conform to contemporary practice in the world of elite sport with World Ranking Lists for orienteering that are perceived as fair and are accepted worldwide.
	1.6	To act as a motivation for athletes to compete at World Ranking Events in their own Federation and in other Federations.
	1.7	To provide a means of establishing qualification criteria and starting orders for major IOF events.
FootO	1.8	To develop a Federation League Table to be used (in particular) for determining national quotas for the World Cup.
	<b>2</b>	<b>General provisions</b>
FootO	2.1	There shall be separate World Ranking Lists for Sprint and for Middle/Long Distance.
MTBO SkiO TrailO	2.2	There shall be a single World Ranking List.
FootO MTBO SkiO	2.3	World Ranking points shall be weighted according to the level of the event; higher points shall be awarded to those who do well at the IOF's highest level events.

FootO MTBO SkiO	2.4	At each race, the point differences shall be linear with respect to time; each minute shall be worth the same number of points from the fastest time down to the slowest time.
FootO MTBO SkiO	2.5	Every participant in a World Ranking Event who has completed his/her course according to the rules for the event shall receive at least 10 World Ranking points.
FootO MTBO SkiO	2.6	The World Ranking points gained by the winner of a race shall be fixed for the final races at the IOF's highest level events and limited by upper and lower bounds for other races.
	<b>3.</b>	<b>IOF World Ranking Lists</b>
	3.1	The IOF World Ranking Lists are based on the results in the following events:
		<ul style="list-style-type: none"> <li>• IOF World Championships</li> </ul>
FootO MTBO SkiO		<ul style="list-style-type: none"> <li>• IOF World Cup</li> </ul>
FootO		<ul style="list-style-type: none"> <li>• Orienteering events in the World Games</li> </ul>
FootO MTBO SkiO		<ul style="list-style-type: none"> <li>• IOF Regional Championships, classes W21E and M21E</li> </ul>
TrailO		<ul style="list-style-type: none"> <li>• IOF Regional Championships</li> </ul>
FootO SkiO		<ul style="list-style-type: none"> <li>• Orienteering Championships of FISU (The International University Sports Federation) and CISM (The International Military Sports Council)</li> </ul>
FootO MTBO SkiO		<ul style="list-style-type: none"> <li>• IOF Junior World Championships (A-finals only)</li> </ul>
		<ul style="list-style-type: none"> <li>• IOF World Ranking Events (WRE), as nominated by member Federations according to criteria determined by the IOF and accepted by the IOF Council into the official IOF Calendar of Events.</li> </ul>
FootO MTBO SkiO	3.2	In each discipline there shall be separate lists for men and women.
	3.3	Each competitor who features in the World Ranking Lists has an IOF Ranking ID provided by the IOF. Only athletes from IOF member federations are eligible to have an IOF Ranking ID.
FootO MTBO SkiO	3.4	Where the M18E/W18E and/or M20E/W20E classes are competing on the same courses and under the same conditions as the M21E/W21E classes, competitors in those other classes shall be included in the World Ranking calculations. For these other classes to be eligible for World Ranking Points, the start list must be prepared for course as a whole, not separately for each class.
FootO	3.5	There are two separate World Ranking Lists, for Sprint-type events, known as the <i>Sprint Orienteering World Ranking List</i> , and for Middle/Long Distance-type events, known as the <i>Orienteering World Ranking List</i> .

MTBO	3.6	There is a single World Ranking list known as the <i>Mountain Bike Orienteering World Ranking List</i> .
SkiO	3.7	There is a single World Ranking list known as the <i>Ski Orienteering World Ranking List</i> .
TrailO	3.8	There is a single World Ranking list known as the <i>Trail Orienteering World Ranking List</i> .
	<b>4.</b>	<b>IOF World Ranking Events</b>
	4.1	IOF World Ranking Events (WRE) are international events which are nominated by member Federations according to criteria determined by the IOF and accepted by the IOF Council into the official IOF Calendar. They are organised under the authority of the IOF and the Federation of the organiser.
	4.2	There is no limit on the number of WREs that a Federation may nominate each year.
	<b>5.</b>	<b>IOF WRE Service Fee</b>
	5.1	An IOF service fee, as determined by the IOF Council, shall be paid for IOF World Ranking Events (WRE) (last dot point of 3.1 above).
	5.2	There is no WRE service fee for the higher level events listed in 3.1 whose results also count towards the World Ranking List.
	<b>6.</b>	<b>IOF WRE Application Criteria</b>
	6.1	For the higher level events listed under 3.1, WRE status is accorded without a separate application.
FootO	6.2	For IOF World Ranking Events (WRE) only, there is an application procedure for each calendar year of World Ranking Events. Applications from member Federations for events due to take place in January, February or March must reach the IOF at least six months prior to the event date. Applications from member Federations for events due to take place in other months (April – December) should reach the IOF no later than September 30th in the year prior to the event year and shall be approved or rejected by the IOF by November 30th the same year.
MTBO TrailO	6.3	For IOF World Ranking Events (WRE) only, there is an application procedure for each calendar year of World Ranking Events. Applications from member Federations should reach the IOF no later than September 30th in the year prior to the event year and shall be approved or rejected by the IOF by November 30th the same year.
SkiO	6.4	For IOF World Ranking Events (WRE) only, there is an application procedure for each season (1 November – 30 April) of World Ranking Events. Applications from member Federations should reach the IOF no later than September 30th prior to the season and shall be approved or rejected by the IOF by October 31st the same year.
	6.5	All WREs shall be open events (with no restriction on entry by nationality, age etc.) unless otherwise determined by the IOF.
FootO MTBO SkiO	6.6	WREs shall provide one men's race and one women's race; these are normally of Long, Middle or Sprint type, defined in accordance with the IOF Competition Rules.

FootO MTBO	6.7	WREs should not normally be mass start events nor should they have chasing starts; however, requests to select mass or chasing start events as WREs should be made to the IOF Office and, in some cases, may be considered favourably by the relevant Discipline Commission.
SkiO	6.8	Mass start or chasing start races with individual time-keeping are allowed to be WREs provided the course is forked. WREs normally consists of one race. Sometimes the competition can be made up of two races: a prologue followed by a chasing start. In that case it is the total time of the two races that counts for WRE points.
	6.9	Where a multi-race event is selected, one (or more) of the individual races shall be nominated as the WRE.
	6.10	Events listed in 3.1 shall have an IOF licensed Event Adviser to control the competition (does not apply to FISU and CISM events).
	<b>7.</b>	<b>IOF World Ranking Points Calculation</b>
FootO MTBO SkiO	7.1	<p>Definition</p> <ul style="list-style-type: none"> <li>• A ranked athlete for a particular race is defined as an athlete who is placed in the race and has current World Ranking scores, disregarding scores of 10.</li> <li>• An outlier athlete is one whose preliminary calculated unweighted ranking points RP are more than 100 different from their average prior unweighted ranking points.</li> </ul>
FootO MTBO SkiO	7.2	<p>Initial calculations</p> <ul style="list-style-type: none"> <li>• Calculate the average prior unweighted ranking points of all ranked athletes in the race. The points to be included are those which were earned in the period for which points can contribute to a person's total ranking score, defined in 8.1-8.3.</li> <li>• Calculate the mean MP and the standard deviation SP of the average prior unweighted ranking points of all ranked athletes.</li> <li>• Calculate the mean MT and the standard deviation ST of the race times RT of all ranked athletes.</li> <li>• Determine the unweighted (IP = 1) calculated score for the winner using the appropriate formula given in 7.5 below.</li> </ul>
FootO MTBO SkiO	7.3	The maximum ranking points for a race and the weighting factor IP for the race are set as follows:
		<ul style="list-style-type: none"> <li>• World Championships Finals ("A" Finals only): <ul style="list-style-type: none"> <li>○ Winner scores 1425</li> <li>○ <math>IP = 1425/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>
FootO		<ul style="list-style-type: none"> <li>• The World Games <ul style="list-style-type: none"> <li>○ Winner scores 1400</li> <li>○ <math>IP = 1400/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>• World Cup Finals ("A" Finals only): <ul style="list-style-type: none"> <li>○ Winner scores 1400</li> <li>○ <math>IP = 1400/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>

SkiO		<ul style="list-style-type: none"> <li>• European Ski Orienteering Championships: <ul style="list-style-type: none"> <li>○ Winner scores 1400</li> <li>○ <math>IP = 1400/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>• Other official IOF Regional Championships (non-World Cup status): <ul style="list-style-type: none"> <li>○ Winner scores a minimum of 1100 and a maximum of 1375</li> <li>○ If the Winner's unweighted calculated score is between 1100 and 1375, <math>IP = 1</math></li> <li>○ If the Winner's unweighted calculated score is less than 1100, <math>IP = 1100/\text{Winner's unweighted calculated score}</math></li> <li>○ If the Winner's unweighted calculated score is greater than 1375, <math>IP = 1375/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>
		<ul style="list-style-type: none"> <li>• All other races: <ul style="list-style-type: none"> <li>○ Winner scores a minimum of 800 and a maximum of 1375</li> <li>○ If the Winner's unweighted calculated score is between 800 and 1375, <math>IP = 1</math></li> <li>○ If the Winner's unweighted calculated score is less than 800, <math>IP = 800/\text{Winner's unweighted calculated score}</math></li> <li>○ If the Winner's unweighted calculated score is greater than 1375, <math>IP = 1375/\text{Winner's unweighted calculated score}</math></li> </ul> </li> </ul>
FootO MTBO SkiO	7.4	<p>If there is at least one ranked athlete, perform a preliminary calculation of ranking points RP for each competitor at the event as follows:</p> <ul style="list-style-type: none"> <li>• The formula <math>RP = (MP + SP \times (MT - RT)/ST)</math> is used if there are 8 or more ranked athletes.</li> <li>• The formula <math>RP = (2000 - RT \times (2000 - MP) / MT)</math> is used if there is at least one but fewer than 8 ranked athletes.</li> </ul>
FootO MTBO SkiO	7.5	<p>Finally, recalculate the ranking points RP for each competitor at the event as follows:</p> <ul style="list-style-type: none"> <li>• Calculate the mean MP and the standard deviation SP of the average prior unweighted ranking points of all ranked non-outlier athletes.</li> <li>• Calculate the mean MT and the standard deviation ST of the race times RT of all non-outlier ranked athletes.</li> <li>• The formula <math>RP = (MP + SP \times (MT - RT)/ST) \times IP</math> is used if there are 8 or more non-outlier ranked athletes.</li> <li>• The formula <math>RP = (2000 - RT \times (2000 - MP) / MT) \times IP</math> is used if there is at least one but fewer than 8 non-outlier ranked athletes.</li> <li>• If there are no non-outlier ranked athletes then MT is set to the winner's time and the formula <math>RP = (2000 - RT \times 1200/MT) \times IP</math> is used.</li> <li>• Any competitor who successfully finishes a WR event according to the rules of the event, but for whom RP is less than 10 as calculated above, shall be given 10 ranking points.</li> </ul>

FootO	7.6	<p>For a Knock-Out Sprint, ranking points are calculated as follows:</p> <ul style="list-style-type: none"> <li>• The Knock-Out Sprint Qualification races are normal WREs.</li> <li>• Those who qualify for the elimination rounds (36 if there are 3 elimination rounds and 6 competitors in each heat) score further ranking points according to their placing in the final overall results (IOF FootO Rule 24.16).</li> <li>• The ranked runners who qualify for the elimination rounds are ordered by their previous mean scores (ignoring their ranking in this competition). The difference D is calculated, between the previous mean scores of the ranked runners who are the 10th and 90th percentiles (rounded to nearest whole number) in that list. Identify the runners who are the 10th and 90th percentiles in the results list of the elimination rounds and count the number of runners N from the 10<sup>th</sup> to 90<sup>th</sup> percentiles inclusive. The per-place-increment is D/N-1.</li> <li>• The runner in the 10th percentile position in the results list of the elimination rounds scores the ranking points of the 10th percentile position in the list ordered by previous mean score. Each place higher in the results list gets an extra per-place increment and each place lower gets the points reduced by the per-place increment.</li> <li>• Any runners who are tied for position are awarded the same points, those of the highest placed tied runner.</li> <li>• If there are fewer than 10 finishers with world ranking scores the winner gets 800 points and the last finisher 10 points.</li> <li>• There must be at least 10 finishers for the competition to count for World Rankings.</li> <li>• If the Knock-Out Sprint is a competition within one of the events listed in 7.3 where the winner's score is fixed, the above calculation is carried out. Then the winner's score is adjusted to the appropriate fixed score and the scores of the other runners are scaled pro-rata.</li> <li>• If the Knock-Out Sprint is a competition within one of the events listed in 7.3 where there is a maximum and minimum for the winner's score, the above calculation is carried out. Then if the calculated score for the winner is higher than the maximum, or lower than the minimum, the winner's score is adjusted to the appropriate value and the scores of the other runners are scaled pro-rata.</li> </ul>
FootO MTBO SkiO	7.7	<p>Before each ranking calculation, both groups of athletes with current ranking points (i.e. men and women separately) shall have the positive unweighted points of each athlete re-based so that their average points have an overall mean of 1000 and a standard deviation of 200. Current ranking points are those which were earned in the period for which points can contribute to a person's total ranking score, defined in 8.1-8.3.</p>
TrailO	7.8	<p>At least 6 athletes must participate for a class to be valid for WRE points.</p>



TrailO	7.9	<p>Preliminary calculations</p> <ul style="list-style-type: none"> <li>• Before each calculation the average ranking points for the top 6 competitors at the event are rebased. Average rebased ranking points = (Athlete ranking points-Leader ranking points)/6. The Leader is the current leader of the world ranking list. These rebased average ranking points are used for the M6R calculations below.</li> <li>• Calculate M6R, the mean of the rebased ranking points of the 6 best ranked competitors at the event. Athletes with no ranking are assigned a score of 15.</li> <li>• Calculate the mean of the 3 best scores <ul style="list-style-type: none"> <li>○ For PreO: M3P is the mean of the 3 best points scored</li> <li>○ For TempO: M3T is the mean of the 3 best times scored</li> </ul> </li> </ul>
TrailO	7.10	<p>Finally, calculate the ranking points RP for each competitor at the event as follows where PBW=Places Behind Winner:</p> <ul style="list-style-type: none"> <li>• For PreO: <math>RP = M3P - CP + M6R + PBW \times 0.05</math> where CP is each competitor's scored points at the event</li> <li>• For TempO: <math>RP = 3 \times (CT - M3T) / M3T + M6R + PBW \times 0.05</math> where CT is each competitor's scored time at the event</li> </ul>
TrailO	7.11	Any RP higher than 15 will count as 15.
	<b>8.</b>	<b>Calculation of World Ranking List Score</b>
FootO	8.1	For scores to count towards a person's total ranking score, they must have been earned within 24 calendar months of the calculation date.
MTBO	8.2	For scores to count towards a person's total ranking score, they must have been earned within 12 calendar months of the calculation date.
SkiO	8.3	For scores to count towards a person's total ranking score, they must have been earned within 18 calendar months of the calculation date. However out of season, between 1 May and 31 October, the rankings are static and show the ranking scores as they will be on 1 November.
TrailO	8.4	For scores to count towards a person's total ranking score, they must have been earned within 18 calendar months of the calculation date.
FootO	8.5	The five best scores subject to the above provisions are totalled to give a person's ranking list score.
MTBO	8.6	The four best scores subject to the above provisions are totalled to give a person's ranking list score.
SkiO	8.7	The five best scores subject to the above provisions are totalled to give a person's ranking list score.
TrailO	8.8	The six best scores subject to the above provisions are totalled to give a person's ranking list score. If fewer than 6 scores exist, a value of 15 will be added for each missing score.



	<b>9.</b>	<b>Publication of World Ranking Lists</b>
	9.1	Results shall be electronically submitted to the IOF on the day of the race, containing the required information and in the required format as determined by the IOF. The IOF Ranking IDs must be included. Any athletes who are not from an IOF member federation (and therefore cannot have an IOF Ranking ID) must be omitted from the electronic submission.
	9.2	The WRE organiser is responsible for providing WRE results to the IOF. If the IOF does not receive the WRE results on time and in the required format, the WRE status of the event may be cancelled.
	9.3	The IOF World Ranking Lists shall be updated as soon as practicable following each WRE and published on the IOF website.
SkiO	9.4	During a WSOC period the World Ranking List shall be updated after each race and published by the next morning so that the start order for subsequent races can be based on the updated World Ranking List.

## Latest changes

### January 2019

- Purpose of the WRS added
- Aims of the WRS updated
- FootO ranking based on the best 5 scores over 24 months
- TrailO ranking based on the best 6 scores over 18 months
- Reduced fixed weightings for Major Events
- Base ranking algorithm refined to eliminate outliers.
- Rules for Knock-Out Sprint added

### July 2020

- Rules for Knock-Out Sprint amended
- Annual re-basing to mean of 1000 and standard deviation of 200

### January 2021

- 7.4, 7.5 The formula used if there is at least one but fewer than 8 ranked athletes amended to  $RP = (2000 - RT \times (2000 - MP) / MT)$
- 7.5 The formula used if there are no non-outlier ranked athletes amended to formula  $RP = (2000 - RT \times 1200/MT) \times IP$  where MT is the winner's time
- Redundant rule 9.4 deleted and subsequent rule renumbered
- 7.2 Extra dot point to define the period over which the average unweighted points is calculated
- 7.7 Re-basing to be carried out before each calculation rather than annually.