



Forth Yacht Clubs Association

Sportsboat Class Definition

1. Introduction:

In preparation for ECSW at Port Edgar in Aug 2013, the FYCA reviewed its recommendations on the treatment of lightweight planing yacht designs, generally referred to as 'sportsboats', in handicap fleet racing. The review panel concluded that classifying sportsboats based on design analysis should continue. This sportsboat class definition has been confirmed by the FYCA until further notice.

2. Handicap Issues:

2.1 Displacement Yachts:

The handicapping of conventional displacement yachts using the Portsmouth Yardstick (PY) system is based on extensive achieved performance values from many races in a wide variety of sailing conditions. PY does not incorporate any differential handicapping related to wind strength, hence between different designs the same ratio of performance is assumed whatever the conditions. Although some designs may have a 'light weather flyer' reputation while others are noted for their 'heavy weather ability', the performance of conventional displacement yachts is generally progressive with wind strength hence the assumption of a constant ratio in handicapping is reasonably accurate across a wide range of wind conditions.

2.2 Sportsboats:

From the mid-1990s a number of new yacht designs appeared, known as 'sportsboats', such as the Sigma 8m, Hunter 707, Cork 1720, etc. These lightweight planing designs display distinctly different performance characteristics compared to conventional displacement yachts. If conditions permit continuous, hydrodynamic planing there is a step increase in their speed. Although many conventional yachts will plane, it is normally restricted to short periods surfing down the face of a wave, although they can extend their surfing by 'riding' the quarter wave of a larger & faster vessel but this happens only in rare and exceptional conditions. A sportsboat's 'digital' switch in speed once it starts planing makes fair handicapping a significant problem when raced against conventional yachts with progressive speed characteristics as wind strengths increase.

If a sportsboat's handicap is based only on its performance in displacement mode, it will be significantly under-handicapped in planing conditions. Conversely, if its handicapping includes many planing performances, it will be over-handicapped sailing in displacement mode in light wind. In either case this makes for unsatisfactory competition. In practice, most sportsboat performance data in the FYCA database comes from displacement sailing conditions. When planing conditions occur, a sportsboat's achieved performance may be faster than the -7.5% limit beyond which the FYCA assessment algorithm rejects the data as 'non-representative' hence it would not be included in the average performance calculation.

RORC found similar issues with the measurement based IRC rating system and promoted but later abandoned a sportsboat SBR rating system to achieve fairer competition between different sportsboat designs. Although sportsboats have IRC ratings, it is recognised that it is difficult to mix conventional and sportsboats designs. Course shape and wind strength can significantly affect relative results.

2.3 Sportsboats on the Forth:

At the FCYC/RFYC Edinburgh Regatta in August 2007, the Laser SB3 'Firefly' rounded a buoy near Oxcars well behind most of the Div-1 fleet and proceeded to plane past them all on the 3nm reach to a Wardie Bay mark, overtaking yachts with much faster handicaps. Although the helmsman's skill was applauded, there was agreement that racing such a mix of designs in those conditions made nonsense of 'fair competition'.

The problem of achieving fair racing for conventional and sportsboat designs, whatever the wind and sea conditions, was first addressed by PEYC in 2008. Initially the club proposed putting all SBR rated designs into a sportsboat class for the main autumn regatta. However it was pointed that, across the range of sportsboat designs, there was a considerable difference in planing capability. Yachts with SBR ratings at that time ranged from those that planed readily such as the Melges 24 and Cork 1720, to more conventional designs such as the Hunter 707 that did so only rarely. PEYC recognised that for major events, there should be a separate class for 'high performance' sportsboats based on design analysis rather than arbitrary classification. The key issue was to establish if there was a clear boundary between high performance sportsboats and those that are much closer to conventional displacement yachts. In preparation for the 2009 autumn regatta, PEYC consulted Mike Urwin, Technical Director of the RORC Rating Office that provides IRC certification, to establish suitable criteria to differentiate between designs.

2.4 Sportsboat Definition:

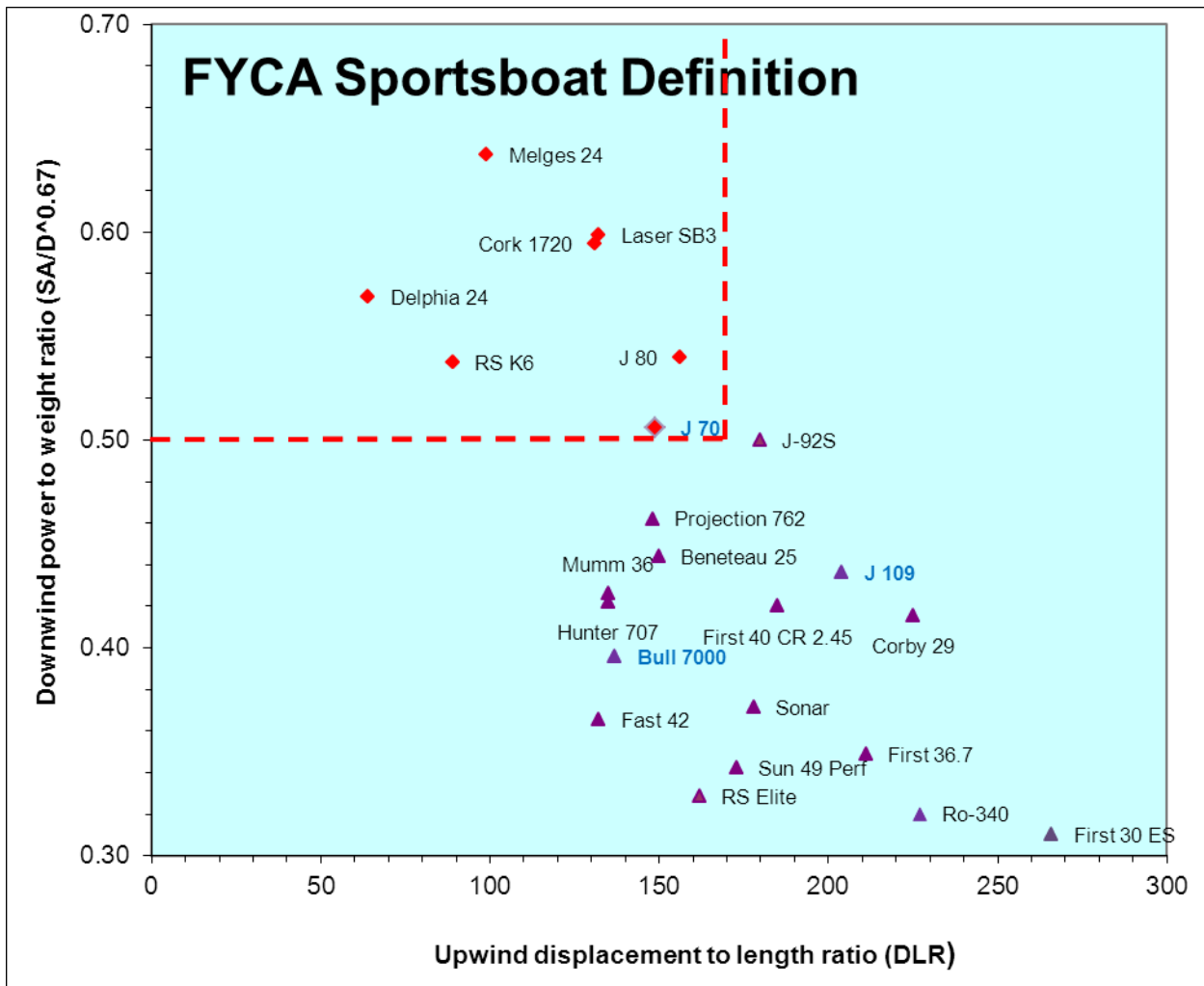
Based on Mike Urwin's analysis and advice, PEYC adopted the following 'high-performance' sportsboat definition, endorsed later by the FYCA Handicap Committee:

- **Downwind power to weight ratio ≥ 0.50**
($SA/D^{0.67}$ based on total downwind sail area m^2 [Main+Spin] divided by total displacement $Kg^{0.67}$ [inc. Crew weight])
- **Displacement to length ratio ≤ 170**
($DLR = (27.87 \times IRC \text{ Displacement})/LWP^3$ as defined by RORC measurement rules)

Appendix A contains the design data and the performance ratios for a range of conventional displacement yachts and sportsboat designs. The graph below plots their power to weight ratio versus DLR. Leaving aside the J-70, a relatively new design, the original analysis confirmed the significant gap in assessment ratios between sportsboats known to plane readily, such as the Melges 24, Cork 1720, SB3 & J-80, and those that plane rarely, such as the Projection 762 & Hunter 707, thus performing more like conventional displacement yachts. For example, the Hunter 707 has almost identical ratios to the Mumm 36.

Based on the analysis, the sportsboat designs listed below were classified as either 'High Performance' or 'Conventional' as follows:

High Performance Sportsboats	Conventional Sportsboats
• Melges 24	• Projection 762
• Cork 1720	• Beneteau 24
• Laser SB3	• Hunter 707
• Delphia 24	• RS Elite
• RS-K6	• Sonar
• J-80	• Bull 7000
• J-70	



2.5 Sportsboats on the Clyde:

There is no published definition of sportsboats for use on the Clyde. In the past race organisers have normally separated out those that had SBR numbers. In general most regattas try to keep the sportsboats in a class of their own and away from the larger displacement boats. When they do race together the sportsboats are generally mixed with the smaller IRC boats, typically Class 3.

Sportsboats may apply for and have been given CYCA handicaps. It has been stated that these are only realistic for windward-leeward courses.

For the passage races the sportsboats are normally excluded on safety grounds and the problem of mixed racing does not arise.

2.6 Sportsboats on the Solent:

For the major regattas the sportsboats are given their own class and when enough one-design boats are racing these will be given their own class. When there are insufficient numbers the sportsboats will be racing with the displacement yachts. It is recognised that in these cases the results of the race are often determined by the wind and tide conditions rather than the handicaps.

3. Review Conclusions:

The FYCA Review Panel concluded that:

- The disparity in the speed of high performance sportsboats, dependent on wind and course configuration, makes equitable handicapping against conventional yachts in a wide range of conditions, virtually impossible.
- From observation there are sportsboat designs that plane very rarely and perform mainly as conventional displacement yachts.
- The assessment criteria generated by Mike Urwin, who reviewed and confirmed his original analysis, are technically sound and based on readily available measurement data.
- Considering the yachts likely to compete on the Forth, the gap in the assessment ratios between the J-80, at the lower end of sportsboat designs defined as 'high performance', and the Projection 762 is substantial and constitutes a clear boundary.
- The FYCA should continue recommending that, whenever possible, member clubs should avoid including High Performance sportsboats with conventional yacht designs in handicap racing.

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Appendix A - Yacht Design Data:

	P	E	MHW	MAIN	SPA	SA	BW	Crew	DISP	SA/DISP ^{0.67}	DLR	Pole/Bowsprit
	m	m	m	m ²	m ²	m ²	Kg		Kg			
Melges 24	8.81	3.80	2.70	21.45	55.96	77.41	822	4	1292	0.64	99	Bowsprit
Laser SB3	8.10	3.30	2.33	17.06	47.26	64.32	685	3	1075	0.60	132	Bowsprit
Cork 1720	10.02	4.04	2.63	24.61	69.37	93.98	1365	5	1915	0.59	131	Bowsprit
Delphia 24	8.65	3.60	2.57	20.01	50.08	70.09	850	4	1320	0.57	64	Bowsprit
J 80	9.14	3.81	2.48	21.17	65.00	86.17	1473	4	1943	0.54	156	Bowsprit
RS K6	7.09	2.94	2.08	13.32	29.57	42.89	300	3	690	0.54	89	Bowsprit
J 70	7.97	2.88	2.13	15.08	45.50	60.58	794	4	1264	0.51	149	Bowsprit
J-92S	11.90	4.25	2.70	30.32	81.35	111.67	2575	6	3205	0.50	180	Bowsprit
Projection 762	9.35	3.62	2.36	20.60	50.82	71.42	1300	5	1850	0.46	148	Pole
J 109	13.18	4.70	3.05	37.60	108.00	145.60	5050	8	5840	0.44	204	Bowsprit
Beneteau 25	9.41	3.65	2.37	20.85	44.47	65.32	1249	4	1719	0.44	150	Pole
Mumm 36	13.63	5.02	3.21	41.17	75.53	116.70	3558	8	4348	0.43	135	Pole
Hunter 707	8.80	3.76	2.46	20.18	37.80	57.98	1083	4	1553	0.42	135	Pole
First 40 CR 2.45	16.11	5.54	3.52	53.50	132.51	186.01	7962	10	8912	0.42	185	Pole
Corby 29	11.70	3.94	2.55	27.93	77.27	105.20	3154	7	3864	0.42	225	Pole
Bull 7000	9.00	3.48	2.45	19.96	34.37	54.33	1080	4	1550	0.40	137	Bowsprit
Fast 42	14.50	5.82	3.78	51.24	97.97	149.21	6560	11	7590	0.38	178	Pole
Sonar	8.34	3.41	2.28	17.57	29.95	47.52	925	4	1395	0.37	132	Pole
First 36.7	13.85	4.75	3.00	39.30	83.45	122.75	5441	9	6311	0.35	211	Pole
Sun 49 Perf	16.50	5.40	3.65	55.40	145.97	201.37	12400	13	13590	0.34	173	Pole
RS Elite	7.80	2.98	2.22	15.33	26.39	41.72	990	3	1380	0.33	162	Pole
Ro-340	11.95	4.19	2.69	30.20	62.51	92.71	4100	7	4810	0.32	227	Pole
First 30 ES	11.30	3.72	2.39	25.36	57.81	83.17	3510	7	4220	0.31	266	Pole