**Who is competing in BUSA events?**

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**Plain language summary**

The challenges facing sailing in the UK, world-wide and at a university level are complex, but without sufficient baseline data it is difficult to understand the effects of steps to address these challenges.

While we now have a better understanding of who is a member of BUSA clubs, this does not tell us who might be competing in BUSA events and how these two focusses for BUSA might be different. Members of BUSA clubs are ultimately the product of the culture around youth sailing in the UK before they attend university and may return to non-university clubs after their graduation. UK sailing is generally focussed upon the south coast and there is evidence too that there is a large gap between male and female participants, particularly at higher levels.

In this study, we took the results of all BUSA events between 2013-2019 and analysed them in terms of the regions that were sending teams to events and their results. Here we show that Scottish and northern clubs are consistently underrepresented at all BUSA run events, which we primarily attribute to an increased expense and travel distance from many BUSA events. These clubs are also not likely to perform as well at Team Racing Finals across the sampling period.

Furthermore, we analysed the gender breakdown of competitors across the period sampled. In all cases there were fewer female helms compared to male and for any yacht based event, there was also significantly more male crew than female. There were however, no changes in fleet racing in terms of female crew and there were actually more female crew at Team Racing Finals compared to male. This we attribute in part to clubs trying to “get around” existing gender balance requirements.

Overall while club membership may be more equal in terms of male and female participants, this is not the case for female competitors. In addition there is a reduced number of competitors from clubs which are further away from the main hub of sailing in the UK, the south coast. While both these metrics are likely to be better than the UK average, more progress is vital. As a result, this study details initial suggestions to improve the situation for Scottish and Northern clubs, alongside measures to improve and support female participation, particularly for helms.

**Introduction**

It has previously been identified that the sport of sailing is facing a number of challenges, including a drop in participants between the ages of 18-35 (Gibson, 2018) and a participant demographic which is shifted in favour of older, male, sailors. The drivers behind this shift are likely to be varied and in part due to a “leaky pipeline” of female participants as the youth recruitment demographic is approximately 55:45 male: female (Penhaul Smith et al., 2020). Furthermore, opportunity availability has been identified as a key limiting factor by female sailors as a limiting factor in their progression within the sport, with female sailors being offered, or taking, fewer opportunities compared to their male peers (Low et al., 2019). This leads to a cycle in which it is sailors with less experience are passed over for their more experienced peers, giving those peers more experience and so making them the more logical choice to fill spots on teams and boats. This opportunity limitation is likely to also apply to sailors further away from the hub locations of sailing. Greater travel distances and therefore more expensive events makes it harder for sailors who are not based on the south coast, the major hub of sailing in the UK (Gibson, 2018), to take opportunities and gain the necessary experience to stay competing at high levels within the sport.

The British Universities sailing association (BUSA) is predominantly made up of sailors who are between the ages of 18-25. Many come to BUSA with extensive sailing experience, making them products of the current culture around sailing in the UK. Because BUSA is a national governing body in it’s own right, it is uniquely placed to attempt to understand the nature of sailing in the UK. BUSA members are not only a critical demographic which are participating in lower numbers compared to others, but it also has a much more even gender balance (55:45 male: female) and active membership (65% compared to 37% for the UK as a whole) than other, non-university, sailing clubs.

In this study we take the results from all BUSA run events in the UK for the last five years (2013-2019) and compare the region that sailors are from and their gender across the time period.

**What did we find?**

This study paints a more stark picture of the gender and regional results of BUSA clubs than those previously identified (Penhaul Smith et al., 2020). This is because club membership fails to account for who is participating in a given section of the sport and who makes selection for teams to attend BUSA run events. Across the sampling period (2013-2019) there are clear differences in the number of people competing in BUSA events, with the greatest attendance at Fleet racing, which is the only event with does not have a limited number of entrants. The majority of competitors are from south central or western region clubs in all disciplines and, at Team racing Finals, they are much more likely to win their matches and so rank higher in the final results.

**Which regions are attending BUSA events?**

There was as significant difference in the number of regions attending team racing finals (Kruskal-Wallis, chi squared= 16.0841, df=4, P<0.05, Fig: 1). There was no significant difference between the number of Northern and Scottish universities attending team racing finals, however these were significantly fewer compared to the midlands, south central and western region teams (mean= 6 s.d± 0.89 south central region, mean= 4.17 s.d± 0.41 compared to Scottish region, fig: 1). In addition, there were significantly greater numbers of Scottish and Northern teams compared to midlands, south central and western teams which did not leave team racing playoffs (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 13.2538, df= 4, P<0.05, mean= 1 s.d± 0.63 south central region compared to mean= 2.33 s.d± 0.82 Scottish region).

In addition to more teams attending Team Racing Finals from the Western and South Central regions, there is also a clear difference in their likely results (Table: 1). There are a number of potential reasons for this. More southerly-based clubs are closer to the hubs of sailing in the UK, which may mean there is an increase in the availability of expertise. There are also more events held in the midlands, western and south regions compared to the north and Scotland in any given year, meaning that the expense and time commitment associated with travel to these events is higher. Furthermore, there are also a large number of other team racing events which can be attended, which may mean that teams closer to these events have more opportunities to train together against top quality teams. As more of these events occur in the midlands and further south in the UK this again reduces the opportunities for northern and Scottish teams to train by placing a financial and time commitment based barrier to attendance.

There was an overrepresentation of south central and western teams when comparing the number of teams, by region, attending yachting nationals (Kruskal-Wallis, chi squared= 25.0482, df= 4, P<0.05). There region with the greatest number of teams was the South central region (mean= 8.67, s.d± 1.03), while the lowest was the northern region (mean= 2, s.d± 0). When comparing these teams by region, there was not a significant difference between the number of Scottish, northern or midlands teams (Dunn’s non-parametric comparison). There were a greater number of midlands, south central and western teams attending match racing finals (Kruskal-Wallis, chi squared= 10.056, df= 4, p<0.05), where there were significantly greater numbers of teams from, the midlands (mean= 2.33, s.d± 2.07), South central (mean= 3.17, s.d± 2.14) and western (mean= 4.67, s.d± 1.75) regions (Dunn’s non-parametric comparison). These differences corroborate the lower attendance and performance of teams from Scotland and the north at Team Racing Finals, as the BUSA Yachting Championships is always held at Gun wharf Quays in Portsmouth. This can result in a journey of 450 miles to attend this event (Edinburgh- Gun Wharf Quays). This means that training on the boats which the team will be racing in is prohibitive reducing the number of less experienced teams attending. There is a large yacht racing scene based in the Firth of Forth and the Clyde in Scotland, meaning students can gain this racing experience elsewhere, but there are fewer opportunities available to many of the northern region universities. This is a potential contributory factor to explain the why universities have the lowest attendance to these events.

When analysing the numbers of teams from a given region attending the Fleet Racing Nationals there were a significantly greater number of south central (mean= 8.17, s.d± 1.94) and western (mean= 8.67, s.d± 1.51) teams attending Fleet racing Nationals in the fast handicap fleet (Kruskal-Wallis, chi squared= 27.6463, df= 4, P<0.05 and Dunn‘s non-parametric comparison). The was also the case for the teams attending the slow handicap fleet at Fleet Nationals (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 25.7074, df= 4, P<0.05), with the greatest number of attendees coming from the western regions (mean= 7, s.d± 2.28). There was a significantly greater number of south central (mean= 8.5, s.d± 1.38) and Western (mean= 9, s.d± 2.19) region sailors attending the fleet nationals in the Laser fleet (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 24.9772, df= 4, P<0.05). There were significantly fewer Scottish (mean= 0.17, s.d±0.41) and northern (mean= 2, s.d± 1.67) teams attending in the Firefly fleet at Fleet Nationals compared to south central, western and midlands teams (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 28.5677, df= 4, P<0.05). We suggest that the low attendance to many of these fleets is partly driven by a location of many of the fleet racing events between 2013-2019. There has not been an event during the sampling period north of Draycote water (Warwickshire). This has mean that the minimum travel distance for a northern university such as Newcastle was 210 miles (Newcastle- Draycote) which for clubs can be a massive expense, particularly if they must transport their own boats this distance.



Figure 1 The average number of competitors from a given region competing in named BUSA events between 2014-2019, ± standard deviation

**ELO rating of teams at Finals**

When the teams competing were averaged by region there were clear differences in their likely results (Table: 1). The south central was most likely to win their matches against all other regions (2013-2019), while the Western region was more likely to win against all regions except the South central teams. Midlands teams were likely to outperform the Scottish and Northern teams, but lose to the South central and Western teams and Scottish teams were only likely to beat the Northern teams. The North was likely to be the lowest performing team, with a less than 50% probability of beating any team from another region at BUSA Team racing Finals. As a result, it is much more likely for South central and Western teams to rank much higher in the final results, compared to Northern and Scottish clubs.

Table 1. The likely results in a match at team racing finals.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Median team loss probability | **Midlands** | **Northern** | **Western** | **Scotland** | **South Central** |
| Median Team win probability |  | 2508.773 | 1948.166 | 2580.992 | 2015.43 | 2766.399 |
| **Midlands** | 2508.773 |  | 93.5% | 40.3% | 94.2% | 34.1% |
| **Northern** | 1948.166 | 7.6% |  | 3.9% | 49.6% | 3.0% |
| **Western** | 2580.992 | 66.4% | 95.4% |  | 95.9% | 42.6% |
| **Scotland** | 2015.43 | 10.4% | 54.9% | 5.4% |  | 4.2% |
| **South Central** | 2766.399 | 83.4% | 98.1% | 71.1% | 98.3% |  |

**Gender diversity**

**Gender breakdown of helms**

There was a significantly greater proportion of male helms competing in team racing (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3077, df= 1, P<0.05, Fig: 2), with 77.27% of all helms competing identifying as male. There was a significantly greater % of male helms competing in yachting nationals (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3077, df= 1, P<0.05), with 84.36% of all helms competing identifying as male. Furthermore, there was a significantly greater proportion of male helms competing in match racing (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3662, df= 1, P<0.05), with 89.10% of all helms competing identifying as male. There was a significantly greater proportion of male helms competing in fleet nationals in the fast handicap fleet (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 9.8, df= 1, P<0.05), with 71.04% of all helms. This was also the case for the slow handicap fleet (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 9.8, df= 1, P<0.05), with 66.23% of all helms competing identifying as male. The laser fleet at fleet nationals also has a significantly greater proportion of male helms competing (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 9.84, df= 1, P<0.05), with 77.27% of all helms competing identifying as male. Finally the firefly class had the lower % of male helms (64.65%), however this was still significantly greater than female helms (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 9.8, df= 1, P<0.05), with 35.35% of all females identifying as female.

This study quantifies the disparity between male and female helms competing in the different aspects of the sport that BUSA hold competitions in. In all instances there are more male helms than female, with a greater disparity in events which involve keelboat sailing compared to dinghies, with a slight reduction when the boats used were Fireflys or slower (team racing, Firefly and slow handicap fleet racing). The reasons for this are likely to be complex and hard to disentangle. We suggest that, while there is a relative equal proportion of male: female sailors at youth level (RYA, 2019), this also hides disparities in the number of female helms, such as those observed in this study. We also suggest that the lower number of female helms may be due to explicit discrimination by those coaching and supporting university sailing as observed elsewhere (Low et al., 2019). Even when explicit discrimination is not present, we also cannot rule out institutional biases, which may further reduce the opportunities for female helms (Low et al., 2019). The lack of opportunities for female helms has previously been identified as a limiting factor in expanding women’s sailing (Low et al., 2019; West, 2019), meaning this issue self-perpetuates. There is an additional regional factor in this analysis. The south central region has the lowest percentage of female club members (Penhaul Smith et al., 2020), but these are the clubs most likely to attend (Fig: 1) and achieve the top results in team racing finals (Table: 1). This will skew the gender balance of helms at Team Racing Finals suggesting that this region should be an area of particular concern for BUSA in the future.



Figure 2 The average gender split between male and female helms in BUSA run events between 2014-2019, ± standard deviation

**Gender breakdown of crews**

There was a significantly greater proportion of female crews competing in team racing (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3077, df= 1, P<0.05, Fig: 3), with 30.71% of all helms competing identifying as male. This result is the only instance in which female crews are overrepresented compared to male crews. This therefore suggests that, in an effort to “get around” gender requirements for teams at team racing events, female sailors are being deliberately placed as crews.

The increased number of female crews in team racing was in contrast to yachting nationals in which there was a significantly greater percentage of male crew competing in yachting nationals (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3077, df= 1, P<0.05), with 61.18% of all crews competing identifying as male. Furthermore, there was a significantly greater proportion of male crew competing in match racing (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 8.3077, df= 1, P<0.05), with 53.11% of all crews competing identifying as male. Both of these events occur in keelboats, which are known to have a strong cultural bias against female sailing (Crawley, 1998; Low et al., 2019). There may also be an issue around the physicality of many of the roles on the yachts used in yacht racing. Roles such as pit, main and jib trim are classically considered to be roles for more physical sailors (“grunt” sailors), whom are overwhelming men (Crawley, 1998). This suggests that in future there is potential to move yachting events in to boats that have a lower perceived requirement for “grunt” sailors, which will enhance opportunities for female crew.

There was no significant difference in the proportion of male of female crews competing in fleet nationals in the fast handicap fleet (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 1.4735, df= 1, P>0.05). This was also the case for the slow handicap fleet (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 1.18, df= 1, P>0.05) and the Firefly class (Kruskal-Wallis and Dunn’s non-parametric comparison, chi squared= 0.2618, df= 1, P>0.05). The Firefly dinghy may be helping this issue as the “optimum” combined crew mass is between 105-155kg (Guy, 2009). Therefore, anecdotally, if the helm is male, then to reach the optimal crew weight a smaller female helm is often preferred. The ability of sailors to choose their own boat to attend fleet racing events will also contribute as sailors can then sail with a crew who best suit the boat they are sailing. Choosing whom you wish to sail with to attend a given event then becomes a challenge for individuals, whom it would appear have a reduced bias towards male crew. While this unfortunately is not a solution for other events, which are limited by choice of boat, it does suggest a potential pathway by training more of these sailors to helm and crew yachts, match race and to helm in team racing.



Figure 3 The gender split between male and female crews in BUSA run events

**Conclusions**

This study paints a more stark picture of the gender and regional results of BUSA clubs than those previously identified (Penhaul Smith et al., 2020). This is because club membership fails to account for who is participating in a given section of the sport and who makes selection for teams to attend BUSA run events. Across the sampling period (2013-2019) there are clear differences in the number of people competing in BUSA events, with the greatest attendance at Fleet racing, which is the only event with does not have limited entry. The majority of competitors are from south central or western region clubs in all disciplines and, at Team Racing Finals, they are much more likely to win their matches and so rank higher in the final results. There are more male helms compared to female helms in all circumstances, irrespective of sailing discipline, while the proportion of female crews is more equal for fleet racing and is greater than male crews for team racing. In the case of team racing this suggests that teams are looking to “get around” the gender requirements present in this competition. This also study paints a poor picture of the number of female helms competing at BUSA events. As a result we can suggest a number of potential interventions which may improve opportunities for female helms, female yacht crews and to boost the number of Scottish and Northern teams competing in BUSA events.

**Future work for BUSA**

**Regional participation**

As the number of events that have been held in the midlands and further south has greatly outnumbered those in the north and Scotland, we propose that there should be an equal number of each, each year, starting in the 2020-2021 academic year. This will reduce the travel times for the northern and Scottish teams, while providing a source of income for clubs in the region. If bids can be encouraged from other, non-university clubs, this may improve this process by expanding the number of locations available for events. By breaking the hold that locations such as Gun wharf Quays and Weymouth have upon yacht and match racing respectively this may further expand opportunities for northern and Scottish clubs to compete in events which they have historically been poorly represented at.

To improve the results of clubs BUSA will also look to expand the availability of training, through engagement with non-university clubs and class associations. This may improve the experience level of northern and Scottish clubs, improving their potential results. We at BUSA will aim to pressure the RYA and UKTRA in also adopting these changes to expand opportunities for the north and Scotland.

**Gender participation**

This is a key area identified by a number of groups and charities already (The Magenta Project, The Maiden Factor and the World Sailing Trust), some of which BUSA is already collaborating with. Enhancing this collaboration in the future would be a logical step for BUSA. In addition increasing participation of female sailors, both as helms and crews, will increase the overall number of participants in university sailing.

At a senior management level we will be looking to make a diversity and inclusivity based role explicit within the constitution, to be handled by the senior Vice president. As part of this role we will also look to develop a diversity and equality policy to be implemented within BUSA. From there we can utilise these experiences to aid other clubs in the development and implementation of their own versions of these policies, which may include encouraging female representation at senior management levels within university sailing clubs. We will be pushing the RYA for increased representation of female race officials, including Principal race officers and umpires, and look to support the development and retention of female coaches and instructors within university sailing clubs. BUSA also aims to provide support for university clubs to develop mentoring programs, participation pathways and for opportunities for female helms to develop their skills. This may be through targeting the Development fund or tailoring the support which we give to university clubs, alongside collaborating with the other national governing bodies for sailing in the UK and charity groups.

**What will success look like?**

If we can successfully implement these recommendations over the next five years, we will expect to see an increased number of participants from northern and Scottish clubs alongside their improved results. In addition, we will see greater overall participation both in BUSA events and in BUSA club membership.

In BUSA events we also will expect to see a more equal number of male: female helms and crews participating. BUSA clubs will also be more inclusive and the increased number of female coaches and race officials is likely to improve the provision of these services as a more diverse workforce of volunteers can engage with a wider range of potential participants. This is likely to have a knock on effect on the UK marine and sailing industries through a more diverse potential workforce, benefitting the whole of the UK in the longer run.

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**Methodology**

This study utilises the published results of the past five years of BUSA events (2013-2019 seasons inclusive) and lists the results of the universities and the gender of competitors, both of which had to be reported as a part of event registration. All analysis was conducted in R (v3.6.2). For these events, none of the regions attending the events were normally distributed (Shapiro-Wilks, P<0.05). Kruskal-Wallis and a *post-hoc* Dunn’s non-parametric comparison were utilised to compare the attendance of each region. The gender breakdowns of helms and crews (% of total number of competitors) were not normally distributed (Shapiro-Wilks, P<0.05) and these results were compared utilising an Kruskal-Wallis and *post-hoc* Dunn’s non-parametric comparison.

**ELO rating of team racing teams at finals**

An Elo rating system was used to analyse the performance of the teams at playoffs and Finals (Aldous, 2017). The "expected performance" of one team in a head-to-head against another was given by the formula P = 1/(1+(3.2^((T2-T1)/232))), where T2 and T1 are the respective Elo ratings of the two teams. The coefficients 3.2 and 232 were obtained by fitting the curve generated by the formula to the results of the UK team tour from 2019 (Collings, 2018).

This formula was applied to the results of each BUSA Finals and Playoffs from 2007-2019. A team's "expected performance" against each of their opponents was summed to give a total "expected score", which corresponds to the number of teams they would be expected to finish ahead of at the end of a completed round robin. The difference between the expected and actual performance was used to calculate the team's new Elo rating.

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