



DEALING WITH WEED – UK GUIDANCE

Inland lakes, gravel pits, reservoirs and rivers can sometimes be affected by large growths of aquatic weed which can cause problems for racing and recreational boating in the summer months.

2010 was a particularly bad year for weed issues with a record number of clubs reporting problems. The very cold winter followed by a warm spring encouraged rapid proliferation of weed all over the country forcing many clubs to operate in a restricted sailing area and in some cases having to cancel events.

A range of management options are available to sailing clubs faced with weed problems and this guidance provides an overview of these and uses case studies to illustrate successful approaches.

WHAT CAUSES WEED GROWTH?

Aquatic plant growth is generally a sign of good water quality and they act as an important food and habitat source for birds, invertebrates and fish. Having a little bit of weed is therefore a good sign and doesn't cause an issue for boating. So what causes the levels of weed growth to increase so dramatically?

Given the number of factors that could affect the levels of weed growth it is difficult to predict the impact from one year to the next. In lakes with poor water quality only algae can survive (including toxic blue-green algae), resulting in a murky "pea soup" appearance. Reduction of water pollution over recent decades has led to a reduction in algal growth and improved clarity of water and this has supported increased weed growth as sunlight is able to penetrate through to the bed. Other important factors include run off from agricultural fields and the weather; for example if nitrate/phosphate rich fertilisers are applied to fields next to a water body and heavy rain follows shortly afterward, some of these chemicals can end up in the water leading to an increased level of aquatic plant growth.

The range of variables contributing to the level of weed growth is matched by the number of other factors that need to be considered when looking into management options. Many of the waterbodies we use for boating are also important for nature conservation or for drinking water supplies which can limit the approaches we can use to keep our sailing area open. Furthermore, some of the most prolific types of weed we see in our waterways are not native to the UK which can make management more complicated, particularly if the waterbody is designated for nature conservation reasons. More guidance on non-native invasive species is available from the RYA website.

WHAT ARE THE MANAGEMENT OPTIONS?

Historically excessive weed growth could be controlled through the application of herbicides, however since 2010 the use of most herbicides in waterbodies has been banned in the UK leaving only physical methods of control. The remaining options are as follows:

1. Cutting

The simplest approach is to cut the weed in a similar way you would mow a lawn throughout the growing season.

Weed cutters can range from a simple blade attached to a motor launch up to a purpose built machine – with associated price tags! Once you have your cutting tool it is a case of working out within your club the timing of cutting and how to go about dividing up the effort. You will also need to think about how best to dispose of the weed.

The simple cutting blades will leave the ‘cuttings’ floating in the water which may also restrict boating activities. These will therefore need to be collected and disposed of in some way. A purpose built weed cutter usually has a ‘harvesting’ function inbuilt however it will still be necessary to identify a disposal route. Depending on the quantity of weed you need to dispose of it may be necessary to liaise with your Local Authority to establish any protocols they have on such things. In many cases it may be possible to set up a ‘composting area’ within the boundaries of the club grounds for use by keen gardening members – or indeed non-members – however it is worth noting that in warm summer temperatures decomposing weed can give off quite a strong odour. As they break down, plants also release nutrients which can wash back into the water body and promote further weed growth. It’s therefore important to set up composting areas well away from the water’s edge.

If your sailing club operates on a water body that is designated for nature conservation purposes it is likely that cutting will be the only option available to you. Depending on the features that the designation covers it is possible that there may be some restrictions on how often and how much of your water body you can cut. It is essential that you get in touch with the relevant conservation agencies when you start thinking about how to manage your weed problem; you will probably need their consent to undertake weed cutting and they can offer some good advice on different approaches that could work for your club.

As with your back garden this method can be very labour intensive as the weed could need cutting regularly throughout the growing season drawing heavily on volunteer time resources. Once a good system is in place however this management technique can be very effective as demonstrated by the Welsh Harp Sailing Association.

CASE STUDY: WELSH HARP

The Welsh Harp Sailing Association represents a range of organisations which use the Brent Reservoir in North West London for sailing, windsurfing and canoeing. The 150 acre reservoir is owned and managed by British Waterways, is an important flood storage area for this part of London and has SSSI status. In June 2008 prolific weed growth began to seriously interfere with training and racing activities and options for weed management were investigated.

Early research focussed on identifying the weeds involved, understanding their life-cycle and getting advice on control mechanisms. This involved all interested parties including British Waterways, Natural England, and the Environment Agency. It was agreed all round that prevention of weed growth was preferable to simply coping with grown weed, *if* this could be squared with conservation interests.

Given the Brent reservoir's SSSI status and as it is part of an open water system (there are two streams running in and one running out), ploughing, harrowing or anything which might disturb the lake-bed was not allowed; the use of blue dye was also not permitted. So at first only limited cutting was allowed – in effect a coping mechanism – using a fixed 'D'-shaped cutting blade mounted on the bow of a small second-hand Berkenheger weedboat. This began in spring 2010. The blade cut to a depth of about a metre and a width of 1.5m. The aim was to cut the sailing area between the 1 and 2 metre depth contours, keeping open a "sailing bowl".



'D' Cutter



'V' Cutter

Although moderately effective this approach was incredibly labour intensive, slow and at the peak of the season was barely sufficient to keep the sailing area open. The WHSA did further research and sought consent from Natural England and others to switch the 'D' blade for a 'V' shaped blade towed behind a launch. This would allow them to cut much faster and therefore cover a wider area. Following a trial and demonstration to prove this would not disturb the reservoir bed, consent was granted in 2010 for the use of the 'V-cutter' and the WHSA are looking forward to a more successful season in 2011.

Collection of weed cuttings remains a time consuming element of the management of the sailing area at the Brent. At present the huge quantity of cut weed is collected and deposited in a number of designated areas around the lake. This allows any invertebrates removed with the weed to return to the lake and the weed to break down in a natural way. The hope (following scientific advice) is that V-cutting from early in the year at monthly intervals will eventually result in fewer and smaller lengths of cut debris which can be allowed to remain in the water without causing problems for either wildlife or recreational interests. Effort over this winter is going into plotting waypoints and tracks so that cutting can be managed by Wide Area GPS.

2. Ploughing/Harrowing

Another way of managing your weed growth is through the employment of a harrow/plough. This is similar to the equipment used by a farmer on land albeit on a much smaller scale.

Weed harrows range from something as simple as some heavy duty chain being towed along behind a powerboat to purpose built rake attachments that can be deployed from a suitably modified vessel. If your weed problem is confined to the shallows you can even use people power to rake the bed by hand – with the appropriate safety precautions in place!

The effect of harrowing is twofold: it breaks off the new shoots as they are starting to emerge and buries seeds too deep to germinate, and it churns up the sediment creating high levels of turbidity. This has the double effect of limiting the amount of weed able to start growing and slowing growth of any weeds that have managed to establish by limiting the amount of sunlight that can penetrate through the water.

Harrowing can be similarly labour intensive to cutting unless you start harrowing by mid-February before the water temperature warms up enough to encourage weed growth (about 10°C). If you can get in there early enough you will be able to stop the weed getting established. This technique is only really effective when the plants are quite small and weak. Once they have grown beyond about 50cm harrowing is no longer the most effective way of managing things. Each situation will be different but harrowing may need to continue throughout the season at about 6-8 week intervals to prevent the establishment of any new growth. It may be necessary to use a combination of harrowing and cutting if the weed has got a strong foothold at your club.

The major benefit of harrowing is that if you can prevent new growth establishing then you will not have any weed to dispose of; if you harrow successfully for a number of seasons it is likely that you will reduce the ability of the plants to regenerate thereby reducing the amount of effort required to manage the problem over time. The downside is that if your water is protected for nature conservation purposes, used as a drinking water reservoir or linked to any other waterbodies then you may not be able to get consent to harrow. However, consent may be given in

some exceptional circumstances, and will be considered on a site-by-site basis; the key is to approach the relevant authorities early in the planning stages and involve them in on-going discussions about managing the problem.

If there is no reason why you cannot use harrowing then it can prove to be an effective management technique for aquatic weed problems; North Lincs Sailing Club have been using harrowing to successfully manage their weed problem since 2007.

CASE STUDY – NORTH LINCS SAILING CLUB

North Lincolnshire and Humberside Sailing Club are based on an old clay pit in the East Midlands. With a sailing area of about 60 acres the club uses the water for dinghy sailing, windsurfing and safety boat training. Weed started to become a problem in 2005 and after doing some research the club committee decided that harrowing would be the best approach for them. With the help of Google and some helpful boat brokers they managed to source a second hand 27ft workboat for £7,500 in 2007. Powered by a 90hp engine and fitted with a 1.5tonne bollard pull this boat is perfectly equipped to tow the 3m² harrow around the 60 acre lake.

Having established that the key to success is to disrupt the weed before it can gain a foothold, NLHSC harrow the lake over the course of a fortnight in mid-February every year. This activity is carried out by volunteers from the club following GPS coordinates to ensure they cover the entire lake floor systematically, with the exception of a 3 metre margin that is left untouched. Not only does this activity prevent the weed from causing any disruption to their sailing season it also helps to flatten the bed of the lake which is ridged and uneven as a result of its previous life as a clay pit. As the bed becomes flatter, harrowing becomes easier and faster. The un-harrowed margins ensure that habitat for wildlife (including birds, fish and invertebrates) is retained. Club President Rodney Clapson says ‘Since we’ve had this workboat and been doing the harrowing our lake is 99.9% clear for the whole season; the secret is to get in there before the water warms up and the weed starts to grow.’



The harrow cost NLHSC around £800 and was sourced from an agricultural engineering firm in Devon

The lake that NLHSC use is part of the Humber Estuary Site of Special Scientific Interest (SSSI) so the club engaged with Natural England when considering the options for managing their weed issue. Harrowing would not normally be permitted on a SSSI, but in this instance Natural England was able to show some flexibility in approach, in consideration with site specific circumstances.

3. Dye

A relatively new management technique has recently been developed which involves adding a blue dye to the water to limit weed growth. Developed by a company called Dyofix[®], this blue dye acts by removing the ultraviolet (UV) part of the light spectrum from the water column which is selectively used by plants as an energy source to make food.

By removing their ability to 'feed' you can considerably reduce and potentially prevent the plants from growing. Not only does this technique have the potential to be extremely effective, as the dye costs about £70-£100 per hectare, it is also relatively inexpensive. When applied correctly the dye can be effective for 2-3 months depending on the amount of sunlight and rainfall.

As the dye is vegetable based, it is harmless to humans and animals, however as all plants use the UV part of the spectrum, it can potentially kill every plant in the water; this is a problem if your sailing area is protected for nature conservation reasons. Even if your waterbody is protected more for birds or animals than plants, you are still unlikely to be given consent to use it as the plants are probably important sources of food and habitat.

If you share your water with a water company or with the Environment Agency as a flood storage area then you will need to check with them before adding the dye to the water.

As the dye can only work if it is applied at the right dilution level, this technique can only work in low or no flow conditions where mixing is at a minimum. In other words, this technique cannot be applied in rivers or lakes/reservoirs with strong through-flow. Anecdotal evidence has demonstrated that this dye doesn't work as effectively if the water temperature exceeds 10°C and is less effective in alkaline than in more acidic waters. More information on Dyofix[®] and the range of products available and suppliers can be found at their website www.dyofix.co.uk

CASE STUDY: Humber Bridge Water Ski Club

The Humber Bridge Water Ski Club use a 32 acre old clay pit on the south bank of the River Humber. A few years ago they found that fennel pondweed was causing them serious problems filling the water and making it virtually impossible to ski. The weed, some of it 18ft long, was causing even the boat powered by 260hp V8 engines to grind to a halt.

After trying cutting and finding it to be too demanding on volunteer time and too expensive if carried out by contractors (~£4000) the club looked into using the liquid form of Dyofix[®]. After purchasing ten 5L containers for around £600 the club dispersed the dye around the lake using powerboats in early July 2009. Within four weeks of application the weed had died back and the club were able to ski freely and were able to host the Kneeboard Nationals in September of that year.

Dyofix[®] was used to treat the lake again at the beginning of 2010 and the club has reported no weed problems at all throughout the year. Learning from their previous experience, fewer containers of dye were required so the cost of weed management in 2010 was around £400. Hugely pleased with the success of this management technique, the club intends to continue applying Dyofix[®] at the beginning of each season and looks forward to many more successful years.

NON-NATIVE INVASIVE SPECIES

Non-native invasive species are plants and animals from other countries that are introduced to Great Britain by people and have the ability to cause damage to the environment, the economy, our health and the way we live.

Non-native invasive species can be easily spread on equipment and in water, for example as small fragments of plants which can regenerate, as tiny (sometimes microscopic) larva and as eggs. It is important that this spread is controlled to minimise their impacts. Weed cutting and ploughing have the potential to result in the spread of non-native species and it is important that if your lake contains invasive species that care is taken to minimise the risk of spread. Advice on how best to achieve this is available from the RYA website <http://www.rya.org.uk/infoadvice/planningenvironment/Pages/AdviceonAlienSpecies.aspx>

FUNDING

A range of potential funding sources are available to help clubs with the costs associated with setting up their weed management system. As these sources are subject to fairly regular change the best way to find out about what is currently available is to look on the RYA Funding Webpage at <http://www.rya.org.uk/infoadvice/clubsclass/finances/Pages/sourcesfunding.aspx>

If you are one of a group of clubs in a similar area with the same issues then it might be worth looking into pooling your resources. Not only could this help to reduce the costs for each club, you will also be able to draw upon the experiences of others to help inform your management choices.

SHARING THE WATER – AND THE WEED!

If your sailing water is important for nature conservation, drinking water storage, flood storage or any other reason apart from boating it is important that you consider these factors when planning your management of the weed. The best approach is to involve all interested parties in discussions at an early stage so that the plan can be tailored to meet the needs of all water users. In some cases you will require consent from a regulatory authority (for example from Natural England in a SSSI) and unless you own your lake, you will always need consent from the landowner. In many cases it will be in the interests of more than one party to manage the weed issue which should allow any costs to be shared and national bodies such as Natural England can draw on experience from around the country to help inform decision making. They may also be able to provide advice on the type of weed you have present and the options available for managing the situation.

Most regulatory authorities have a standard initial approach to discussions about weed management although they are keen to stress that decisions on consenting etc are made on a case-by-case basis. Below is a brief summary of the approach taken by the key regulatory bodies you are likely to come across in your discussions about weed management:

NATURAL ENGLAND

Natural England (NE) is the Government's advisor on nature conservation and is responsible for, among other things, the protection of all Sites of Special Scientific Interest (SSSI) in England. You will need consent from NE to undertake any management activity in a SSSI and it is always worth seeking their advice as you're considering your options.

A SSSI is usually designated due to the presence of certain types of plants, animals or wildlife habitats ('interest features'). The potential for weed management to impact on the SSSI's interest features must be taken into account when assessing different control options. If an operation is likely to have a negative impact, then NE will not permit it. SSSI interest features vary from one site to the next, which means that some methods of weed control will be an option on some sites but not others.

NE's preference on the whole will be for cutting as a management technique as it is the least destructive and unintended consequences are likely to be limited. However it is worth discussing all options with them as decisions are made on a site-by-site basis as demonstrated by North Lincs Sailing Club.

In issuing consent to cut weed in a SSSI NE may want to apply a number of conditions related to, for example, the frequency, timing and area of cutting. NE will usually consent for 5% of the water area being cut but any more than that will need discussion. Sudden changes in the percentage of open water and plant coverage can upset the balance of plants and animals in the water with negative impacts, and so NE need to be comfortable that the risk of this happening is reduced. NE appreciate

that 5% can represent a small amount of area for boating and confirm that several cuts in a season will be acceptable in most cases. The final decision for a site is likely to be influenced by the extent of weed coverage across the whole lake, and the types of weed that are present.

NE have a policy of working with recreational users of SSSIs to ensure that activities can continue in ways that are compatible with the conservation interest. Contact your local office for advice. More info available at www.naturalengland.org.uk

ENVIRONMENT AGENCY

The Environment Agency (EA) are a regulatory authority with a wide ranging remit ranging from water quality to flood risk management. Consent is needed from the EA to carry out any management activity that has the potential to affect water quality, biodiversity and/or the ability of an area to act as flood storage. Essentially, unless your lake is privately owned and does not act as a source or sink for any other part of an open water system, it will be necessary to involve the EA in your discussions on weed management.

As well as being responsible for many aspects of environmental management, the EA is also responsible for championing recreation in an environmentally sustainable way, especially when it comes to outdoor water based recreation. Their recreational specialists have a wealth of experience of dealing with managing sites whilst minimising the impact on the environment. In their role of flood prevention they are also responsible for weed cutting in large stretches of the waterways of Britain to ensure they can carry away flood waters in periods of heavy rainfall. This combination of experience of managing weed and understanding the importance of recreation means that they can often provide useful input to discussions on weed management in sailing lakes.

The EA is divided up into Regional and Area offices and the first step will be to get in touch with the recreational lead for your local area. They will be able to help with developing your weed management strategy and also advise you on any other consents you may need from the EA. More information can be found at www.environment-agency.gov.uk

Both Natural England and the Environment Agency have contributed to the production of this guidance and encourage clubs seeking to manage weed problems in locations where their consent is required to get in touch as early as possible.

SCOTLAND, WALES & NORTHERN IRELAND

If your club is based in Scotland, Wales and Northern Ireland the regulatory authorities you will be dealing with are slightly different albeit with similar remits. As with clubs in England, it is always worth getting in touch with these bodies early in the process to make sure you don't fall foul of any environmental laws.

Scotland: Scottish Natural Heritage (SNH) are the equivalent to NE in Scotland and more information can be found at www.snh.gov.uk

Scottish Environment Protection Agency (SEPA) is the equivalent to the EA in Scotland and their web address is www.sepa.org.uk

Wales: Countryside Council for Wales (CCW) are responsible for nature conservation and contact details for your local office can be found at www.ccw.gov.uk

Environment Agency Wales is the devolved body from the EA for England and operates in much the same way and shares the same website www.environment-agency.gov.uk

Northern Ireland: All issues related to nature conservation are dealt with through the Department of Environment in N Ireland and their web address is www.doeni.gov.uk

Water quality comes under the remit of the Northern Ireland Environment Agency (www.ni-environment.gov.uk) however flood risk management and land drainage are dealt with by the Rivers Agency (www.riversagency.cyni.gov.uk)

Other organisations that you may need to contact could, depending on your situation, include Local Authorities, Water Companies, British Waterways, The Broads Authority, the National Park Authority and the National Trust.

The best approach is to draft a letter/ e mail describing the nature of your problem and the potential solutions you are considering and to send it out to all relevant organisations. Hopefully all that need to be involved will be happy to meet and discuss a way forward thereby ensuring the approach is sustainable and legal. Although this may seem onerous it often saves time in the long run - after all NE/EA are unlikely to refuse a consent they helped to write the application for!

Appendix A provides a quick reference guide to potential management options in different scenarios. It is important to note that this is a high level guide and is merely meant to be a starting point for discussions about the way forward – you will still need to seek approval from the relevant regulatory authorities.

Appendix B is a flow diagram illustrating suggested main steps in approaching the management of your weed problem and is in essence a summary of this guidance document.



APPENDIX A

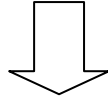
DEALING WITH WEED

Is your boating lake used for....	Flood Storage?	Drinking water reservoir?	Local Nature Reserve/SSSI?	Open water system?	Multiple use site e.g. fishing?
Management Options					
Cutting	Yes	Yes	Yes – possibly with caveats; seek advice with nature conservation agencies and potentially the local authority	Yes – unlikely to be able to leave cuttings in the water as they may float downstream; talk to the Environment Agency	Yes – provided all user groups are involved in the planning and health and safety concerns have been fully addressed.
Harrowing/Ploughing	Yes	Possibly – seek advice from the Environment Agency and the Water Company managing the reservoir	Unlikely – seek advice from the nature conservation agencies early in your management planning	Possibly – depends on the level of contamination in the sediment; seek advice from the Environment Agency	Possibly – provided all user groups are involved in the planning and health and safety concerns have been addressed to the satisfaction of all parties.
Dye	Yes	Yes	Unlikely	Possibly – depends on the location etc, seek advice from the Environment Agency.	As above.

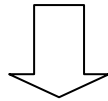
APPENDIX B DEALING WITH WEED

Identify the problem

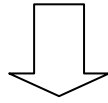
- What type of weed is it?
- How much area is affected and how does it affect your clubs activities?



Talk to other clubs which have experienced/are experiencing similar problems – The RYA has a database of ‘affected clubs’ which could be a useful starting point.

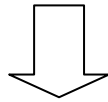


Check whether there are limits on what you can do to manage the situation e.g. are you in a SSSI?
Talk to the relevant regulatory authorities, landowner and other interested parties.



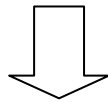
Cost out the solutions

- What kit will you need?
- Talk to equipment manufacturers and other clubs re sharing resources.



Think about funding

- Who benefits from your club facilities?
- Look at the RYA funding webpage
- Talk to other clubs



Document the whole process (consents, funding, equipment, volunteer effort) so if you need to refer back or are seeking to change your approach in the future you have all the details.

There is no ‘one size fits all’ for weed management so some trial and error might be involved; a record of what has already been tried may well be useful.