

Guidance on sampling rare aquatic plants

This note provides guidance on sampling rare or threatened aquatic plants. It has been written specifically to provide advice on appropriate sampling methods for protected species e.g. floating water plantain *Luronium natans*, but applies to all species where there may be a risk of harming a population through destructive sampling techniques. Natural England expects all licence applicants to follow this guidance when considering destructive sampling techniques.

The purpose of this note is to protect vulnerable species and populations from unnecessary damage and to ensure that the most appropriate sampling technique is used on each occasion; it is not intended to restrict the ability of surveyors to obtain a licence. This note will be referred to in all licences which allow destructive sampling and it is expected that licensed work will only be undertaken in accordance with this guidance.

Natural England will assess licence applications taking in to consideration: species conservation issues; health and safety issues; excessive costs; environmental considerations; and sampling methodology. Only where it has been clearly demonstrated that non-destructive techniques are not suitable (or where material collection is necessary) will a protected species licence, allowing destructive sampling, be issued.

1. Options for non-destructive sampling of aquatic plants

A challenge to surveyors of aquatic plants is determining what is growing beneath the water surface, this is particularly true of fully submerged species growing in deeper water e.g. lakes, canals or slow flowing rivers. In calm, sunny conditions and with clear water it may be possible to view submerged plant beds from the bank or from a boat (though a sample may be required to confirm identification). However, it is recognised that surveying in these conditions is often not possible or practicable. A range of non-destructive surveying methods exist and **we would expect all of these to be considered before a destructive technique is employed:**

- visual observation from bank or boat
- bathyscopes or glass-bottomed buckets
- underwater (video) cameras
- SCUBA or snorkelling

Underwater viewing devices (bathyscopes or cameras) are generally used from a boat and can provide a very good impression of the underwater vegetation composition and structure. However, these devices are not particularly useful in turbid or peat stained water or where there are excessive growths of algae or macrophytes on the water surface. SCUBA and snorkelling may be appropriate in certain situations e.g. where detailed mapping is required, however, it is noted that there are few surveyors trained in both scuba and macrophyte identification and there may be overriding health and safety issues associated with diving in waters with significant plant growth.

2. Destructive techniques

In cases where the above techniques are not suitable due to environmental conditions or health and safety issues, a destructive sampling method may be necessary. It is also recognised that samples may be necessary to confirm identification.

Destructive techniques include:

- Grapnels
- Rakes (frequently adapted garden rake heads)
- Grabs (mechanical grabs generally designed for sediment sampling e.g. Eckman grab – rarely used for plant surveys)

All of the devices used for macrophyte sampling vary in their ability to collect plant material and small linear leaved species (e.g. *Luronium natans*) are most likely to be missed unless a standard grapnel or rake has been modified with extra tines. Unfortunately, increasing the size or number of tines will make sampling more destructive. All of the above devices have the potential to damage submerged plant beds creating areas of bare substrate that may be vulnerable to invasion by other species, or erosion by wave action or boat wash.

3. Techniques for destructive sampling

Sampling equipment:

- standard grapnels should be used when sampling suitable species, but should be no larger than 15cm in diameter..
- double headed rake grapnels should be limited to 8 tines (approximately 17cm) in length. Tines should be suitably curved to ensure that disturbed plant material is recovered.
- grapnels should be of a suitable weight to ensure they do not bounce off the bed dislodging uprooted material.

Repeated sampling

- once the presence of a rare species has been determined (even if only through visual identification) no further grapnel/rake samples should be taken from that locality and where necessary an alternate quantitative value should be adopted such as estimating abundance using the volume of material collected on the grapnel/rake.

Returning material

- all material removed (with the exception of non-native or nuisance species) should be returned to the water body as it is likely to survive and may re-root (it is acceptable to retain a small voucher specimen to confirm identification). Ideally *Luronium natans* should be returned to shallower margins where it may have the opportunity to re-colonize. It is an offence to possess samples of *Luronium natans* without an appropriate licence from Natural England.

Non-native species

- care should be taken to ensure that non-native or nuisance species are not spread on sampling equipment (e.g. by avoiding sampling within large expanses of such species, and cleaning all plant material from equipment before moving location).

A record should be kept of all the sites where destructive techniques are used with an accompanying rationale explaining why non destructive techniques were not appropriate. This should accompany the licence report.

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