Standard Maintenance Operations Policy Document

Broads Internal Drainage Board

Version 5.0

Training and Revision Register

Date	Revision Details	Version Number
07/01/16	Hydro morphological Harm and Importance of Standard Maintenance Operations-Training	1.0
09/01/17	SMO Biosecurity and Invasive Species Training	1.0
12/10/17	Bio-security and white clawed Crayfish ID Training	1.0
20/03/18	Reviewed with Natural England and Environment Agency. Creating version 2.0.	2.0
24/04/19	Updated drain images within SMO	3.0
20/05/19	Broads SMO Final Presented to Board	3.0
22/12/22	Reviewing document in line with Environment Act 2021. Changed to V4. Created as Draft 1	4.0
23/05/23	Further updates of Draft 1 undertaken ready for IDB Board Meeting on 05/06/23	4.0
21/12/23	Following conversation with Dan Duthie on the 09/11/23 the final document was created.	5.0

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Standard Maintenance Operations Policy Document

1.0 Introduction

Many of the ditches maintained by the Broads Internal Drainage Board are of outstanding importance for nature conservation and show a transition from freshwater to brackish conditions across the area. Many nationally scarce freshwater plant species such as water soldier and several pondweed species are present within many of the Board's IDB maintained drains. The area is also home to many Section 41 species and their habitats (NERC Act 2006 as amended). Working practice is important to conserve and enhance these features of interest, whilst still maintaining the conveyance to the pumps and the water management requirements of the district.

The Broads (2006) Drainage Board manages the water levels in agricultural and residential areas, across the pumped catchments of Broadland, operating in an estimated catchment area of 45,602 Hectares. This area is serviced by 37 pumping stations. Maintenance of the drainage infrastructure has always been achieved by the regular weed cutting of stretches of watercourses. However, some desilting has always had a place in the maintenance schedule, to allow for the capacity of drains to be retained and ensure unimpeded conveyance to pumping stations.

The Board has had a Standard Maintenance Operations (SMO) Document since the year 2000. The aim of this document has always been to allow a uniform maintenance procedure to be carried out to a consistently high standard in designated wildlife sites and in Board-maintained ordinary watercourses alike. However, changes in legislation and key political drivers have resulted in a regular review of maintenance practices with the emphasis being placed on the sustainable management of our natural resources within these catchments.

The drains within the Broads (2006) IDB catchments are mostly that of artificial or heavily modified watercourses draining toward their respective pumping station. This document has been aligned with the ADA and Environment Agency document, "Guide to Management Strategies and Mitigation Measures for Achieving Good Ecological Potential in Fenland Waterbodies" (2017). The main aim of this Fenland GEP document recognises the core function of Artificial or Heavily modified watercourses in flat landscapes and emphasises the importance

of efficient conveyance and flow to pumping stations, being balanced with ensuring opportunities are taken to enhance and achieve good ecological potential within these watercourses. A sustainable and well-planned maintenance programme is also key to this ambition.

The Broads IDB SMO document recognises the importance of the sustainable management of drainage catchments as natural environmental systems and as an ecosystem service and acknowledges the importance of managing the Boards drains appropriately. This document should also be read in conjunction with the ADA Environmental Good Governance Guide, written to aid IDBs navigate the requirements of the Environment Act 2021 and other environmental legislation.

The SMO document also aligns itself naturally alongside the Broads IDB Biodiversity Action Plan (BAP 2023-28), whereby the Board seeks to enhance Habitats and Species of principle importance whilst carrying out its Statutory function. The Broads IDB watercourses may act as linking corridors for wildlife to disperse between nature conservation sites, enhancing ecological networks, improving site connection and enabling species or their genes to move. They may play an important role in the Norfolk Local Nature Recovery Strategy contributing toward the Lawton principal of “bigger, better, more joined up” landscape scale approaches to nature recovery.

During this update of the document, there is also a necessity to recognise the growing evidence of climate change predictions and consider the potential this has to adversely impact future operations and flood risk of the catchment served. The Board continues to work on its Carbon Management Plan and will continue to review and make more efficient its maintenance programme, and use of fossil fuels, particularly where efficiencies and sustainable measures can be achieved alongside the flood risk management requirement. The Board aims to be Carbon Net Zero by 2050 and have cut at least 50% of emissions by 2030.

The Standard Maintenance Operations document has been reviewed in consultation with officers of the Board and officers of Natural England to produce a maintenance document, suitable for the maintenance requirements of the Broads (2006) IDB.

This SMO document will be reviewed within a five year period or may be reviewed and updated in a lesser period of time if any substantive legislative or material change is required to be reflected during this time frame.

2.0 Legislation

As a Statutory Risk Management Authority, the Broads (2006) IDB operates under the powers of the Land Drainage Act (1991) and complies with various statutory instruments. As a Drainage Authority it must comply with a number of National and International legislative duties, regarding the aquatic environment, biodiversity and wildlife sites within the IDB District. It should be noted that failure to comply with any of these statutory obligations, has the potential to result in both Personal and Corporate Liability being brought about to both individual Board Members and the Board, by the Enforcement Body. As a result, the Court may issue a fine dependent on the severity of the offence and insist on restorative works being carried out and paid for by the offender; some fines of which may be unlimited. Furthermore, some offences may attract a custodial sentence.

The main legislative drivers are as follows:

2.1 International Legislation

Water Environment (Water Framework Directive) (2017) – a statutory duty to ensure that reasonable actions are taken to improve the physical and chemical nature of the waterbodies under their management, with the aim of achieving good ecological status or potential of surface waters by 2027. This can be achieved by putting in place environmental improvements or mitigation measures where applicable and undertaking sensitive management of watercourses.

The Conservation of Habitats and Species Regulations (2017) - a statutory duty in the exercise of any functions, to have regard to the Regulations which provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

2.2 National Legislation

Wildlife and Countryside Act (WCA Act) (1981) - imposes a statutory duty to protect native species (especially those at threat), control the release of non-native species and protect SSSIs.

The Countryside and Rights of Way Act (CROW Act) (2000) – this act amends the WCA Act and enforces a duty for Statutory Authorities to be responsible for conservation and enhancement of SSSIs. It also enhances Natural England's enforcement power.

Natural Environment and Rural Communities Act (NERC) Act (2006) - a statutory duty to ensure that every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity to maintain and enhance the natural environment (Habitats and Species set down in Section 41 of the NERC Act (2006)) when carrying out flood risk management activities.

Flood and Water Management Act (2010) – requires flood and coastal erosion risk management authorities to contribute towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions.

Environment Act 2021 - Strengthens the General duty of public authorities, to conserve and enhance biodiversity. A public authority which has any functions exercisable in relation to England must from time to time consider what action the authority can properly take, consistently with the proper exercise of its functions, to further the general biodiversity objective. set out by Section 40 of the Natural Environment & Rural Communities (NERC) Act 2006, to require enhancement as well as conservation, of biodiversity through their functions. The act also requires public authorities to actively carry out Strategic Assessments of the actions they can take to enhance and conserve biodiversity, and then take that action.

2.3 Protected Species and Habitats and Other Considerations

There are networks of protected species and habitats across the UK. Some of these species such as water voles, breeding birds, otters and bats are given full protection under the law for both the individual species and their habitats. Some habitats and species are identified in Section 41 of the NERC Act (2006) and

classified as Habitats and Species of Principal Importance, which require specific consideration by public bodies to determine where habitats or species can be enhanced by the IDB, whilst carrying out its duties as a public body.

Some habitats and species are covered by separate and specific legislation, such as: the Badgers Act (1992), the Salmon and Freshwater Fisheries Act (1975), the Hedgerow Regulations (1997) and Tree Preservation Orders. We need to ensure that this legislation is considered and complied with when undertaking IDB work activities.

2.4 Non Native Invasive Species and Biosecurity

The spread of Non-Native Invasive Species has the potential to cost the Broads IDB dearly, both in economic terms and in the loss of biodiversity interests. The spread of non-native species e.g. Japanese Knotweed, the Killer Shrimp, is illegal under Schedule 9 of the Wildlife and Countryside Act (1981) (as amended). It is therefore unlawful to cause these species to spread as a result of any IDB operational activity.

Biosecurity is key to preventing the spread of these organisms into the Broads IDB watercourses. The BIDB staff currently do all they can to help prevent the spread of non-native invasive species whilst undertaking operations. When the IDB drains are scoped by the Engineer and Environmental Officer, non-native species locations are recorded and if possible a plan to eradicate or control them is put into action.

Staff have undergone training on Non-Native Species and sightings are reported to the NNNSI via the “iRecord app. Training is reviewed and undertaken regularly and a Biosecurity Policy has been adopted by the Board.

Click here for BIDB Biosecurity Policy 2022

Machinery is steam cleaned prior to being moved between catchments (Nozzle temperature 60C) using a portable steam cleaner system.

Operator and surveyor boots are cleaned following work between catchments and Virkon Aquatic is applied to cleaned machinery, equipment and footwear.

2.5 Conservation Sites – Statutory and Non- Statutory

Prior to undertaking an operation which may affect a SSSI, the IDB is required to give formal notice to Natural England under section 28H of the Wildlife and Countryside Act 1981 (as amended).

Prior to undertaking an operation in or adjacent to a site of international importance (SAC, SPA, Ramsar), then under the Conservation of Habitats and Species Regulations 2017 (as amended) the IDB must carry out a Habitat Regulations Assessment (HRA) or where necessary an Appropriate Assessment prior to undertaking an operation. This is carried out in consultation with Natural England. The burden of proof is on the proposer (i.e. the BIDB) to determine that no significant effect will take place on any of the features of interest of the protected site and where an appropriate assessment has been undertaken, then there should be no adverse effect on any of the features of interest.

The BIDB has a 5 year agreement with Natural England to allow routine maintenance to be carried out on all the nationally and internationally designated sites within the Broads catchment area.

Some sites which may or may not be designated SPA, could have wintering birds on or close to the working area (i.e. on grazing marshes or near salt marshes). Prior to undertaking works on or near these sites the Environmental Officer will need to assess the time of year (preferably no works will happen during wintering bird season between November and February), and the presence or absence of wintering birds and applying for Natural England assent where applicable. The BIDB has a good working relationship with the RSPB and will work closely with them for site-specific advice.

In drains where maintenance is being undertaken on a greater than annual cycle, a desk study will be undertaken prior to works to ensure maintenance is not impacting on Wildlife and Countryside Act (1981) Schedule 5 species (see Appendix 1).

Non-statutory sites such as County Wildlife Sites (CWS) do not require any formal written permission; however these sites are noted for their habitats and

species, some of which may be protected. These sites have a significant value within the county and to the Local Nature Recovery Strategy and it is within everybody's interest to ensure that work does not impact on these sites. Where BIDB are required to work on or near CWS, then we will continue to liaise with the Norfolk Wildlife Trust prior to starting works.

2.6 Emergency Works

Emergency works may be required to be carried out during exceptional or unmitigated circumstances, such as in the event of a structural failure, pump seizure or during periods of extreme weather conditions, (such as a tidal surge or flood event). In many of these circumstances, third parties and their property may be put at risk. In these, or similar events, it may be necessary to undertake Emergency Works or increase pumping to protect people and their property within the Broads IDB catchment area. However, these emergency procedures may have the potential to impact on a SSSI or European Protected site. In an emergency, it is reasonable to carry out operations in or near the protected site. However, Natural England should be informed of the operation as soon as practicable after the event.

Reporting the emergency operation to Natural England is key to determining a satisfactory outcome to the emergency and prevents the deterioration of the site and the wellbeing of species therein. Reporting the operation is fundamental to prevent legal action being taken against the Board for carrying out an illegal operation in a designated site.

2.7 Cultural and Heritage Sites

Landscape, cultural and heritage sites may be present within work areas or adjacent land, some of these such as Historic buildings, Scheduled Monuments and Conservation areas require permission to undertake work on or adjacent to them. In the instance where ground is to be broken, Historic England (UK government's statutory adviser and a statutory consultee on all aspects of the historic environment and its heritage assets) will be contacted and searches will be undertaken prior to operations which require breaking ground.

3.0 Meeting Good Ecological Potential in Broads IDB Watercourses

Meeting good ecological potential within the eastern watercourses is a key goal for the BIDB. The legislation and key political drivers have recognised the need to ensure the sustainable management of their watercourses as natural resources within all catchments. This document hopes to strike the balance between helping the drainage infrastructure to meet the overall good ecological potential required of artificial and heavily modified channels under the remit of the Water Framework Directive but also to ensure sufficient conveyance of water to the pumps, particularly during extreme weather events and periods of high flow.

Much of the Broads IDB catchment lies below sea level and relies on water being conveyed to a pumping station, from where the water is evacuated to a higher level, river or estuary. As such, the majority of the Broadland watercourses have historically been artificially created or heavily modified, with the purpose of moving water to a pumping station in times of high flow. These watercourses are not dynamic or fast flowing like those of a gravitational system. Therefore, their purpose needs to be recognised first and foremost and prior to undertaking opportunities to improve their ecological potential. In this way, these watercourses should be considered in a similar way to that of a fenland watercourse.

The appropriate balance between conveyance and good ecological potential must be met. However, the Board will look for opportunities to conserve or enhance the physical and ecological parameters of the watercourses where this is achievable to do so without inhibiting the dedicated function of the watercourse.

The ADA and Environment Agency, “Guide to Management Strategies and Mitigation Measures for Achieving Good Ecological Potential in Fenland Waterbodies” (2017) and the Anglian River Basin Management Plan and the EA's Catchment Data Explorer should also be looked to on a case by case basis for guidance on determining mitigation for WFD designated waterbodies in pumped catchments.

3.1 Maintaining Successional Processes within Broadland Watercourses

Sensitive, maintenance of a watercourse will be beneficial for wildlife and necessary for achieving a habitat mosaic of watercourses. This will have benefits

for many species and communities within the drainage channel network. The key to maintaining many of the designated features of the Broadland drainage dykes is to maintain watercourses at differing stages of the successional process. For example a newly desilted drain will exhibit an array of early colonisers such as charophytes or certain pondweed species. Whereas drains left for a longer rotational period prior to vegetation cutting or desilting may exhibit a larger abundance or diversity of macrophytes, invertebrates and molluscs. Many riparian owned drains may not be maintained for several years but the regular and rotational maintenance of IDB watercourses ensures a small percentage of the entire drainage network in the catchment retains areas of open water, which is so important to so many animal and plant species.

With the differing successional stages, water depths and operational cycles, this will maintain ecological diversity. The other important factor which is key to maintaining this habitat mosaic, is good water quality.

4.0 How the Standard Maintenance Operations Document will work in practice

This document will be called the Standard Maintenance Operations Policy Document and will be used to inform outside bodies of the way in which the BIDB intend to carry out maintenance practices and acts as the basis from which all maintenance practice initiates. The document is subject to review on a regular basis. Version control allows any changes to be recorded.

All Operatives, Contractors and Supervisors asked to carry out maintenance for BIDB now and in the future, will undertake a Training session based on the Standard Maintenance Operations Policy Document. Training needs will be reviewed regularly, in line with any amendments made to the Standard Maintenance Operations Policy Document.

Prior to initiating any maintenance activity, operatives and contractors will receive a job specific tool box talk. All watercourse maintenance will receive regular supervision by a trained Operation's Manager or a member of the Environmental Team.

5.0 Mowing of Bankside Vegetation

The aim of mowing is threefold:

1. It allows unimpeded visibility for the driver.
2. It improves the conveyance of a watercourse.
3. It prevents the establishment of trees and scrub along the nearside water's edge.

Mowing of the bankside vegetation will be carried out by a tractor and flail or aside mounted flail on a 360◦ hydraulic machine. In some areas where access cannot be achieved or is considered inappropriate for a machine, then strimmer's and hand tools will be utilised.

Mowing of bankside vegetation will be undertaken throughout the year, though in bird breeding season works will only take place where necessary in low-risk environmental areas. However, prework checks will take place between March to September to ensure nesting birds are not present, prior to maintenance and always consider the Boards statutory responsibilities set out in the Wildlife and Countryside Act 1981 (as amended). Prework checks will be recorded on the operator's time sheet.

Where protected species or breeding birds are found then effective mitigation will be put in place to ensure compliance with the law. This may mean delaying works depending on what is found or leaving an appropriate buffer zone on either side of a nest. The length of the buffer zone will be species specific and should be agreed by a member of the Environmental Team.

The flail height should be set to 150mm to ensure water vole are not disturbed or displaced by the mowing activity (*as per* Annex B Management Activities IDB Water Vole Class Licence).

5.1 Environmental Option M5

Visibility for the driver is crucial in being able to carry out targeted maintenance. However, appropriate visibility to carry out operations may be achieved by applying a "Health and Safety Cut" to the batter and bank top.

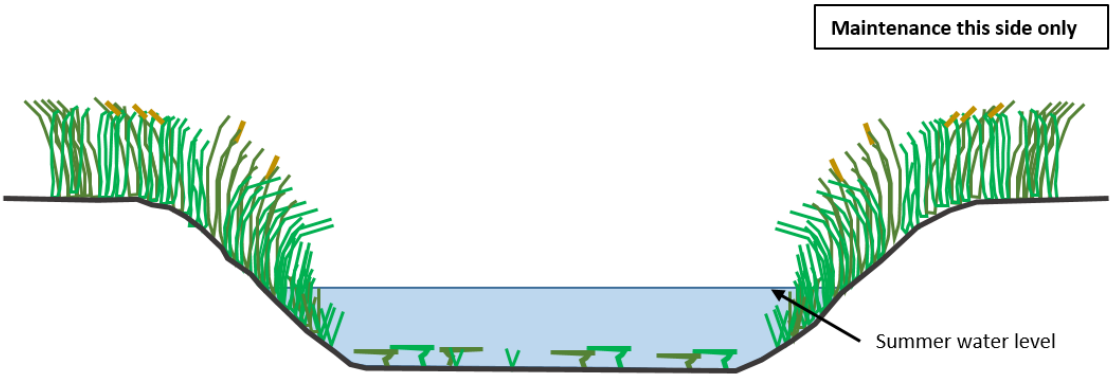
- A 1m vegetated zone above the watercourse is left uncut but the remaining batter and one cut is taken from the nearside bank top, to determine the edge of the watercourse and help prevent the machine from falling in the water. The flail height will be set to 150 mm.

- Where there is less freeboard and the batter is less than 1m, the remaining vegetated zone will be left and one cut will be taken along the bank top. The flail height will be set to 150 mm.

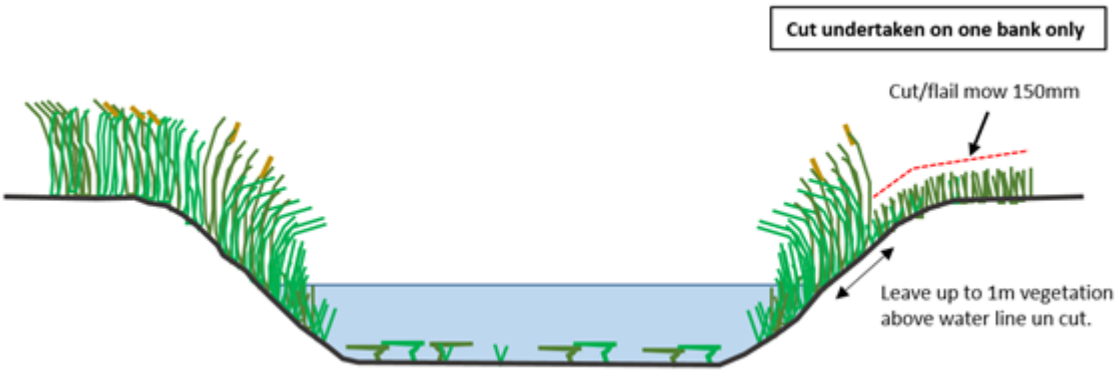
No WFD assessment required prior to instigating this method

M5 Grass Control

Before Operation



After Operation



5.2 Environmental Option M4

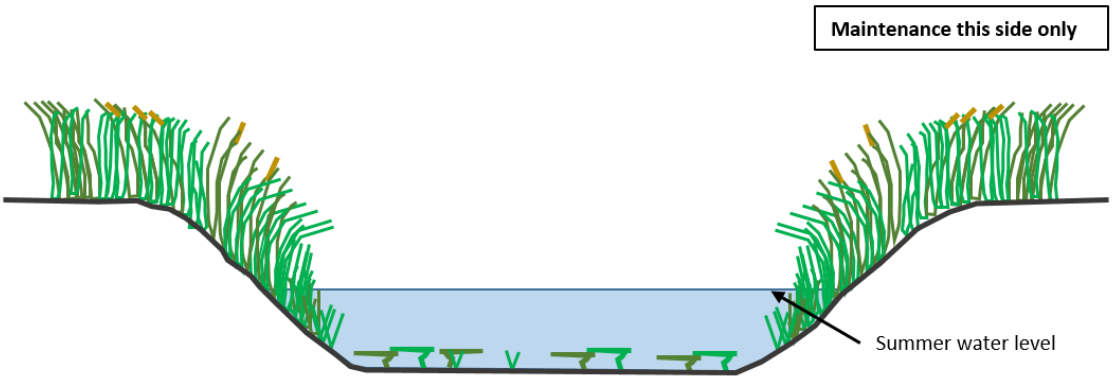
Where Environmental Option M5 is deemed inappropriate due to access issues, scrub/bramble encroachment, flood risk or more serious site-based Health and Safety factors then mowing should take place down the nearside batter only to the water's edge and one cut along the nearside bank top.

The flail height will be set to 150mm.

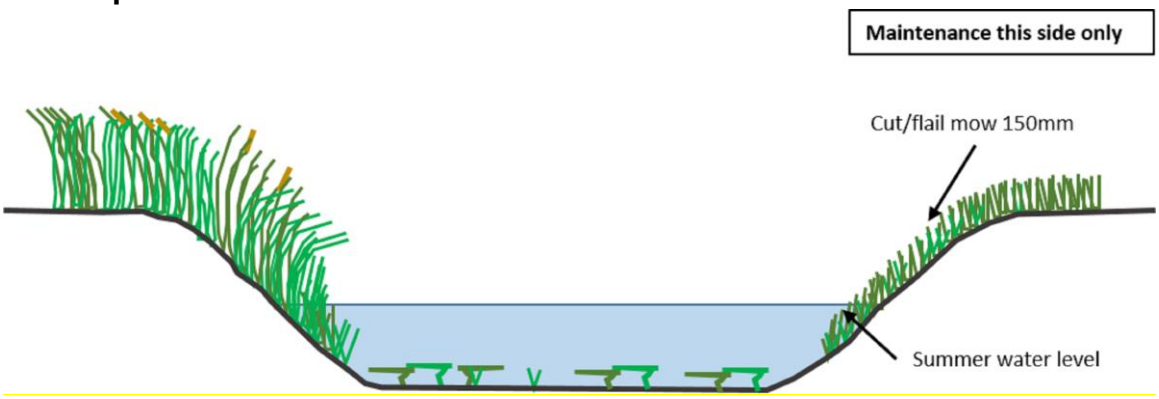
No WFD assessment required prior to instigating this method.

M4 Grass Control

Before Operation



After Operation



6.0 Emergent and Instream Weed Control

The Board removes vegetation from watercourses mechanically, using a weed cutting basket attached to a 360◦ hydraulic machine. Where this is not practical, due to the size of the watercourse or impeded access, then manual clearance is employed using hand tools, such as a chrome.

Emergent and instream vegetation clearance will be undertaken throughout the year, though in bird breeding season works will only take place where necessary in low risk environmental areas. However, prework checks will take place between March to September to ensure nesting birds are not present, prior to maintenance and at all times consider the Board's statutory duties set out in the Wildlife and Countryside Act (1981) (as amended).

No work will take place in designated sites during bird breeding season under normal environmental conditions. Work should not be planned during bird breeding season or between November – February during overwintering bird season. However, under unusual environmental conditions, consultations will take place and appropriate planning of such works will be undertaken on a case by case basis.

The main aim of emergent and instream weed control is to allow unimpeded water flow within the banks of the watercourse and improve conveyance. Weed cutting will take place cyclically as part of a regular rolling programme. In addition, drain maintenance is required to conserve the various stages of colonisation of the drains for their designated features and prevent succession taking place.

To accommodate access to growing crops and to satisfy conservation interests, wherever possible alternate banks will be maintained from one clearing cycle to the next. Some important pumped drains may require maintenance more than once in one year. Wherever possible the work will be carried out on one side of the drain in any one year cycle.

The weeding basket should always be set to ensure no deepening of the watercourse occurs during the process of weed cutting. In most instances in drains greater that 2m, a margin of emergent vegetation will be left uncut at the

water’s edge as wide as it is practical to do so.

Instream weed control will work in conjunction with the mowing regime specified in Section 5.0. Weed cutting will be carried out using one of a series of options:

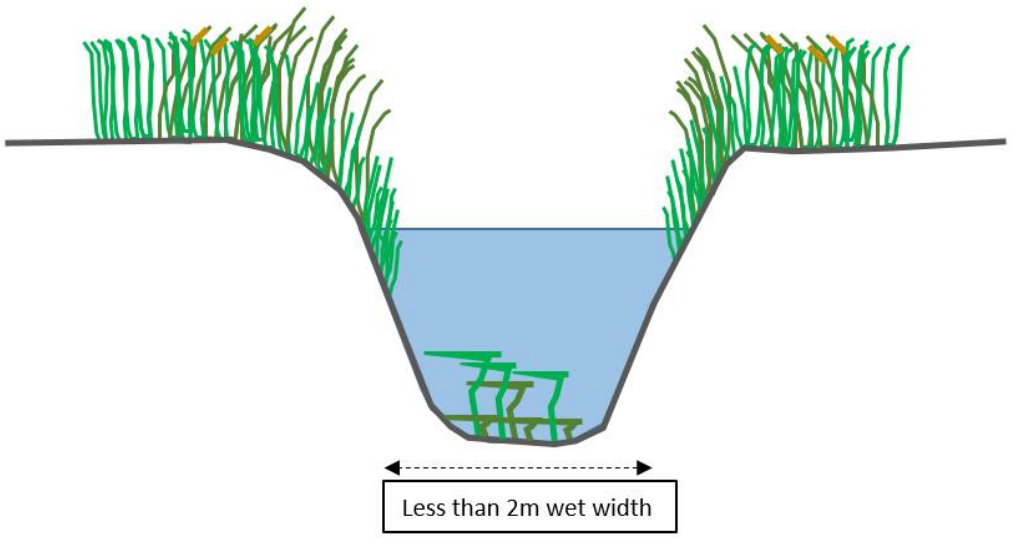
6.1 In drains less that 2m wet width

In narrow drains all instream emergent vegetation will be removed and no fringe will be left. Cut material should be set back behind the machine as far as possible or placed on the opposite bank top. Care will be taken not to place material on floristically rich areas, wet flushes or block grips. No wet vegetation or mud should be allowed to slip down the bank face.

A WFD assessment will be undertaken prior to this operation.

Weed cutting instream vegetation - In drains less that 2m wet width

Before Operation



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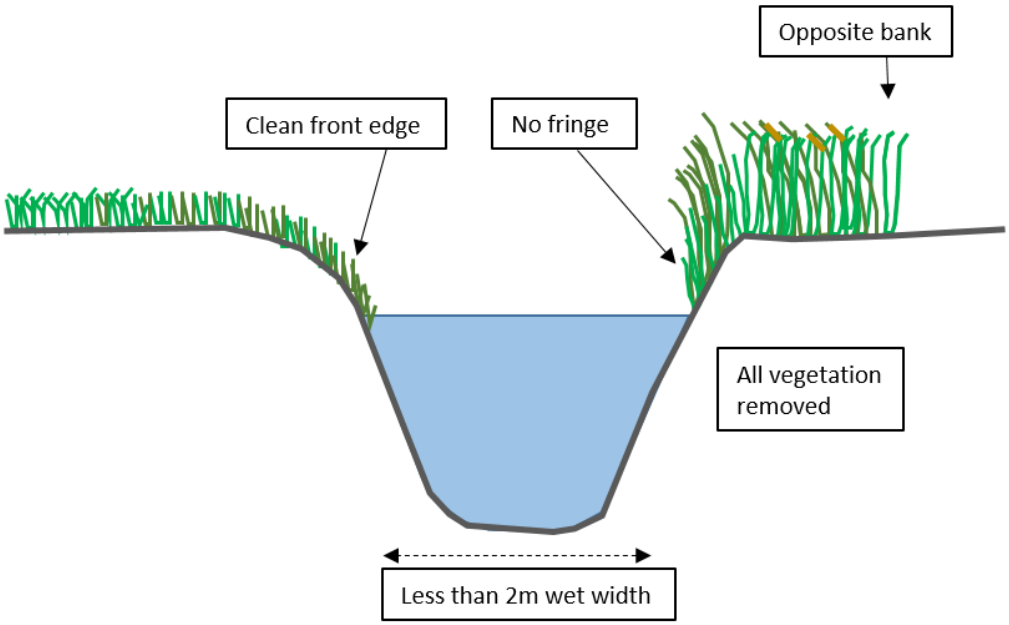


6.2 In drains greater than 2m wet width – Leave opposite margin

This practice allows for a margin to be created on the opposite bank. The margin consists of leaving as much wet width vegetation *in situ*, as far as is practicable for the size of drain (Approx 10-20% remaining). The nearside toe will not be exposed or touched by the weed cutting basket.

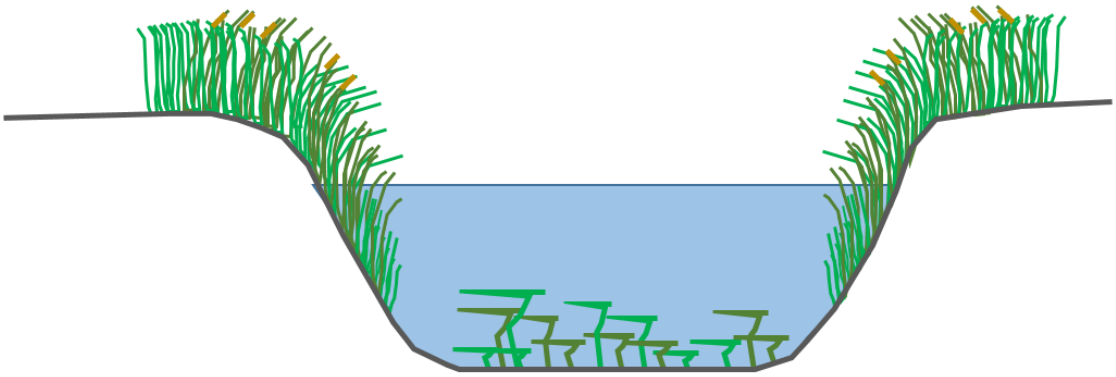
Cut material should be set back behind the machine as far as possible or placed on the opposite bank top. Care will be taken not to place material on floristically rich areas, wet flushes or block grips. No wet vegetation or mud should be allowed to slip down the bank face.

The weed cutting basket should be set to ensure that no deepening of the section takes place.

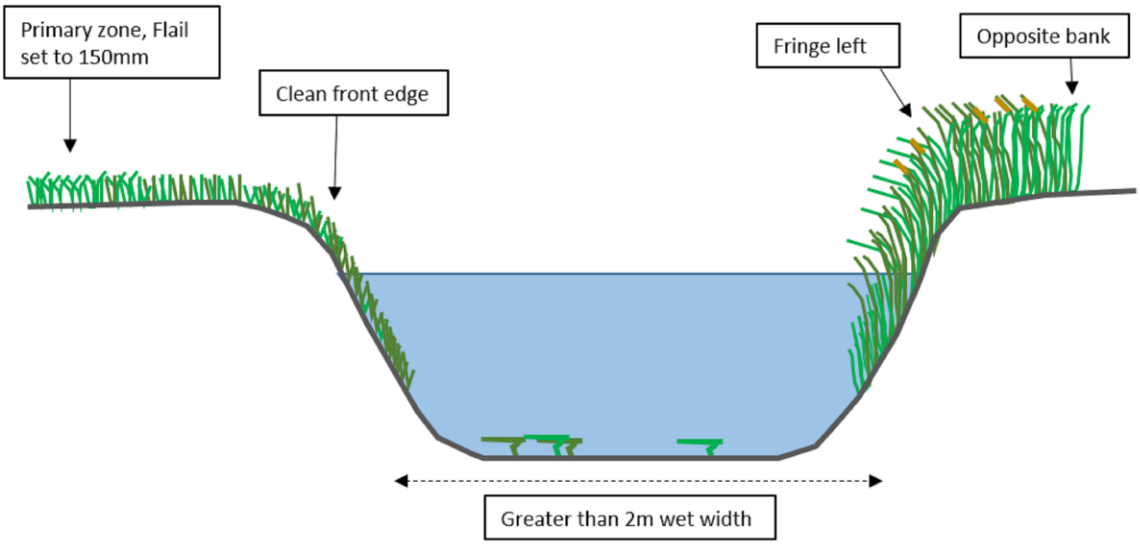
No WFD assessment will be undertaken prior to instigating this method.

Weedcutting instream vegetation - In drains greater than 2m wet width – Leave opposite margin

Before Operations



After Operations



6.3 In drains greater than 2m wet width – Leave opposite and nearside margin

This practice allows for a margin to be created on the opposite bank and between 60-80% of the instream vegetation to be removed centrally. The margin consists of leaving as much wet width vegetation as far as is practicable for the size of the drain *in situ* (20-40%). The nearside toe should not be exposed or touched by the weed cutting basket.

Cut material should be set back behind the machine as far as possible or placed on the opposite bank top. Care will be taken not to place material on floristically rich areas, wet flushes or block grips. No wet vegetation or mud should be allowed to slip down the bank face.

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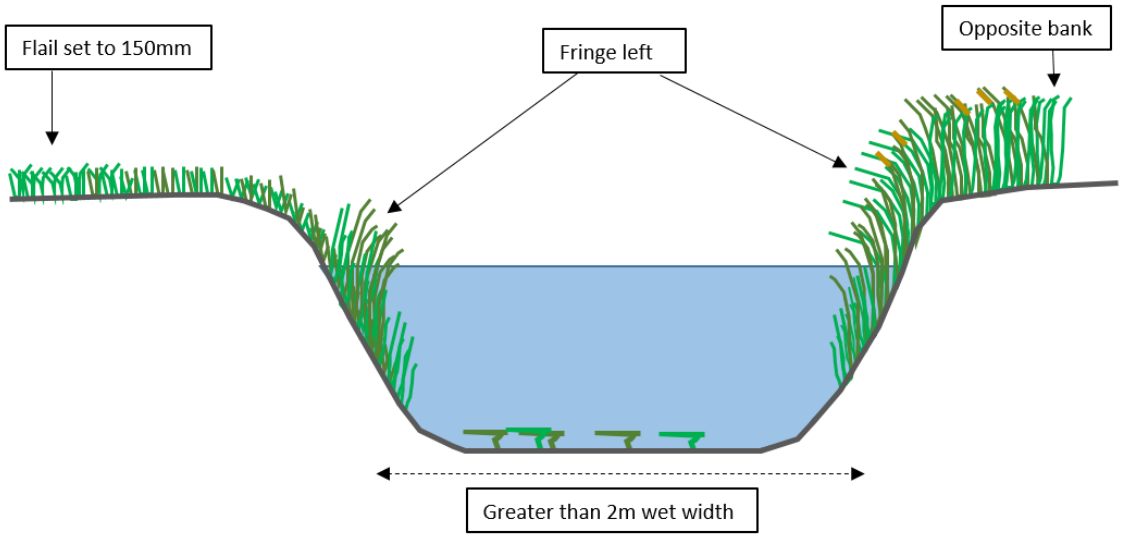
The weed cutting basket should be set to ensure that no deepening of the section takes place.

No WFD assessment will be undertaken prior to instigating this method.



7.0 Tree and Bush Management

Bankside trees and shrubs provide shade and keep water cool. Instream branches improve the ecology of the watercourse by providing food and substrate for invertebrates and cover and food for fish.

With the high ecological benefits attributed to the aquatic environment by trees, the first consideration prior to any tree, bush or branch removal should be, does it really need removing?

The aim of tree management is threefold:

1. To allow unimpeded access for machinery into a site and prevent damage to the machine e.g. Hydraulic pipework becoming caught up in branches.
2. To prevent the sides of watercourses becoming overgrown and in some instances, overshaded.
3. To prevent instream blockages occurring in areas of high flood risk.

Due to the open landscape throughout much of Broadland, tree management will be looked upon on a case by case basis the Technical and Environmental Team. The aim will be to strike a balance between the ecological benefits to the watercourse and conveyance.

Woody material will not be installed or left in the channel as this may impede the conveyance of water to the pumping station. However, consideration should be paid to the utilisation of overhanging branches as shelter and shade for fish and the opportunity to improve instream ecological diversity by other means where possible.

Tree and bush work can be undertaken between August – March, in a normal year. Prework checks are recommended between August to September and Mid-February to March to ensure nesting birds are not present, prior to maintenance. It is an offence under the Wildlife and Countryside Act (1981) to recklessly disturb a breeding bird or its nest during the bird breeding season and tree work out with these seasons in not recommended. Any tree work required during bird breeding season may be undertaken only following consultation with and having had appropriate checks undertaken by the Environmental Team.

Veteran trees may be subject to a Tree Preservation Order or may provide roosting sites for bats. Any trees with thick ivy, holes, cracks, fissures, splits, lightning strikes, lifting bark or staining need further investigation by an ecologist.

Fallen trees or root systems may also act as couches or holts for Otter. It is crucial then, that trees are not cleared without prior investigation by the Environmental Team as this may constitute an offence under the Conservation of Habitats and Species Regulations (2017).

Dead trees should be left in situ as ecologically they can provide niches for a rich diversity of species, ranging from invertebrates to birds and bats. These should be left and not be touched without prior investigation by the Environmental Team as this may constitute an offence under the Conservation of Habitats and Species Regulations (2017).

7.1 Disposal of Waste Timber

Where board's operators have found it necessary to remove or trim overhanging trees or shrubs, then trees and bushes can be removed or cut up as wood piles or left on the bank top to enhance the terrestrial habitat. Material can be left only where the there is no risk of material being washed back instream, where it may result in culverts becoming blocked.

Waste timber may be chipped and spread where the landowner is happy for this to occur and where no detriment will be caused to the surrounding environment. Where chipping is required in a designated site, then consultation with Natural England needs to be undertaken as part of the assenting process.

Alternatively, the chippings or waste timber can be removed from site. No mulching will take place on Broadland grazing marsh.

Burning timber is the least favourable option in Broadland, however it may be necessary for some timber to be burned. As far as practicable, fires will be no larger than a conventional domestic bonfire and will be situated only in areas where spoil has been deposited during previous maintenance activities. No burning will take place directly onto peat to avoid the underground spreading of fire. In this instance fires will be made on tin and the ash removed.

Under the Environmental Permitting Regulations (England and Wales) 2016 a Waste Exemption licence (D7) permits the burning of 10 tonnes of untreated wood in the open during a 24 hour period. Though exemptions are subject to change in the near future. Where burning is proposed in a designated wildlife site, prior consultation with Natural England will be undertaken.

Burning and chipping is expensive and will therefore only be undertaken upon request and where no detriment to the surrounding environment will take place.

Wood piles provide habitat for a large variety of vertebrates and invertebrates and will be left where appropriate to do so.

8.0 Instream Silt Removal

The low energy nature of the pumped system of the Broads catchment, makes it prone to silt accretion within the system. The frequency of silt removal will depend upon the characteristics of the watercourse and surrounding land use. Some drains will therefore require attention more frequently than others. However, channels will usually be desilted, only when the depth of silt affects the hydraulic capacity and conveyance of the drain and where it affects pumping efficiency.

The environmental risk involved in silt removal in the Broads IDB catchments, is deemed to be high, therefore each operation involving instream silt removal will be looked at carefully on a case-by-case basis. A WFD assessment will be required prior to any desilting operation taking place and mitigation measures will be put in place as required. Where there is the need to remove silts from the beds of watercourses the minimum of channel de-silting will be undertaken to promote good aquatic communities and look for opportunities to undertake ecological improvement.

The Board uses hydraulic excavators which can operate through 360o to desilt watercourses. The Board has powers under Section 15 of the Land Drainage Act, 1991 to deposit material arising from the maintenance of a watercourse on the banks and within 9m of the watercourse.

De-silting is a planned activity and as far as is practicable should only be undertaken between October and February when water temperatures are cool. However, where works are deemed necessary at other times of the year, then a prior assessment of works by the Environmental Team will take place and regular dissolved oxygen monitoring will be undertaken prior to and during operations. Monitoring will ensure the organic material within the silt does not impact upon dissolved oxygen levels within the watercourse and cause a fish kill. Where dissolved oxygen levels are deemed too low, work will be stopped.

Where protected species, overwintering or breeding birds are found, prior to a planned programme of works, then effective mitigation will be put in place to ensure compliance with the law. This may require delaying the works depending on what is found.

Desilting operations will be carried out in conjunction with the mowing regime specified in Section 5.0.

No removal of any bed material (dredging) will take place during the desilting process as this will likely result in the deepening of a watercourse, which will be detrimental to the ecology of the watercourse (see section 6.1). Slubbing's will be placed well back behind the machine, preferentially on an historic spoil bank, to prevent spoil being washed back into the water and reduce further nutrient enrichment of the watercourse.

Leaving a fringe of marginal vegetation will serve to minimise risks of environmental harm, maintain the seed bank and leave cover and food for invertebrates and other aquatic animals. However, there may be situations where the watercourses are narrow, where a drain will need to be desilted from bank to bank, to maintain its land drainage function. All the options will be considered very carefully in relation to conveyance, prior to undertaking a desilting exercise.

In drains where maintenance is being undertaken on a greater than annual cycle, a check will be undertaken to ensure maintenance is not impacting on Wildlife and Countryside Act (1981) Schedule 5 species (see Appendix A).

Desilting in a pumped catchment may be required from time to time to maintain conveyance in these slow moving or often still, linear watercourses. Silts washed in from farmland, roads or development can accumulate over time and can be particularly problematic around culverts, water control structures or in front of pumping stations. Desilting if undertaken sensitively can have a positive influence on drainage channels in allowing early coloniser plants such as stonewort's or pondweeds gaining a foothold where the seedbank has been disturbed. The Board has no wish to undertake desilting too regularly as it can be expensive, carbon-intensive and if undertaken too often or in an unsensitive manner, may denude a watercourse of instream macrophytes or invertebrates. Therefore appropriate land management is an important consideration for landowners or tenants to ensure catchment sensitive farming practices are in place to prevent diffuse pollution entering the watercourse in the first instance, which may cause conveyance problems to the Board as well as wider scale catchment nutrification issues.

There are 3 possible options for desilting operations determined by the width of the watercourse, flood risk and the ecological sensitivity of the watercourse:

8.1 In drains less that 2m wet width – Narrow drains

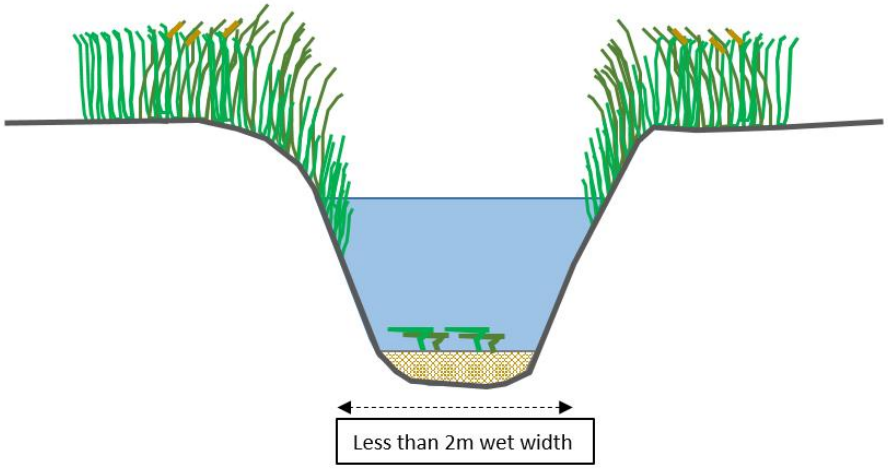
In narrow drains less than 2m wet width, all emergent vegetation and slubbing's will be removed and no fringe will be left.

All removed slubbing's will be set back behind the machine, preferably on an historic deposition pile or where circumstances dictate, slubbing's can be put across the drain as far as possible on the opposite bank top.

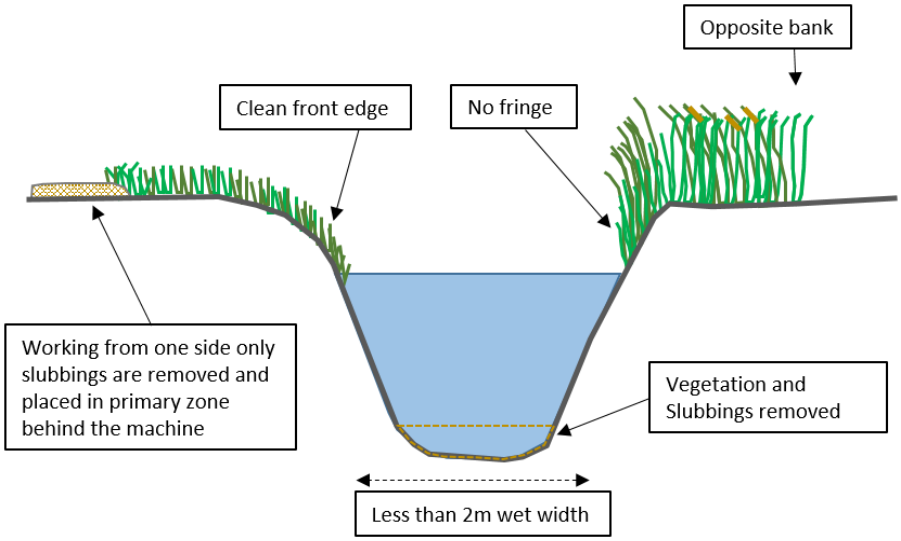
Wet material or mud should not be allowed to slip down the bank face and should not be placed on floristically diverse areas, wet flushes, fill in grips or impact on habitat requirements of Schedule 5 species. The front face of the bank should remain clean.

A WFD assessment will be undertaken prior to works.

Before Desilt



After Desilt



8.2 In drains greater than 2m wet width – Leave opposite margin

In drains greater than 2m wet width, a fringe of emergent vegetation will be left on the opposite emergent margin to act as a seed bank and refuge area. The machine will work from one bank only.

An appropriate margin of silt and vegetation should be left *in situ* as far as is practicable for the size of the drain (10-20% approx). The nearside toe should not be exposed or touched by the slubbing bucket.

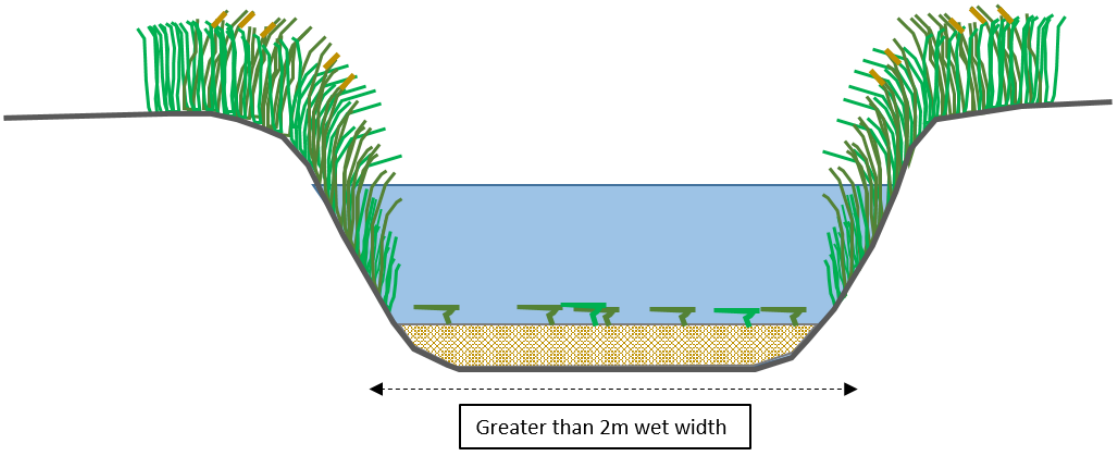
All removed slubbing's will be set back behind the machine, preferably on an historic deposition pile or where circumstances dictate, slubbing's can be put across the drain as far as possible on the opposite bank top.

Wet material or mud should not be allowed to slip down the bank face and should not be placed on floristically diverse areas, wet flushes, fill in grips or impact on habitat requirements of Schedule 5 species. The front face of the bank should remain clean.

Overlying silts only should be removed; no deepening of the section should take place.

A WFD assessment will be undertaken prior to works.

Before Operational Desilt



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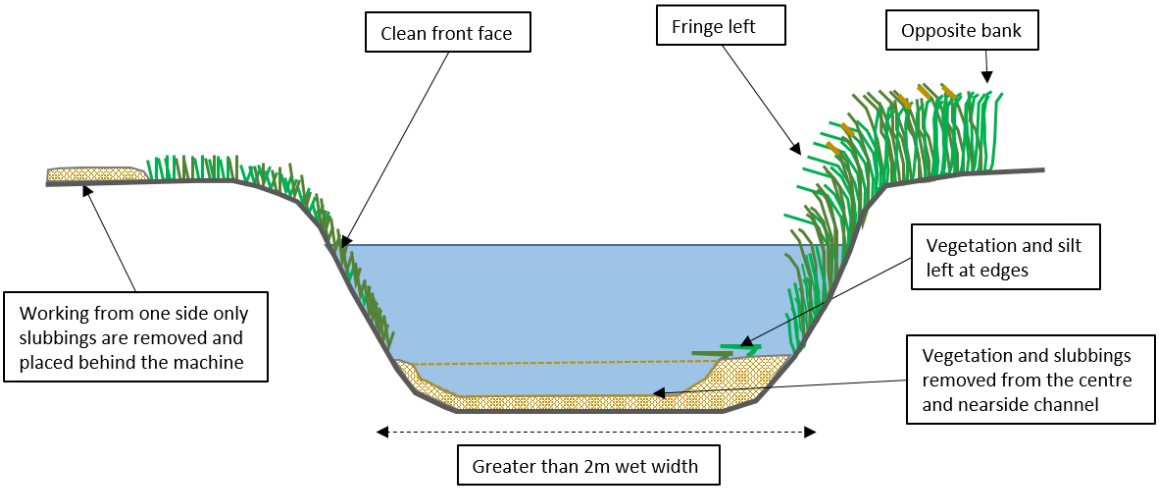


8.3 In drains greater than 2m wet width – Leave opposite and nearside margin

In drains greater than 2m wet width, a fringe of emergent vegetation can be left on the nearside and opposite emergent margin to act as a seed bank and refuge area to encourage recolonisation by plants and invertebrates etc. The machine will work from one bank only.

An appropriate margin of silt and vegetation should be left *in situ* as far as is practicable for the size of the drain (10-20% approx). The nearside toe should not be exposed or touched by the slubbing bucket.

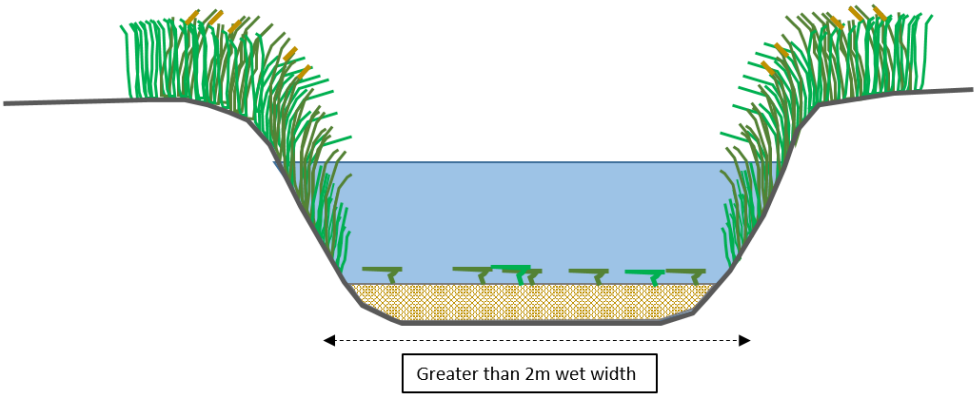
All removed slubbing's will be set back behind the machine, preferably on an historic deposition pile or where circumstances dictate, slubbing's can be put across the drain as far as possible on the opposite bank top.

Wet material or mud should not be allowed to slip down the bank face and should not be placed on floristically diverse areas, wet flushes, fill in grips or impact on habitat requirements of Schedule 5 species. The front face of the bank should remain clean.

Overlying silts only should be removed; no deepening of the section should take place.

A WFD assessment will be undertaken prior to works.

Before Operational Desilt



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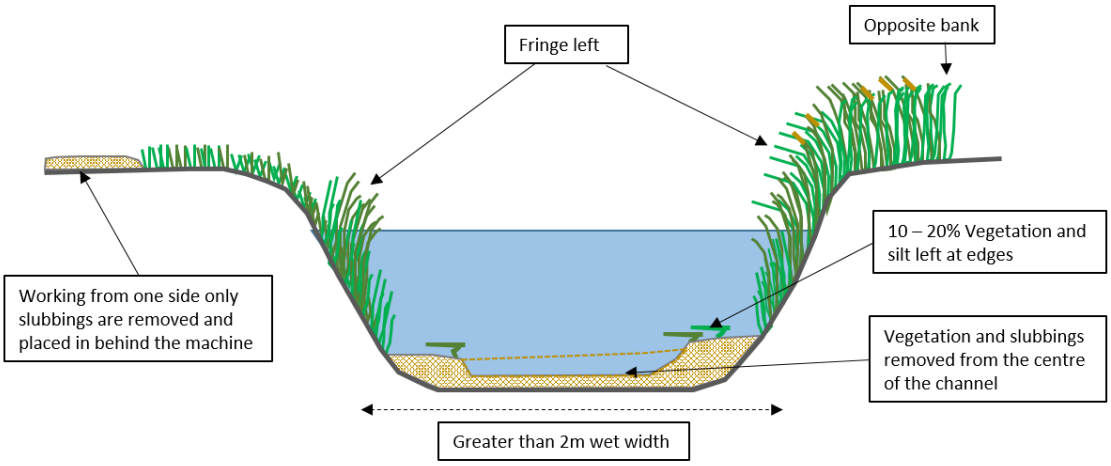
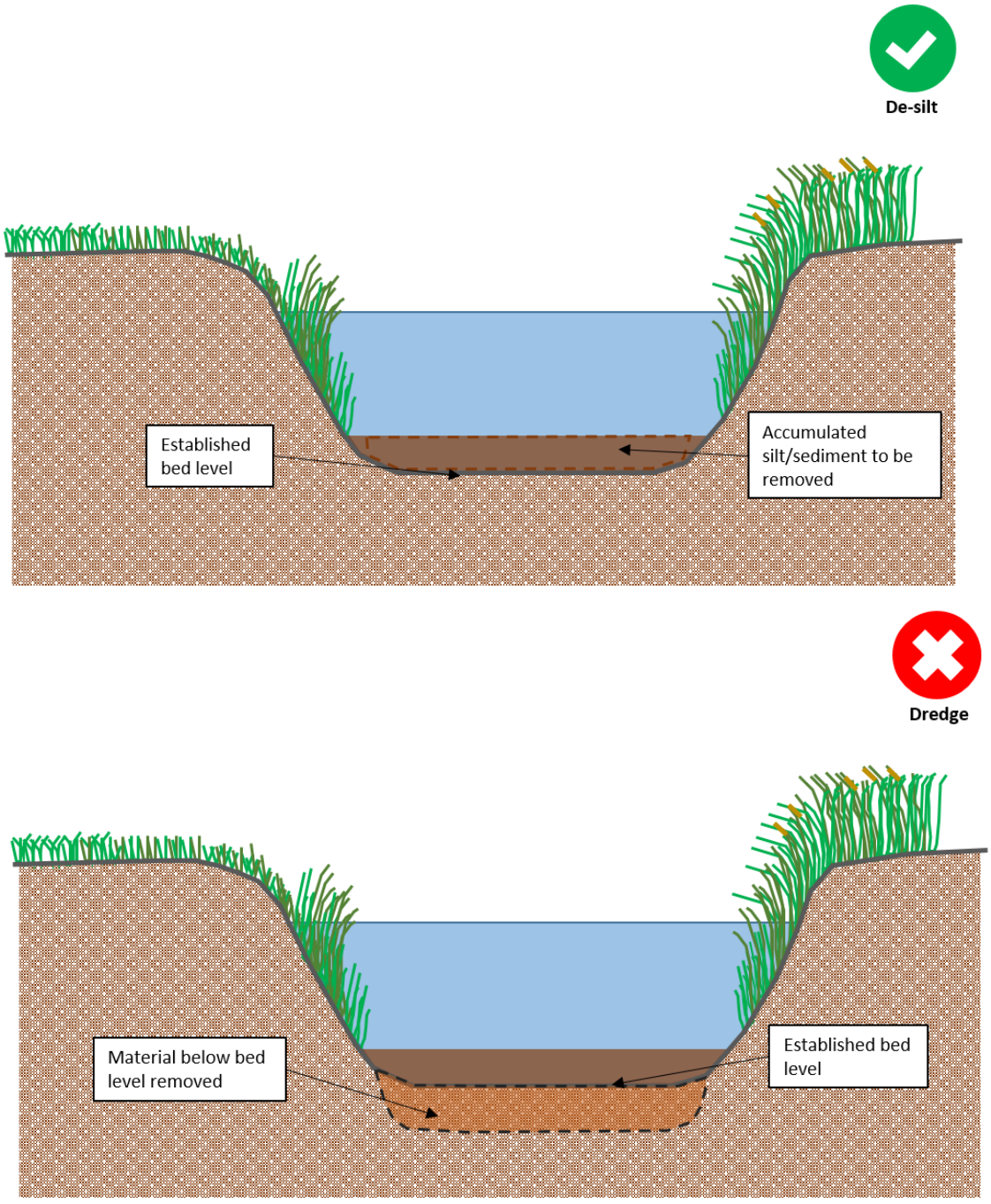


8.4 The Important Difference Between Desilting and Dredging:

Desilting is when silts that have accumulated in the water channel are removed. **No deepening or over widening will occur during desilting**. Dredging is where material below bed level is removed and is likely to lead to overdeepening of the channel, the slowing of flows and a continuous need for further maintenance.



9.0 Herbicide Use for Weed Control

Herbicide is used occasionally to control growth in the Broads Internal Drainage District. Chemical control will be considered where weed growth cannot be effectively controlled by mechanical means, in inaccessible areas or in the case of Non-native invasive species, e.g. Japanese Knotweed and Giant Hogweed or Floating Pennywort.

Before any herbicides can be used in or near watercourses, written consent must be obtained from the Environment Agency in the way of an Herbicide Authorisation. Consultations with Natural England must also take place before the licence can be issued, where the chemicals may have an impact on SSSI watercourses or land parcels.

If chemicals are to be used, then only herbicides and adjuvants cleared for aquatic use will be used in or beside water i.e. Glyphosate (Roundup BiActive) and Topfilm. Only suitably qualified operatives with an NPTC certificate in the Safe Use of Pesticides (PA1) and the application of pesticides in or near water using a hand held applicator (PA6W) will be permitted to carry out any herbicide application on behalf of the BIDB and comply with the Official Controls (Plant Protection Products) Regulations 2020.

Herbicides will only be used in accordance with the Control of Pesticide Regulations 1986 and the Food and Environment Protection Act 1985. The storage and use of these substances will also comply with the Control of Substances Hazardous to Health Regulations 1988. It should be noted that the use of herbicides within the Board's drainage district may also affect or be affected by agri-environment scheme requirements.

No WFD assessment required prior to instigating this method.

10.0 Bank Reprofiling

Sometimes the bed and banks of watercourses require to be re-profiled to ensure their efficient use as land drainage channels to accommodate and store high flows. Banks may have been poached by cattle, horses, red deer or slips may have occurred and it may be necessary to reprofile some sections of drain. However, the environmental risk involved in bank reprofiling in the Broads IDB catchments is deemed high, particularly to water vole whose habitat and welfare, falls under the protected species legislation of the Wildlife and Countryside Act 1981 (as amended).

No bank reprofiling should be undertaken without first assessing the drain and receiving instruction from the Environmental Team. A desk study and schedule 5 species check may be necessary. Appropriate mitigation measures and timing may be required prior to any reprofiling work. The IDB Water Vole Class licence may apply.

Consideration should be given where practicable and where landowners are in agreement, to reshaping of banks to create marginal wetland habitats (berms), however, capital grant in aid may be required in this instance.

Checks must be made with Environmental Team well in advance of operation to ensure appropriate survey and mitigation is undertaken.

A WFD assessment will be required for specific lengths of reprofiling work.

11.0 Culvert Installation or Repair

Any culvert installation or repair will need prior assessment by the Environmental Team and a WFD assessment may be required, depending on the location and the length of the culvert to be installed or whether the culvert is to be replaced, like-for-like. The IDB Water Vole Class Licence may apply and mitigation windows should be considered. In general culverting should be avoided and other alternative measures considered.

A WFD assessment will be required prior to work of this nature being carried out.

12.0 Control of Water Levels

The control of water levels is of paramount importance to a number of stakeholders within the Broads (2006) IDB catchment area; urban and rural communities, landowners and a large area of national and internationally designated wildlife sites. Conservation interests, flood risk and agriculture all need to be considered to ensure the water management requirements of all stakeholders are balanced appropriately. Water levels are physically controlled within the Broads Internal Drainage Districts in two ways:

- by the maintenance and operation of levels at pumping stations;
- by maintenance and control of water control structures (WCS).

Where feasible to do so, to further nature conservation, water levels will be maintained at an agreed level which are compatible with nature conservation and land-use interests.

Land managers may be encouraged to accept higher levels if these can be achieved without affecting neighbouring land management interests particularly as part of the new Environmental Land Management Schemes, to improve peatlands or to impact the wider Local Nature Recovery Strategy. Water levels will in the future be prescribed within agreed Water Level Management Plans. These plans will be built to accommodate the fluctuations required of normal summer and winter water levels and any future considerations for climate change adaptation. Any proposed deviation from these prescribed levels may require a

Habitat Regulations Assessment to protect the nature conservation interests of the area.

13.0 References

Association of Drainage Authorities (2008). The Drainage Channel Biodiversity Manual- Integrating wildlife and flood risk management. Buisson, R. S. K., Wade, P. M., Cathcart, R. L., Hemmings, S. M., Manning, C. J. & Mayer, L. (2008). The Drainage Channel Biodiversity Manual: Integrating Wildlife and Flood Risk Management. Association of Drainage Authorities and Natural England, Peterborough.

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Environment Agency (2012). Delivering consistent standards for sustainable asset management. Maintenance Standards Version 3, March 2012.

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Mayer, L., Moodie, I., Carson, C., Vines, K., Nunns, M., Hall, K., Redding, M., Sharman, P. & Bonney, S. (2017). Good Ecological Potential in Fenland Waterbodies: A Guide to Management Strategies and Mitigation. Measures for achieving Good Ecological Potential in Fenland Waterbodies.

Natural England CLASS LICENCE- Intentional disturbance of water voles and damage/destruction of water vole burrows by means of ‘Displacement’ (Internal Drainage Boards).

14.0 Appendix

14.1 Table 1: Schedule 5 Species present in the Broads IDB

Schedule 5* species		Habitat Type					
Scientific Name	**Common Name**	**Water Body**	**In Channel Vegetation**	**Bankside Vegetation**	**Ditch Bank**	**Emergent Vegetation**	**Advised Maintenance Technique**
Avricola amphibius	Water vole	Yes all year to feed and travel.	Yes, food and predator cover all year.	Yes, food and predator cover all year.	Yes, burrows into bank all year	Yes, Feeding on most plants	Mow bank side vegetation down to 150mm to SMO standard. Do not touch the banks during maintenance. Weedcutting in-channel vegetation to SMO standard.
Lutra lutra	Common Otter	Yes, they are very mobile animals	Yes, uses it for hunting fish and other species.	Yes if there are areas for resting, couches such as in an old tree.			Leave fallen trees where possible if not causing flood risk. Consult the Environmental Team for further work on trees. To SMO standard.
Vespertilionidae	All bats			Yes if ancient trees are present with holes, or trees with potential holes if covered in ivy.			Leave trees that have bat potential. Consult the Environmental Team for further work on trees. To SMO standard
Anguis fragilis	Slow Worm			Yes, Requires dense vegetation, especially grasses coupled with sunny areas to allow thermoregulation and, preferably, loose soil into which to burrow.			Mow bank side vegetation down to 150mm. Do not touch the banks. To SMO standard
Lacerta vivipara	Common lizard			Yes, Damp or wet areas, especially where abundant grass tussocks are present to provide food, shelter, basking and hibernation sites.			Mow bank side vegetation down to 150mm. Do not touch the banks. To SMO standard
Natrix natrix	Grass snake	Yes, they are very mobile animals		Yes, they are very mobile animals using all types of habitat.	Yes, they are very mobile animals		Mow bank side vegetation down to 150mm. Do not touch the banks. To SMO standard

Schedule 5* species		Habitat Type					
Scientific Name	**Common Name**	**Water Body**	**In Channel Vegetation**	**Bankside Vegetation**	**Ditch Bank**	**Emergent Vegetation**	**Advised Maintenance Technique**
Vipera berus	Adder			Yes, In all suitable habitats, dry, open, sunny areas with adjacent dense ground cover are essential. Hibernation sites tend to be on south-facing slopes; tree root systems, crevices in banks, and voids in piled materials are often used. Wetter areas around ponds, lakes, bogs or mires are also used (especially in the summer) providing there are dry banks or grass tussocks for basking.	Yes, especially if it is south facing		Mow bank side vegetation down to 150mm. Do not touch the banks. To SMO standard
Bufo calamita	Natterjack toad	Prefers ponds		Confined to coastal sand dune systems, coastal grazing marshes and sandy heaths. Winterton.			Do not fill in any ponds without first consulting Environment Officer.
Triturus cristatus	Great crested newt	Prefers ponds		GCN move away from ponds and other water during the winter to find a suitable area to hibernate such as tree roots or animal burrows.			Do not fill in any ponds, without first consulting Environment Officer, even if they become dry at certain times of the year.
Papilio machaon	Swallowtail Butterfly			Yes, The caterpillar larval stage of the butterfly feed on milk parsley, this flowers during July to September. Adults use tall mixed fen and marshes.		Yes – Caterpillars feed on milk parsley	Only use previous tracking routes for the digger that has low biodiversity value. Where milk parsley is known to grow a survey will need to be completed by an ecologist to confirm its presence. If found maintenance should be avoided so not to disturb the plant and surrounding cover. Where milk parsley is identified during scoping/walkover or local knowledge informs us of its presents this should be marked out on the ground and on the plan so it can be protected.
Anaciaeschna isoceles	Norfolk Hawker	Yes, the larval stage, nymph inhabits unpolluted freshwater environment for up to 2 years before metamorphosing into adult form.	The optimum conditions for breeding appear to be unspoilt grazing marsh dyke systems with clean, non-saline water, rushy margins, an abundance of water soldier and the presence of other aquatic plants.				When weed mowing leave opposite margin and if water solider is present leave water soldier and other floating plants in situ and return some of them to the water if removed.

Schedule 5* species		Habitat Type					
Scientific Name	**Common Name**	**Water Body**	**In Channel Vegetation**	**Bankside Vegetation**	**Ditch Bank**	**Emergent Vegetation**	**Advised Maintenance Technique**
Austropotamobius pallipes	White clawed crayfish	Yes, gravel channel bed, does not like silt	Yes, uses vegetation for cover.		Yes burrows into the bank		Do not remove gravels from the drain bed, do not touch the bank. To SMO standard.

*Schedule 5 (section 9.1a, 9.4a, b, and c) of the Wildlife and Countryside Act 1981

Instruction Notes
1. Is the drain regularly maintained?
2. If the drain is regularly maintained and habitat associated with scheduled 5 species is not present the work can continue with caution following the SMO standard.
3. Is the drain maintained on a two to 10 year rotation?
4. If the drain is not regularly maintained the Environment Officer needs to assess the drain first by a desk study and scoping visit to find out whether Schedule 5 species and / or habitat is present in the area.
5. Where habitat type is present but works timing is such that Schedule 5 or other protected species won't be present and if after the planned works, sufficient habitat will remain within a natural dispersal distance of the species then works can proceed as planned.
6. Where habitat type is present but works timing is such that Schedule 5 or other protected species won't be present and if after the planned works, sufficient habitat won't remain adjust the works to ensure it will for example reduce the extent or phase the works over several seasons
7. Where habitat type is present and works timing indicate Schedule 5 species may be present appropriate action will be taken, including a thorough ecological survey to identify the presence of Schedule 5 species.
8. If after the thorough survey species are absent, work may continue within parameters set out in 5.
9. If work is required when scheduled 5 species are present suitable licenses and assents will need to be applied for through Natural England to survey and mitigate the habitat successfully.
10. If after the thorough surveys the schedule 5 species are present further measures will need to be undertaken. Such as: a. Work methods adapted to avoid "killing, or recklessly damaging" b. Work timing adapted to avoid "killing, or recklessly damaging" c. Work abandoned and alternative drainage strategy sought