

Copeland Bird Observatory

Mowing Manual

2016



How to use this document

The purpose of this document is to provide instructions and advice on how to use the lawnmowers on the island safely and efficiently, continuing the work that has been carried out on the island since 1996.

You do not need to read and remember every detail. However there are very important sections that you should study and become familiar with. These relate mostly to your Health and Safety, but also to ensure you don't cause any damage to the habitats and birds.

If you have any comments or suggestions of how to improve this document, please email:
cbohabitat@gmail.com

There are principles and tips that you should be aware of, and you should refer to the these for details when you need to.

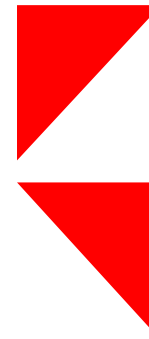
For the rest, you will pick up things gradually through operating the lawnmowers.

So, you should skim read this document, be aware of where you can refer to for details when you need to, and take note of the Health and Safety suggestions.

If you are on the island and don't want to read why the work is important and why it works, but **just want to know how to use the machines, then read from pages 11 to 23.** And the Risk assessment of course...

To help you identify the sections you must read, these will have a read triangle at the top corner of the page.

Handy tips or summaries can be found in the boxes in the margins.



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Whilst this document is long, **many of the tasks detailed here will become second nature**. It is intended as an introduction to the work, while **other sections will only be useful as a reference** for carrying out irregular tasks.

The methods described here have been developed by carrying out the work for 19 years, from 1996 to 2015 inclusive.

Introduction

Why, What, Where, When, Who? The structure of this document answers these basic questions.

The Instruction manuals for the lawnmowers are kept on the island, and were not available when writing this document. They contain many of the methods and requirements for servicing the machines, and should be referred to for deciding when to change the filter, spark plug, and carry out any other detailed maintenance.

The main themes that are being conveyed are about:

- your Health and Safety
- making sure you don't use the machines that will harm either any feature on the island (legally protected), or the machines themselves (very costly to replace).
- it is hoped that these recommendations will help you achieve more, for the time you dedicate to it.

I hope you enjoy working on the island.

Definition of “mowing”

Mowing on CBO means cutting **AND** removing the cuttings.

Area of Special Scientific Interest

The island is legally protected and is an Area of Special Scientific Interest. The qualifying features within this site are the Manx Shearwaters, and the Arctic terns. Any action that could negatively impact on these species needs to be notified to Northern Ireland Environment Agency (NIEA) before it is carried out.

The mowing programme has been pre-approved in this regard, because it is detailed within the Management Plan agreed with NIEA. However, any deviation from the methods described in this document would need to be approved by NIEA before they are carried out.

For example, if someone was to use the lawnmowers without collecting the cuttings, or use trimmers, or scythe bracken and not rake the cuttings away from the area, this would have a negative impact on the shearwaters, as it would render the soils more prone to burrow collapse, and would reduce the islands capacity for supporting the rabbit population. So, NIEA would have to be notified and permission approved before this was done.

Loss of fescue dominated habitats would have two effects on the Shearwaters:

- 1) This would cause the Shearwater burrows to be more prone to collapse, as the soil would be less stable without the fibrous roots of the fescue to protect the burrows from visitors walking over them. **Over the medium to long term, this would mean that CBO would have to restrict people from walking over the parts of the shearwater colonies that were prone to collapse, as is the case on Skomer and Skokholm.**
- 2) it would also be detrimental to the health and function of the rabbit population, which in turn would compromise the sustainability of the shearwater population over the long term.

The Vision

The vision is to restore a relatively low maintenance, extremely valuable habitat, across selected areas and all paths, for the benefit of visitors to, and the birds found on CBO.

Natural succession—a natural process

The most valuable habitats are those listed in the UK Biodiversity Action Plan as “priority habitats”, and are identified by NIEA and subject to Habitat Action Plans. These are regarded by ecologists as important habitats because they are rare semi-natural habitats.

On CBO, the priority habitat found is “Maritime Cliff and Slope” which contains a collection of habitat types. The most valuable of these can be found on CBO existing in small remnant patches. The communities found on the restoration paths and areas also resemble them. These plant communities approximate roughly to those called Maritime Grasslands in the National Vegetation Classification system.

The island has experienced a gradual then rapid natural succession over the last 80 years from grass dominated swards that were maintained by traditional farming grazing and cultivation, to rank bracken dominated vegetation. This is a perfectly natural process after abandonment, and has been recorded on many species rich grasslands and semi-natural habitats across Europe.

Management interventions

The question then must be asked, is this acceptable, or is it something we need to do something about? The Bird Observatory depends on good access for people to visit, enjoy, and conduct the monitoring and ringing tasks. This is extremely important work, so providing paths is an even higher priority than providing facilities for overnight stays. Clearly, a bracken covered island with no paths and a complete loss of valuable habitats would make running an Observatory impossible.

It would extremely undesirable to provide access by spraying, strimming or cutting the rank vegetation, but in doing so, lose the valuable and biodiverse habitats that are recognised by ecologists and governments as priorities for taking positive conservation action to prevent their loss. These habitats support many different types of birds, but also help to stabilise the soils above burrows, making them more robust and able to withstand access by visitors.

The photographs on the following page illustrate the main habitat types and what actions are needed to maintain them.



Bracken - an extremely vigorous rank habitat of low biodiversity value that eventually displaces all other vegetation. **Restricts visitor access from May to November.** Does not contribute to soil stability and therefore visitors should not walk across areas with shearwater burrows, as this causes burrow collapse, and would be irresponsible.



BRACKEN



Covers >70% of the island. Spreads prolifically into bare soil and red campion areas. Healthy grassy swards that out-compete it for water and nutrients slow, or even prevent its spread.

Management: Cutting and spraying
Bracken is ineffective over the long term, restoration to grassy swards seems the only way to sustainably control it.

Path with mainly **red campion** cover— a very fast growing rank species that thrives on high organic and moist soils, that are nitrogen rich. It is very good at invading patches of bare soil and out-competing everything except bracken. Its contribution to soil stability is only slightly better than bare ground or bracken, because it has very small roots, rather like lettuce. This means most of the soil under the rosette has no roots within in it. This plant covers and provides access to many shearwater areas, while at least bracken provides a deterrent to prevent burrow collapse. The campion canopy traps moisture and dies each year leaving a litter layer, which makes paths slippy, and recycling nutrients for even faster growth next year.



RED
CAMPION



This was the best result achieved when bracken was cut and not removed from the paths prior to 1999. ***It is the best that can be hoped for if bracken were to be sprayed.*** It is the stage before Yorkshire fog dominates.

Yorkshire fog is a great improvement on the above. It has a non-slippy surface, and burrows are supported with a fibrous root system. Obstacles are clear to see and not trip up on. Whilst it is not a priority habitat, it does provide a limited amount of foraging for rabbits and migratory birds. Oh, and a good barrier to bracken invasion.



YORKSHIRE
FOG

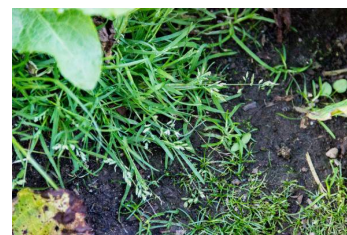


Yorkshire fog dominated grassland is produced after many years of mowing bracken and then red campion, and of course **lifting the cuttings**. It is an intermediate habitat before fescue dominated short sward is restored.

Fescue dominated sward—no slimy litter layer, great foraging for rabbits and migratory birds. Has an extremely dense fibrous root system to protect burrows from collapsing when visitors walk across it, and there is a clear view of burrows and any other features. This is a very valuable priority habitat as well in its own right.



FESCUE



A good stress tolerator, therefore reliable and stable. This is only **produced when cuttings are removed, after more than 10 years of management.** The areas must be mown periodically to stop natural succession to the above habitats.



The Mission and task

The mission is to continue to implement a “degradation” approach of habitat restoration. This will reduce the amount of broad habitat type on the island, and more importantly, increase the extent and condition of valuable short sward maritime grassland habitats on the island. Doing this will benefit people, rabbits, and birds.

The task is to use lawnmowers to cut and collect as much biomass as possible from the treatment areas that were established from 1996 to 2013.

Why?

The island is a special place to visit. Many members of Copeland Bird Observatory have contributed to the management of its management over the years, hoping to do their bit by improving the habitats and access to the island. The mowing has undoubtedly been the most significant habitat management programme carried out on the island.

The brief summary below highlights the results of the work carried out since 1996, and explains why the work makes a positive difference.

In short, the process of cutting the rank vegetation, and more importantly collecting the cuttings for many years has impoverished the soils of Nitrogen and probably phosphorus, which has resulted in several things:

- 1) The vigour and extent of rank species (whose growth is largely dependent on available nitrogen) has decreased (Bracken and Red Campion)
- 2) There has been a change in the vegetation community on the treatment areas. There has been a trend away from rank broad habitats towards relatively species rich, early successional Maritime Grassland habitats.
- 3) The rabbit population has enjoyed relatively high and stable population levels over the last ten years - as a direct result of the expansion of suitable foraging habitat.
- 4) The paths and restoration areas have an improved soil stability, since the restored grassy sward has a deep fibrous root system which acts as a good natural cushion matting, which means that shearwater burrows are less prone to collapse when walked over by visitors and by natural means.



The only other habitat management actions carried out on the island by members since 1954 has been:

- **the eradication of the invasive non-native Himalayan Balsam (almost achieved), and**
- **the establishment of trees and woodland cover to benefit migrating birds (achieved).**

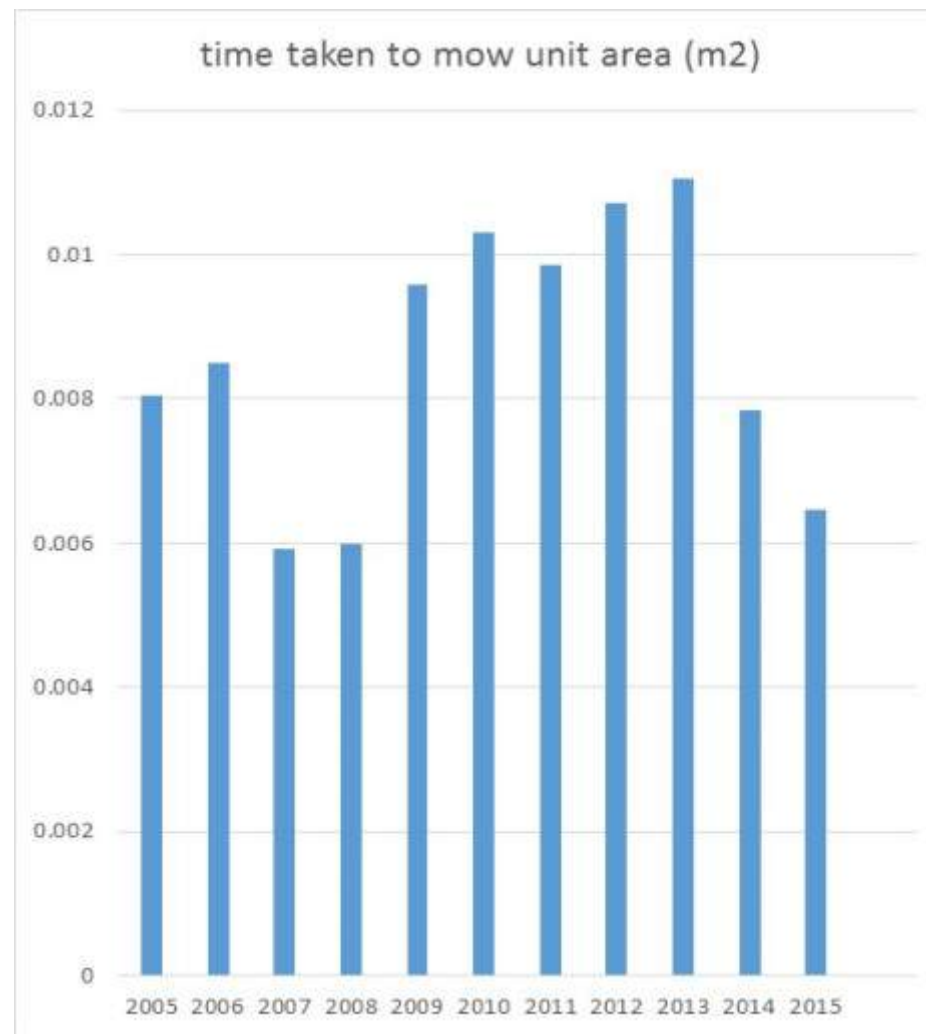
The most valuable habitats are usually only found on soils with low phosphorus availability. The mowing has created the growing conditions which these habitats require (including low organic content and litter, and in which natural succession to rank habitats is less likely to occur).

The natural conditions and processes which govern the type of vegetation that is found on any particular part of the island is a complex subject. However, **this needs to be understood in order to predict what effect a particular management technique has on them.**

It is perhaps easier to visualise the impact of not collecting the cuttings by thinking about the cuttings that were collected from the north garden area from 1996 onwards.

These were spread around the planted Sitka spruce trees in the north garden plantation. What do you think the result of doing this was? So, what do you think happened when the cuttings were scattered on the paths? **Why would you want the vegetation on the paths to grow faster and faster?**

Red campion is the best invader of bare earth on the island. Red campion growth (vigour) is directly related to the amount of nitrogen available, so this explains why the leaves got smaller in successive years. Nitrogen exists mainly in the organic component of the soil. If there is no litter layer, there is very little nitrogen.



This has been an amazing transformation. In the 1980s and early 1990s, sickle mowers and scythes were used to cut the bracken, more often than not leaving the cuttings in situ. This had the effect of smothering and killing the fescue short sward, and therefore killed off the vegetation which was the most effective barrier to stop bracken expansion. Bracken regrowth was therefore swift, and it expanded rapidly into new areas, in precisely the places that it wasn't wanted. Burrow collapse was a common and upsetting occurrence, most notably at South and East Promontory.

The main factors that control growth and survival of plant species are the availability of water, soil nutrients, and exposure to salt. Plants become stressed if they do not receive enough water to prevent leaves from being damaged in hot windy and sunny conditions. **Good stress tolerators can survive very well in unfavourable growing conditions.** On the island, common ones are Fescue, lichens, and bracken. Sometimes they become burnt and turn brown during droughts with windy conditions, however they usually rejuvenate once it rains again. The most obvious example of a poor stress tolerator is Yorkshire fog. It is thought that a relatively low rainfall during winter 2012 and early spring resulted in a soil moisture deficit, and so it did not survive the exposure from the Spring winds. This happened before, in the 1980s, and probably before.

Rabbits do eat the Yorkshire fog grass, and they slowed down the growth to some extent. However, despite the rabbits best efforts, large patches of longer grasses tended to develop into cushions. These were then topped by the lawnmowers, leaving the straw coloured dead centres.



Paths disappeared completely - if they were not cut by July (e.g. the Circular path from the Well to West Warren could not be found, as recorded in the Chat log entry in July 1991). A layer of rotting bracken and red campion lay on the ground, trapping moisture, creating a slimey surface, which was perfect for red campion and bracken growth, promoting a vicious circle of ever faster growing vegetation. The rabbit population crashed twice in the early 1990s, with estimates dropping to single figures, because there was very little foraging habitat left to allow the population to recover from myxomatosis, fluke and rabbit flu. The population almost became extinct. Oyster Catcher chicks often starved before fledging, with very little short sward on the wet flushes to find food.

As of the end of 2015, the vegetation communities on the paths and areas contained a high proportion of valuable species that are found on Maritime Grasslands. However, there has been a distinct lack of Yorkshire fog grass, which used to be a major component of the restoration treatment areas. It completely died in the Spring of 2012, and has not yet recovered by 2015. This resulted in lots of bare earth being created where the fog died, perfect for pioneer rank species such as Red campion, ragwort, and Bracken to spread into.

The situation now is that the rank species are growing more slowly than ever before, and it is encouraging to see a good proportion of the ground covered in Fescue, sea campion, self-heal, Pearl wort, pennywort, with the occasional Scarlet pimpernel, Forget-me-knot, Brookweed, and eyebright and centaury, and even a small element of Yorkshire fog. In other words, the communities resemble the target habitat type that is the goal for restoration. All of these species are good stress tolerators.

The restoration process

The plant communities change dramatically as restoration proceeds:

- 1) After the first mowing of **bracken**, a bare and bracken litter covered ground is left.
- 2) Over the next few years **red campion** spreads rapidly to form almost a complete cover, taking advantage of the high litter content (large source of nitrogen), and lack of competition. The red campion also responds very well to being cut, regrowing back very quickly.
- 3) After several years of mowing though, the leaves become smaller, and gaps appear between each plant. **Yorkshire fog** tended to grow in the gaps between the red campion plants, and sometimes fescue grass appeared as well. When Red campion and Yorkshire fog grasses made up most of the vegetation cover,

Many studies have found that the nutrient status of the soils supporting the valuable species rich (early successional stage) grasslands had much lower available phosphorus, than the soils supporting the more productive latter stage grasslands (which have a much lower value for biodiversity).

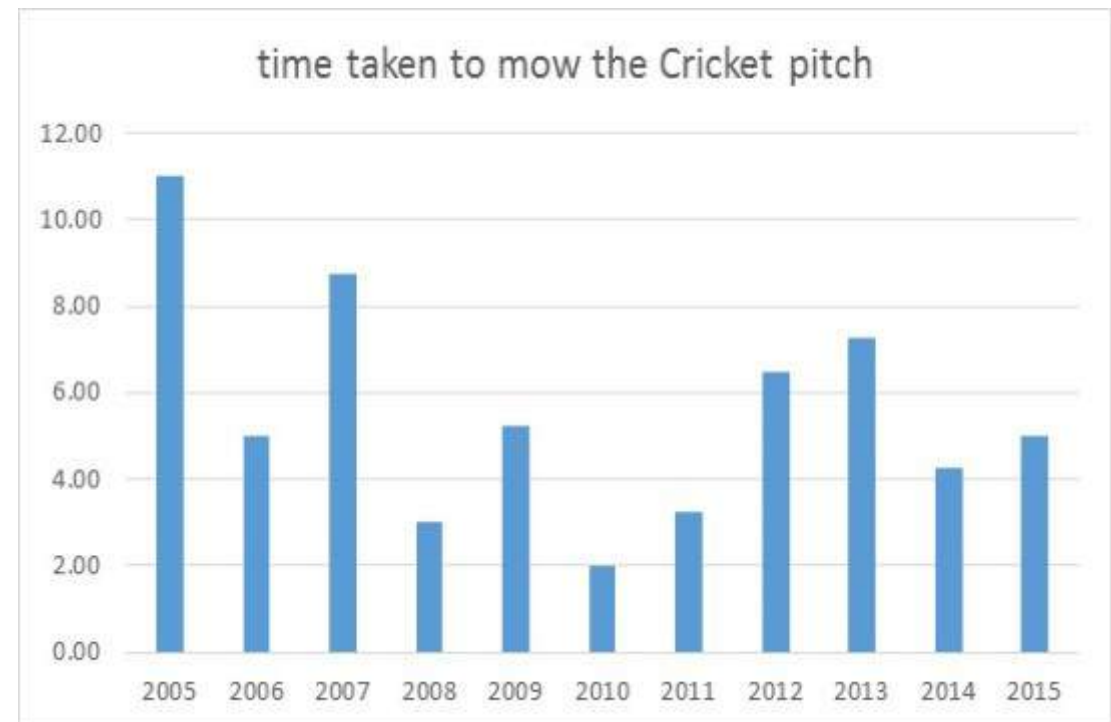
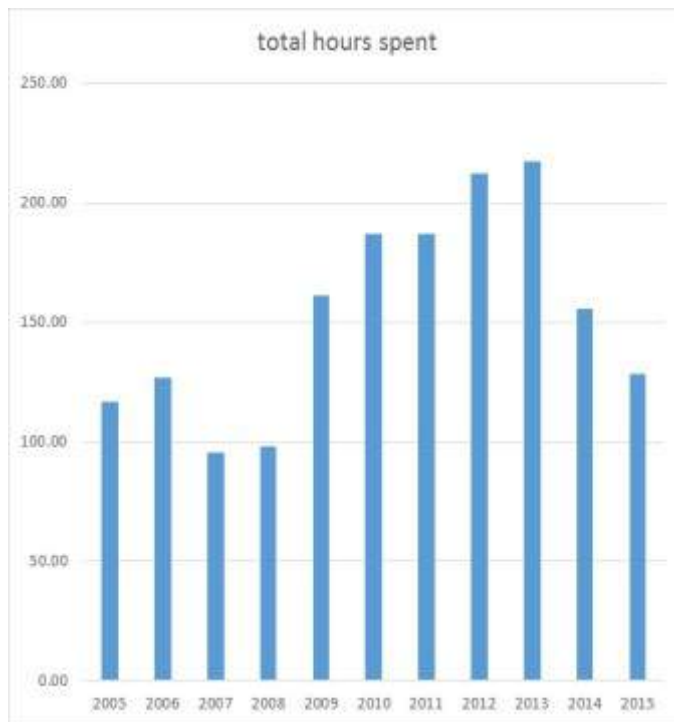


mowing yielded very high amounts of biomass. Yorkshire fog, like all grasses, responds well to cutting, and regrows quickly.

- 4) However, as the growth rates of this grass decreased over time, gaps would appear and **fescue** was able to slowly invade the spaces, gradually making up more and more of the sward. This is probably because the amounts of available phosphorus in the soil was decreasing.

A fescue dominated Maritime Grassland is the target habitat, i.e. this is the aim.

1685 hours have been spent by members mowing the paths and areas from 2005 to 2015 inclusive, and an estimated 900 hours spent from 1996 to 2004. This gives a total estimated amount of 2600 hours since 1996 spent on restoration of valuable habitats and more easily maintained paths, using the degradation approach to restoration.



It is important to continue this work to allow visitors to enjoy the island safely and without disturbing the nesting birds, providing clearly marked and permanent paths.

What does the mowing involve?

It isn't exactly fun. It is very hard work. But it can be very rewarding...

You don't have to enjoy using the lawnmowers, but it helps if you get to know how they work. These are the best available machines for carrying out the task.

You and the machines can only do what you can do. The drive on the rear wheels has a maximum speed. There is an optimum speed of progression you can achieve, depending on the height and density of the vegetation you are mowing. ***No amount of wishing or of willing the machine to go faster will change that.*** In fact, if you don't respect these limitations, the job will be more difficult.

However, ***your efficiency can be improved*** by shortening the time it takes you to empty the collector bag, and the wheel barrows. So ***the distance between the lawnmower and where the wheelbarrows are positioned is crucial.*** Also, the approach you take can reduce the time you will need to complete an area or path: do you have to mow over the same ground again to reach another section you left uncut? Do you leave the tallest wettest bits to dry out a little more in the wind, or do you do them now, before the next shower arrives? Some times it can be like a game of chess.

Once you get used to using the machines, you may even relax your mind and reach a state of rhythmic efficiency.

Before you go to the island

Check with the last person that there is enough petrol on the island. The machines use a litre of petrol every 2.5 hours. Remember to bring your working clothes and boots (see PPE on page 13).

Using the machines

The lawnmowers – a brief description of their capabilities and differences:

Stiga A and B

Two commercial grade lawnmowers. An unusual feature is that the engine is mounted onto the cutting deck with rubber suspension washers. This means the engine vibrations are not transferred to the handles, good for the operator. These are very powerful machines, and collect the cuttings very well into a light collector bag.

One drawback of these machines is that the drive belt for the wheels can start slipping if the vegetation is wet. This is because vegetation mulch gathers around the drive belt and pulley wheels. If the vegetation is drying out in the wind without any further



Unlike most garden lawnmowers, the Stiga and the Alko machines have engines with a pressurized oil pump ensuring the engine is lubricated at gradients of up to 30 degrees.

showers, it is best to clean around the belt and continue, as it usually dries out quickly.

Another feature which is hard to get used to when changing the blades, is the friction washers which are on either side the blade, to protect the shaft from damage.

Alko

This machine isn't quite as powerful as the Stiga, however seems to cope well with collecting cuttings. It is as manoeuvrable as the Stiga, with perhaps a lower centre of gravity, and is thought to be a good machine to learn to use, before progressing to the Stigas. It can also has a higher maximum speed, good for using on the paths to mow a light density of plants later in the year.

The drawback is that the cutting deck is made of steel, and will have a much shorter life expectancy than the Stigas. Metal implements should not be used to clean under the deck.

Mountfield

This is a small plastic decked lawnmower, specifically for the purpose of mowing the Toilet steps, and lower shore path from the Stormie net to the East Jetty. **This should only be used by extremely experienced operators if at all.** It has a small deck with a relatively high centre of gravity, and is more prone to tilting over than the others.



You should study this Risk Assessment before you use the mowers each day. Check what the hazards are, and follow the controls.

Why does hogweed sap cause burns? Ultraviolet light in the sun's rays causes a chemical reaction in the sap, to make a chemical which if it makes contact with skin, causes severe burns in some people.

Risk assessment

A risk assessment is included in the "Path and habitat management work recording book", and also in the appendix of this document, on pages 36 to 38. Long trousers and sleeves are recommended.

Common hogweed grows around the southern end of the island. Some people experience the same burns as a result of phytophotodermatitis, as that known of for Giant hogweed. If you are burnt, wash with cold water, cover up from sunlight, and seek medical advice, telling them you have been in contact with Hogweed.

Personal Protection Equipment

Wear long sleeved shirts/jackets/tops. Wear boots with grippy soles and toe cap protection. Always use ear muffs and gloves.

Gloves and ear muffs are provided and allocated to named persons for safe keeping and individual use. It is illegal to supply anyone with already used PPE. You can find new pairs in a Husqvarna box which is stored either in the corridor (on the shelves to the left of the door into the Common room), or in the shed in the old buildings.



Emergency stop: *release the dead man's handle and push the mower gently away from you.* Do not worry about damaging the machine. If you have slipped it is more important that the machine is well away from you.



Choosing which areas or paths to mow next

All paths were regarded as being equally important up to 2015. However, in case the mowers broke down at some point during the stay and couldn't be used, there was a tendency to begin mowing the paths and areas with the tallest growth of rank vegetation on them.

2016 onwards – it is likely that the committee will rank the paths in order of importance, and will give instruction as to which paths are most important to maintain for access and ringing purposes.

Starting the lawnmowers

- 1) Is the blade attached? Is the blade sharp? Is the spark plug connected? Is the handle secure, bolts not loosened?
- 2) Find the controls: The dead man's handle (or proximity lever), the drive control, and throttle control.
- 3) Check that the reservoir tank tap is positioned open, not shut (as it should be left).
- 4) Fill with petrol – use the non-spill funnel on the Husqvarna petrol container. This is faulty, the funnel must be removed quickly once the tank is full. The containers of petrol are stored in the metal bench units beside the lawnmowers in the Old Buildings.
- 5) Wheel the mower to a flat clear space with no tall vegetation underneath.
- 6) Depress the proximity lever (dead man's handle) and pull the starter cord.
- 7) Leave running for a minute before tackling long vegetation.
- 8) Push the drive lever to engage the back wheel drive, and proceed to walk behind the mower, releasing the drive lever when you want to slow down or stop.

The Stiga mowers have an automatic choke, while the Alko is has a manual choke. Once warm, both should be running at full revs, without misfiring.

Wheeling the mower along the paths from the courtyard is pretty light duty and counts as a warm up before launching into a heavily vegetated path.

It is a good idea to spend an hour walking around the island, assessing the growth and sometimes taking "before" photographs. This was usually on a Friday evening, after unpacking the gear.

The action for pulling the starter cord is to use a medium pull to draw the cord out slowly, then once the starter is spinning with a certain momentum, pull it more quickly and increase your effort in a steady pull, not with a snap. Swivel your shoulders as you do this, as well as pulling with your arm. Developing this action is key to many a happy hours mowing.

How to use the machines efficiently to treat the paths and areas

Height setting

For 95% of the time, there is no need to change the setting from the standard setting, which for the island is slightly higher than middle height (55mm on the Alko, and about 3 (out of 7ish) notches down from top height on the Stiga).

Throttle setting control

Adjust the throttle lever to achieve the full revs. Note this is slightly back from fully up. Never mow any vegetation on anything less than full throttle.

Drive speed control

The drive should be thought of more as an assist, especially on taller vegetation, although the drive does make quite a difference on hills. It is important not to use the drive while turning over shearwater burrow areas, as turning and driving at the same time can loosen bare soil, which may have small amounts of grass establishing on them.

The collector bag

The whole point of the treatment is to lift as much biomass as possible. **It is extremely important not to continue cutting after the bag has filled.** This would mean the mower would then act as a mulcher, which leave cuttings on the ground. It would also mean that the deck would be clogged up with vegetation, and would need to be cleaned out.

Avoiding stones and rocks

Two things to note here: try to avoid hitting them in the first place, and what you do when you do hit them (and you will).

If you are unfamiliar with an area, it is a good idea to walk over it first, noting where the stones are. There aren't very many on the whole island, ones that spring to mind are at the well and on the well path, in front of the house, at one point on the East side path, the lower shore, and at the Gully. These are indicated on the terrain difficulty map within the "Path and habitat management work recording book".

The most important thing if you do hit a stone or rock, is to lift the deck up and pull the machine backwards, so that the blades don't continue to hit it. If possible release the dead man's handle, although this is more difficult to do, without letting

The control lever for the cutting deck height is located beside the rear right of the Stiga, and on the left of the Alko.



Some people can hear a slight change in tone of the sound from the mowers just before the collector bag fills. Others can judge when the collector is likely to need emptied before it is full, just by getting into the rhythm of when they need to empty. **Ultimately, this is the most important factor in determining if an operator is efficient or not.**

The mowers seem fairly robust, and so far, none have come to irreparable harm. Bosses, and friction bosses may need replaced after the worst impacts (as they are designed to take the impact). You can tell this if they are harder to start, with large compression from the engine as you pull the starter cord.

the deck and blades down onto the stone, probably causing more damage.

If you do hit a stone, check that the blade isn't bent or damaged before starting it again. Undo the spark plug cable, and turn the blade around, noting if one edge of the blade is lower or higher than the opposite blade edge as it passes a particular spot on the deck. If it is, it will need to be replaced to maintain a steady balanced centrifugal force. If you notice vibrations, this would damage the machine further.

Continued over/



Mitigation to avoid disturbing nests and chicks

Many species of birds nest on the island, and the restoration has benefitted some for example pied wagtails, Oyster catchers, pipits and many on migration.

Providing clear paths for visitors to follow is a good measure to minimise disturbance to nesting birds. The island has many visitors who walk around all parts of the island, and they need to be managed by providing clear paths that have low vegetation so that any nests can and chicks can be seen and not trampled. The birds also become used to people in regularly visited parts.

It has always been possible to mow the treatment areas throughout the nesting season, without disturbing the birds to cause failures in nesting attempts. This is possible, but only if you take care and consider how long you are spending in an area, which species could be disturbed and what their tolerances are, and make sure you don't mow any hiding chicks.

You will find a map in the "Path and habitat management work recording book" called "Environment features map". This shows all of the areas where the birds regularly nest, and includes Arctic terns, Eider ducks, Oyster catchers, Peregrine, Ringed plover, Black headed gulls, and Lesser Black Backed gulls. These species tend to nest faithfully in roughly the same place each year. There is specific advice on the map to minimise the chance of disturbance through mowing.

Mitigation and control measures include:

- 1) Planning to minimise the time you spend in any one area, perhaps taking two or three visits with breaks in between to allow adults to settle. Examples of this would be mowing the cliff if the Peregrines are there, it is best to take several periods to complete the job.
- 2) Some species are not faithful to nest sites, i.e. move from year to year. Stockdoves tend to be disturbed by walkers at medium to long distances, whilst mower operators (with the engine noise) can approach to within 1 metre before they rise from their burrows. This is the same for Gulls and Eider. The lesson learnt is that mowing does not disturb birds as much as a walker, and they perhaps become habituated to a gradually approaching operator with a noisy engine.
- 3) If you do disturb either Eider, Stockdoves, Peregrines, or terns, retreat to a distance that allows them to settle again, and complete the treatment area at another time in several periods if necessary.

For the Peregrines, note the following lesson learnt from 2014:

On 2/6/14, the areas on the Cliff were mown up to the edge, without any alarming from the Peregrines.

On 4/6/14, whilst mowing the western end of the Cliff area, a peregrine appeared and chased a gull away, but the peregrine retreated, even though the operator who was in clear view.

On 5/6/14, the Cliff path and edge of the area was mown whilst the Shearwater burrows were checked by the Oxford University team of two. The peregrine alarmed overhead while they did this, and until they returned to the house. After this, while the mowing operator was still working on the cliff, the peregrine sat on Mew Lighthouse, only returning to alarm when one of the Oxford team returned.

It was thought that the reason why the peregrine alarmed at the Oxford team, and not the mowing operator (who was wearing a high viz orange jacket) was that the team had already visited the lower shore on a previous day, under the cliff to check the Black Guillemot nest boxes. The peregrines perceived them as a threat. Whilst the mower had worked close the edge of the cliff where the peregrine nest was, this does not appear to have been perceived as a threat to the Peregrines. The lesson to take away is, do not wear the same clothes while mowing, as you did if you visited the lower shore under the nest previously.

It is a good idea to start the mowing mid May or before. By cutting all of the vegetation short on the West Warren, Lower shore, North Landing and North Point, this will deter most species from nesting on the paths and treatment areas.

Eiders tend to nest on ground with last years bracken litter on it, and so therefore will not on the treatment paths and areas.

You can also raise the cutting height of the deck to ensure the blade does not damage soil. Secondly, avoid using the drive mechanism whilst turning, and don't turn on bare soil.

The Lawnmower engines can technically work on slopes of up to 30 degrees for long periods, without causing damage to the engine.

Lumpy ground and avoiding damage to the burrows

There are some areas and paths that have portions of the treatment area that are very uneven. Usually, this is because the soil is very deep and loose, and is where rabbits and shearwaters have dug out large volumes of soil from underground. It can also be because the area was very prone to collapse and was therefore subject to continual maintenance of burrows at some point in the past.

So how do you avoid causing damage to a burrow? The Lawnmowers have four wheels, and are well balanced between all four. So, if you are approaching a burrow or a hollow amongst burrows that you suspect may be weak (if is not covered in fescue or Yorkshire fog grasses), you can lift the front wheels over it, and then when you reach solid ground at the other side, simply lift the back wheels over it and continue on.

The lawnmower exerts much less ground pressure (25kg per axle) than a person, so it can be used to mow a central weak area with the operator standing on the periphery, without the operator traversing the ground. The Wheel barrows can become heavy when full, so you should avoid taking full barrows across bare soil.

Direction of working

The lawnmowers efficiency is reduced if you mow down, or to a lesser extent - up a slope, with regards to collecting cuttings. The chute will block before the bag is full, and some cuttings may even fall onto the ground.

It is recommended that you work across a slope, rather than up and down it. Short sections of steep paths can be worked by working the mower backwards and forwards across the slope in short lengths at right angles to the path length.

Planning your approach to an area or path

The mowers are very efficient at gathering the cuttings into the collector bags if used in a specific way. However, they have limits, depending on the height of the vegetation being cut and whether it is wet after recent rain. Often, the cutting deck and the chute into the collector bag can become clogged, particularly if you are mowing bluebells, or are not appreciating the machines capabilities. It is annoying and less efficient when you have to stop often to clear the chute and cutting deck.

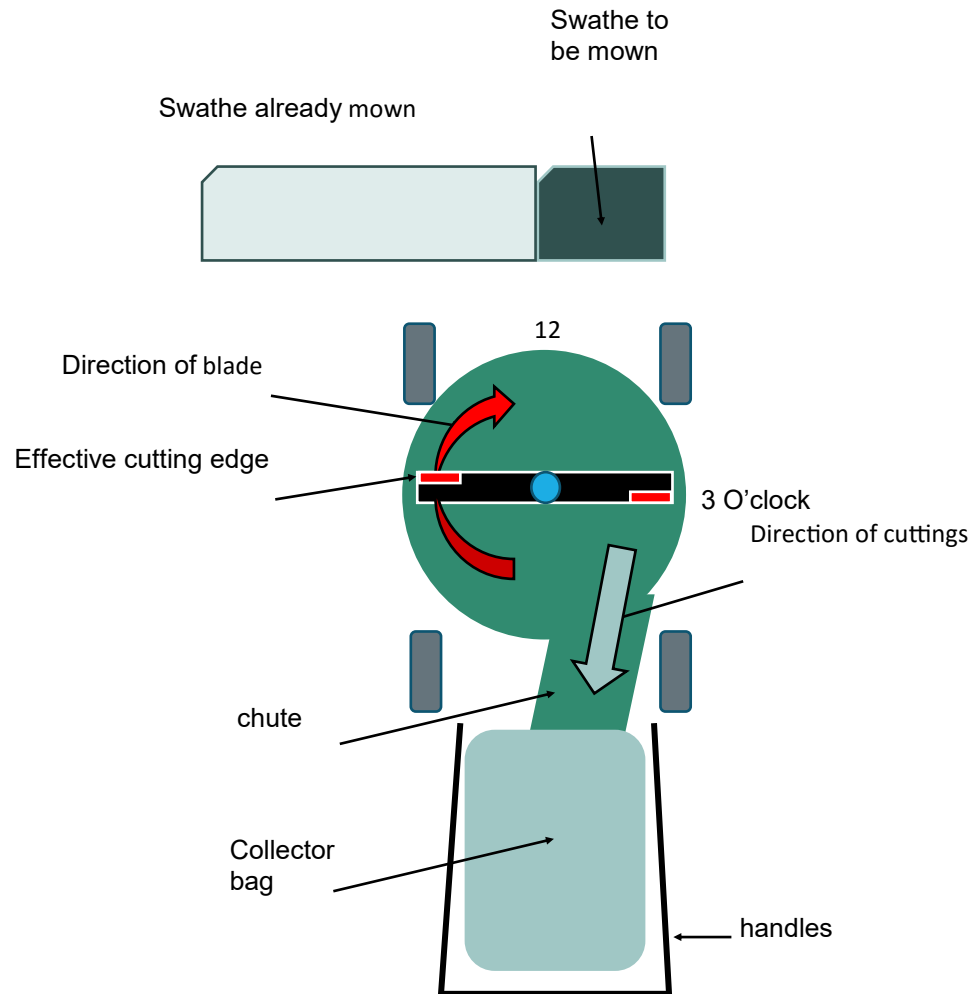
You can improve your efficiency by understanding the anatomy of the machine, and work this to your advantage.

The tops of the spoil heaps can be hit by the lawnmower blades, and even "topped". This does not compromise the burrow structure in any way or leave it more prone to collapse. However, it is not good practice - as it may remove establishing grasses on that surface, and also blunts the blade.

The chute blocks because of gravity, working against the flow of cuttings towards the collector bag.

If you must mow down a moderate slope, e.g. the Well path, empty the collector bag before starting down and more often that you would otherwise do.

The diagram below explains why the direction you approach an area to be mown, makes all the difference. It is common that you will only mow half the width of the cutting deck, and it is very important you use the correct half! ***You should see that the optimum part of the cutting deck is the outer 4 centimetre band from 12 to 3 o'clock***, because this means that once they are cut, the cuttings have a short distance to travel to the collector bag.



“Biting off more than you can chew” is a useful saying to remember!

Slow down your speed of progress or take a narrower swathe, if you are tackling vegetation that is taller or wetter than usual.

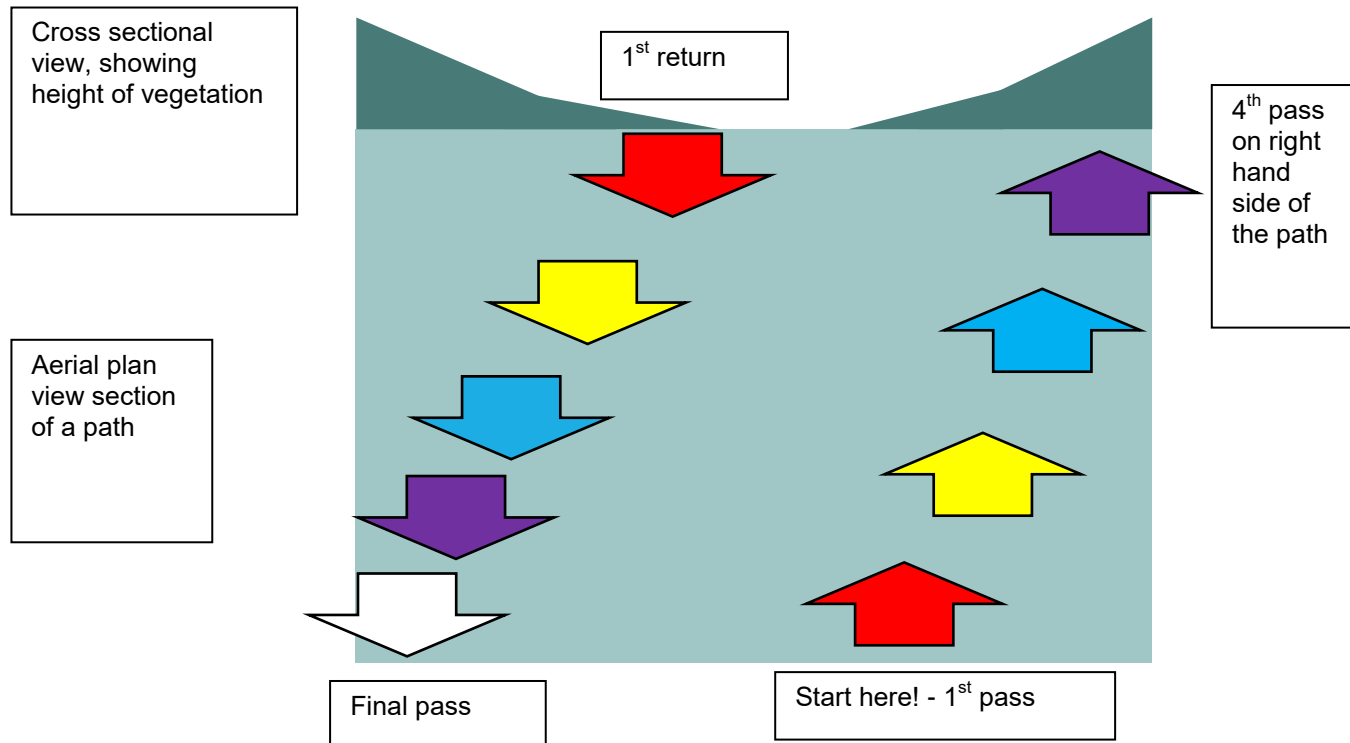
For tall vegetation, it is good to mow it twice, first at full height, and then again at the usual setting, collecting the cuttings as always. This is often done for the Eden project.

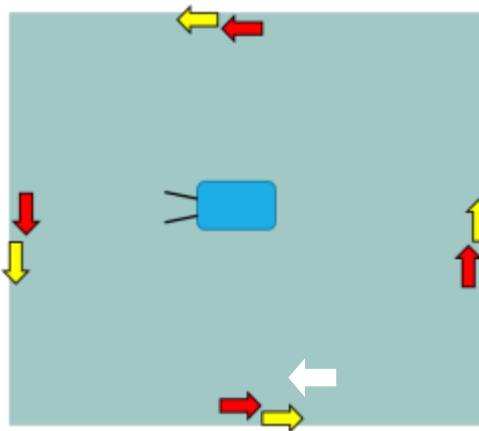
Approaching paths

After many years of mowing, the growth is less on the centre of paths and areas, and always taller and denser on the edges. For this reason, it is a good idea to mow the centre of the path first, and then work out towards the edges with subsequent passes as shown in the diagram above:

The length of the section of the path you chose to do should vary according to:

- 1) The length of pass you can treat to fill the collector bag
- 2) The placement of the cuttings deposit position, either a tree or more often, a wheel barrow. You always want to be handy to a wheel barrow so that you minimise the time it takes for you to empty the collector bag, and begin mowing again. So don't head away off into the distance and leave your wheel barrow behind! The less time your machine is not working, the less time it will take you to complete the task.





Note, in the diagram to the left, if the growth of vegetation on the edge isn't too bad, you can start mowing the outermost edge in an anti-clockwise direction (yellow arrow), then switch to clockwise on the second pass (white arrow).

The approach for areas

This is the same as for paths, in so far as ***you should always use the right hand side of the deck to cut a new half swathe***. For relatively small areas, it is good to place the wheel barrow in the centre and mow from the outside inwards (see diagram to the left). If the edge vegetation is too tall or wet, you can decide to mow the band one in from the outside as follows:

- 1) Start by mowing a band in an anti-clockwise direction (the red arrow), roughly half a deck width out from the very edge of the treatment area.
- 2) Once you have completed the first circuit, mow the outside edge circuit (the yellow arrow)
- 3) Then turn the mower around and mow the new outside band in the opposite direction (white arrow).
- 4) Continue mowing in a clockwise direction until you finish in the centre.
- 5) Remember, you should always cut the vegetation using the optimum 12 to 3 O'clock part of the deck.

For larger areas, you can divide the area up to into sections, so that the wheel barrow is handy for you, or you could use two or more wheelbarrows, and work around a combination of them.

Avoiding the less common and more interesting plant species

The most important thing is to mow as much biomass as possible, but this is usually only ragwort, bracken, red campion, and some others. When you can, try to avoid mowing the less common species, such as centaury, eyebright, orchids (in the Eden project), and also Marsh thistles.



Emptying cuttings

The cuttings should always be emptied in a place where they will not detrimentally affect the habitat, or where they will be of use for tree growth. The cuttings should never be placed on top of or near a burrow, so check before you empty. The following list ranks the places in order of desirability, preferred ones first:

- 1) **In the sea, below the high water mark**, e.g. below the Well (for all of Well path), Lower Shore, or North Point.
- 2) **Around planted trees**, e.g. in the Millennium Plantation, Cricket pitch, the Withy, all of the Cliff areas, Bluebell Gully, Heli-bushes, South path, or the West Wood.
- 3) **Beside Elder bushes**, e.g. Flagpole, Gully, Heli-bushes, Radar, South Garden, West of North Garden Wall, or the Crow trap.
- 4) **In tall rank bracken areas**. This is alright, as long as they are downslope of the treatment path or area, and won't cause a nuisance in the future. Examples where this is done are the circular paths, Gully bridge and Gully path. It is particularly important that you check for burrows before emptying, and you should be able to see where last year's cuttings were deposited, to continue with the same spot.

Never ever dump the cuttings on the treatment areas.

Cleaning under the deck and around the blades

When the deck and chute clogs up, you will find it is best to clean and clear it as soon as possible. Always wear gloves for doing this.

- 1) Disconnect the spark plug
- 2) Tilt from left side up and away from you
- 3) Use your fingers and hands to clear all of the mulched vegetation, and put it in the collector bag to empty.
- 4) Re-connect the spark plug lead.



Tilt the lawnmower from the left side up to ensure the engine starts easily again. Tilting the other way could cause petrol to run out into the air filter.

Cleaning after using the Lawnmowers

Refer to the following section “Brushing and cleaning the machines after use” on page 25.

You want to leave the machine ready for use for the next trip and volunteers.

It is not a pleasant task to have to clean the vegetation from the deck after it has been rotting for a while! It smells like silage/rotting manure.

Recording the work you do

All work is recorded in the “Path and habitat management work recording book”.

Reasons:

- 1) To record the time taken to treat each path and area so that analysis can be carried out.
- 2) Keeping a record of the machine hours for the purposes of scheduling servicing and recording costs.
- 3) Recording volunteer hours for grant funding reporting purposes.

How to record your work:

- a) **Fill in the date at the top of both the table and map pages**
- b) **Complete a row for each period of work you spent:**
 - i. Your name (initials will do after the first, as long as there aren't other volunteers with the same initials!)
 - ii. The hours you spent to the nearest 15 mins, recorded in decimals. E.g. One and a quarter hours is recorded as “1.25”. Three quarters of an hour is “0.75”.
 - iii. Record the name of the machine, either “Stiga A”, “Stiga B”, “Alko” or “Mountfield”.
 - iv. Record the name of the paths and areas you mowed, and any notes of interest, e.g. “mowed the edges only”, or “upper section only”.
- c) **Shade in the areas or paths you mowed on the map.** Its free form drawing.
- d) Compare your notes with the map so they agree.
- e) Make a note about any particular notes of interest.

The record book consists of a double page per day of work. There is a table for details on one page, and a map on the other.

There is a complete record of all work carried out since 2005



Regular maintenance

Oil the starter cord

It is good to oil the starter cord before you first use the lawnmower as the cord will be dry and the oil will be absorbed, and again when you put it away at the end of a period of use.

- 1) Depress the proximity lever (or dead man's handle), pull the cord gently and slowly out as until it is fully removed.
- 2) Wind the cord around the handle to secure it.
- 3) Use 3 in 1 oil and run the nozzle slowly along the length of the cord from the top down towards the starter mechanism.
- 4) If the cord looks badly frayed and thin at any point, unscrew the four small bolts and take the whole unit to a dealer to replace the cord.

This slows down the wearing and rotting of the cord, especially in wet conditions.

Cleaning the handles

This is especially needed when mowing bluebells. The mulch can gather around the handles. It can become sticky, compromising the function of the proximity lever (dead man's handle).

- If the dead man's handle isn't working properly, brush it clean or use the flat headed screw driver to scrape the worst bits off. You may need to use a sponge with a scourer to wash with water and washing up liquid.
- Check that the lever does release properly.

Cleaning the rear wheel drive mechanism

This is important for the Stiga mowers. Mulched vegetation builds up around the drive belt. If this is wet, it seems to cause the belt and pulley wheels to slip, which is very annoying.

- 1) Stop the engine and use the Park tool to undo the three Allen key screws, and slide the cover off.
- 2) Clean around the belt and pulley wheels with your fingers or a stick or brush (if you are in the courtyard).
- 3) Replace the cover again, but don't overtighten the screws, taking care to ensure the front lip is inserted on the correct side of the deck and deck height lever/bar.

Continued over/

Three screws



It is good to do this at the end of a session as a matter of course, but is may need done once an hour if the vegetation is wet. The Alko mower seems less fussy in this regard.



- 4) The drive mechanism within the back wheels should also be maintained, probably once a year, depending on use.
 - a) Use the socket wrench or a spanner to remove the back wheels.
 - b) Check the manual. Brush or remove the dirt from around the sprockets on the inside of the wheels.
 - c) Replace the wheel, **but do not over tighten the nuts/bolts**.

It is very easy to overtighten the nuts, and break the axle. This is a costly dealer repair. Just tighten until there is a slight resistance, it is not a problem if they fall off again.

Brushing and cleaning the machines after use

- 1) Disconnect the starter plug cable.
- 2) Lift the mower deck up from the left side as you approach from the working position at the back.
- 3) Set something under the handle to prop it up in a position slightly less than completely on its side. It is good to use one of the granite blocks for this, or some large logs.
- 4) Keep the amount of time the mower is not on its wheels to a minimum.
- 5) Brush the underneath of the cutting deck, and also under the back flap, especially where the collector bag has contact with the mower, as dirt build up can cause the collector bag to fall off.

Change the cutting blade

There is a socket wrench set in the shed.

- 1) Wear leather gloves when you loosen the blade
- 2) Hold the blade with one hand while using the wrench in the other. If the blade is tighter than it should be, use a block of wood to lock the blade whilst using the wrench. Be very careful, as the socket could fall off the blade bolt without warning.
- 3) Be sure to remember the order of the bolt, metal washers, and friction washers, as it is very important to replace all in the proper order again.
- 4) You may need to replace the friction washers (see note beside)
- 5) When putting a new sharpened blade back on, do not overtighten the bolt.

The Stiga mowers have a friction washer mechanism rather than a boss (a boss has studs through the blade which are designed to break if a solid object is hit, this reduces the likelihood of damaging the shaft). This means the order of the metal



washers and the friction washers must be correct, and it is very easy to over tighten the bolt, rendering the friction washers useless.

You will notice this when pulling the starter cord, as it will appear that the engine has too much compression and will yank your arm back which will be sore.

Changing the engine oil

- 1) Find the engine oil and the portable tray/tank which are kept in the shed and on the bench beside the lawnmowers in the old buildings.
- 2) Run the lawnmower for at least five minutes to warm the engine up, and turn the fuel reservoir to the off position, and run the engine until it stops through lack of petrol.
- 3) Set the tray/tank beside the lawnmower, on the same side as the dip stick on the top of the engine (right hand side).
- 4) Remove the cap on the tray, and the cap on the engine, and tilt the lawnmower over slowly, then quickly, checking to make sure the oil falls out and onto the tray completely. The weight of the mower switches to bearing solely on the back wheel, so it is not a straight lean over - you will need to adjust the position of the mower and the tank to make sure the oil falls into the tray.
- 5) Leave the machine to drain the oil for at least five minutes.
- 6) Return the mower onto its wheels. Leave the tray on a very flat place to drain into the tank as much as possible.
- 7) Replace the cap on the tank tray.
- 8) Refill the oil in the engine. It is difficult to measure, and it is best to replace the dip stick cap, and check the level after a while to make sure the amount is correct, and adjust as necessary.
- 9) Turn the reservoir tap on, start the engine and run for 2 minutes. If the engine is overly smoky, stop.
- 10) Check the level of the dipstick and either fill more, or take some out by following step 3 onwards.

You will need to change the oil after 30 hours of use, and as part of the over-wintering preparation.



You will need to install a new set of friction washers usually about once every 30 to 40 hours, perhaps more often. This may be more often until you become familiar with tightening the bolt by the correct amount (less than you would expect). It is very rare that a blade bolt works itself loose whilst working, and this is not usually a dangerous occurrence.

It seems best to have it at the maximum recommended level. Overfilling will make the engine smoke and should not be done. Under-filling and the engine could seize, and damage it beyond repair.

All tools and spare parts are kept in the wooden shed in the ruins of the old buildings

Changing the air filter and spark plug

Check the spark plug model type in the lawnmower manual to ensure you fit the right one. This should be done once a year.

Spare air filters should be replaced once every two years or every 100 hours, whichever is more often.

Preparing the machines for over-wintering

- 1) Try to plan refills of the petrol tank to leave very little if no petrol in the tank
- 2) Run the engine for five minutes, and **change the engine oil**
- 3) **Clean and brush the machine** as usual, including the handles
- 4) Disconnect the spark plug, and **change the blade**
- 5) **Clean the drive mechanism**
- 6) Start the mower and run for two minutes
- 7) Turn the fuel tap off and continue to run the machine until the petrol runs out and the mower stops
- 8) Remove the spark plug and pour a little (a capful) of **engine oil into the chamber**
- 9) Pull the starter cord to make the pistons turn, rise and fall, to circulate the oil around the engine chamber
- 10) Refit the spark plug

11) Store the machine in the old buildings

Refer to the manual if you need further details.

Repairing breakdowns of machines

The machines are relatively new, but they will require repair at some point. If there is a breakdown, ask Ian McKee for advice. It may be that a part of the mower can be taken off for repair, rather than transporting the whole machine in the boat which is very undesirable and difficult.

A major repair was needed to one of the Stigas, when I tightened the back wheel too much and broke the bolt attached to the axle plate.

I would expect the starter cords to need replaced one every two or three years, if they are regularly oiled. If they are not oiled, they would need to be replaced twice a year perhaps.

The cables may need to be replaced. These are the throttle, proximity and drive

Note, when the engine is started in the following year, it will be smoky until the oil is burnt off.

Always report any faults to Ian McKee so that new parts can be ordered and sent to the island.

cables. It is difficult to predict when they will need replaced.

Parts required on a regular basis

Friction washers for the Stiga mowers. These are not expensive, but a supply should be kept on the island to use when needed.

The blades need to be sharpened and brought back to the island. There are three or four blades for each machine to ensure there are always enough sharpened blades on the island while others are off for sharpening.

Gloves, ear muffs

Gloves normally last for about 40 to 50 hours of use, ear muffs until they are visibly dirty. New pairs are required for each volunteer, they cannot be shared or passed on.

Look closely, there is a brand new blade held directly underneath the old worn one! This shows how much the old blade has been sharpened...



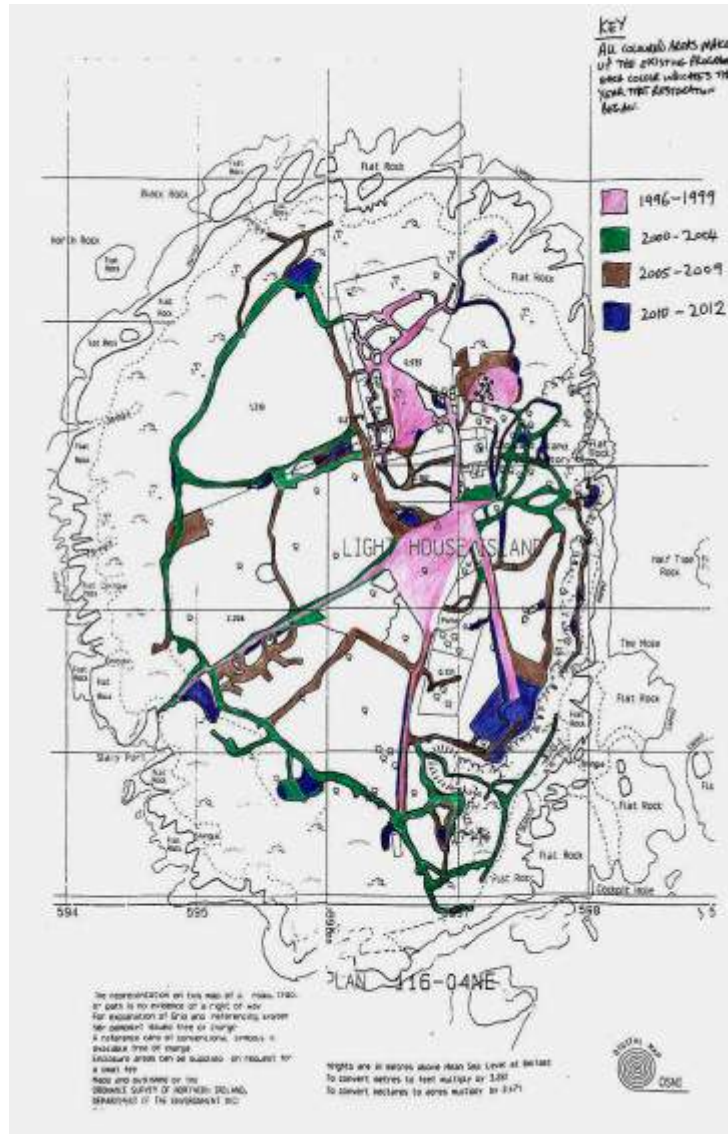
Where?

Maps showing the paths and areas that need to be treated are within the “Path and habitat management work recording book”.

The first area mown was the main area in the North garden, begun in 1996.

As the years progressed, more and more areas were adopted until 2011. The map below shows when each of the treatment areas and paths were begun, categorised into five year groups.

The Cricket pitch and Radar were added to the mowing programme in 1997. Most of the main paths have been mown every year since 1999.



When?

Treatments have been carefully timed through the growing season, 4 separate weeks, to allow efficient cutting and lifting. An alternative approach would be to carry out a small amount of mowing every weekend from May to September, and ***ensuring that each path and area is treated before the growth is too much for the lawnmowers to cope with.***

The following notes have been written assuming each path and area is treated four times a year, and all treated within the space of a week at each point.

Mid/ end of May

What is achieved:

- 1) sets out the mowing template for following through the rest of the year.
- 2) The first wave of bracken growth is topped, meaning that the dense bracken areas do not become impassable by the end of June (if the bracken is allowed to grow untreated)
- 3) Red campion seems to grow throughout the year, albeit slowly over the winter. This treatment takes it down to a lower height, meaning that gulls do not nest on the paths and restoration areas. In addition, once hatched, if not reduced in height, chicks will hide on the paths and will be trampled by visitors, as they are very hard to see within red campion. This was particularly important along the lower shore path when the Arctic terns nested there. The paths were mown in the third week of May, before they settled to nest each year.
- 4) Bluebell growth and spread is checked, if mown. Bluebells begin growing before the bracken canopy is established, however, once the bracken fronds have emerged and become established, growth seems to be reduced. On the treatment areas, as bracken is prevented from establishing a canopy, I believe that the lack of competition for the Bluebells results in an expansion of bluebells, and certainly a higher density. From a treatment point of view, if these areas still have bracken fronds appearing, and they are not mown early, then it's a double whammy in June, as there will be taller and denser growth of both bracken and bluebells, and therefore impossible to mow. Next year's growth for both will be even greater, litter will build up feeding faster growth, and the path or area will succeed quickly to tall bracken, leaving no sign of a path or restoration area. Continued over/

The edges of the paths and areas can be identified by spotting the dead bracken stalks from last year, which are found up to the edge of the treatment areas.

From an ecological point of view, the bluebells are not a negative factor, although if they were to continue expansion, they would displace fescue grass to some extent and reduce islands capacity to support the rabbit population at an important time of the year for foraging. And they would perhaps displace other finer plant species. From a path management point of view, they are a slippery surface to walk on, and obscure the burrows, so would become a hazard for visitors. The timing of their dieback is after the bracken has grown to a considerable height, and so it was always beneficial to mow the bluebells so that the second mow would handle the bracken growth.

This photograph was taken at the very end of June. It had been mown in mid May, so the bracken was not as dense or high as it would have been, if it hadn't been mown.



- 5) Yorkshire fog grass is mown down to a low height. If this is not done, it tends to grow to a high height, developing into a cushion, with a dead dry centre. If this happens, it needs to be mown eventually, leaving a seed bed for rank species such as ragwort and red campion to grow, slowing the restoration process. Continual mowing of Yorkshire fog results in fescue grass expansion (exactly what is wanted).
- 6) This treatment also removes some of the rank species canopy cover, resulting in better growth of fescue grass which is often lurking underneath, making it more available for foraging by rabbits (which seem to ignore it if surrounded by rank species).

Please note, the mowing work in May and June **is the hardest of the year**, due to the presence of Bluebells. Even if the patches are avoided, they do grow in small groups and individually within the red campion areas on the paths and areas. We called the mulch “guacamole”.

End of June/ beginning of July

What is achieved:

- 1) The second wave of bracken is treated (the bulk of the growth).
- 2) Any vigorous red campion growth is treated, usually along the ecotone edges of the paths and areas.
- 3) Ragwort growth is treated before it gets too tall
- 4) A reasonable amount of biomass is harvested, before the high growth rates happen over the summer
- 5) Further help for finer species that would otherwise be suppressed by rank plants.

Beginning of August

What is achieved:

- 1) There may be a few remnants of bracken fronds, at a hopefully low density. This will depend on whether the treatment at the end of June/ early July was too early though.
- 2) This cut is mainly to collect the biomass growth from both red campion and ragwort. Also Yorkshire fog grass if present again in the sward. The growth through July is usually quite prolific.

Continued over/

Middle to end of September

What is achieved:

- 1) As above point 2, this cut is mainly to collect the biomass growth from both red campion and ragwort. Also Yorkshire fog grass if present again in the sward.
- 2) Preparation of the treatment areas for the winter. This reduces the height of the red campion, which will seem to continue to grow slowly over the winter. This mowing means that the height of the red campion is not too high for starting the treatments in the following mid/ end of May.
- 3) Again, any treatment of rank species will increase the amount of fescue grass available for rabbits to forage.

The foraging available over the winter is the main factor in limiting the population going into the next breeding season.

If the treatment areas are not mown in September, treatments would need to be carried out the following April to catch up instead, although April is usually a wet and windy time of year to do this!

This tall fescue was found lurking underneath the dochans and red campion. Mowing this taller vegetation allows the rabbits to find it, increasing the foraging available.



The importance of timing the mowing perfectly

These photographs illustrate the need to carry out regular and carefully timed mowing of the paths to keep them functional for walking along. They were all taken during 2015 of the middle path in the Heli-bushes. Many of the paths do not have such strong bracken growth, however, pressure points are at the bottom of the South Path, parts of the Circular paths, North Garden paths, and North Landing.

Please see over/

Taken on 19th May, before mowing. Note the taller vegetation is mainly Bluebells and red campion



Taken on 22nd May, after mowing. Bluebells and early bracken fronds topped.



Taken on 22nd June, before mowing.
The lawnmowers can just about cope
with this height of vegetation...



Because the bluebells and bracken was
topped in May. Taken on 26th June,
after mowing.



Taken on 13th September, before it
was mown for the final time. This col-
lected some of the bracken that had
fallen over, and topped the red campi-
on and ragwort, freeing up more fes-
cue and pearlwort for the rabbits to
forage before the onset of winter.

Who?

It is important that volunteers have a good knowledge of using lawnmowers or wheelbarrows, know their own limits, are self-sufficient, learn the techniques quickly, and can make sound judgements according to the conditions they encounter.

The following points give an idea of the work involved, and the conditions on the island:

- **Walking** on uneven terrain
- **Pushing and manoeuvring** the lawnmower around the work area, which can be on uneven and sloped ground
- **Mow paths and areas as specified:** following the mowing template areas, cutting at correct height, **collecting all cuttings**, identifying when collector needs emptied, using the machine in an efficient manner to maximize productivity
- **Lifting and carrying** up to 15kg collector bag from back of machine for emptying into the barrows
- Wheel a double wheeled barrow weighing up to 70 kg to **empty the cuttings** at the defined points for depositing
- Manoeuvring the lawnmowers (each weighing between 40 to 50kg) around challenging terrain
- **React to circumstances** such as weather, alarming nesting birds and inform others in team, knowing when to ask the Duty Officer for advice
- **Carry out basic maintenance** on the machines and **know how to spot poor performance and faults of machines.**
- **Recording work completed** in the sheets and maps provided
- **Be responsible for your own safety, and ensure you do not cause others to have any accidents**
- **Wear the recommended Personal Protection Equipment (PPE).** Leather gloves and ear muffs are provided on the island, but volunteers will need to bring their own boots, long trousers, and long sleeved tops.

Risk Assessment for using the lawnmowers, page 1 of 3.

Volunteers must never be under the influence of alcohol. This is important for the safety of individuals and other members of the team.

Hazard	Consequence	Likelihood	Who could be harmed	controls
Rotating blades	major wound of feet	low	Operator and assistants	<ul style="list-style-type: none"> • Induction and updates to include training and instruction • Be aware that if operator slips, let go of the dead man's handle and push the mower away. • Do not attempt to control the position of the mower if you do slip. • Do not use on steep slopes with slippery surfaces. • Be aware that wet weather makes vegetation slipperier. • Wear sturdy boots with grippy soles. Do not use boots if the soles have a worn tread. • Boots with toe cap protection are strongly recommended.
Rotating blades	Major wound of hands	low	Operator and assistants	<ul style="list-style-type: none"> • Induction and updates to include training and instruction. • Start procedure: test the dead man's handle once engine has warmed up, ensuring it works when released (and does not stick in the on position). Note the performance of the engine after releasing regularly. • If it is sticky from mulched vegetation, stop using mower and clean/fix. • Follow due process of ensuring machine stops before inspecting under deck – undo cap from spark plug. • When brushing and cleaning mower after use, clean handle and mechanism of the dead man's handle, ensuring it is not sticky.
Slippy surfaces	Slips and falls injuries	Depends on weather, low to high	All volunteers	<ul style="list-style-type: none"> • Be aware that wet weather makes surfaces slippy. • Avoid using the lawnmower on steep short vegetated surfaces when they are wet. • Wear sturdy boots with grippy soles. Do not use boots with worn soles. • Mowing bluebells increases the risk of slipping, as the cut leaves are wet

Risk Assessment for using the lawnmowers, page 2 of 3.

Hazard	Consequence	Likelihood	Who could be harmed	controls
Uneven terrain	Trips and falls injury	common	All volunteers	<ul style="list-style-type: none"> Survey treatment area or path if you are unfamiliar with the site. Note slopes, burrows and uneven terrain
Sloping terrain	Slips and falls injury	common	All volunteers	<ul style="list-style-type: none"> Survey treatment area or path if you are unfamiliar with the site. Note slopes. Plan mowing routes and directions accordingly. Work across the slopes, not up and down.
Flying stones	Puncture or eye wound	low	Island visitors, All volunteers, particularly assistants	<ul style="list-style-type: none"> Refer to and study the terrain difficulty map on the record book. Survey the treatment area if you are unfamiliar with the site. Identify any stony areas and avoid treating that area, raising the cutting height of the lawnmower if you are confident that this is sufficient to prevent contact. Do not work close to other operators, other volunteers, or any island visitors on known stony areas. Stop the mower if anyone approaches within the work site that is unfamiliar with the workings of the mower your task.
Toxic plant skin burn	Severe burn of skin	Depends on sunlight	All volunteers	<ul style="list-style-type: none"> All volunteers to be shown how to identify the plant All volunteers to wear long sleeved shirts and long trousers Take care when mowing areas where the plant is, and when depositing cuttings, do not rub skin or eyes with gloves on which have plant material on them.
Strong sunlight	sunburn	Depends on weather, low to very high	All volunteers	<ul style="list-style-type: none"> Apply sun lotion, particularly if working between 1000hrs and 1500hrs on partially overcast or sunny days in May, June, July, August or September. Consider how acclimatised to sunlight you are, and your skin characteristics and how susceptible you are to burning. Be aware that UV exposure is significantly increased on the island, as light is deflected off the sea.

Risk Assessment for using the lawnmowers, page 3 of 3.

Volunteers must never be under the influence of alcohol. This is important for the safety of individuals and other members of the team.

Hazard	Consequence	Likelihood	Who could be harmed	controls
Noise	Deafness/tinnitus	high	operators	<ul style="list-style-type: none">Always wear ear muffs
Heat exhaustion	fainting	Depends on weather	operators	<ul style="list-style-type: none">Keep hydrated, drink plenty of water or diluted juice during regular breaks.Remember that tea and coffee do not hydrate as effectively as pure water.
Sharp blades	Hand cut	medium	Person carrying out maintenance	<ul style="list-style-type: none">Always wear leather gloves when replacing the blades or adjusting/dismantling metal parts.Wear leather gloves when cleaning the underneath of the deck

