WOODLAND HERBIVORE IMPACT ASSESSMENT

WHIA LITE METHOD

BEST PRACTICE GUIDANCE

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Aim

The aim of this guide is to describe how to measure impacts of large herbivores on woodland vegetation

Woodland species		
Holly	Ilex aquifolium	palatable
Rowan	Sorbus aucuparia	palatable
Hazel	Coryllus avellana	palatable
Oak	Quercus petraea and Quercus robur	palatable
Scots pine	Pinus sylvestris	palatable
Birch	Betula pendula and Betula pubescens	less palatable
Sitka spruce	Picea sitchensis	less palatable
Bramble	Rubus fruticosus	palatable
Blaeberry	Vaccinium myrtillus	palatable
Raspberry	Rubus idaeus	palatable
Hard fern	Blechnum spicant	less palatable
Bog myrtle	Myrica gale	less palatable

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Key Indicators

The main impact that large herbivores have on woodland is through browsing.

Browsing is measured by looking at the impacts on three indicators:

- Seedlings/saplings
- Lower shoots
- Preferentially browsed plants

What to do

The three key indicators should be measured at each stop across the woodland (see table below for suggested number of stops in relation to woodland size). Stops can be, but do not have to be permanently located using GPS.

At each stop pace out a 25m radius for a circular assessment area. Within the circle, compare the amount of browsing on each species for each indicator and, using the field recording form, keep a gate tally in the corresponding cell in the table against each indicator photograph for the appropriate impact level. Where the indicator is abundant and browsed at the same impact level, record '10+' / '50+' rather than counting each stem in a gate tally.

Suggested number of stops for different sizes of woodland

woodland area/ woodland polygons	*suggested number of HIA stops*
<5HA	2
5-10HA	3
10-30HA	5
>30HA	8

When to measure

Assessing impact at the end of winter (late February to early May), before new growth starts in spring, provides an assessment of the impact over the previous twelve months. If you are surveying in the growing season, disregard the current year's growth and look carefully to see what the amount of browsing was on the previous year's growth.

What to measure

Use the Photo Guide to help you decide the level of impact for each indicator. Record the number of trees /plants that you find that fall into each of the browsing /grazing rate categories specified for each indicator within the Photo Guide.

Seedlings/saplings

Look at the amount of browsing on the leading (outer) shoots and assess the amount of the previous year's growth removed by browsing. The aim is to assess how much was browsed at the end of the winter.

Keep a tally in the Field recording form against the corresponding impact level.

LOW/NO IMPACT	
For unpalatable species	*No browsing visible*
For palatable species	*<25% of the last full year's growth removed by browsing*
MEDIUM IMPACT	
For *unpalatable species*	*<25% of the last full year's growth removed by browsing*
For palatable species	75->90% of the last full year's growth removed by browsing
HIGH IMPACT	
For *unpalatable species*	*>25% of the last full year's growth removed by browsing*
For palatable species	75->90% of the last full year's growth removed by browsing

Lower Shoots on trees taller than 2 metres

Look at the browsing on basal shoots and the browse line, and using the Photo Guide, assess the amount of the last growing season's growth removed by browsing (when assessing in winter).

LOW/NO IMPACT	
For unpalatable species	*No browse-line visible*
For palatable species	*<25% of the biomass removed by browsing*
MEDIUM IMPACT	
For *unpalatable species*	*<25% of the biomass removed by browsing*
For palatable species	*25-75% of the biomass removed by browsing*
HIGH IMPACT	
For *unpalatable species*	*>25% of the biomass removed by browsing*
For palatable species	7well maintained browse-line or 75->90% of the biomass removed by browsing

Keep a tally in the Field recording form against the corresponding impact level photograph.

Preferentially browsed and other (non-tree) plants

Look at the browsing on all shoots and estimate the proportion of biomass removed (as in bramble, raspberry hard fern and bog myrtle) or the proportion of shoots that have been browsed (as in blaeberry).

Use the Photo Guide to identify the appropriate impact level and record the tally in the Field recording form against the appropriate impact level.

LOW/NO IMPACT	*<25% of the biomass removed/ or number of shoots browsed*
MEDIUM IMPACT	*<25-75% biomass removed/ or number of shoots browsed*
HIGH IMPACT	*75->90% of biomass removed/ or number of shoots browsed*

How to analyse

For each stop (25m radius circle), count the number of records at each impact level for each indicator. For each indicator, record the indicator with the highest tally. Each stop will have three results.

In a wood that has been heavily browsed for a long time, browsing indicators may be few and far between. If this is the case, and the relevant indicator is not present within the 25 m circle (e.g. browse line), where that indicator is encountered en route to the next stop, record the relevant impact level against the stop that you have just left. E.g. if you do not encounter any browsing to lower shoots within stop 1 but come across a hazel with Medium browsed basal shoots en route to stop 2, record Medium against Shoots for stop 1.

To summarise the gate tallies for each indicator, use the most representative/frequent impact level and record in the right hand column in the Field recording form below..

Field recording form for each stop

Indicator	**Impact level**				
	Very High/ high	Medium	Low/ no impact	None seen	Summary
Shoots					
Seedlings/saplings					
Preferentially browsed plants					

Compare the impact level for each indicator across all of your stops, and record the most frequent/ representative impact level for the woodland in the right hand column of the Summary table below.

Stops	1	2	3	4	5	6	7	8	Overall woodland summary for each indictor
Shoots									
Seeds/ saplings									
Preferentially browsed and otherplants									

You may find that not all the indicators give the same result in terms of impact level. Summarizing the current impact level in a woodland as one overall result giving equal weight to all indicators can mask important information and occasionally give a misleading result, and for this reason is not recommended. It may be useful to retain the information for each indicator separately to allow comparison, with any subsequent results for management purposes.

Frequency of assessment

Since current herbivore impact is defined as the impact of herbivores in the previous twelve months or less, monitoring every year can provide useful information on how impacts are changing over time. This can be especially useful for tracking the effect of management on herbivore impacts. Management can then be tailored to achieve the desired level of herbivore impact.

Setting target levels for current herbivore impact

Once you have completed your Herbivore Impact Assessment you may want to compare your result with a target impact level. The table below provides a summary of the effect of each of the impact levels, if maintained over the long term, on the condition of established woodlands. Whether the outcome

is desirable or not depends on the objectives for the woodland. In the table below, the long-term implications of each impact level are compared with some common natural heritage objectives. This information may help with setting a target impact level for the woodland

High or Very High	Medium	Low or No Impact
TThere will be very little, if any, successful regeneration of palatable tree and shrub species, either from seed or from shoots, and little regeneration of unpalatable tree and shrub species. The ground flora will be of low species diversity with few or no preferentially grazed plant species present. There will be no or very little flowering and seed setting. The woodland will be open with a short ground layer, a very sparse, if any, shrub layer, no climbing plant species and a short field /ground layer dominated by a few plant species. Food and habitat for invertebrates, birds and small mammals will be limited. The woodland, if it persists at all in the long term, will lose its palatable tree and shrub component. There will be large volumes of deadwood as the woodland senescess	There will be little successful regeneration of palatable tree and shrub species. Unpalatable tree and shrub species will be regenerating well, given suitable light conditions. The ground flora will be of moderate species diversity with some preferentially grazed species present but in low abundance and producing very few, if any, flowers or seeds. There may be abundant flowering and seed setting of plant species that are not preferentially grazed. There will be few, if any, climbing plants. Food and habitat for invertebrates, birds and small mammals will be favourable for those species able to use the moderately open and diverse woodland structure but limited range of tree, shrub and ground flora species. It will be unfavourable for species that require very open woodland or very abundant glades. In the long term the woodland will lose its palatable tree and shrub component	All species of tree and shrub with seed sources will be regenerating well given suitable light conditions although the abundance of young trees of more palatable species will be lower than if there were no browsing. The ground flora will be of high species diversity and all species will be able to flower and set seed to some degree. Climbing plants will be abundant. The diverse structure, frequently higher plant species diversity, and greater flowering and seeding, will provide food and habitat for many species of invertebrate, bird and mammal but will be unfavourable for those species that require open woodland and /or abundant glades. In the long term the woodland is likely to remain in a similar condition.