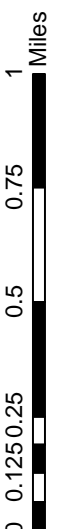
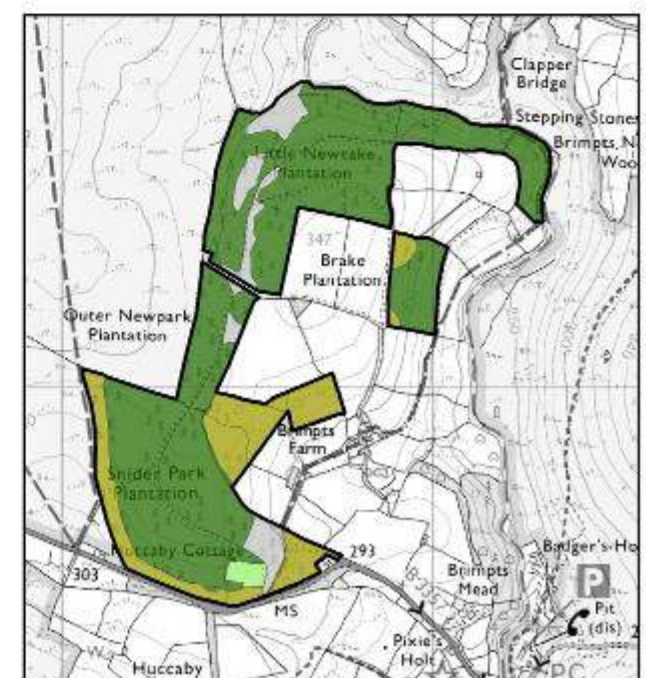
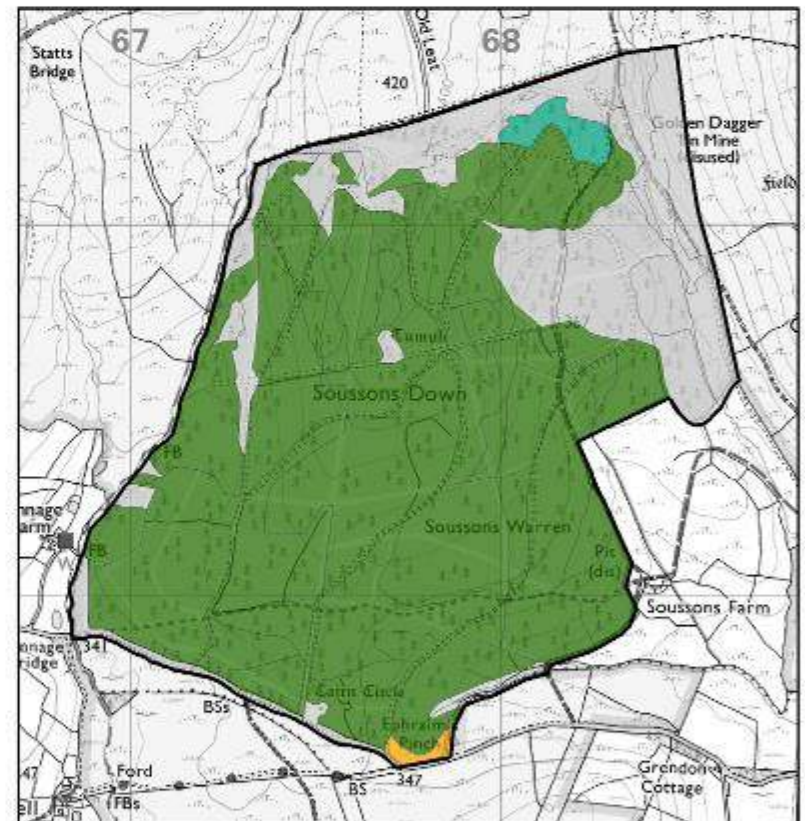
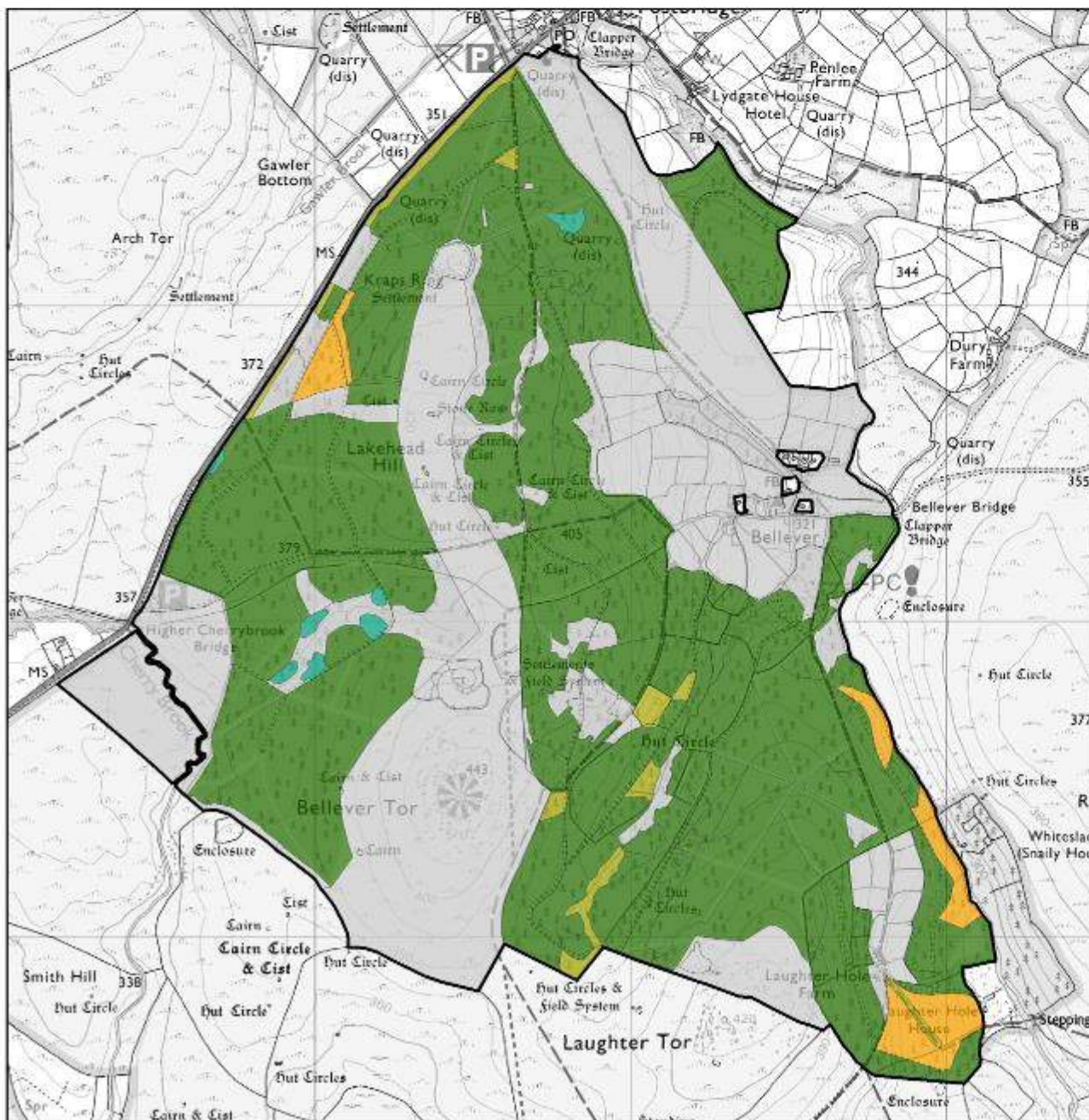
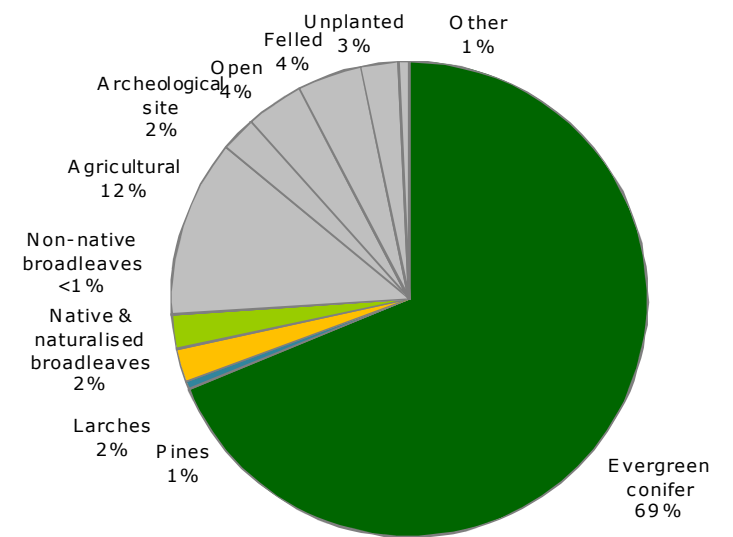
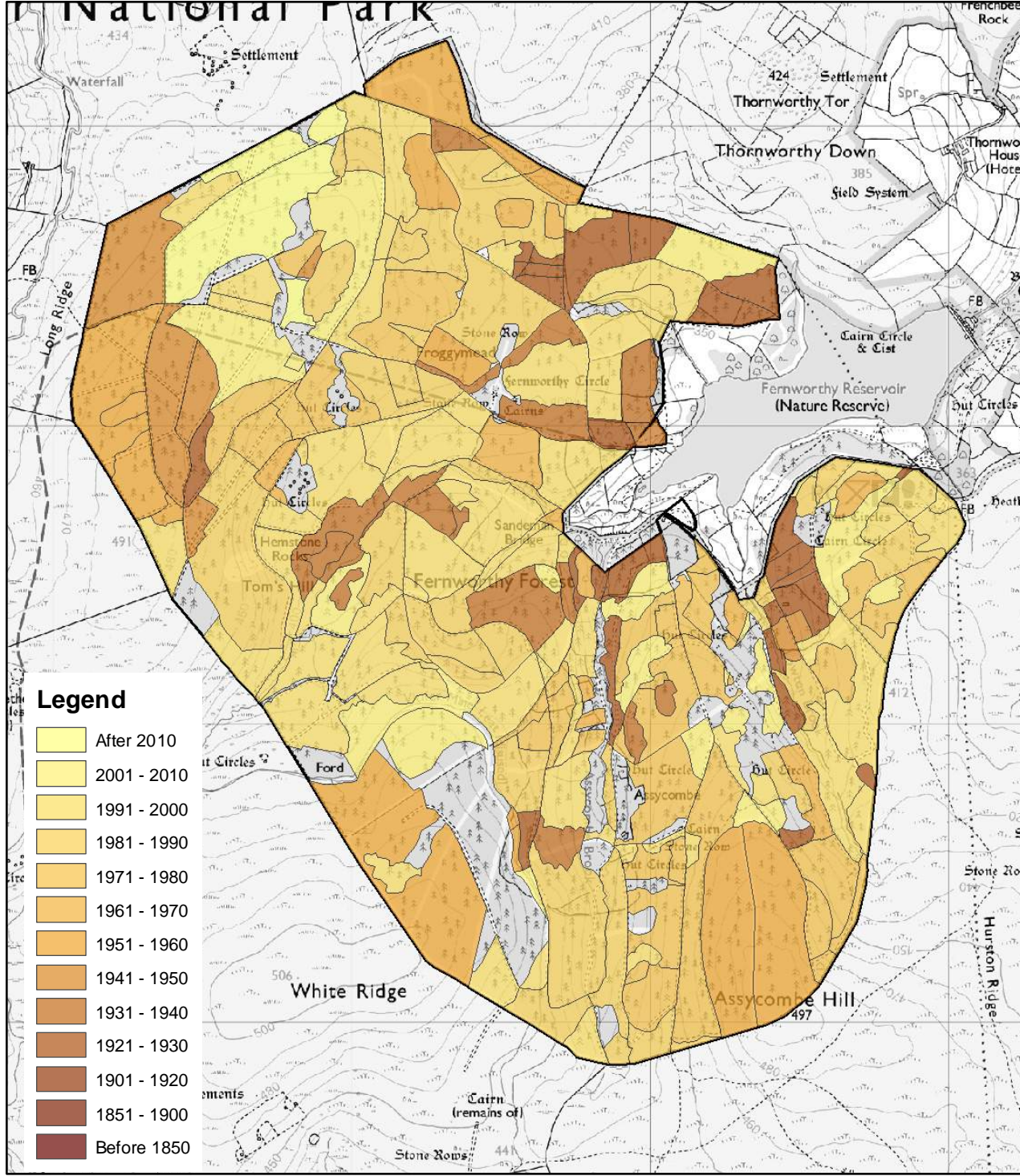
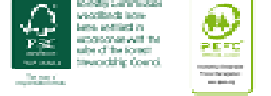


The species composition of the Dartmoor forests is predominantly made up of Sitka spruce, 65% (904ha) of the Plan Area. The minor species are primarily made up of other conifers such as Japanese larch, Norway spruce and Douglas fir. The small broadleaf components which make up 2% of the Plan Area are predominantly planted beech, with birch, rowan and willow naturally regenerating in places.

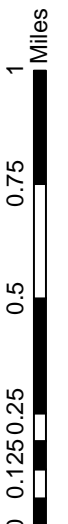
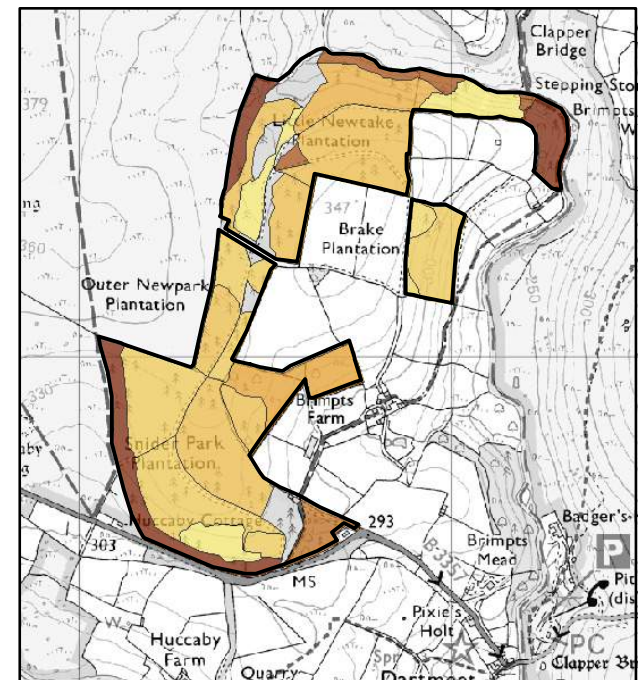
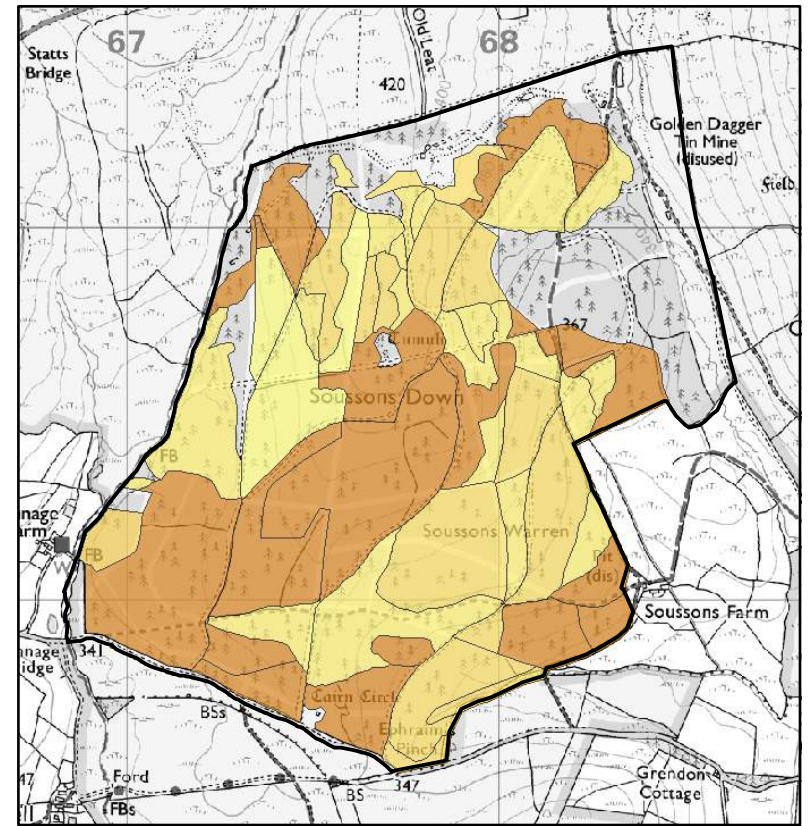
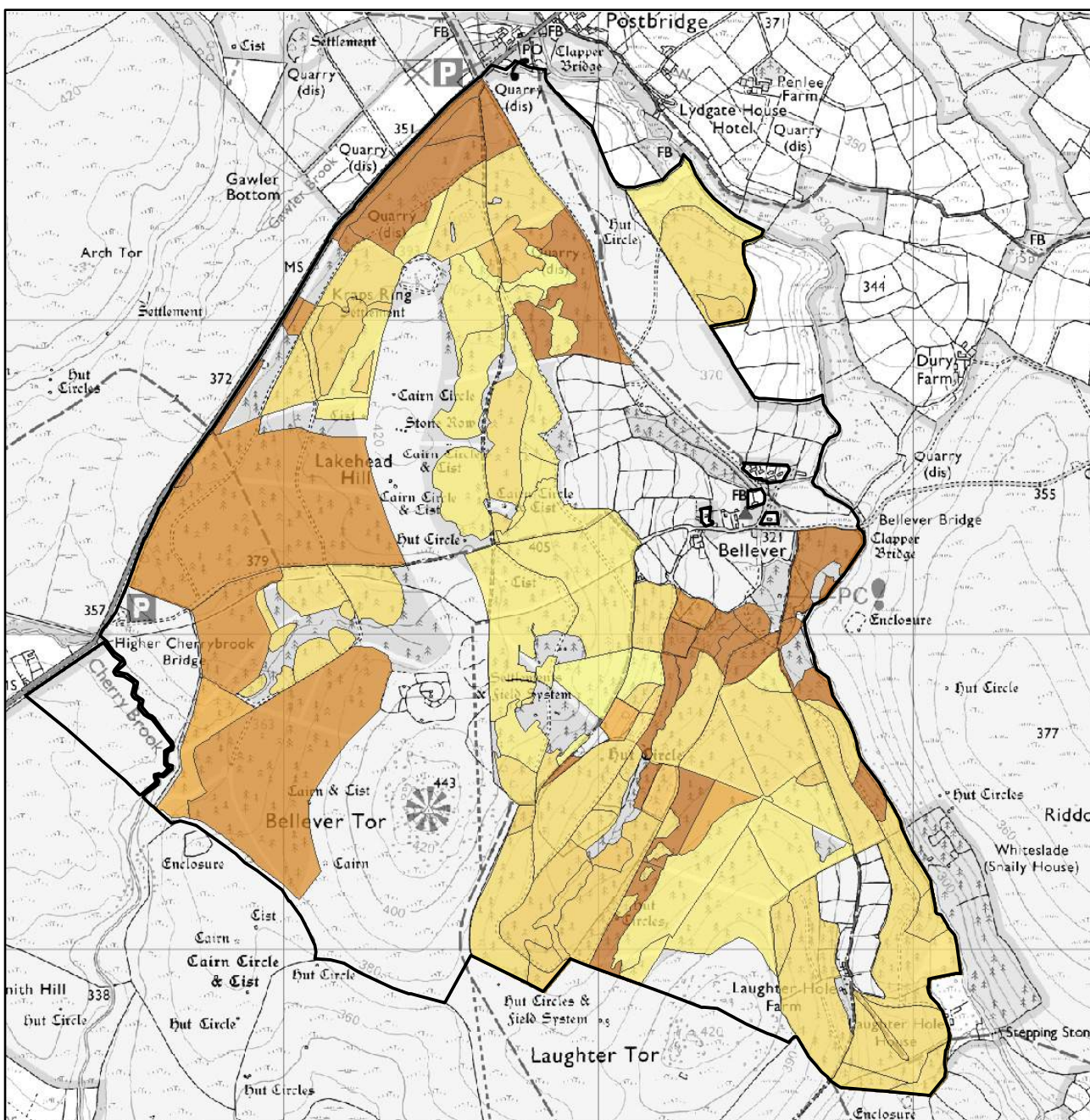
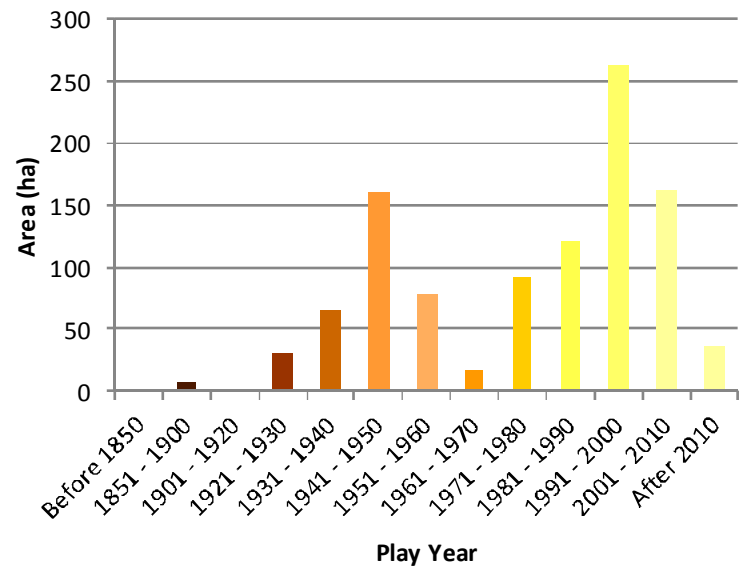
There is significant amount of open space within the Plan Area, much of which is grazed agricultural land. The remaining areas are managed open space, archaeological features, transient open space and felled and unplanted areas.



# Current Age Class



The initial planting of the Dartmoor forests commenced on the moorland in the early 1920s, with the exception of some small areas in Brimpts. These crops are now either coming to the end of their first rotation or beginning their second as shown in the chart below. Most are single-aged standards originally intended to be managed on a clearfell rotation. However, some more sheltered areas are now being managed through shelterwood systems and delivering simple and complex multi-aged stands which is diversifying the age class.

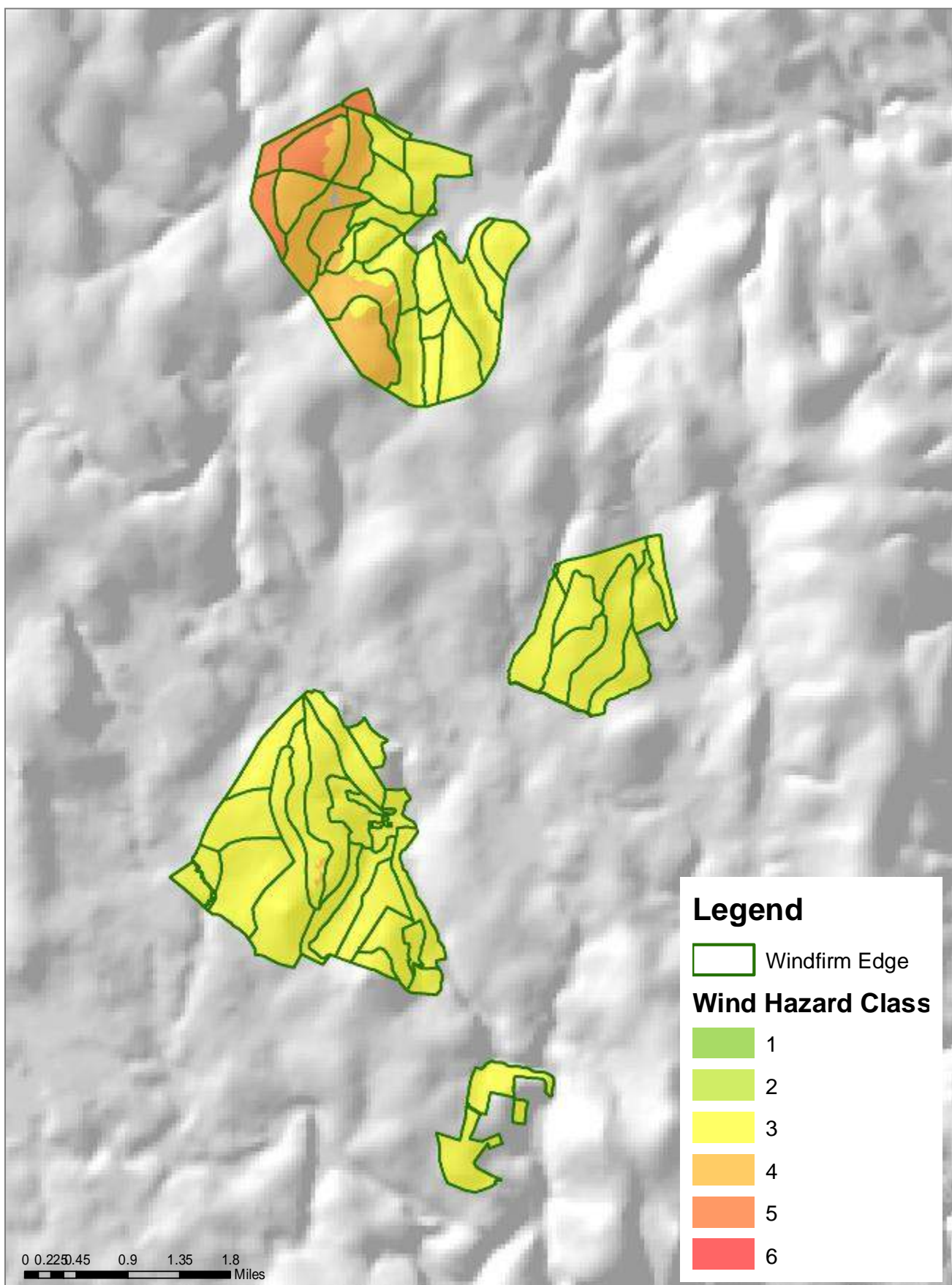
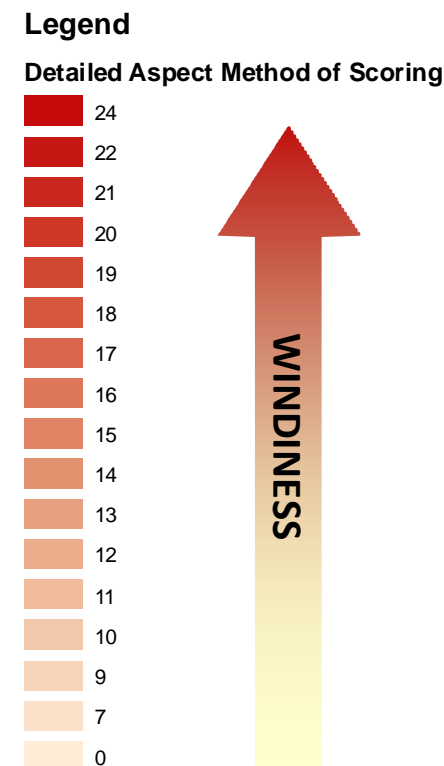
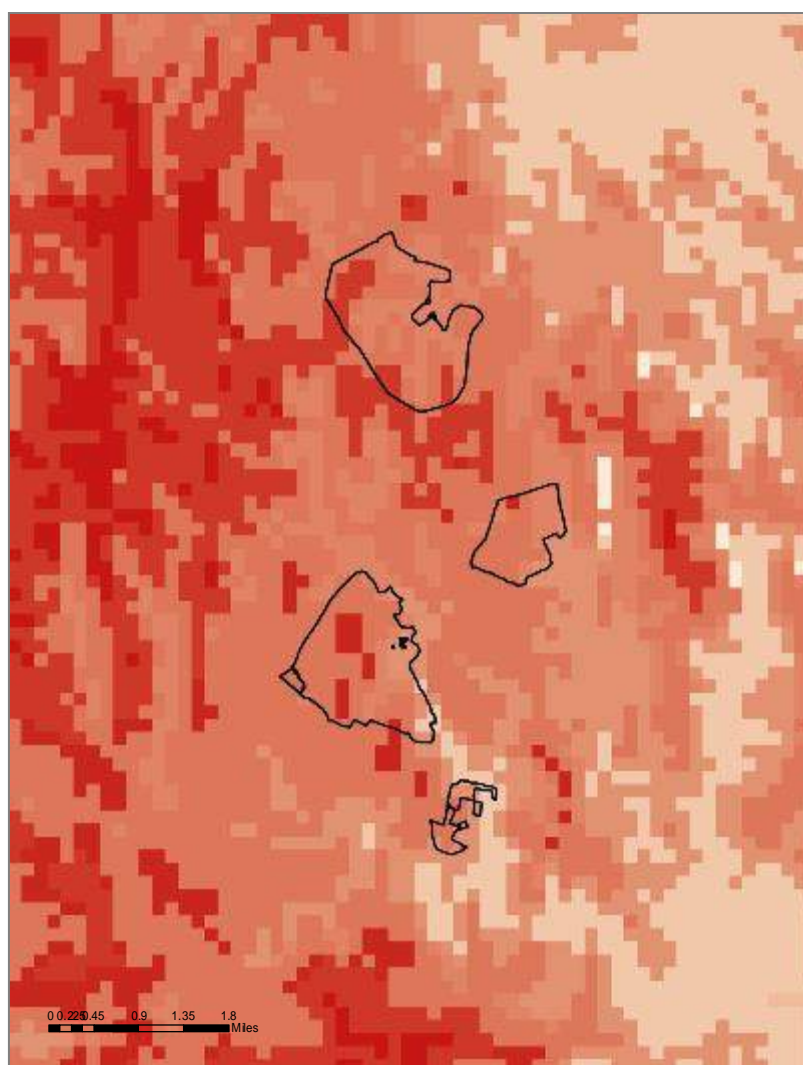


# Wind Hazard



## Windiness & Exposure

The Dartmoor Forest and surrounding landscape is characterised and shaped by its exposure and windiness. The elevation, aspect and topography of the forests all contribute the sites being very windy in places. The highest, western edges of Fernworthy are notably windy given their situation and the limited shelter around them. Bellever's windiest areas are not wooded but still the western edges experience significantly high winds. High winds threaten the integrity of crops and windthrow can either occur in single catastrophic events or gradually encroach as a weak spot is opened up. The wind hazard class of a site is measure through a sites DAMS (Detailed Aspect Method of Scoring) and the nature of the crops on which it sits.



## Managing Wind Hazard












On sites where the wind hazard is high (i.e. 4 and above) and crops exposed, a clearfell and restock approach is often the only viable way of delivering sustainable forest management. Working to wind firm edges, created through road and ride management as well as well-designed thinning regimes, the economic potential of the crop is realised. A high wind hazard class can also mean that thinning should be avoided and rotations shortened. Sites with a lower wind hazard class are those which can be considered for management through CCF. The shape and extent of Brimpts means that this forest is also prone to windthrow and should be managed through a number of large clearfells.

Where windthrow does occur tidying and clearance will be required with an assessment of whether the remaining crop is stable enough or economically efficient to retain. If large clearance is required as a result of windthrow an appraisal of adjacent crops is required. Approval to remove standing trees following windthrow will be sought according to the following tolerance table.

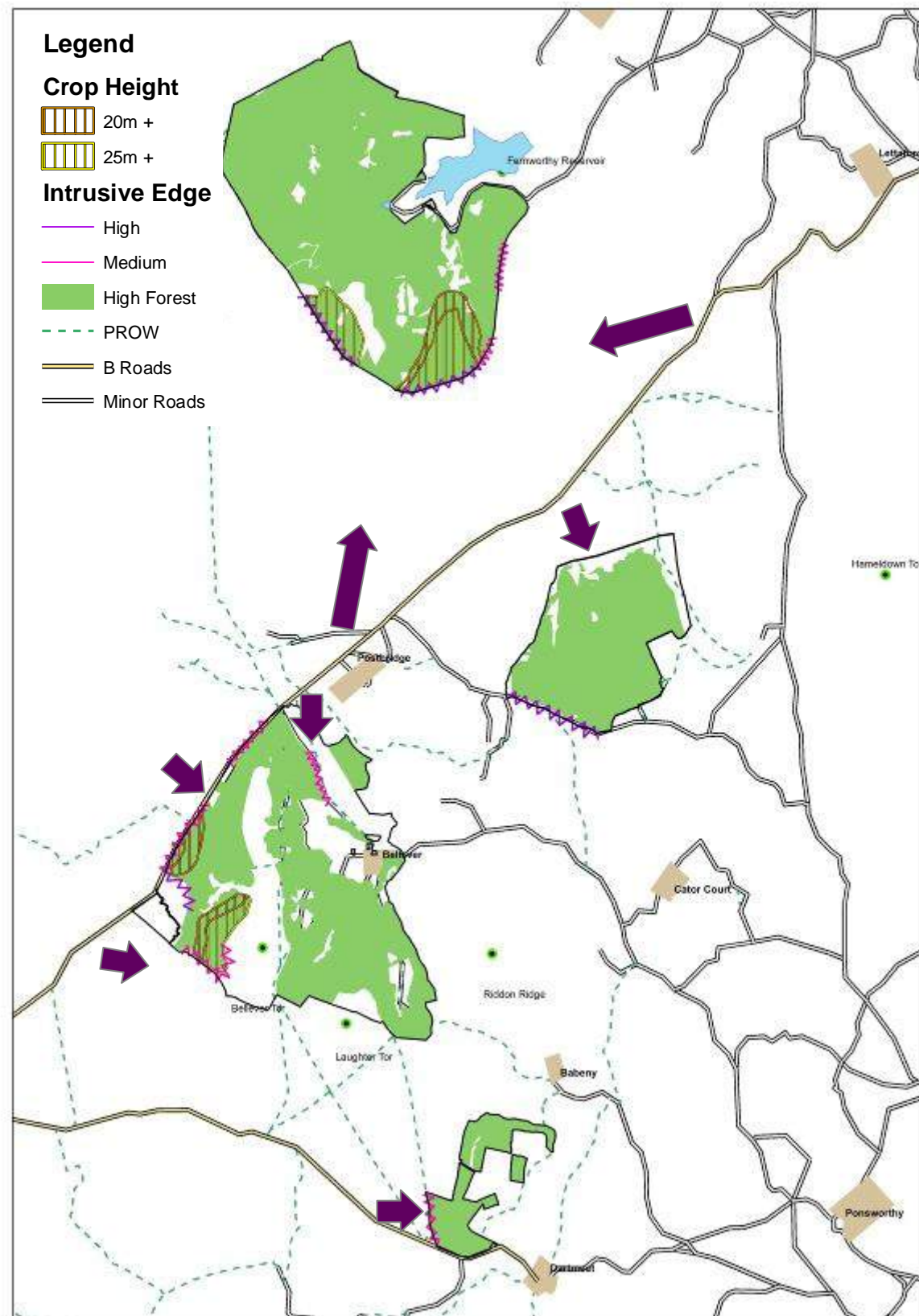
	<b>Clearance of standing trees</b>
<b>FC Approval normally not required</b>	Up to 0.5ha
<b>Approval by exchange of letters and map</b>	0.5ha to 2ha - if mainly windblown trees > 2ha to 5ha in areas of low sensitivity
<b>Approval by formal plan amendment</b>	> 5ha



The Dartmoor Forest Plan area over relies on Sitka spruce as its major timber producing species. This is due to its exceptional yield and a constant demand for its supply. The advent of increased threat to tree health from pests and diseases (see page 46) in recent years has highlighted the need for forests to be resilient to change and threats. As a result steps should be taken in thinning to diversify stand structure and in planting to diversify tree species. A comprehensive (but by no means exhaustive) list of suitable alternative species are outlined below:

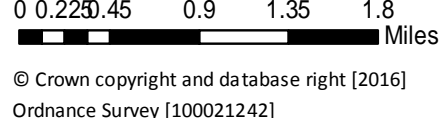
Species	Site requirements	Notes for Dartmoor
<p>Noble fir</p> <p><i>Abies procera</i></p> 	<p>Prefers a cool and moist (i.e. &gt;1000 mm rainfall) climate; can cope with exposure and is more frost resistant than other firs, therefore most suited to upland Britain including higher elevations. Grows best on fresh to moist mineral soils of poor nutrient status, but suffers severely from heather competition.</p>	<p>Suitable to be used on some of the most exposed large clearfell sites. Should be planted both solely and in mixture with Sitka spruce. Concerns around timber quality but strength considered better than other silver firs. Grand fir also has a role in less exposed clearfell sites.</p>
<p>Pacific silver fir</p> <p><i>Abies amabilis</i></p> 	<p>It is suited to a cool maritime climate with rainfall of &gt;1250 mm well distributed across the year. Cold hardy in Britain but can be vulnerable to late frosts and does not withstand exposure or drought. Grows on soils of poor to rich nutrient status provided these have fresh to moist soil moisture.</p>	<p>A species suited to many sites as a substitute for larch. Lacks timber quality but should not be overlooked a sub-species when restocking clearfell sites or for underplanting as part of CCF. Seed remains difficult to source so European silver fir could be used as a suitable alternative.</p>
<p>Douglas fir</p> <p><i>Pseudotsuga menziesii</i></p> 	<p>Likes a wetter climate and moist soil but can be damaged by late frost and will not tolerate serious exposure. Needs a deep, well-drained soil and is unsuited to waterlogged soils.</p>	<p>A good alternative to Sitka spruce on more sheltered, richer and better drain sites. It has the potential to work well in tandem with the Sitka and make a significant contribution to the CCF areas.</p>
<p>Western hemlock</p> <p><i>Tsuga heterophylla</i></p> 	<p>A shade tolerant species best suited to moister climates in Britain with &gt;1000 mm rainfall. It is cold hardy throughout Britain, but is very sensitive to late frosts, does not tolerate exposure and is drought sensitive. Best growth is on acid brown earths on lower valley sides in upland forests.</p>	<p>A number of crops are already being managed on clearfell rotations and well established complex CCF stands at the north of Fernworthy and valley sides of Brimpts. Known to be susceptible to <i>Sirrococcus tsugae</i> in Fernworthy.</p>
<p>Swamp cypress</p> <p><i>Taxodium distichum</i></p> 	<p>Prefers a humid and moist sub-humid climate with around 1000–1500mm of annual rainfall. It often grows in intermittently flooded or very poorly drained sites and does not grow well on alkaline soils.</p>	<p>An experimental species with great potential as a high quality timber producer. Should only be used on wetter sites with an acknowledgement of future climatic projections.</p>
<p>Wellingtonia</p> <p><i>Sequoiadendron giganteum</i></p> 	<p>Best growth is on poor to medium soils of slightly dry to fresh soil moisture status such as acid sandy loams. Is not suited to heavier gleys, peats or very poor dry soils. It appears somewhat more cold tolerant than coast redwood and it is more tolerant of drought and exposure than that species.</p>	<p>A suitable species on slightly more sheltered sites, Coast Redwood (<i>Sequoia sempervirens</i>) is also suitable on the least exposed sites. Has the potential to be a resilient species for the future and for amenity value, but, for now, should be used in discreet areas and number.</p>
<p>Oriental spruce</p> <p><i>Picea orientalis</i></p> 	<p>A species that is adapted to warm summers and cold winters. Best suited to soils of poor to rich nutrient status and slightly dry to moist soil moisture. Should be cold hardy throughout Britain but only moderately tolerant of exposure; a late flushing species and can therefore be used on sites prone to late spring frosts.</p>	<p>Only suitable on a few, less exposed and better draining sites, namely Brimpts and some parts of Soussons. Seed may be difficult to source in the coming years. Serbian spruce is also a suitable alternative for Dartmoor, given its relative tolerance to exposure and cold.</p>
<p>Aspen</p> <p><i>Populus tremula</i></p> 	<p>A light demanding species which grows on a wide range of sites from slightly dry to wet soil moisture and of poor to rich soil nutrient status. Moderately tolerant of exposure and is cold hardy and frost resistant.</p>	<p>Will grow well in mixture with various broadleaves or on the fringes of conifer crops across Dartmoor. Small plantings as part of a feathered edge would deliver high landscape value.</p>
<p>Grey alder</p> <p><i>Alnus incana</i></p> 	<p>It is a light demanding pioneer species and cold hardy in Britain; however, it often spreads by root suckers which can be invasive. It is only moderately tolerant of exposure. It has a rather wider site tolerance than either common or red alder, being suited to moderately dry to wet soils of poor to medium nutrient regime.</p>	<p>Small plantings in wetter areas could improve soil fertility and provide visual diversity. Could be substituted with red (<i>Alnus rubra</i>) and common (<i>Alnus glutinosa</i>) alders.</p>
<p>Beech</p> <p><i>Fagus sylvatica</i></p> 	<p>A shade tolerant species which withstands wind exposure and is cold hardy but is susceptible to frost damage when young. It can be found on mineral soils of poor to medium nutrient status including calcareous soils but does not tolerate compacted, waterlogged or very dry soils.</p>	<p>Small plantings particularly open forest edge will provide visual diversity. Given the isolated nature of the blocks, squirrels should not be have too detrimental an impact on timber quality.</p>
<p>Rowan</p> <p><i>Sorbus aucuparia</i></p> 	<p>This is a light demanding pioneer species which often grows in mixture with other broadleaves or on the edges of conifer stands. It is cold hardy, frost tolerant and can withstand severe exposure, even if it does not grow to a large size.</p>	<p>Small plantings of select seed from good form source could produce significant timber yields on the edge of large plantings and as part of a feathered edge.</p>

# Landscape Integration



Long distance views

Short distance views



## Landscape Impact

The forests are significant features in the National Park landscape and can be seen from considerable distances. There are a number of p.1950 spruce crops on the forest edge which sit in exposed and visible locations. The contrast between high forest and heathland is stark, with clear notches visible in the landscape.

Whilst a number of intrusive edges do feature within the internal forest landscape the majority of the intrusive edges are found on the forest edge and accentuated by the contrast with the open moorland.

The Plan will make a targeted effort to soften some of these edges and deliver a forest that integrates better into the landscape. The focus and extent of this softening will be determined by how visible the edges are and their impact on the wider landscape (see Landscape Analysis, pages 35-36).

This integration will be achieved by two mechanisms:

- 1) feathered edge creation as and when edge crops reach economic maturity (as described below).
- 2) clumped planting along existing edges where open space is available and not considered an ecological priority, as illustrated below. A diffuse edge of open space and tree cover, and not simply a broadleaf belt, will be achieved over time.



## Feathered Edge

A feathered edge will be created in areas of greatest landscape impact to minimise the contrast between high forest and open moor. The aim will be to create a more gradual visual and natural convergence between the high forest and moorland. The edge will consist of a transient area of open space and regenerating forest. The area may replanted by up to 50% to allow greater species and visual diversity but natural regeneration will be favoured where possible to create a natural graded edge. Any planting will occur in clumps to create clusters of trees in an open surrounding rather than contiguous strips. The initial creation of the edge area will be done at the time of programmed clearfelling so as not to compromise the integrity of windfirm edges. Once felled, as transient zones, these areas will be maintained at the time of programmed operations and then first economic opportunity and therefore may become up to 100% forested at times. However the aim will be to maintain these areas at around 50% open and 50% forested as illustrated in the photograph below. The extent and timing of the creation of these areas is prescribed on pages 20-23, the landscape implications of this is outlined on pages 35-36.

