

Revisiting the Sefton Coast Woodlands Forest Plan: an ecological context

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Introduction

A 20-year *Forest Plan* was introduced in 2002/03 to guide the management of the Sefton Coast woodlands. It has become increasingly apparent in recent years that the way in which the plan has been implemented has led to conflicts with the ecological interest of the Sefton Coast sand-dune system, on which most of the woodland is situated. This paper seeks to outline the problems and suggest possible solutions.

A Sefton Coast Landscape Partnership Project *Conserving Coastal Woodlands* seeks to put in place a co-ordinated schedule of woodland management activities for the period 2013-2022. This will help to update the long-term goals of the woodland plan in the context of the *Sefton Coast Nature Conservation Strategy* and the changing socio-economic climate. It is hoped that this paper will contribute to the project.

Origin of the Sefton Coast woodlands

The Sefton Coast dune system was probably devoid of woodland throughout most of its history (Yorke & Yorke 2008), although dune scrub is a natural part of vegetation succession, occurring in the older and more sheltered areas. Some of this could have resembled woodland at times of dune stability. Thus, the place name “Birkdale”, which is of Norse origin, implies the presence of birch (*Betula*) during the Viking era.

The first plantation was developed in the 1790s by Rev. Richard Formby at what is now called “Firwood”, south of Lifeboat Road, Formby (Yorke & Yorke 2008). However, tree planting did not begin on a large scale until Charles Weld-Blundell saw pine plantations on the French coast in 1887. He hoped to stabilise blowing sand which was a threat to built infrastructure and agricultural land at a time when the dune system was much more mobile than at present. It would also obviate the trouble and expense of Marram (*Ammophila arenaria*) planting and he foresaw an improved amenity for the district. Weld-Blundell aimed to make a financial return after about 30-40 years on a

land-holding which was seen at the time as “an unprofitable waste”. This attitude towards coastal dunes was widespread in the late 19th and early 20th centuries, many British and European dune systems being stabilised and converted into conifer woodland, an action even supported by eminent ecologists (Rooney & Houston 2009).

After initial trials, Corsican Pine (*Pinus nigra* ssp. *laricio*) became the dominant tree used. Both major coastal manorial land-owners, Charles Weld-Blundell and Jonathon Formby, undertook extensive conifer planting from Ravenmeols to Ainsdale and, by 1932, most of the current woodland was in place. However, the expected commercial success did not materialise and planting was then halted on grounds of economy, fears of taxation and a legal requirement for felling to be licensed (Yorke & Yorke 2008). The landed estates were sold off during the mid-20th century, large areas of the coastal woodland coming under the ownership of the Nature Conservancy (now Natural England) in 1965 and The National Trust in 1967. Other major owners are Sefton Council, Formby Golf Club and the Reserve Forces & Cadet Association for the North West of England & the Isle of Man (Altcar Rifle Range). Roche (2003) lists as many as 27 owners of coastal woodland.

Management of the Sefton Coast woodlands

Over recent decades, it became clear that the pinewoods, which had become a significant local amenity, were aging and that woodland management needed to be addressed on a coastwide, rather than piecemeal, basis.

One of the first contributions to this aim is found in the *Sefton Coast Management Plan* (1997-2006), which lists as an objective: “To achieve an acceptable balance between woodland and open dunes, enhance the landward woodland and increase its value for nature conservation and amenity. The *Plan* further proposes relevant policies:

- Partners, including *The Mersey Forest* team, will prepare and implement a coastwide woodland and scrub management strategy.
- The strategy will ensure that the protective function, landscape, ecology and amenity value of the existing landward woodland belt will be maintained.

- Areas of proposed new planting will be assessed against nature conservation, landscape and amenity criteria, and, if appropriate, implemented as part of *The Mersey Forest* initiative. The removal of substantial blocks of woodland will also be assessed against nature conservation, landscape and amenity criteria.

The first of these policies bore fruit in the form of a *Sefton Coast Woodland and Scrub Management Strategy* (Ennion 1999). This comprehensive document proposes seven major management objectives:

- Enhance quality and continuity of woodland and scrub resource where appropriate.
- Increase woodland cover where appropriate.
- Maintain and enhance the nature conservation value of woodland and scrub where appropriate.
- Ensure decisions regarding removal of woodland and scrub for open dune restoration accord with international, national and local nature conservation policies.
- Extend community uses of the woodland and scrub resource where compatible with other objectives. Encourage community involvement in decisions about management of woodland and scrub.
- Encourage development of sustainable long-term woodland and scrub management plans.
- Develop mechanisms for implementation of the strategy and indicators for the sustainable management of woodland and scrub.

With reference to the second of these objectives, it is stated that new planting must carefully consider existing ecological value and the impact of planting on adjacent sites. The strategy also lists broad areas that might be suitable for new planting, including: Crosby Marine Park, Blundellsands and Formby settlement edge, Range High School/Range Lane (Formby), field north of Asparagus Cottage, small field near Greenloons Farm, fields north of Woodvale airfield (outside dune heath areas), Victoria Park Southport. The report further proposes to manage areas of mature scrub within

rearward woodland to favour development of mixed woodland. Where invertebrate and bird interest is high, such areas should be managed as scrub to retain this interest. However, the document recognises ecological threats from scrub in some areas. It also mentions concerns about coastal squeeze of dune habitats caused by marine erosion at Formby Point.

Following a period of public consultation, the *Sefton Coast Woodlands Forest Plan* was approved in January 2003, to cover a period of 20 years. The plan seeks to involve all land-owners on the coast working together to improve the condition of their woods which total 419ha, of which 263ha are pinewoods (over 10% of the sand-dune area). The vision is to maintain historically important landscapes and the habitat of rare species, such as the Red Squirrel (*Sciurus vulgaris*), to provide for quiet enjoyment of the countryside and to support business opportunities. A series of Management Objectives required to achieve the vision is listed:

- To maintain the present woodland mosaic and variety of structure
- To create a 'healthy' or normal woodland age profile
- To maintain the focus on pine species as a food source for the Red Squirrel and to retain the existing woodland character.
- To maintain areas of indigenous small-seeded broadleaf species, up to but no more than 10% of the total area.
- To provide suitable habitats within the woodland structure for all appropriate species, especially those designated as Priority Species.
- To ensure an economic return where feasible.
- To involve additional willing land-owners in the development of suitable woodland mosaic habitats.
- To maintain, establish and participate in appropriate joint ventures and forums for the purposes of management and evaluation.

Underlying the Management Objectives is a series of broad principles that dictate good silvicultural practice. Thus, the creation of a 'healthy' age profile will require selective thinning, felling and replanting of over-mature trees in small "coups" (Roche 2003).

The *Forest Plan* is divided into three main documents: volume I, Overview (Roche 2003); volume II , Inventory Data; volume III, Annual Management Schedule, the latter being a long, complex document detailing management prescriptions for each compartment over a period of ten years from 2003 to 2012.

A 2007 plan update provides a more detailed analysis of woodland types on the coast. This gives 269.5ha of pure or predominantly conifer woodland within the total wooded area of 419ha, the remainder consisting mostly of broad-leaved woodland and mature scrub.

A *Forest Plan Mid-term Review Report* was published by *The Mersey Forest* in May 2008. This includes the following table of areas (ha) subject to management:

	Target	Achieved
Thinning	84.64	67.50
Coupe creation	15.52	13.96
Planting	17.07	21.38
Natural regeneration	2.50	1.90

The report mentions that, in addition, 5ha have been planted up as forest. Medium-term objectives are listed as follows:

- Maintain the same area of woodland we have at present.
- Maintain pine trees as a source of food for Red Squirrels.
- Maintain the existing character of the Sefton Coast woodlands.
- Ensure local; people work together while managing the woodland to help check progress and quality.
- Utilise the woodlands as an educational and amenity resource.

This document also discusses the outcomes of various public consultations, emphasising the divergent range of views, for example from removal of all trees from the sand-dunes to increasing the woodland footprint.

Ecological impact of conifer plantations

The impact of pine plantations on coastal dune ecosystems has been extensively researched, both nationally and on the Sefton Coast, a useful summary being provided by Weaver (2008). The following impacts are generally accepted within the scientific community:

- Conifer plantations replace a rare and biodiverse sand-dune habitat (12,800ha in England) with one that is much less diverse and relatively common nationally. With a few exceptions, the specialist biota associated with coastal dunes does not survive under conifers.
- Conifers intercept more precipitation and transpire more ground-water than dune vegetation, leading to a lowering of the water-table in their vicinity and adverse effects on dune-slacks, an extremely rare habitat nationally (534ha in England).
- Trees “fix” the dune landscape, preventing small-scale instability and the development of bare sand-patches that are essential to many coastal dune specialist plants and animals.
- Conifers create an effective wind-break, providing shelter which encourages colonisation of other woody vegetation, such as birch, poplar (*Populus*) and Sea Buckthorn (*Hippophae rhamnoides*) scrub. The rapid spread of mainly introduced shrub species into open habitats is a major ecological problem on the Sefton Coast.
- The pines readily seed into open dune habitats, such as fixed-dunes, dry-slacks and dune-heath, adding to the scrub problem.
- As most of the conifer woodland is situated along a coastline that is subject to marine erosion, open dune habitats to the west of the woodland are being progressively “squeezed” into a narrowing zone between the beach and the plantation edge. Recent aerial photographs graphically demonstrate the severity of this problem (Plate1).



Plate 1. Recent aerial photograph showing “coastal squeeze” at Formby Point.

Conifers and sand-dune conservation

The above effects raise serious and complex issues as most of the Sefton Coast, including the wooded areas, is covered by national and international conservation designations. A substantial proportion (about 43%) of the Sefton Coast SSSI is in unfavourable condition, largely due to over-maturation and over-fixation of the dune vegetation and the consequent spread of scrub. A UK government Public Service Agreement requires 95% of SSSIs to be in “favourable” or “recovering” condition by 2010. Weaver (2008) considers that these problems would probably have occurred in the absence of conifers but concludes that they are being made substantially worse by the presence of the plantations. He further suggests that *Natural England* should be working with the Community Forest interests to create, over the long-term, replacement conifer woodland to landward of the coastal sand plain, so that substantial areas of conifer plantation on the

dunes can be progressively removed, with the remaining plantations being allowed to develop into broad-leaved woodland.

However, the *Forest Plan* accepts the long-term presence of conifer plantations on the dunes, with replanting to maintain them. Due to the problem of “coastal squeeze” already mentioned, one likely result of this policy is that the proportion of the dune system occupied by conifers could actually increase. Indeed, because of the many small-scale plantings described below, this may already be happening. Pye & Neal (1994) report that coastal erosion at Formby Point has been active since about 1906 over a distance of approximately 5km at an average rate of around 3m per annum. Therefore, over the past 20 years, roughly 30ha of sand-dune habitat has been lost to marine erosion. Opposite the erosion front, 20ha of pine woodland was removed during the 1990s (Ainsdale NNR dune restoration project) and about 10ha of new pine planting has taken place (as detailed below). Therefore a net gain of 10ha of new dune habitat released from plantations has been more than wiped out by the 30ha loss due to erosion, resulting in a higher proportion of this section of dunes now being covered in pine trees.

The Ainsdale dune restoration project

Ainsdale Sand Dunes National Nature Reserve, owned by *Natural England*, has the largest extent of pinewood on the coast (c.130ha), mostly planted between 1920 and 1934. In 1990, about 40ha of mainly Corsican Pine near the sea, known as the frontal woodlands, were programmed for removal to restore the former landscape of dune ridges and slacks with their special wildlife which the reserve was established to protect. This frontal woodland, which is in poor condition, is vulnerable to future coastal erosion and acts as a shelter-belt for about 50ha of fixed-dunes and slacks to the east where scrub invasion, especially of birch, has become a major problem. The conifers also seed into the open dunes, acidify the soil and draw down the water-table in the slacks. By 1996, two phases (20.5ha) out of four had been completed, clear-felling being followed up by winter sheep-grazing. Subsequent monitoring has shown remarkable improvements in habitat condition and the return of characteristic biota within the cleared areas (Atkins 2004; Smith 2009).

The dune restoration project also included management of the landward plantations on the NNR, especially works to improve the habitat of the Red Squirrel. However, following the completion of Phase 2, adverse public reaction to the tree felling led to a moratorium on management works, including the removal of conifers in Phases 3 and 4, until further assessment had taken place. A detailed 150-page environmental assessment for the Ainsdale dune restoration scheme was published in 2004 (Atkins 2004). This recommended either of two felling options taking due account of landscape concerns. In February 2008, *Natural England* proposed a modified programme for the remaining frontal woodland, avoiding large-scale clear-felling and phasing restoration work over about 20 years, in line with the *Sefton Coast Nature Conservation Strategy*. This area was not included in the *Forest Plan*'s management recommendations (Roche 2003).

Rooney & Houston (2009) describe a growing movement across Europe in recent years, often led by state forestry services, to restore open dune systems by removing tree plantations. However, they also point out that, in many local communities closely linked to dune areas, there is a "tradition or history" expressed as a reason to oppose any plans to remove plantations or encourage bare sand. In Sefton, this appears to relate to a "folk memory" of shifting dunes a century or more ago when the system was much more mobile. The Sefton duneland is now so heavily vegetated that any large-scale sand movement in the foreseeable future is unlikely and, in any event, could easily be controlled using stabilisation techniques developed over the past 30 years (Smith 2009).

Sefton Coast Nature Conservation Strategy

With a 50-year vision for the conservation of coastal resources, a *Nature Conservation Strategy* was formulated by the Sefton Coast Partnership between 2005 and 2007. It post-dates the *Forest Plan* but acknowledges its existence and seeks to operate within it. Thus, it states that the present woodland mosaic, variety and structure will be maintained through silvicultural management aimed at creating a "healthy" or normal woodland age profile. It also suggests that conifers may be appropriate as an element of mixed amenity woodland or as a nurse species for broad-leaved woodland. "Limited" planting of

conifers on land of “low conservation value” is accepted, without defining the latter term. However, the *Strategy* includes as a “Key Project for 2007-2012” the need to find a long-term solution concerning the eventual loss of frontal woodlands at Freshfield and how this can be managed to ensure the conservation of nature and landscape. It further acknowledges that, as the dune frontage retreats at Formby Point, the woodland edge should also retreat.

The impact of recent conifer plantings

Since the *Forest Plan* was implemented, not only has there been a programme of thinning and restocking existing plantations but also the widespread planting of conifers in other habitats. For example, on Altcar Rifle Range, according to the *Forest Plan*, by 2003, there were 28.78ha of woodland, 23.43ha (mostly pine) having been planted since 1989. However, planting on open duneland (outside the SSSI) has continued apace with the range authorities recently celebrating their one millionth planted tree. The total plantation area is now thought to be over 30ha. Some recent plantings have been justified on the grounds of noise reduction for nearby housing. However, there appears to be no scientific literature on best practice to guide such management.

Between June and August 2009, I visited parts of the Ravenmeols and Lifeboat Road properties of Sefton Council and the National Trust estate at Formby Point to map areas of recent conifer planting. For each compartment, notes were taken on vegetation characteristics and other features, enabling a rough assessment of ecological value to be made under the headings “Low”, “Moderate” or “High”. I also took into account observations from previous visits made over several years; it is important to stress, however, that the data were not collected systematically and specialist surveyors may well discover other significant interests. The results are summarised in Tables 1 – 4. Nineteen compartments were found that had been planted since about 1995, most after 2000. Their total area is nearly 10ha (24 acres) (6.02ha at Ravenmeols, 0.64ha at Lifeboat Road, 3.22ha at Formby Point). This is equivalent to about 3.7% of the predominantly conifer woodland on the coast. About 26% of the total area was judged to be of low ecological interest, 47% moderate and 28% high (Table 4). It should be noted

that many of these plantings date from an era just before the *Forest Plan* and may be linked to *The Mersey Forest* or other schemes. Nevertheless, all are included in the *Forest Plan* working documents.

At Ravenmeols, several existing broad-leaved woodland plots, mostly dominated by poplars and Sycamore (*Acer pseudoplatanus*), have been wholly or partially felled and replaced by conifers (Table 1; Plate 2). One consequence of this is that ruderal vegetation, stimulated by the sudden increase in light levels and nutrients built up during decades under woodland, has exploded, leading to some areas now being dominated by chest-high nettles (*Urtica dioica*) and brambles (mainly *Rubus tuberculatus*). In contrast, at Lifeboat Road and on the National Trust estate, most of the newly planted sites consist of former agricultural land, probably mainly asparagus fields. Although the vegetation has developed secondarily, it often includes diverse fixed-dune communities rich in duneland plants and invertebrates.



Plate 2. Mature deciduous woodland replaced by conifers, Ravenmeols.

Under the terms of the *Sefton Coast Management Plan* and *Woodlands & Scrub Management Strategy*, these sites should have been ecologically assessed before being allocated for conifer planting. I have seen no evidence that this took place; indeed, the *Forest Plan* working document (volume III) says nothing about the possible ecological interest of sites listed for coniferisation. I know from my own observations that many compartments were of demonstrable and often high value to wildlife. The broad-leaved woodland areas that were recently converted to pine at Ravenmeols supported numerous breeding birds, including several pairs of Willow Warbler, which is Amber Listed as a Species of Conservation Concern in Britain. A study of the Red Data Book-listed and nationally declining Smooth Cat's-ear (*Hypochaeris glabra*) on the Sefton Coast found that two of its main haunts contain recently planted pine trees (Smith 2008). One of these sites (36f in the *Forest Plan*), occupying about 0.22ha along the northern edge of a former asparagus field, was investigated further in June 2009 (Plate 3). It was found to support a high diversity of 71 vascular plants, nine of which are nationally or regionally notable (Smith & Lockwood 2009). This plant community appears to be close to the National Vegetation Classification's SD19, an open habitat dominated by dune annuals that Gateley & Michell (2004) showed is the most rapidly declining vegetation type on the Sefton dunes. The young trees here will eventually shade out this habitat and most of the plant species associated with it. This site, together with seven others similarly affected, appears to be within the SSSI/SAC (Table 3).



Plate 3. Rich botanical site (compt. 36f) planted with conifers, Formby Point.

The rationale for these additional plantings is not clear as the management objectives of the *Forest Plan* appear to say nothing about expanding planting or “infilling” open sites. While management of existing plantations could be justified on amenity grounds and for Red Squirrel conservation, an ecologist might well ask the question: “Do we really need more conifers on the Sefton Coast?” Taking into account Altcar Rifle Range and other sites not included in this study, there are at least 40ha (96 acres) of recently planted conifer woodland on the Sefton duneland. This area is about twice the size of that removed during the 1990s dune restoration scheme at Ainsdale Sand Dunes NNR. In addition, there are other compartments listed for future coniferisation in volume III of the *Forest Plan*. The Sefton Coast seems to be one of few places in Britain still planting pines on sand-dunes (Rooney & Houston 2009).

Table 1. Compartments at Ravenmeols dunes affected by recent conifer planting.

MG = mesotrophic (neutral) grassland; SD = sand-dune communities.

Forest Plan no.	Area (ha)	Grid Ref. (SD)	Approx. year of planting	Habitat	Ecol. value	Notes
18g	2.11	282058	1998	MG	Low	Formerly grazed pasture, now dense conifer with some broadleaves. Needs thinning.
18f	2.22	283056	2002	MG, tall herb & scrub	Mod.	Former field modified by tipping. Diverse vegetation, breeding birds and insects. Now mixed pine & broadleaves thinly planted.
18m (part)	0.04	281059	2004	SD acid grassland	High	Former rabbit-grazed glade in woodland. Half planted up; poor growth due to drought conditions.
18h (part)	0.42	281058	2006	Old mixed woodland	High	Formerly dom. mature Sycamore, supported many breeding birds and migrants, now tall ruderal vegetation.
18i	0.30	282060	2006	Old mixed woodland	Mod.	Formerly dom. Sycamore etc. with breeding birds; now tall ruderal vegetation.
18n	0.49	282057	2007	Mature scrub	High	Dune scrub (Poplar & Sycamore) with breeding birds, including Willow Warblers. Now tall ruderal vegetation.
18j	0.40	282061	2007	Old mixed woodland	Mod.	Formerly open woodland with ground flora of hybrid bluebells; now tall ruderal vegetation.
18i (part)	0.04	282057	2008	MG	Mod.	Rabbit-grazed ride between older plantations, now planted up.
TOTAL	6.02					

Table 2. Compartments at Lifeboat Road affected by recent conifer planting.

Forest Plan no.	Area (ha)	Grid Ref. (SD)	Approx. year of planting	Habitat	Ecol. value	Notes
102a, b	0.64	280068	2004	SD/MG grassland & scrub	Mod.	Formerly part open field, part mature scrub. Diverse rabbit-grazed vegetation, rich in insects. Some trees showing rapid growth, others poor.

Table 3. Compartments at Formby Point affected by recent conifer planting.

Note: Some of the compt. nos. on the Forest Plan maps are almost illegible and may therefore have been misinterpreted.

Forest Plan no.	Area (ha)	Grid Ref. (SD)	Approx. year of planting	Habitat	Ecol. value	Notes
38b (part)	0.30	275079	1995	MG?	Low?	Former asparagus field; now tall, dense pines that need thinning. Original condition obscure. (SSSI)
36e	0.32	277076	2001	SD grassland	High	Dune grassland with Dewberry, rather thinly planted with young pines.
36b	0.43	278080	2001	MG/SD grassland	Mod.	Former asparagus field; varied vegetation, dryer to north where planting has failed. (SSSI)
35d	0.54	282078	2001	SD acid grassland	High	Former asparagus field; diverse, lichen-rich, rabbit grazed, many insects, some scrub invasion. (SSSI)
36c	0.38	278078	2001	MG, some SD grassland	Mod.	Sparsely-planted pines in tall coarse grassland with patches of more varied dune grassland; many insects. (SSSI)
36f	0.22	280079	2001	SD acid grassland	High	Edge of former asparagus field; outstandingly rich vegetation, including Smooth Cat's-ear; many insects. (SSSI)
38d	0.27	275077	2004	MG/SD	Mod.	Rather poorly grown young pines in neutral and sand-dune grassland; many insects.
37e	0.29	276072	2004	SD grassland	High	Poorly grown young pines in diverse dune grassland, lichen-rich; numerous insects; colony of Smooth Cat's-ear. (SSSI)
33c	0.28	276082	2006	SD grassland	High	Former asparagus field; rich dune grassland, rabbit-grazed, lichen-rich in places. (SSSI)
35e	0.19	280077	2008?	SD acid grassland	High	Lichen-rich acid grassland, covered in plastic tubes with young pines, many dead. (SSSI)
Total	3.22					

Table 4. Summary of ecological value of recently coniferised compartments.

Zone	Total compartment area (ha)	Area of low value (ha)	Area of moderate value (ha)	Area of high value (ha)
Ravenmeols	6.02	2.11	2.96	0.95
Lifeboat Road	0.64		0.64	
Formby Point	3.22	0.30	1.08	1.84
Total	9.88	2.41 (24%)	4.68 (47%)	2.79 (28%)

Solutions

Volume I of the *Forest Plan* fully acknowledges the ecological importance of the Sefton Coast sand-dune system and specifies many of the adverse effects on the pine plantations upon this interest. Indeed, any objective reading of Roche (2003) could not but applaud the scope of the document and agree with the broad principles and management objectives set out. However, Roche makes no mention of a requirement to maintain the current woodland “footprint”; this seems to have been added later as, for example, in the *Mid-term Report* mentioned earlier. The origin of and rationale for this objective, which is additional to those listed by Roche (2003), are not clear but it could, of course, be used to justify the additional planting of open ground referred to earlier but not the coniferisation of existing broad-leaved woodland which appears to be beyond the remit of the *Forest Plan*.

A strong case can now be made for a detailed review of the *Forest Plan* and, in particular, the way it is being implemented on the ground:

- The requirement to maintain the existing woodland “footprint” is clearly unsustainable, having unacceptable ecological impacts as outlined above.
- The recent and unfortunate demise of the Red Squirrel population will also need to be considered as this species featured strongly in the original plan objectives and content.
- Planting of open land and coniferisation of broad-leaved woodland should not take place unless and until ecological assessment of such sites has taken place.
- Those sites recently planted should be reassessed and the trees removed where necessary to maintain ecological interest.
- The problem of “coastal squeeze” and the need to set back the woodland edge as marine erosion takes place at Formby Point should be incorporated into the plan revision.
- The longer-term recommendation for relocation of woodland inland of the dune belt, as outlined by Weaver (2008), could also form part of the review.

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