A LICHEN SURVEY OF SELECTED AREAS OF CORFE CASTLE

Bryan Edwards
Dorset Environmental Records Centre

July 2014

CONTENTS

INTRODUCTION

A lichen survey of the walls of Corfe Castle was commissioned in 2007 by the National Trust (Giavarini, 2007). This surveyed highlighted a number of important species and mapped their locations. A request was made for an assessment of lichen species and communities on a 16 metre section of wall to the west of the Outer Gatehouse and 115 metres of the eastern wall of from Horseshoe Tower to just north of Plukenet Tower.

METHODS

The survey was undertaken over two half days in June 2014 during dry and sunny weather. The stonework and mortar was search using a x10 hand lens with inbuilt light. A species list was made noting the frequency of each of species. The vast majority of species were identified in the field but small fragments of several minute pyrenocarps were taken and identified with a compound microscope.

For the purposes of this report lichen names follow Smith *et al* (2009) and lichen communities James *et al* (1977), the conservation status of lichens follows Woods & Coppins (2012).

RESULTS

A total of 55 species were recorded from the areas surveyed representing 52% of the lichens recorded from the site. One species, *Collema fragile* is Red Listed as Vulnerable and is on Section 41 of the NERC Act (2006) and a Priority Species under the UK Biodiversity Action Plan. Seven species are classed and Nationally Scarce. Several species are characteristic of relatively undisturbed sites such as natural limestone outcrops or mediaeval stonework.

LICHEN HABITATS

Like vascular plants lichens grow in distinct assemblages or communities. On calcareous rock the degree of exposure, dampness, shade and enrichment all determine the species and communities present. Three main habitats were present in the area surveyed and are described below.

Well lit horizontal surfaces

The top surface of the eastern wall comprises small limestone blocks with very few flint stones or heathstone blocks. Lichens are abundant but the thalli are rather small. Most obvious are the white patches of *Aspicilia calcarea*, yellow *Caloplaca flavescens* and brown-black *Verrucaria nigrescens*. Associated species include *Caloplaca dichroa*, *C. flavocitrina*, *C. holocarpa*, *Lecanora albescens*, *Protoblastenia rupestris*, *Sarcogyne regularis*, *Verrucaria baldensis* and *V. hochstetteri*. In one area on the Eastern Wall the Nationally Scarce *Caloplaca ochracea* and *Hymenelia prevostii* were noted along with *Toninia episema*, which is parasitic on the thallus of *Aspicilia calcarea*. The few acidic flint / chert stones support a few common species including *Buellia ocellata*, *Candelariella vitellina* and *Tephromela atra*.

Steeply sloping and vertical surfaces

The walls are built of large blocks of cut limestone ashlar. These surfaces have been exposed for centuries and in places are relatively undisturbed and many blocks have a complete coverage of lichens. *Caloplaca flavescens*, *Verrucaria baldensis* and *V. nigrescens* are the most prominent species with smaller quantities of *Acrocordia conoidea*, *Caloplaca aurantia*, *C cirrochroa*, *C. dalmatica*, *C. marmorata*, *Clauzadea metzleri*, *Diplotomma alboatrum*, *Opegrapha calcarea*, *Porina linearis*, *Protoblastenia calva* and *Verrucaria fuscella* These species are typical of the ***Caloplacetum heppianae*** community of well lit limestone rocks and walls. Over most of the areas surveyed the limestone is very pure with only small areas, mostly below bird perches, showing signs of enrichment. These areas support *Caloplaca limonia*, *Diploicia canescens*, *Physcia tenella* and *Xanthoria parietina*.

In places where water seeps through the stone jelly lichens are present with *Collema auriforme*, *C. crispum*, *C. tenax*, *Leptogium plicatile* and *Placynthium nigrum* plus *Toninia aromatica* and *Agonimia tristicula* which is often found overgrowing the *Collema* thalli. This community of lichens with a blue-green photobiont is referable to the ***Placynthietum nigra***. The most important member of this community at Corfe Castle is the Red Listed *Collema fragile* which was noted in two places in the 2007 survey and was found at a new site during the present survey on the eastern wall south of Plukenet Tower. (see figs 5 & 6).

Shaded vertical surfaces

The inner wall between the Outer Gatehouse and the First Tower has the best examples of the Dry Limestone Communities (the *Dirinetum stehammariae* and *Leproplacetum chrysodetae*). The broken western end of the section has abundant *Dirina massiliensis* f. *sorediata* with a local abundance of the nationally scarce *Lecanographa grumulosa*, plus the local *Opegrapha mougeotii* and an un-named taxa with a pale pink sorediate thallus. Further along dry recesses on the north face have *Caloplaca chrysodeta* and *C. xantholyta*, plus a little *Botryolepraria lesdainii*.

FIG 1. Hard limestone block on inner face of eastern wall north of Horseshoe Tower showing a well developed lichen community of well lit limestone (the ***Caloplacetum heppianae***) with white patches of ***Aspicilia calcarea***, yellow ***Caloplaca aurantia*** and ***C. flavescens*** and the brown-black ***Verrucaria nigrescens***.

FIG 2. ***Protoblastenia calva,*** a good indicator species of the better developed ***Caloplacetum heppianae*** communities found on the least disturbed areas limestone wall, especially the Eastern Wall.

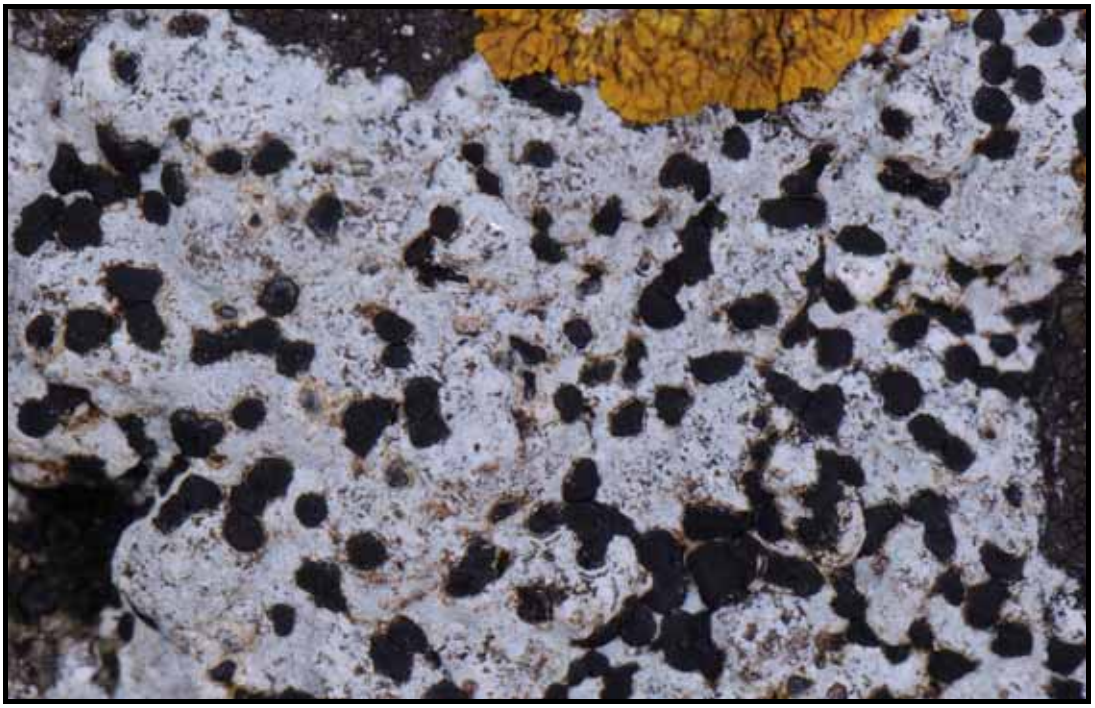

FIG 3. ***Clauzadea metzleri*****, Nationally Scarce**, inner face of eastern wall to the south of Plukenet Tower, where it is locally frequent on vertical blocks of limestone. This appears to be the first record of this species for the Castle.

FIG 4. ***Lecanographa grumulosa*****, Nationally Scarce**, west of Gatehouse. This species has been known from the Castle since the 1880s.

Summary of interest features:

1. ***Lecanographa grumulosa*** frequent on broken end of wall by the First Tower, with ***Opegrapha mougeotii*** present also.

2. Good example of dry limestone community with ***Caloplaca chrysodeta*** and ***C. xantholyta*** on north face of wall.

3. ***Caloplaca cirrochroa*** is frequent on the outer wall of Horseshoe Tower.

4. ***Toninia episema*** frequent on large patches of Aspicilia calcarea on top of the low wall.

5. The Nationally Scarce ***Clauzadea metzleri*** is locally abundant along some sections of the inner face of the eastern wall between Horseshoe Tower and Plukenet Tower

6. ***Caloplaca ochracea*** on the horizontal surface of the tops course of stones, with ***Toninia episema*** also present.

7. Small fragmented thallus of the Red Listed and Section 41 ***Collema fragile*** on vertical surface of a stone low down on the wall.

FIG 5. Eastern Wall, site for ***Collema fragile***, RDB Vulnerable, S41, on vertical stone indicated by the red arrow. The blue arrow shows the location of the Nationally Scarce ***Hymenelia prevostii*** on the horizontal stonework on the wall top. Ideally the patch of Ivy on the wall should be removed as it could potentially harm the lichens (and the wall).

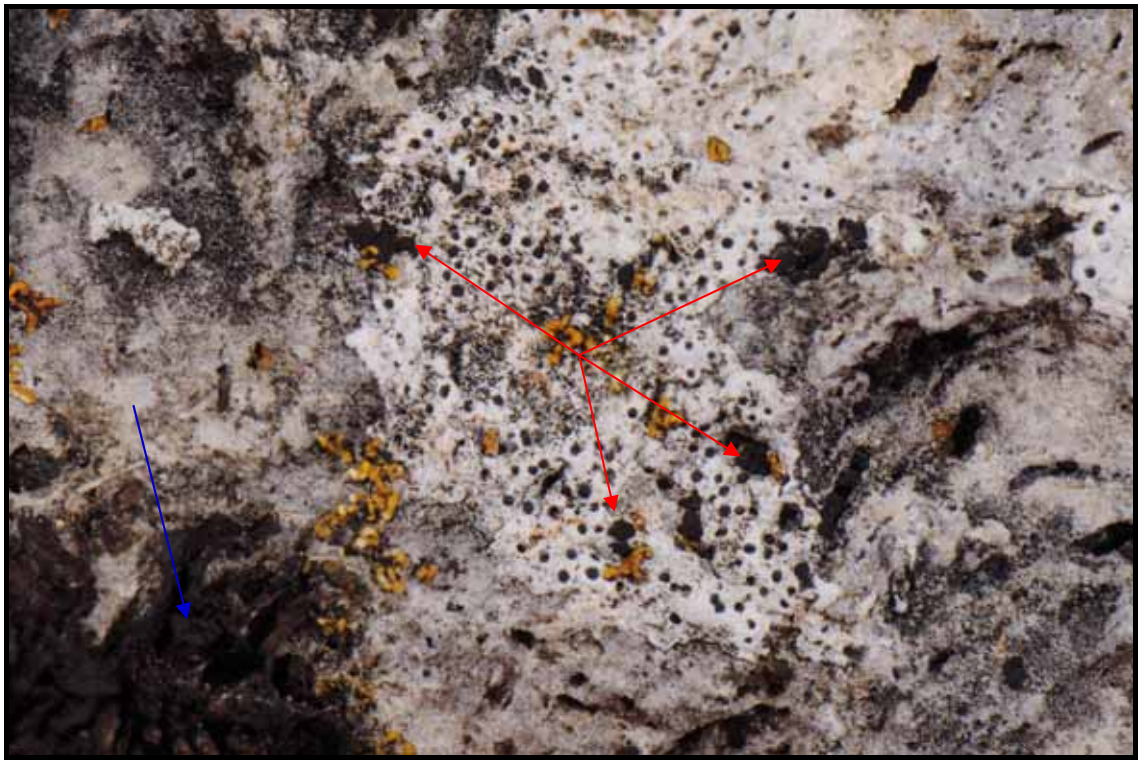

FIG 6. Very small and fragmented thallus of ***Collema fragile*** (red arrows), with the much larger ***Leptogium plicatile*** in the bottom left corner (blue arrow).

FIG 7. Area of wall supporting the Nationally Scarce ***Caloplaca ochracea*** on the horizontal surfaces of the top layer of stones.

FIG 8. ***Caloplaca ochracea***. A Nationally Scarce lichen of well-lit hard limestone, preferring horizontal surfaces. Found in suitable habitat in southern and western Britain north to Argyll. It is easily confused with the much more common *C. dalmatica*.

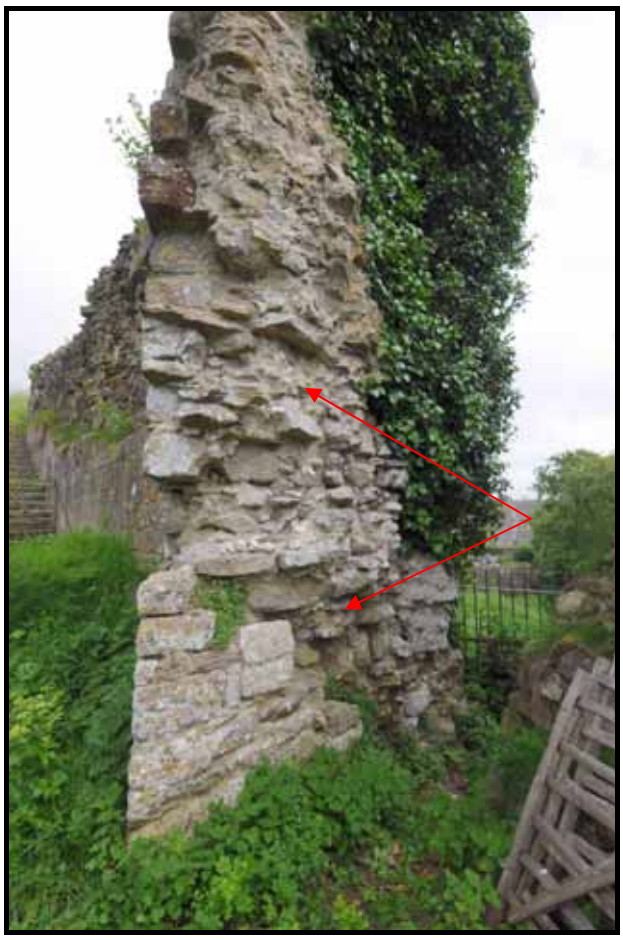

FIG 9. The western end of the wall between the Outer Gatehouse and First Tower. The sheltered dry surfaces of the stone and old mortar support a good population of the Nationally Scarce ***Lecanographa grumulosa*** and a small amount of ***Opegrapha mougeotii***.

FIG 10. Section of the inner face of the Eastern Wall. This section of the wall supports three Nationally Scarce species, ***Clauzadea metzleri*** on the vertical face, plus ***Caloplaca ochracea*** and ***Toninia episema*** on horizontal surfaces on the wall top. The encroachment of Ivy on to the wall is a concern and if left will be detrimental to the lichen interest.

ASSESSMENT

The area surveyed supports saxicolous lichens typical of well lit limestone rocks and old walls. The majority of them are widespread and common species that are widespread on similar walls throughout the Castle. Several areas do support rare and scarce lichens including one Red Listed and Section 41 species, but the areas are very small and typically most interest is on the vertical surfaces.

The proposed works should not have a detrimental effect on the lichens. However, care should be taken if areas of vertical wall are to be re-pointed as any leaching from the mortar can affect the lichens. The soft capping of putting patches of vegetation on horizontal surfaces where people climb on the walls will mostly affect areas of rubble infill that have been disturbed and mortared in the recent past and many support common species. Once stabilised the small vegetation patches with associated soil may diversify some areas as the soil edges will eventually be colonised by *Collema* species and *Agonimia tristicula* as is the case on the section of wall to the south-east.

MANAGEMENT RECOMMENDATIONS

When repairing ancient stonework the following general rules should be considered when important lichen species and communities are present:

- When large stones are removed but are to re-used they should be replaced in the same aspect
- When re-pointing, the mortar should be in keeping with the particular stone type and the surfaces of the adjacent stones should be kept as clean as possible
- If possible areas should not be covered up with dark non-breathable coverings for long periods
- Any soil or dust accumulated on the stones adjacent to the areas of work should be removed when dry using a soft brush
- In several areas, notably the stretch of wall between Outer Gatehouse and First Tower and the Eastern Wall south of Plukenet Tower there are extensive patches of Ivy which threaten some of the rarer lichens found on the Castle. If these are not a threat to the stability of the walls then they should be cut back from the areas supporting important lichens.

REFERENCES

Giavarini, V.J. 2007 *Lichen survey of castle walls, Corfe Castle, Dorset*. Unpublished report to the National Trust.

James, PW, Hawksworth, DL & Rose, F 1977 *Lichen Communities in the British Isles*: A Preliminary Conspectus. In Lichen Ecology, Seaward, MRD (ed), pgs 295-413. London, Academic Press.

Smith, CW, Aptroot, A, Coppins, BJ, Fletcher, A, Gilbert, OL, James, PW & Wolseley, PA 2009 *The Lichens of Great Britain and Ireland*. London, British Lichen Society.

Woods, RG & Coppins, B J 2012 *A Conservation Evaluation of British Lichens and Lichenicolous Fungi*. Species Status 13. Joint Nature Conservation Committee, Peterborough.

APPENDIX I: Lichen and bryophyte species recorded June 2014

*A = Eastern wall, inner face
B = Eastern wall, outer face
C = Horseshoe Tower
D = wall west of Gatehouse

Species	Status	Frequency	Habitat	A*	B	C	D
Acrocordia conoidea		O[1]	Sheltered vertical limestone	#	#	#	#
Agonimia tristicula		R	Damp limestone and overgrowing *Collema* species	#	#		#
Aspicilia calcarea		F-LA	Sunlit limestone	#	#	#	#
Aspicilia contorta		R	Horizontal sunlit limestone	#			
Belonia nidarosiensis		VR	Sheltered vertical limestone		#		
Botryolepraria lesdainii		R	Dry shaded underhangs on limestone		#		#
Buellia ocellata		VR	On flintstone	#			
Caloplaca aurantia		O-LF	Sunlit limestone	#	#	#	
Caloplaca chrysodeta		R	Dry shaded underhangs on limestone				#
Caloplaca cirrochroa		O	Well lit vertical limestone	#	#		#
Caloplaca dalmatica		O-LF	Well lit limestone	#	#	#	#
Caloplaca dichroa		O	Horizontal sunlit limestone	#	#		
Caloplaca flavescens		F	Well lit limestone	#	#	#	#
Caloplaca limonia		O-LF	Dry vertical enriched limestone	#	#	#	#
Caloplaca marmorata		R	Horizontal sunlit limestone	#	#		
Caloplaca oasis	NS	O-LF	Well lit vertical limestone	#	#	#	
Caloplaca ochracea	NS	R	Horizontal sunlit limestone	#			
Caloplaca saxicola		R	Dry shaded underhangs on limestone				#
Caloplaca xantholyta		R	Dry shaded underhangs on limestone		#		#
Candelariella vitellina		R	On flintstone	#			
Catillaria lenticularis		R	Well lit vertical limestone	#	#		
Clauzadea metzleri	NS	O-LF	Sheltered vertical limestone	#			
Collema auriforme		O	Seepage areas on horizontal and vertical limestone	#			
Collema crispum		R	Seepage areas on horizontal and vertical limestone		#		#
Collema fragile	VU; BAP, S41	VR	Sheltered vertical limestone	#			
Collema tenax		O	Well lit limestone and mortar	#	#		#
Diploicia canescens		O	Enriched vertical limestone	#	#	#	#
Diplotomma alboatrum		O-F	Sheltered vertical limestone	#		#	#

Species	Status	Frequency	Habitat	A*	B	C	D
Dirina massiliensis f. *sorediata*		R	Shaded underhangs on limestone		#	#	#
Hymenelia prevostii	NS	R	Horizontal sunlit limestone	#			
Lecanographa grumulosa	NS	R	Shaded underhangs on limestone				#
Lecanora albescens		O	Well lit vertical limestone	#	#		#
Lecanora campestris		R	Sheltered vertical limestone	#			#
Lecanora crenulata		O	Sheltered vertical limestone	#	#		#
Lecidella stigmatea		R	Sheltered vertical limestone	#			
Leptogium gelatinosum		O	Seepage areas on horizontal and vertical limestone	#	#		
Leptogium plicatile		O	Seepage areas on horizontal and vertical limestone	#	#		
Opegrapha calcarea		O	Sheltered vertical limestone	#	#		#
Opegrapha mougeotii	NS	R	Shaded underhangs on limestone				#
Phaeophyscia orbicularis		R	Well lit enriched limestone	#			
Physcia tenella		R	Well lit enriched limestone	#	#		
Placynthium nigrum		O	Seepage areas on horizontal and vertical limestone	#	#		#
Porina linearis		O-LF	Sheltered vertical limestone	#	#	#	#
Protoblastenia calva		O	Well lit limestone	#			
Protoblastenia rupestris		O	Horizontal limestone	#	#		
Sarcogyne regularis		R	Well lit limestone		#	#	
Tephromela atra		VR	On flintstone	#			
Toninia aromatica		O	Horizontal sunlit limestone	#	#		
Toninia episema	NS	O	Overgrowing *Aspicilia calcarea* on horizontal sunlit limestone	#			
Verrucaria baldensis		F-LA	Well lit limestone	#	#	#	#
Verrucaria fuscella		O	Well lit limestone	#	#	#	
Verrucaria hochstetteri		O	Well lit limestone	#	#	#	#
Verrucaria macrostoma f. furfuracea		O	Well lit limestone				
Verrucaria muralis		O	Well lit limestone & mortar	#	#		#
Verrucaria nigrescens		F-LA	Well lit limestone	#	#		#
Xanthoria parietina		O	Well lit enriched limestone	#	#		#

[1] **Frequency:**

A = Abundant
F = Frequent
O = Occasional
R = Rare
VR = Very rare
L = Locally (e.g. LF = Locally frequent)