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**Second Report by the United Kingdom under  
Article 17**

**on the implementation of the Directive  
from January 2001 to December 2006**

**Conservation status assessment for :**

**H5110: Stable xerothermophilous formations with  
*Buxus sempervirens* on rock slopes (*Berberidion*  
p.p.)**

Please note that this is a section of the report. For the complete report visit <http://www.jncc.gov.uk/article17>

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# H5110 Stable xerothermophilous formations with *Buxus sempervirens* on rock slopes (*Berberidion p.p.*)

Audit trail compiled and edited by JNCC and the JNCC Woodland Lead Coordination Network

This paper and accompanying appendices contain background and data used to complete the standard EC reporting form (Annex D), following the methodology outlined in the document entitled “Assessment, monitoring and reporting under Article 17 of the Habitats Directive, Explanatory Notes & Guidelines, Final Draft 5, October 2006.” The superscript numbers below cross-reference to the headings in the corresponding Annex D reporting form. This supporting information should be read in conjunction with the UK approach for habitats (see ‘Assessing Conservation Status: UK Approach’).

## 1. National-biogeographic level information

### 1.1 General description and correspondence with National Vegetation Classification (NVC) and other habitat types

Table 1.1.1 provides a summary description of H5110 stable box formations and its relations with UK classifications. It comprises semi-natural and natural stands of stable, xerothermophilous and calcicolous scrub dominated by box *Buxus sempervirens*. This habitat is extremely rare in the UK, as stands of box scrub are usually non-permanent, changing to woodland or grassland over time. No equivalent type is separated within the NVC or Biodiversity Action Plan (BAP) priority habitat types.

**Table 1.1.1** Summary table showing the relationships between habitat H5110 and UK vegetation/habitat classifications



Classification	Correspondence with Annex I type	Comments
EU Interpretation Manual	= H5110	Includes stable xerothermophilous and calcicolous scrubs dominated by <i>Buxus sempervirens</i> , of hill and montane levels. These formations correspond to xerothermophilous <i>Buxus</i> thickets with their fringe associations of the <i>Geranion sanguinei</i> alliance on calcareous or siliceous substratum. They also constitute the natural woodland edge of calcareous dry forests rich with <i>Buxus</i> . In the euro-siberian region, the more open formations are rich in submediterranean plant species. Syntaxa: <i>Berberidion p.p.</i> , <i>Amelanchiero-Buxion</i> . Most box scrub in the UK is usually non-permanent, changing to woodland or revering to grassland over time.
National Vegetation Classification (NVC) (Rodwell 1991)	No equivalent type to H5110	Box scrub is recorded as a minor component of NVC types W12 and W13.
BAP priority habitat type	No equivalent type to H5110	The closest priority habitat types, lowland beech and yew woodland and lowland mixed deciduous woodland, are much broader in scope than H5110.

## 2. Range <sup>2.3</sup>

### 2.1 Current range

Range surface area <sup>2.3.1</sup>: 100 km<sup>2</sup>  
 Date calculated <sup>2.3.2</sup>: May 2007  
 Quality of data <sup>2.3.3</sup>: Good

Maps 2.1.1 and 2.1.2 show the range and distribution of H5110 stable box formations in the UK. Semi-natural and natural formations of H5110 stable box scrub are extremely rare in the UK. At only one site, Box Hill in south-east England, does it form a stable (i.e. persistent) native stand. At this location, it is developed on steep, chalk slopes, where other tree species are unable to grow to mature size. At two other sites, in Gloucestershire and Buckinghamshire, box-dominated scrub occurs but is non-permanent, gradually changing to woodland if left unmanaged.

Map 2.1.1 Habitat range map <sup>1.1</sup> for H5110	Map 2.1.2 Habitat distribution map <sup>1.2</sup> for H5110
	
<p>Range envelope shown in blue/grey shade in above map is a minimum convex polygon constructed using JNCC Alpha Shapes tool (see Technical Note I for details of methodology).</p> <p>See Section 7.1 for data sources</p>	<p>Each yellow square represents a 10x10km square of the National Grid and shows the known and/or predicted occurrence of this habitat.</p> <p>10-km square count: 1</p>

## 2.2 Trend in range since c.1994

**Trend in range<sup>2.3.4</sup>:** Stable  
**Trend magnitude<sup>2.3.5</sup>:** Not applicable  
**Trend period<sup>2.3.6</sup>:** 1994-2006  
**Reasons for reported trend<sup>2.3.7</sup>:** Not applicable

The broad range of H5110 stable box formations appears to have not changed since 1994.

## 2.3 Favourable reference range<sup>2.5.1</sup>

**Favourable reference range:** Approx. 100 km<sup>2</sup>

Section 3.2.1.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference range estimates for habitats have been determined in the UK. Based on this approach, the current surface area, 100 km<sup>2</sup>, has been set as the favourable reference area. Reasons for this are discussed below.

The current range area of H5110 stable box formations is limited to a single 10 km square in southern Britain covering 100 km<sup>2</sup>. This includes the only known location for native stable box scrub, where it grows on suitably dry and calcareous soils (sufficient for box to grow but not for trees such as beech, yew and ash) and is not particularly affected by livestock grazing (such that the site would eventually become grassland). Box scrub appears to have persisted at this site for many decades.

We are not aware of any other sites within the native range where box scrub has or could form self-perpetrating (stable) stands in the absence of direct intervention. In most locations box scrub changes to woodland (due to tree invasion) or grassland (where the site is heavily grazed). Given this situation, it has been judged that the current range area has to be taken as the favourable reference range area, even if this is very small. The range of box scrub could potentially be increased, if such stands were perpetuated by removing invading trees and excluding grazing animals. Such situations are however regarded as non-stable and outside the scope of the Annex I habitat H5110 in the UK.

## 2.4 Conclusions on range

**Conclusion<sup>2.6.1</sup>:** **Favourable**

The habitat range has remained stable since 1994 and for many decades beforehand. Given that stable box formations are limited to a single site in southern Britain, it has been taken that the current range represents the favourable reference range, even if this is very small in area (100 km<sup>2</sup>).

## 3. Area<sup>2.4</sup>

### 3.1 Current area

**Total UK extent<sup>2.4.1</sup>:** **0.2 km<sup>2</sup>**  
**Date of estimation<sup>2.4.2</sup>:** **May 2007**  
**Method<sup>2.4.3</sup>:** **3 = ground based survey**  
**Quality of data<sup>2.4.4</sup>:** **Good**

Table 3.1.1 provides information on the area of H5110 in the UK. The habitat is limited to a single location at Box Hill where it covers c.20 ha.

**Table 3.1.1** Area of H5110 in the UK

	Area (ha)	Method <sup>2.4.3</sup>	Quality of data <sup>2.4.4</sup>
England	20	3	Good
Scotland	Not present	-	-
Wales	Not present	-	-
Northern Ireland	Not present	-	-
<b>Total UK extent<sup>2.4.1</sup></b>	20	3	Good

Method used to estimate the habitat surface area: 1 = only or mostly based on expert opinion; 2 = based on remote sensing data; 3 = ground based survey. Only the most relevant class is given if more than one applies.

Quality of habitat surface area data: 'Good' e.g. based on extensive surveys; 'Moderate' e.g. based on partial data with some extrapolation; 'Poor' e.g. based on very incomplete data or on expert judgement.

### 3.2 Trend in area since c.1994

**Trend in area<sup>2.4.5</sup>:** **Stable**  
**Trend magnitude<sup>2.4.6</sup>:** **Not applicable**  
**Trend period<sup>2.4.7</sup>:** **1994-2006**  
**Reasons for reported trend<sup>2.4.8</sup>:** **Not applicable**

The area of H5110 stable box formations has remained stable at c.20ha since 1994.

### 3.3 Favourable reference area<sup>2.5.2</sup>

**Favourable reference area:** **Approx. 0.2 km<sup>2</sup>**

Section 3.2.2.3 of 'Assessing Conservation Status: UK Approach' sets out how favourable reference area estimates have been determined in the UK. Based on this approach, the current extent, 0.2 km<sup>2</sup>, has been set as the favourable reference area. Reasons for this are discussed below.

The same approach has been taken towards favourable reference area for H5110 as was for the favourable reference range (see Section 2.3.). The habitat is limited to a single location covering c.20 ha, where box is native, where soil conditions are suitably dry and calcareous, where grazing is limited, and where box scrub appears to have formed stable formations for many decades. We are not aware of any other sites where this is or could be the case in the absence of direct intervention. Usually box scrub would revert to woodland (due to tree invasion) or be converted to grassland (where grazing was sufficient intense). Given this situation, it has been judged that the current area of H5110 has to be taken as the favourable reference area, even if this is very small. There is, of course, concern about the long-term vulnerability of this habitat on this account. The habitat area could be increased if box stands were perpetuated by removing invading trees and excluding grazing animals. However, under such circumstances the habitat cannot be regarded as stable and therefore falls outside the scope of the Annex I habitat H5110.

### 3.4 Conclusions on area covered by habitat

**Conclusion<sup>2.6.ii</sup>: Favourable**

This habitat area has remained stable since 1994 and for many decades beforehand. Given that stable box formations, i.e. sites where box has or could form self-perpetrating (stable) stands in the absence of direct intervention, appear to be limited to a single site in southern Britain, it has been taken that the current represents the favourable reference area, even if this is very small in area (c.20 ha).

## 4. Specific structures and functions <sup>(including typical species)</sup>

### 4.1 Main pressures <sup>2.4.10</sup>

The main pressures likely to be affecting H5110 stable box formations are listed below (the related EC code is shown in brackets). These are derived from the Common Standards Monitoring (CSM) condition assessment (see section 4.2.1) for Box Hill Special Area of Conservation (SAC). The assessment of the exceedence of relevant critical loads (see Technical Note III) concluded that air pollution ought not to be considered a potentially significant pressure to the structure and function of this habitat.

- Box blight disease (**973 introduction of disease**)

The main pressures affecting the habitat is a recently established blight disease on box bushes caused by the fungus *Cylindrocladium*. This is a serious foliar disease that produces dark brown spots on the leaves and black streaks on the stems and defoliation. In severe cases, complete leaf loss has been observed but until now no tree death has been recorded. Although this has affected a number of individuals, the impacts are not severe and there are signs of regeneration with new shoots/young leaves evident on many of the affected bushes.

### 4.2 Current condition

#### 4.2.1 CSM condition assessments

Condition assessments based on CSM (see <http://www.jncc.gov.uk/page-2199>) provide a means to assess the structure and functioning of H5110 in the UK. The following attributes were examined for all CSM assessments relevant to the habitat:

- Extent.
- Structure and natural processes.
- Regeneration potential.
- Composition (trees and shrubs).
- Indicators of local distinctiveness.

### SAC condition assessments

Table 4.2.1 and Map 4.2.1 show the CSM condition assessment for Box Hill SAC, which supports the whole of the UK resource for H5110. These data were collated in January 2007. The assessment reported the habitat to be in unfavourable recovering condition.

**Table 4.2.1** CSM condition assessment for UK SACs supporting H5110. See notes below table for details. Information on the coverage of these results is given in section 7.2

Condition	Condition sub-categories	Area (ha)	Number of site features
Unfavourable	Declining	0	0
	No change	0	0
	Unclassified	0	0
	Recovering	20	1
	Total	20	1
	<i>% of all assessments</i>	<i>100%</i>	<i>100%</i>
	<i>% of total UK resource</i>	<i>100%</i>	<i>100%</i>
Favourable	Maintained	0	0
	Recovered	0	0
	Unclassified	0	0
	Total	0	0
	<i>% of all assessments</i>	<i>0%</i>	<i>0%</i>
	<i>% of total UK resource</i>	<i>0%</i>	<i>0%</i>

#### Notes

1. Data on features that have been partly-destroyed have been excluded from this table because they are not relevant to the consideration of present condition.
2. The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data from those used in the six year report produced by JNCC. (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).
3. Only assessments made for qualifying interest features on SAC have been included in this analysis.
4. Area figures for CSM assessments have been calculated using the data presented on the standard Natura 2000 data forms submitted to the EU.

### 4.3 Typical species

Typical species<sup>2.5.3</sup>:

*Buxus sempervirens*

Typical species assessment<sup>2.5.4</sup>:

**On-site assessment of condition of plants**

*Buxus sempervirens* is the main characteristic species for this habitat and has shown a significant decline in condition in recent years at Box Hill due to Box blight disease. No other typical species have been assessed.

### 4.4 Conclusions on specific structures and functions (including typical species)

Conclusion<sup>2.6.iii</sup>:

**Unfavourable – Inadequate but improving**

The EC Guidance states that where the specific structures and functions of a habitat are intermediate between “good with no significant pressures” and “bad with more than 25% of the area of the habitat area unfavourable as regards its specific structures and functions”, the conclusion should be Unfavourable – Inadequate. In the UK, this was generally taken to mean that 5-25% of the habitat area was in unfavourable condition.

The main pressure is Box blight disease. The condition assessment for Box Hill SAC, which supports the whole of the UK H5110 resource, is unfavourable recovering, due to the impact of Box blight disease. Although this has on a number of bushes, the impacts are not severe and widespread signs of regeneration are reported.

**Current Condition of H5110 based on CSM condition assessments**  
(See Sections 4.2 and 7.2 for further information)

**Map 4.2.1 SAC assessments**



**Key**  
Red = unfavourable, i.e. the square contains at least one SAC where this habitat feature is present and has been judged to be unfavourable  
Green = favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been assessed as favourable but there are no unfavourable SAC features  
Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported

## 5. Future prospects

### 5.1 Main factors affecting the habitat

#### 5.1.1 Conservation measures

This habitat exists at a single site, which is protected as a designated Site of Special Scientific Interest (SSSI) (under the Wildlife and Countryside Act 1981) and via as a SAC (in response to the EC Habitats Directive) (see

<http://www.jncc.gov.uk/ProtectedSites/SACselection/habitat.asp?FeatureIntCode=H5110>).

It is owned and managed as a nature reserve by a conservation organisation.

#### 5.1.2 Main future threats<sup>2.4.11</sup>

There are no obvious major future threats to H5110 over the next 10-15 years. Box blight disease could possibly form a threat, but the impacts of this so far appear limited and there are signs of recovery, i.e. it does not clearly represent a long-term threat. Based on an assessment of the exceedence of the relevant critical load for this habitat (see Technical Note III), air pollution is not considered to be a potentially significant threat to the future condition of this habitat. There is concern that the habitat is vulnerable because it exists only in a single site. However, we are not aware of any other sites within the native range where Box scrub could form self-perpetrating (stable) stands in the absence of direct intervention (see section 3.3).

## 5.2 Future condition (as regards range, area covered and specific structures and functions)

### 5.2.1 CSM condition assessments

The CSM condition assessments reported in sections 4.2.1-2 provide a basis to crudely predict the potential future condition of H5110 in the UK. This involved treating all assessments currently identified as either favourable or unfavourable recovering as future-favourable: remaining categories were treated as future-unfavourable – see Table 5.2.1. There are a number of caveats to this approach, which are set out beneath this table. Table 5.2.1 and Map 5.2.1 show the predicted potential future condition for the single SAC that supports the whole of the UK resource for H5110. The whole habitat is expected to recover from the currently unfavourable condition to become favourable.

**Table 5.2.1** Predicted future condition of UK SACs supporting H5110 based on current CSM condition assessments. See notes below table for details. Information on the coverage of these results is given in section 7.2

Future condition	Present condition	Area (ha)	Number of site features
<b>Future-unfavourable</b>	Unfavourable declining	0	0
	Unfavourable no change	0	0
	Unfavourable unclassified	0	0
	Total	0	0
	<i>% of assessments</i>	<b>0%</b>	<b>0%</b>
	<i>% of total UK extent</i>	<b>0%</b>	<b>0%</b>
<b>Future-favourable</b>	Favourable maintained	0	0
	Favourable recovered	0	0
	Unfavourable recovering	20	1
	Favourable unclassified	0	0
	Total	20	1
	<i>% of assessments</i>	<b>100%</b>	<b>100%</b>
	<i>% of total extent</i>	<b>100%</b>	<b>100%</b>

Note that the scenario presented above is based on the same information as used to construct the Table in section 4.1. It is based on the following premises:

- (i) the unfavourable-recovering condition assessments will at some point in the future become favourable;
- (ii) all unfavourable-unclassified sites will remain unfavourable, which is probably overly pessimistic;
- (iii) sympathetic management will be sustained on sites already classified as favourable and these will not be seriously damaged by any unforeseen events.

**IMPORTANT NOTE:** We do not have information on the timescale of the predicted recovery, which may be influenced by many past, natural and human related factors. A sustained, sympathetic management regime is more likely to result in 'favourable' condition being attained.

## 5.3 Conclusions on future prospects (as regards range, area covered and specific structures and functions)

### Conclusion<sup>2.6.iv</sup>: **Favourable**

The EC Guidance states that where “habitat prospects are good with no significant impacts from threats expected and long-term viability assured”, the judgement should be Favourable. In the UK, this was generally taken to mean that range and/or area are stable or increasing, and more than 95% of the habitat area is likely to be in favourable condition in 12-15 years.

The whole resource is protected in a designated nature reserve, which is owned by a conservation organisation. The condition assessment for the relevant SAC predicts that the habitat condition will change from unfavourable to favourable, as Box recuperates from the effects of a blight disease. Although there is some concern about the vulnerability of the habitat, in that it exists only at a single site, there appears not to be another site where Box could form self-perpetrating (stable) stands in the absence of direct intervention.

**Predicted Future Condition of H5110 based on CSM condition assessments**  
(See Sections 5.2 and 7.2 for further information on these maps)

**Map 5.2.1 SAC assessments**

Future status of HSD features  
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- unfavourable
- favourable
- not assessed
- not on SAC



**Key**

Red = future-unfavourable, i.e. the square contains one or more SACs where this habitat feature is present and has been predicted to be future-unfavourable

Green = future-favourable, i.e. the square contains at least one SAC where this habitat feature is present and has been predicted to be future-favourable

Blue = SAC not assessed, i.e. the square contains at least one SAC supporting this habitat feature but no assessment has been reported

## 6. Overall conclusions and judgements on conservation status

**Conclusion<sup>2,6</sup>:** **Unfavourable - Inadequate but improving**

On the basis of Structure and Function, the overall conclusion for this habitat feature is Unfavourable – Inadequate.

**Table 6.1** Summary of overall conclusions and judgements

Parameter	Judgement	Grounds for Judgement	Confidence in judgement*
Range	Favourable	Current range is stable and not less than the favourable reference range.	2
Area covered by habitat type within range	Favourable	Current area is stable and not less than the favourable reference area.	2
Specific structures and functions (including typical species)	Unfavourable - Inadequate but improving	Structures and functions considered to be intermediate between “good with no significant pressures” and “more than 25% of the habitat area unfavourable as regards its specific structures and functions”. Although affected by box blight disease, the impacts are not severe and widespread signs of regeneration are reported.	2
Future prospects (as regards range, area covered and specific structures and functions)	Favourable	Habitat prospects over the next 12-15 years considered to be good with no significant impacts from threats expected and long-term viability assured. Condition is predicted to change from unfavourable to favourable, as box recuperates from the effects of a blight disease. There is some concern about the vulnerability of the habitat, in that it exists only at a single site, but no other natural sites are known where it could occur.	2
Overall assessment of conservation status	Unfavourable - Inadequate but improving	On the basis of Structure and Function, the overall conclusion for this habitat feature is Unfavourable – Inadequate.	2

Key to confidence in judgement: 1 = High; 2 = Medium; 3 = Low

## 7. Annexed material (including information sources used 2.2.)

### 7.1 References

RODWELL, J.S. (ed.) 1991. British Plant Communities Volume 1: Woodlands and Scrub. Cambridge University Press, Cambridge.

#### Map Data Sources

JNCC International Designations Database. Joint Nature Conservation Committee.

## 7.2 Further information on CSM data as presented in sections 4.2 and 5.2

**Table 7.2.1** Summary of the coverage of the data shown in Tables 4.2.1 and 5.2.1

Data	Value
Number of SACs supporting feature (a)	1
Number of SACs with CSM assessments (b)	1
% of SACs assessed (b/a)	100
Extent of feature in the UK – hectares (c)	20
Extent of feature on SACs – hectares (d)	20
Extent of features assessed – hectares (e)	20
% of total UK hectarage on SACs (d/c)	100
% of SAC total hectarage that has been assessed (e/d)	100
% of total UK hectarage that has been assessed (e/c)	100

Notes.

1) Extent of features on SACs (d) includes only those features that have been submitted on the official Natura 2000 data form as qualifying features. This figure is based on the habitat extent figures presented on standard Natura 2000 data forms; 2) The data included are from CSM assessments carried out between April 1998 and December 2006. NB: these include additional and some up-date data from those used in the six year report produced by JNCC (Williams, J.M., ed. 2006. *Common Standards Monitoring for Designated Sites: First Six Year Report*. Peterborough, JNCC).

**Table 7.2.2** Summary of grid square map data shown in Maps 4.2.1-3 and 5.2.1-3

Status	Number of squares	Proportion of all squares
Current – Unfavourable (red)	1	100%
Current – Favourable (green)	0	0%
On SAC but not assessed (blue)	0	0%
Not on SAC (transparent)	0	0%
Total Number of 10km squares (any colour)	1	100%
Future – Unfavourable (red)	0	0%
Future – Favourable (green)	1	100%