SIXTH FRAMEWORK PROGRAMME
PRIORITY 8.1
Scientific Support to Policies (SSP)

Deliverable 3.3 Report on GIS database and identification of threatened habitats

Project acronym: **COCONUT**

Project full title: **Understanding effects of land use changes on ecosystems to halt loss of biodiversity due to habitat destruction, fragmentation and degradation**

Proposal/Contract no.: **044346**

Date of delivery: **30th of September 2008**

Project home page: **www.coconut-project.net**

Comment:

Understanding effects of land use changes on ecosystems to halt loss of biodiversity

due to habitat destruction, fragmentation and degradation

Deliverable 3.3:

GIS databases and identification of threatened habitats

Ioannis Vogiatzakis, Maria Teresa Stirpe and Simon G. Potts

EU 6th framework Project: **SSPI-CT-2006-044343**

COCONUT: WORKPACKAGE 3

DELIVERABLE 3.3

Introduction

This document reports on the progress made by the University of Reading in an effort to assemble a cohesive European GIS database on the relevant information concerning species, habitats and land use change in and around Natura 2000 sites, and identify priority habitats under threat at the European level.

GIS Datasets

Following a thorough review of existing current and historic datasets for the main taxa (birds, plants, bees, butterflies), as outlined in Deliverable 2.1 of this project, their use in combination with the land cover datasets was not possible. Although these datasets were collated the main spatial datasets within stored in a GIS and employed for the projects' outputs were/are:

- The EEA/DG GIS dataset regarding the Natura 2000 sites for the whole Europe
- BIOPRESS land cover dataset to provide current and historical land cover data
- CLC 2000 an/or Country specific landcover datasets (e.g. Italian CLC 2000) to fill in interpretation gaps of BIOPRESS particularly for 2000
- EUNIS database for information on habitat coding, ecology and distribution

The expansion of GIS data acquisition and subsequent analysis, as outlined in the DoW of the project, was not possible due to lack of support from GISAT partner.

Identification of Threatened Priority Habitats

We evaluated the main land cover changes analysed by the WP team and in conjunction with the results reported by BIOPRESS. These main changes ate the European level were (Gerrard et al. 2006):

1. **FROM** heterogeneous agricultural areas (24 or 242, 243) TO urban fabric (11 or 112), **TO** arable land (21 or 211) and **TO** forest (31 or 311, 312).

2. **FROM** arable land (21 or 211) and pastures (23 or 231) **TO** urban fabric (11 or 112) or **TO** industrial, commercial, and transport units (12).

3. **FROM** shrub and/or herbaceous vegetation association (32 or 324) **TO** forests (31 or 311,312,313), and its inverse conversion, i.e. **FROM** forest **TO** shrub and/or herbaceous vegetation association.

4. **FROM** pastures (231) **TO** shrub and/or herbaceous vegetation association (324).

5. **FROM** arable (211) land **TO** pastures (231) and its inverse conversion

Assuming these changes are representative at the European level then the priority habitats (cf. ANNEX I) that are/will be under mostly under threat are those associated with the respective Land cover types. In order to match the two we used the habitat classification in EUNIS database. In cases where there were problems of consistency and lack of coding information for some types of habitat in the Database we used expert knowledge to assign a habitat type to the correct CORINE land cover class. Obviously there is no *one to one* relationship between ANNEX I habitat types and CORINE Land Cover types. Therefore a Land Cover type will typically include many habitats and sometimes a habitat might be assigned to different CORINE Land Cover class on the basis of ecology and distribution at the European level.

Obviously there is no *one to one* relationship between ANNEX I habitat types and CORINE Land Cover types (Fig 1.). Therefore a Land Cover type will typically include many habitats and sometimes a habitat might be assigned to different CORINE Land Cover class on the basis of ecology and distribution at the European level. For example Habitat Type 9030: *Natural forest of primary succession stages in land upheaval coast* includes different types of deciduous, coniferous and mixed natural thickets and forests developed on land upheaval coasts of the Baltic sea.

The major changes and relation to ANNEX I priority habitats for three Biogeographical Regions i.e. Central Europe, Mediterranean, and Scandinavia are shown in Table 1. Table 2 presents the same changes for the UK

Table 1 Land cover changes and associated Priority Habitats in 3 European Biogeographical Regions

CORINE Land Cover Class*	***Central European*** Priority Habitats**	***Scandinavian*** Priority Habitats**	***Mediterranean Priority Habitats*** **
3.1.1. Broad Leaved Forests	9180, 91E0, 91G0, 91D0, 91S0, 91AA,	9020, 9030, 9080, 9180, 91D0, 91E0	9210 (Italy), 9220 (Italy), 91E0, 91H0, 9180, 91I0, 91AA
3.1.2. Coniferous Forests	9510	9010, 9030	91AA
3.1.3 Mixed Forests		9010, 9030	
3.2.4 Transitional woodland/shrub	91N0 (Hungary)		

*Class subject to major changes according to BIOPRESS results (Gerrard et al. 2006)
** According to ANNEX I for the Habitats Directive

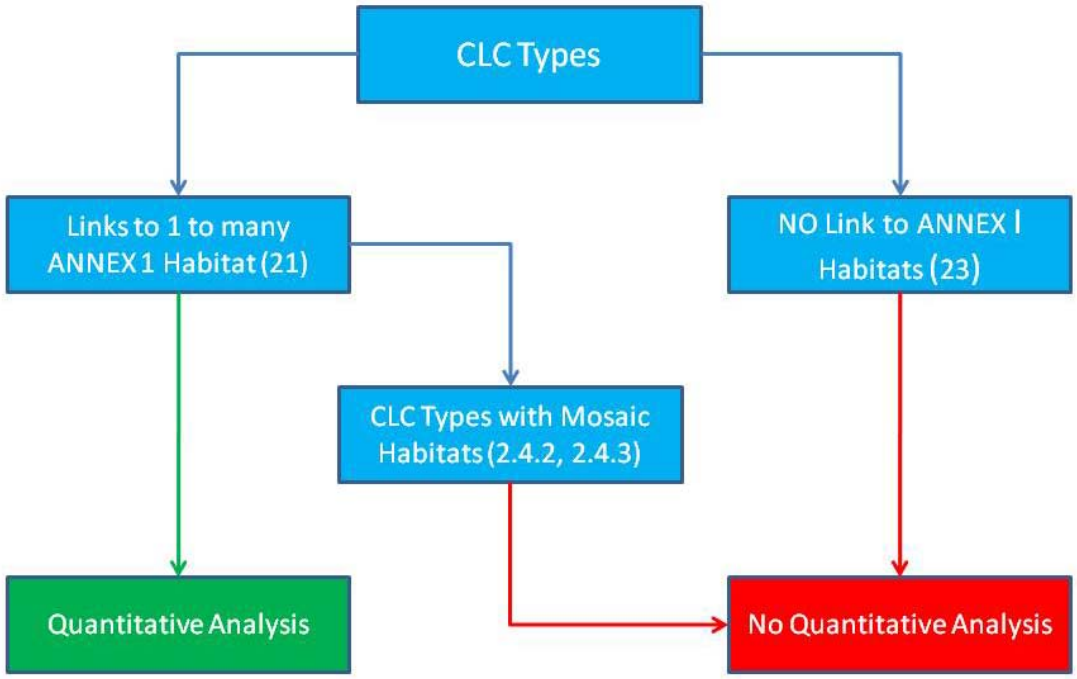

Fig. 1 Relation of Annex I habitat types to CORINE Land Cover Classes (CLC) (Gerrard et al. 2006)

Table 2. Example of changes in UK seminatural classes and their impact on Priority Habitats

Land Cover Before*	**Land Cover After***	**Quality Before****				**Quality After****				**Example of Associated Priority Habitat**
		Plants	Birds	Bees	Butterflies	Plants	Birds	Bees	Butterflies	
242	311	3.2	3.8	2.3	3.1	2.5	3.7	2.4	3.3	9180, 91D0, 91E0
243	311	3.5	4.0	3.3	3.9	2.5	3.7	2.4	3.3	9180
242	312	3.2	3.8	2.3	3.1	1.9	3.3	2.3	3.0	91C0, 91D0
243	312	3.5	4.0	3.3	3.9	1.9	3.3	2.3	3.0	91C0, 91D0
324	311	3.3	4.0	3.9	3.8	2.8	4.8	4.0	4.0	9180, 91D0, 91E0
324	312	1.9	3.3	2.3	3.0	1.9	3.3	2.3	3.0	91C0, 91D0, 91J0
324	313	1.9	3.3	2.3	3.0	2.7	4.7	3.6	3.3	
311	324	3.3	4.0	3.9	3.8	3.3	4.0	3.9	3.8	9180, 91D0, 91E0
312	324	3.3	4.0	3.9	3.8	3.3	4.0	3.9	3.8	91C0, 91D0, 91J0
313	324	3.3	4.0	3.9	3.8	3.3	4.0	3.9	3.8	n/a in the UK
231	324	3.3	4.0	3.9	3.8	3.3	4.0	3.9	3.8	n/a in the UK

*Class subject to major changes according to BIOPRESS results (Gerrard et al. 2006)
*Quality average as derived from experts opinion see Deliverable 2.2

Conclusion

Dataset harmonization and data accessibility at the European level still emerged as an important issue during our review of GIS datasets for this project. There remains a cchallenge for biodiversity information management to ensure a common "language" between different initiatives in order to facilitate information exchange and use for the biodiversity and protected areas in Europe.

Although the quality from one landcover class to another may not change significantly (Table 2) when these changes are mapped (see Deliverable 2.2) they present significant cumulative quality changes mainly around Natura 2000 sites. In addition loss or shrinkage of a land cover class will lead to changes of associated priority habitats will be in turn associated with biodiversity changes

In addition to the habitats reported herein under threat, more are expected to be threatened. This will be due to less intense changes of limited spatial extent, not highlighted here, which might be inevitably associated with priority habitats of limited distribution. These are will be equally important at the European Level.

References

Council of Europe (1992) Council Directive 92/43 EEC of 21 May 1992 on the conservation of natural habitats and wild fauna andflora. Official Journal of the European Communities.

Gerard, F. et al. (2006) BIOPRESS Final report EC-FPV Contract Ref: ENV-CT2002-00178

APPENDIX: Priority Habitats in ANNEX I of the Habitats Directive

1. COASTAL AND HALOPHYTIC HABITATS
1120 * Posidonia beds (Posidonion oceanicae)
1150 * Coastal lagoons
1340 * Inland salt meadows
1510 * Mediterranean salt steppes (Limonietalia)
1520 * Iberian gypsum vegetation (Gypsophiletalia)
1530 * Pannonic salt steppes and salt marshes
1630 * Boreal Baltic coastal meadows
2. COASTAL SAND DUNES AND INLAND DUNES
2130 * Fixed coastal dunes with herbaceous vegetation ("grey dunes')
2140 * Decalcified fixed dunes with Empetrum nigrum
2150 * Atlantic decalcified fixed dunes (Calluno-Ulicetea)
2250 * Coastal dunes with Juniperus spp.
2270 * Wooded dunes with Pinus pinea and/or Pinus pinaster
2340 * Pannonic inland dunes
3. FRESHWATER HABITATS
3170 * Mediterranean temporary ponds
3180 * Turloughs
31A0 * Transylvanian hot-spring lotus beds
4. TEMPERATE HEATH AND SCRUB
4020 * Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix
4040 * Dry Atlantic coastal heaths with Erica vagans

4050 * Endemic macaronesian heaths
4070 * Bushes with Pinus mugo and Rhododendron hirsutum (Mugo-Rhododendretum hirsuti)
40A0 * Subcontinental peri-Pannonic scrub
40C0 * Ponto-Sarmatic deciduous thickets

5. SCLEROPHYLLOUS SCRUB (MATORRAL)

5140 * Cistus palhinhae formations on maritime wet heaths
5220 * Arborescent matorral with Zyziphus
5230 * Arborescent matorral with Laurus nobilis

6. NATURAL AND SEMI-NATURAL GRASSLAND FORMATIONS

6110 * Rupicolous calcareous or basophilic grasslands of the Alysso-Sedion albi
6120 * Xeric sand calcareous grasslands
6220 * Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea
6230 * Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)
6240 * Sub-Pannonic steppic grasslands
6250 * Pannonic loess steppic grasslands
6260 * Pannonic sand steppes
6270 * Fennoscandian lowland species-rich dry to mesic grasslands
6280 * Nordic alvar and precambrian calcareous flatrocks
62A0 Eastern sub-Mediterranean dry grasslands (Scorzoneratalia villosae)
62B0 * Serpentinophilous grassland of Cyprus
62C0 * Ponto-Sarmatic steppes
6530 * Fennoscandian wooded meadows

7. RAISED BOGS AND MIRES AND FENS

7110 * Active raised bogs
7130 Blanket bogs (* if active bog)
7210 * Calcareous fens with Cladium mariscus and species of the Caricion davallianae
7220 * Petrifying springs with tufa formation (Cratoneurion)
7240 * Alpine pioneer formations of the Caricion bicoloris-atrofuscae
7310 * Aapa mires
7320 * Palsa mires

8. ROCKY HABITATS AND CAVES

8160 * Medio-European calcareous scree of hill and montane levels
8240 * Limestone pavements

9. FORESTS

9010 * Western Taïga
9020 * Fennoscandian hemiboreal natural old broad-leaved deciduous forests (Quercus, Tilia, Acer, Fraxinus or Ulmus) rich in epiphytes
9030 * Natural forests of primary succession stages of landupheaval coast
9080 * Fennoscandian deciduous swamp woods
9180 * Tilio-Acerion forests of slopes, screes and ravines
91C0 * Caledonian forest
91D0 * Bog woodland
91E0 * Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
91G0 * Pannonic woods with Quercus petraea and Carpinus betulus
91H0 * Pannonian woods with Quercus pubescens
91I0 * Euro-Siberian steppic woods with Quercus spp.

91J0 * Taxus baccata woods of the British Isles
91N0 * Pannonic inland sand dune thicket (Junipero-Populetum albae)
91S0 * Western Pontic beech forests
91X0 * Dobrogean beech forests
91AA * Eastern white oak woods
9210 * Apeninne beech forests with Taxus and Ilex
9220 * Apennine beech forests with Abies alba and beech forests with Abies nebrodensis
9360 * Macaronesian laurel forests (Laurus, Ocotea)
9370 * Palm groves of Phoenix
9390 * Scrub and low forest vegetation with Quercus alnifolia
9510 * Southern Apennine Abies alba forests
9530 * (Sub-) Mediterranean pine forests with endemic black pines
9560 * Endemic forests with Juniperus spp.
9570 * Tetraclinis articulata forests
9580 * Mediterranean Taxus baccata woods
9590 * Cedrus brevifolia forests (Cedrosetum brevifoliae)