Heritage assessment of vegetation series of Corsica

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Abstract
From 2011 to 2015 symphytosociological investigations were carried out in Corsica in order to typify and map vegetation series and geoseries. This paper proposes a bioevaluation of vegetation series through the identification of natural and semi-natural habitats of Community interest.

Key words: Corsica, dynamico-catenal phytosociology, vegetation series and geoseries, habitats of Community interest.

Introduction
The national program for mapping natural and semi-natural vegetations of France (CarHAB) initiated by the Ministry of Ecology, Sustainable Development and Energy (MEDDE) in 2010, aims to establish an information system of natural and semi-natural vegetations of France, in order to propose tools to answer questions dealing with national conservation policies (protected areas strategy, ...) and to answer European obligations (assessment of the conservation status of habitats of Community interest...). Within this contexte, a research project based on the dynamico-catenal phytosociological method, was carried out in Corsica from 2012 to 2015. Its objective is to characterize the vegetation series and geoseries, highlighting their ecology, their structure, the dynamic trajectories, the role of anthropogenic factors on vegetation dynamics and the catenal position in the plant landscape (Rivas-Martínez, 1987; Blasi, 2010; Loidi et al., 2011). This work allowed to define 78 serials and geoserial units: 34 series, 14 minoriseries and 30 geopermaseries (Lefort, 2013; Tanné, 2014; Delbosc, 2015; Delbosc et al., 2015). The aim of this study is to evaluate the heritage value of vegetation series by assessing the habitats of Community interest (HCI) present in the dynamic stages that compose them (Biondi et al., 2005; Penas et al., 2005; Bagella et al., 2007; Galdenzi et al., 2011; Biondi et al., 2012). Therefore, the aim of this study is essentially to define conservation issues of symphytosociological and geosymphytosociological heritage. First we compare the number of HCI between vegetation series and then we analyze these results by floor vegetation to define conservation issues.

Materials and methods

Area study
Corsica is a Mediterranean island located at the center of the Mediterranean basin which considered one of 25 biodiversity hotspots (Médail & Quézel, 1999; Myers et al., 2000). The island extend for about 852,000 ha and presents an altitudinal gradient from the sea level up to 2,706 m that concerns 7 floors vegetation from the coast to the alpine floor (Gamisans, 1975, 1991; Paradis, 2004). From 2012 to 2015, phytosociological and symphytosociological investigations were conducted on several sectors of Corsica (Fig. 1) in order to typify and map vegetation series and geoseries (Delbosc, 2015).

Natura 2000 network in Corsica
The Natura 2000 network has been set up in application of both european directives: Birds Directive (79/409/EEC) and Habitats Directive (EU Directive 92/43/EEC) for the conservation of habitats and species of community interest. In Corsica, this network represents 43 sites identified as special areas of conservation and 17 sites as special protection areas. This network represents 255,004 ha among which 169,807 ha are terrestrial areas and 85,197 ha are marine areas.

Past and current human impacts
The history of the pastoral society has induced many changes in the Corsican landscape. Until the 1940s, the economy of the Asco valley was practically self-sufficient, mainly based on a farming activity. This mountain farming (slopes arranged in terraces, plateau) was based on a rotating system grazing-crop-fallow (Simi, 1954, 1981). After the Second World War, the hard-
ness of living conditions and the transition to a market economy has favored the rural exodus and led to a massive land abandonment, like in many mountain areas in Corsica (Ravis-Giordani et al., 2004). Fire is the most aggressive factor which participates to the forest degradation of the island. Fire has been considered for a long time as a factor influencing the vegetation dynamics (Flahault, 1924; Trabaud, 1995).

Methods

The typology of the vegetation series and geoseries Corsica was established by Delbosc (2015) according to dynamico-catenal phytosociological method (Tüxen, 1979; Géhu & Rivas-Martinez, 1981; Géhu, 1986; Rivas-Martinez, 1987). This symphytosociological study allows to define the main ecological patterns of Corsica and replace each vegetation in a dynamic trajectory.

The heritage assessment of vegetation series is based on the HCl which are present in each serial unit.

These symphytosociological and phytosociological works allow to describe the HCl of vegetation series and geoseries with correspondence to Natura 2000 habitats description (Bensettiti (coord.), 2001-2005).

Results

Considering the Fauna and Flora Habitats Directive (FFHD), Corsica has 112 habitats of Community interest distributed in most of the vegetation floors. Among the 112 HCl of FFHD present in Corsica (Reymann et al., 2017), 57 were identified in our area. HCl which have not been identified concern marine habitats, temporary pools and aquatic habitats. They also concern ponctual habitats in Corsica as 5330-4 Mediterranean thermophilous thickets to Genista aetnensis (Biv.) DC. Some sectors which have not been observed, like the eastern plain where the west rocky coast are composed singular habitats as 92A0-7 the alder forest of Alnus glutinosa (L.) Gaertn. and Fraxinus angustifolia Vahl subsp. oxyacarpa (Willds) or 5330-1 Mediterranean thermophilous thickets of Euphorbia dendroides L.

Among the 78 geopermaserial and serial units identified, 61 have at least one HCl. Table 1 shows the HCl for each vegetation series.

Analysis of habitat of Community interest

Because the geopermaseries and vegetation series characterize different plant landscape units, the analysis has focused initially on a comparison of the number of HCl between geopermaseries then a comparison of the number of HCl between minoriseries and to finish a comparison of the number of HCl between series.

The numbers of geopermasimeta, minorisimeta and sigmeta of figures correspond to the typology explained in Table 1.

Habitat of Community interest of geopermaseries

Figure 2 shows that the Salsola kali-Euphorbio pep-lis geopermasimeta and Arthrocnemo glauci-Sali-cornio emerici geopermasimeta are geopermasigmeta which comprise the most of HCl. However, three geopermaserial units no comprise HCl (Saxifrago tridactylites-Sedo stellati geopermasimeta, Sedo rupestris-Hieracio pilosellae geopermasimeta, Phragmito australis geopermasimeta).

Habitat of Community interest of minoriseries

Figure 3 shows that all the minoriseries encompass HCl. Three of them encompass 2 HCl (Pistacio lentisci-Junipero macrocarpae minorisimeta, Clematido cirrhosae-Pistacio lentisci minorisimeta variant at Smilax aspera, Paronychio polygonifoliae-Armerio multicepitis minorisimeta).

Habitat of Community interest of series

Galio rotundifolii-Pino laricii sigmetum variant at Luzula pedemontana is the only unit that comprise 5 HCl. Figure 4 shows that 11 vegetation series not include HCl (Buxo sempervirentis-Querco ilicis sigmetum, Ostryo carpinifoliae-Querco ilicis sigmetum, Oenantho pimpinelloides-Querco pubescens sigmetum, Stellario montanae-Buxo sempervirentis sigmetum, Fraxino orni-Acero monspessulanii sigmetum, Acero monspessulanii-Querco ilicis sigmetum, Sorbo aucupariae-Acero pseudoplantani sigmetum, Apio graveolentis-Alno glutinosae sigmetum, Angelico sylvestr-Alno

Fig. 1 - Natura 2000 network in Corsica (INPN, 2015).
<table>
<thead>
<tr>
<th>Name of signataxon</th>
<th>EUR 28 code</th>
<th>EUR 28 Title</th>
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</thead>
<tbody>
<tr>
<td>1 Pitsido lentisci-Juniperu macrocarpa minorisignetum</td>
<td>2250*</td>
<td>Coastal dunes with Juniperus spp.</td>
</tr>
<tr>
<td>2 Sileno corsicae-Amphithilus armadulceae geopamisignetum</td>
<td>1210</td>
<td>Annual vegetation of drift lines</td>
</tr>
<tr>
<td>3 Echinochloa spinosa-Amphithilus armadulceae geopamisignetum</td>
<td>1210</td>
<td>Annual vegetation of drift lines</td>
</tr>
<tr>
<td>4 Crassula maritima-Armero pungetis geopamisignetum</td>
<td>1210</td>
<td>Annual vegetation of drift lines</td>
</tr>
<tr>
<td>5 Maritime pine edaphophoretic dry thermomediterranean serie on coastal gravel terraces [Signetum not defined]</td>
<td>2270-2*</td>
<td>Wooded dunes with Pinus pinea and/or Pinus pinaster</td>
</tr>
<tr>
<td>6 Scrophulario ramossissimae Genista salzmannii minorisignetum</td>
<td>2210</td>
<td>Crassula maritima fixed beach dunes</td>
</tr>
<tr>
<td>7 Helichryso italicci-Scrophularia ramossissimae minorisignetum</td>
<td>2210</td>
<td>Crassula maritima fixed beach dunes</td>
</tr>
<tr>
<td>8 Salsolo kali-Ephorbia peplis geopamisignetum</td>
<td>1310-4</td>
<td>Salicornia and other annuals colonising mud and sand 15.12 - Mediterranean halophilous pioneer communities (Frankenia puleastinae) : formations of halophilous annuals (Frankenia puleastinae, Salvia splendens, Salvia soda, Cressa cretica, Parapholis incisa, P. strirosis, Hordeum marinum, Sphondys dasaricata) colonising salt muds of the Mediterranean region, susceptible to temporary inundation and extreme drying</td>
</tr>
<tr>
<td>9 Helichryso italicci-Cistus salzmannii minorisignetum</td>
<td>1210</td>
<td>Crassula maritima fixed beach dunes</td>
</tr>
<tr>
<td>10 Glaucio fani-Criitho maritimi geopamisignetum</td>
<td>1220</td>
<td>Perennial vegetation of rocky banks</td>
</tr>
<tr>
<td>11 Arthrocnemo glauci-Salicorni emerici geopamisignetum</td>
<td>1310</td>
<td>Salicornia and other annuals colonising mud and sand 15.12 - Mediterranean halophilous pioneer communities (Frankenia puleastinae) : formations of halophilous annuals (Frankenia puleastinae, Salvia splendens, Salvia soda, Cressa cretica, Parapholis incisa, P. strirosis, Hordeum marinum, Sphondys dasaricata) colonising salt muds of the Mediterranean region, susceptible to temporary inundation and extreme drying</td>
</tr>
<tr>
<td>12 Cleomado ciliarisae-Pitsido lentisci minorisignetum</td>
<td>5140-3</td>
<td>West Mediterranean clifftop phryganas (Astragalus-Plantaginetea subalpinae)</td>
</tr>
<tr>
<td>13 Helichryso microphylli-Asterico marium minorisignetum</td>
<td>5410-3</td>
<td>West Mediterranean clifftop phryganas (Astragalus-Plantaginetea subalpinae)</td>
</tr>
<tr>
<td>14 Helichryso microphylli-Astragalus arecicolae minorisignetum</td>
<td>5410-3</td>
<td>West Mediterranean clifftop phryganas (Astragalus-Plantaginetea subalpinae)</td>
</tr>
<tr>
<td>15 Euphorbias papyraceae-Helichryso microphylli minorisignetum</td>
<td>1240-3</td>
<td>Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.</td>
</tr>
<tr>
<td>16 Euphorbias pithyusa-Helichryso italicci minorisignetum</td>
<td>5140-3</td>
<td>West Mediterranean clifftop phryganas (Astragalus-Plantaginetea subalpinae)</td>
</tr>
<tr>
<td>17 Criitho maritimi-Limonic articali geopamisignetum</td>
<td>1240-2</td>
<td>Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.</td>
</tr>
<tr>
<td>18 Criitho maritimi-Limonic articali minorisignetum</td>
<td>1240-2</td>
<td>Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.</td>
</tr>
<tr>
<td>19 Criitho maritimi-Limonic articali geopamisignetum</td>
<td>1240-1</td>
<td>Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.</td>
</tr>
<tr>
<td>20 Criitho maritimi-Limonic articali minorisignetum</td>
<td>1240-1</td>
<td>Vegetated sea cliffs of the Mediterranean coasts with endemic Limonium spp.</td>
</tr>
<tr>
<td>21 Galio scabr-Querce rubetti signetum</td>
<td>9330-3</td>
<td>Quercus ruber</td>
</tr>
<tr>
<td>22 Erico arboreae-Juniperu turbaeae signetum</td>
<td>5210-5</td>
<td>Arboreal matmoral with Juniperus spp. 32.132 - Juniperus phoenicea arboreanimal matroral</td>
</tr>
<tr>
<td>23 Oleo sylvatica-Juniperu turbaeae signetum</td>
<td>5320</td>
<td>Arboreal matmoral with Juniperus spp. 32.132 - Juniperus phoenicea arboreanimal matroral</td>
</tr>
<tr>
<td>24 Cleomado ciliarisae-Pitsido lentisci minorisignetum</td>
<td>9320-3</td>
<td>Ola and Ceratonia forests</td>
</tr>
<tr>
<td>25 Galio scabr-Querce ilictis signetum variet at Lathyrun venetus</td>
<td>9340-11</td>
<td>Quercus ilex and Quercus rotundifolia forests</td>
</tr>
<tr>
<td>26 Galio scabr-Querce ilictis signetum variet at Fraxini armn var. arm</td>
<td>9450-1.5</td>
<td>Mediterranean pine forests with endemic Mesogean pines 42.824 - Corsican mesogean pine forests</td>
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<tr>
<td>27 Galio scabr-Querce ilictis signetum variet at Hydrarsicum spinossissimum and Phragmolu repens</td>
<td>9340-11</td>
<td>Quercus ilex and Quercus rotundifolia forests</td>
</tr>
<tr>
<td>28 Ilici sempervirens-Querce ilictis signetum</td>
<td>5410.3</td>
<td>West Mediterranean clifftop phryganas (Astragalus-Plantaginetea subalpinae)</td>
</tr>
<tr>
<td>29 Ostryo carpinifoliae - Querce ilictis signetum</td>
<td>5130</td>
<td>-</td>
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</table>

**Heritage assessment of vegetation series of Corsica**
<table>
<thead>
<tr>
<th>No.</th>
<th>Taxon</th>
<th>Characteristics</th>
<th>Reference</th>
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<tr>
<td>30</td>
<td><em>Galio saxtri-Querco ilicis pigmentum varians at Quercus pubescens</em></td>
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<td>Quercus ilic and Quercus rotundifolia forests</td>
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<td>31</td>
<td><em>Sambucus nigrae-Carpinus betulus minoris pigmentum varians at Juniperus oxycedrus</em></td>
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<tr>
<td>32</td>
<td><em>Sambucus nigrae-Carpinus betulus minoris pigmentum</em></td>
<td>-</td>
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</tr>
<tr>
<td>33</td>
<td><em>Saxifraga tridactylites-Reseda odorata geospermatis pigmentum</em></td>
<td>-</td>
<td>-</td>
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<td>34</td>
<td><em>Sedo pulchrae-Hettozia pinnatifoliae geospermatis pigmentum</em></td>
<td>-</td>
<td>-</td>
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<tr>
<td>35</td>
<td><em>Osmanthus pinnatifolii-Querco pubescentis pigmentum</em></td>
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<tr>
<td>36</td>
<td><em>Salix montanae-Betula sempervirens pigmentum</em></td>
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<td>37</td>
<td><em>Ilex aquifolium-Querco ilicis pigmentum</em></td>
<td>9380</td>
<td>Forests of Ilex aquifolium</td>
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<td>38</td>
<td><em>Juniperus oxycedrus-Querco ilicis pigmentum</em></td>
<td>4090-7</td>
<td>Endemic oro-Mediterranean heaths with gorse 31.75 - Cymo-Sardian hedgehog-heaths, <em>Carrica-Gentianastrum (Carrinella macrocephala)</em></td>
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<tr>
<td>39</td>
<td><em>Galio rotundifoli-Philae lacticervi pigmentum varians at Erica arborea</em></td>
<td>9530-2.1*</td>
<td>* (Sub-)Mediterranean pine forests with endemic black pines 42.64 - <em>Juniperus communis</em> forests - <em>Pinus laricio</em> forests of the mountains of Corsica (1000 to 1800 m) on granitic soils</td>
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<td>40</td>
<td><em>Cardaminopsis chelidoniae-Betula sempervirens pigmentum</em></td>
<td>6170-15</td>
<td>Alpine and subalpine calcareous grasslands 36.37 - Orot-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
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<td>41</td>
<td><em>Digitales laevarum-Castano salinum pigmentum</em></td>
<td>9260-4</td>
<td><em>Castanea sativa</em> woods</td>
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<td>42</td>
<td><em>Fraxinus ornus-Acer monspessulani pigmentum</em></td>
<td>-</td>
<td>-</td>
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<tr>
<td>43</td>
<td><em>Asperiscolinae-Taxo buccae pigmentum</em></td>
<td>9580.1*</td>
<td>Mediterranean <em>Taxus baccata</em> woods 42.37 - <em>Juniperus communis</em> - <em>Ilex aquifolium</em>, <em>Busus sempervirens</em> restricted to cool, montane areas in the Tenda range, the San Pedrone range and the Cap Corse mountains</td>
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<td>44</td>
<td><em>Acer monspessulani-Querco ilicis pigmentum</em></td>
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<td>45</td>
<td><em>Helichrysum italicum-Gentio salzmanni minoris pigmentum</em></td>
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<td>Endemic oro-Mediterranean heaths with gorse 31.75 - Cymo-Sardian hedgehog-heaths, <em>Carrica-Gentianastrum (Carrinella macrocephala)</em></td>
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<td><em>Genito salzmanni-Alphio berberianae minoris pigmentum</em></td>
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<td>Endemic oro-Mediterranean heaths with gorse 31.75 - Cymo-Sardian hedgehog-heaths, <em>Carrica-Gentianastrum (Carrinella macrocephala)</em></td>
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<td><em>Sedo brevitulli-Diantho goudvani pigmentum</em></td>
<td>8220</td>
<td>Silicenuus rocky slopes with clausiophytic vegetation 62.24 - <em>Cymo-Sardian siliceous montane cliff vegetation (Potentillo crassiflorae)</em>: <em>Potentilla crassiflora</em>, <em>Armeria lenocerephala</em>, <em>Silene requienii</em>, <em>Saxifraga pedemontana</em> sp. cervicornis</td>
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<td><em>Elymo sacrifaci-sarfugae pigmentum</em></td>
<td>8220</td>
<td>Silicenuus rocky slopes with clausiophytic vegetation 62.24 - <em>Cymo-Sardian siliceous montane cliff vegetation (Potentillo crassiflorae)</em>: <em>Potentilla crassiflora</em>, <em>Armeria lenocerephala</em>, <em>Silene requienii</em>, <em>Saxifraga pedemontana</em> sp. cervicornis</td>
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<td><em>Arthemathoro sarcoi pigmentum</em></td>
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<td>Silicenuus rocky slopes with clausiophytic vegetation 62.24 - <em>Cymo-Sardian siliceous montane cliff vegetation (Potentillo crassiflorae)</em>: <em>Potentilla crassiflora</em>, <em>Armeria lenocerephala</em>, <em>Silene requienii</em>, <em>Saxifraga pedemontana</em> sp. cervicornis</td>
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<td>50</td>
<td><em>Pono hahblisi-Phago sylvaticus pigmentum</em></td>
<td>9530-2.3*</td>
<td>* (Sub-)Mediterranean pine forests with endemic black pines 42.37 - <em>Juniperus communis</em> forests of the mountains of Corsica (1000 to 1800 m) on granitic soils</td>
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<td>51</td>
<td><em>Galio rotundifoli-Philae lacticervi pigmentum varians at Luzula pedemontana</em></td>
<td>6170-15</td>
<td>Alpine and subalpine calcareous grasslands 36.37 - Orot-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
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<td>52</td>
<td><em>Festuco sardoir-Phyeumo serrati pigmentum</em></td>
<td>8220-11</td>
<td>Silicenuus rocky slopes with clausiophytic vegetation 62.24 - <em>Cymo-Sardian siliceous montane cliff vegetation (Potentillo crassiflorae)</em>: <em>Potentilla crassiflora</em>, <em>Armeria lenocerephala</em>, <em>Silene requienii</em>, <em>Saxifraga pedemontana</em> sp. cervicornis</td>
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<td>53</td>
<td><em>Armeria lenocerephala-Potentillo crassiflorae pigmentum</em></td>
<td>8220-11</td>
<td>Silicenuus rocky slopes with clausiophytic vegetation 62.24 - <em>Cymo-Sardian siliceous montane cliff vegetation (Potentillo crassiflorae)</em>: <em>Potentilla crassiflora</em>, <em>Armeria lenocerephala</em>, <em>Silene requienii</em>, <em>Saxifraga pedemontana</em> sp. cervicornis</td>
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<td>54</td>
<td><em>Doronicum aristatum-Narthecium roseum pigmentum</em></td>
<td>6430.12</td>
<td>Hydrophilous tall herb fringed communities of plains and of the montane to alpine levels</td>
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<td><em>Doronicum aristatum-Narthecium roseum pigmentum</em></td>
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<td>Alpine and subalpine calcareous grasslands 36.37 - Orot-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
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<td>Heritage assessment of vegetation series of Corsica</td>
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<td><strong>55</strong> Dryopteris oreu-ch-Artherinae-Arundo sordoi &lt;br&gt;geoparismagnietum</td>
<td>8220-11</td>
<td>Siliceous rocky slopes with chaemophytic vegetation 62.24 - Cymo-Saritan siliceous montane clif vegetation (Potentilion crassirameae): Potentilla crassirameae, Armeria leucocephala, Silene requianti, Sarracenia pedemontana ssp. cervicornis.</td>
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<td><strong>56</strong> Paronychia polygona-ch-Armeria multicaespis &lt;br&gt;minoris magnietum</td>
<td>6170-16</td>
<td>Alpine and subalpine calcareous grasslands 36.37 - Oro-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
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<td><strong>57</strong> Sorbus aucupariae-Acer pseudoplatanus magnietum</td>
<td>4909-8</td>
<td>Endemic oro-Mediterranean heaths with geone 31.75 - Cymo-Saritan hedgehog-heaths. Corsica-Genesitellae (Genesitella macrocephalae).</td>
<td></td>
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<tr>
<td><strong>58</strong> Gao montani-Pilea brachystachyi &lt;br&gt;geoparismagnietum</td>
<td>6170-15</td>
<td>Alpine and subalpine calcareous grasslands 36.37 - Oro-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
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<td><strong>59</strong> Valeriana rotundifoliae-Adonis aestivalis briquetei &lt;br&gt;geoparismagnietum</td>
<td>6430-11</td>
<td>Sylleidion monte to snow levels (Andreoroscoelio alpinus and Galio-roscoelietas)</td>
<td></td>
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<td><strong>60</strong> Acino corsici-Tanacetum tomentosii &lt;br&gt;geoparismagnietum</td>
<td>8110-4</td>
<td>Siliceous turf of the montane to snow levels (Andreoroscoelio alpinus and Galio-roscoelietas)</td>
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<td><strong>61</strong> Dorepis grandifloris-Ostrya ilicifolia geoparismagnietum</td>
<td>6170-15</td>
<td>Alpine and subalpine calcareous grasslands 36.37 - Oro-Corsican grasslands of the subalpine (oro-Mediterranean) and alpine levels of the highest mountains of Corsica</td>
<td></td>
</tr>
<tr>
<td><strong>62</strong> Dryopteris carthusiana-Agro glaucescens magnietum</td>
<td>6430-12</td>
<td>Hydrophyllion tall herb fringe communities of plains and of the montane to alpine levels 37.8 - Hydrophyllion perennial tall herb communities of montane to alpine levels of the Betulo-Aegionetum class</td>
<td></td>
</tr>
<tr>
<td><strong>63</strong> Agyro gravoilete-Agro glaucescens magnietum</td>
<td>-</td>
<td>Active raised bogs</td>
<td></td>
</tr>
<tr>
<td><strong>64</strong> Angelica sylvestris-Agro glaucescens magnietum</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>65</strong> Sparganium neglectum-Agro glaucescens magnietum</td>
<td>-</td>
<td>-</td>
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<tr>
<td><strong>66</strong> Frazina angustifolia-Ulmus minoris magnietum</td>
<td>91E0</td>
<td>Riparian mixed forests of Quercus rubra, Ulmus laevis and Ulmus minor, Frazinae arcularis or Frazinae angustifoliae (along the great rivers (Ulmion minoris)</td>
<td></td>
</tr>
<tr>
<td><strong>67</strong> Esparviero corsici-Agro glaucescens magnietum</td>
<td>92A0-4</td>
<td>Salix alba and Populus alba gallerys</td>
<td></td>
</tr>
<tr>
<td><strong>68</strong> Scolopendrio officinalis-Agro glaucescens magnietum</td>
<td>92A0-4</td>
<td>Salix alba and Populus alba gallerys</td>
<td></td>
</tr>
<tr>
<td><strong>69</strong> Cyclamino repandui-Phehrea nitidula magnietum</td>
<td>92A0-4</td>
<td>Salix alba and Populus alba gallerys</td>
<td></td>
</tr>
<tr>
<td><strong>70</strong> Athamanto filix-feminae-Gentiano aculeatae magnietum</td>
<td>92A0-4</td>
<td>Salix alba and Populus alba gallerys</td>
<td></td>
</tr>
<tr>
<td><strong>71</strong> Galio rotundifoliae-Agro glaucescens magnietum</td>
<td>6430</td>
<td>Siliceous montane cliff vegetation of plains and of the montane to alpine levels 37.7 - Wet and siliceous tall herb fringe communities, along water courses and woodland borders belonging to the Pannonicum holmulae and the Conversoniola semen orders (Xenicion fritillarii, Aegopodion podagrariae, Conversoniola semen, Filipenduleion).</td>
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</tr>
<tr>
<td><strong>72</strong> Nasturtio officinalis geoparismagnietum</td>
<td>3150-1</td>
<td>Natural eutrophic lakes with Magnopatamion or Hydrocharition - type vegetation</td>
<td></td>
</tr>
<tr>
<td><strong>73</strong> Nasturtio officinalis geoparismagnietum</td>
<td>3260-1</td>
<td>Natural eutrophic lakes with Magnopatamion or Hydrocharition - type vegetation</td>
<td></td>
</tr>
<tr>
<td><strong>74</strong> Rutstro vincae-Aralis purpureae geoparismagnietum</td>
<td>3260-2</td>
<td>Water courses of plain to montane levels with the Rupicolion plantarum and Callitricho-Batrachocharia vegetation</td>
<td></td>
</tr>
<tr>
<td><strong>75</strong> Rutstro vincae-Aralis purpureae geoparismagnietum</td>
<td>92A0</td>
<td>Salix alba and Populus alba gallerys</td>
<td></td>
</tr>
<tr>
<td><strong>76</strong> Rutstro vincae-Aralis purpureae geoparismagnietum</td>
<td>92D0-1</td>
<td>Southern riparian galleries and thickets (Nerio-Tamaricetea and Serrulagrostietea incisae)</td>
<td></td>
</tr>
<tr>
<td><strong>77</strong> Lenzia minoris geoparismagnietum</td>
<td>3150-3</td>
<td>Natural eutrophic lakes with Magnopatamion or Hydrocharition - type vegetation</td>
<td></td>
</tr>
<tr>
<td><strong>78</strong> Phragmito australis geoparismagnietum</td>
<td>1410</td>
<td>Mediterranean salt meadows (Littoreetalia maritimae)</td>
<td></td>
</tr>
<tr>
<td><strong>79</strong> Phragmito australis geoparismagnietum</td>
<td>3150-1</td>
<td>Natural eutrophic lakes with Magnopatamion or Hydrocharition - type vegetation</td>
<td></td>
</tr>
</tbody>
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glutinosae sigmetum, Sparganio neglecti-Alno glutinosae sigmetum, Cyclamo repandi-Phillyreo sigmetum latifoliae).

In view of these results three main points emerge:
- coastal geopermaseries are those that have the largest number of HCl;
- with the exception of two minoriseries, all identified units have at least one HCl;
- azonal units (swampy vegetation and rivers) are the units that have the least HCl.

**Analysis of priority community interest habitats**

Among vegetation series having HCl, 5 of them encompass a priority HCl: *Pistacio lentisci-Juniper macrocarpae minorisigmetum*, edaphoxerophilous corsican serie dry thermomediterranean at *Pinus pinaster* on coastal gravel terraces, *Galio rotundifolii-Pino laricci sigmetum* variant at *Erica arborea*, *Asperulo odorae-Taxo baccatae sigmetum*, *Poo balbisii-Fago sylvaticae sigmetum*, *Galio rotundifolii-Pino laricci sigmetum* variant at *Luzula pedemontana*.

Only *Galio rotundifolii-Pino laricci sigmetum* variant at *Luzula pedemontana* includes two priority HCl.

**Conservation issues**

Figure 5 shows the number of HCl by type of serial units and by floor vegetation. The coastline is part of the island that includes the largest number of HCl. Supramediterranean and mountain-oro-mediterranean floor are those which comprise the most HCl with respectively 9 and 8 HCl.

**Map of conservation issues**

On the basis of the data obtained for the whole Corsica, we analyzed the distribution of habitats of community interest at the scale of the Asco valley.

Figure 6 indicates that the number of habitats of Community interest is more important on the western part of the valley which is characterized mainly by montain vegetation. However, on the east side of the valley the number of habitats of Community interest is low (on average 1 HCl).

**Discussion**

These results must be interpreted according to the type of serial or geoserail unit. The level of integration that represents geoserail units are composed by a greater number of vegetation which are considered as habitats of Community interest. This is the case of coastal geopermaseries which have an average of 6 to 10 syntaxa against 2 to 3 syntaxa for minoriserial and serial units.

These first results raise questions about some remarkable vegetations without any HCl:
- the presence of a Mediterranean beech forest corresponding to the *Poo balbisii-Fagetum sylvaticae* Gamisans 1975 is not currently recognized in the European referential of habitat EUR28 “Interpretation Manual of European Union habitats”, but deserves special attention. The occurrence of remarkable trees, and the age of these forests provide to these beech forests an exceptional interest representing a major conservation issue (Gamisans, 1981; Rota & Cancellieri, 2013);
- the swampy azonal serial units (*Apio graveolentis-Alno glutinosae sigmetum*, Angelico sylvestris-Alno glutinosae sigmetum, *Sparganio neglecti-Alno glutinosae sigmetum*) do not encompass any habitat of
Community interest. Gamisans (2013) highlighted their limited distribution in Corsica and their floristic interest which have not been recognized in the DHFF. The riparian plant landscape have a complex structure characterized by a geomorphological feature that gives them an ecological and biological value (Quézel & Médail, 2003). The complexity of riparian plant landscape is explained by the presence of various geomorphological sets (benches, floodplain, permanent and temporary water courses) that favour the expression of original vegetation (medioeuropean vegetation of \textit{Salicetea purpurea} Moor 1958 or \textit{Nebroio oleandri-Tamaricetea africanae}, over hanging canopy or alluvial forest formed of \textit{Querco roboris-Fagetea sylvaticae}. Introduction of exotic species (\textit{Ailanthus altissima} (Mill.) Swingle in particular) represents a major threat on this riparian geoseries. Beyond the presence/absence of HCI in the vegetation series, one must integrate a surface size and range of habitats of Community interest. In the study areas surveyed from 2012 to 2015, some series appear punctually and are represented only by one habitat in the plant landscape like the \textit{Asperulo odorae-Taxo bacca-tae sigmetum}. Fire and grazing can:

- on the one hand, reduced the expression of this serie which has been identified on supramediterranean ubacs of Cap Corse. Sylvatic formations of \textit{Buxus sempervirens} and \textit{Taxus baccata} is extremely degraded and may disappear if the intensity and frequency of fire and grazing continue;
- on the other hand, in some cases, anthropogenic pressures such as fire and grazing, maintaining open areas and favor the expression of HIC. This is the case of supramediterranean and mountain series of \textit{Pinus nigra} subsp. \textit{lario var. corsicana} (Galo rotundifolii-Pino laricii sigmetum variant at \textit{Erica arborea}, Galio rotundifolii-Pino laricii sigmetum variant at \textit{Luzula pedemontana}) mainly consisting of heathland and grassland HCI: 4090-7 Supramediterranean heathland of Corsica; 4090-8 mountain heathland of Corsica; 6170-15 meso-xerophilous mountain grasslands of Corsica. This outcomes show that agropastoral and anthropogenic pressures can be favorable to maintaining HCI.

The heritage assessment vegetation series and geoseries of Corsica initiated in this work is the first step of amore consistent work. It requires bioassessment of the dynamic, stages composing each series (Biondi et al., 2005; Penas et al., 2005; Galdenzi et al., 2011). Bioassessment methods need quantitative data to take into account several criteria such as diversity, rarity, originality, quality botanical, area and distance to the potential vegetation (Costa et al., 1987; Martin Osorio & Asensi Marfil, 1987; Penas et al., 2005; Biondi et al., 2006; Bioret et al., 2011).

Two serial and geoserial units can be considered as
major conservation issues.

The *Dryopteridi carthusianae-Alno glutinosae sigmetum* represents a major challenge for the conservation of plant landscape of Corsica. It develops on peaty singular ecological envelops and is recorded on two sites on the island (Valdu and Bagliettu, commune of Moltifao) and covers only 34 ha (Delbosc et al., 2015). Valdu is the largest Sphagnum peat bog in Corsica and probably one of the largest in the Mediterranean region (Gamisans et al., 1998). Besides a plant landscape interest, these peaty complexes contain dozens of remarkable taxa (Calvez & Dupuy, 1995; Branthomme & Varelides, 1996; Ferrandini, 1996; Laitung, 1997; Reille, 1997; Gamisans et al., 1998). The main threat is the increasing colonization of alien invasive species *Ailanthus altissima*.

The *Rubo ulmifolii-Nerio oleandri geopermasigmetum* represents vegetation dominated by two protected species at the regionally level (*Vitex agnus-castus* and *Nerium oleander*) and recorded in a few riparian sites of the island (Paradis, 2006; Paradis & Piazza, 2011). This geopermaseries develops in particular hydrodynamics riparian forests: it is located near the temporary rivers mouths of gravel and pebble terraces which become often dry in summer. The presence of protected species and of one HCl, linked to its singular ecology and its limited distribution provide a high heritage value to this geopermaseries.

The mapping distribution of the number of habitats of Community interest on the Asco valley should be linked with the socio-economic context of the valley. Besides its floristic-phytosociological representativeness, the plant landscape of the Asco valley integrates ancient and recent history of the Corsican pastoral society (Ravel, 1911; Ravis-Giordani, 1983). The fire regime, recurrent and increasingly intense, profoundly changed the structure of the substrate and more widely the density and opening of the canopy of forest habitat (Reille et al., 1980; Pons & Quézel, 1985). In the mesomediterranean and supramediterranean areas, the shorter and more intense fires contributed to eliminate original deciduous vegetations and promoted the instalation of *Quercus ilex* (Gamisans, 1986).

Today, a large part of the valley is grazed by goats, sheep and cattle that play a major role in the structure and texture of vegetation.

This context partly explains the distinction between the western part of the valley, richer in many HCl, and the east part, characterize by a lower number of HCl.

This study should be complemented by a more detailed assessment at the level of plant communities but also at plant landscape. On the scale of the plant community, it would be interesting to analyze the floristic composition (native taxa, endemic, invasive alien), dynamic stage of vegetation series and catenal arrangement of vegetations in each geopermaseries. This criteria are necessary to analyze the ecological functionality of serial and geoserial units and provide simple and rapid measurement of the ecological characteristics and grade of dynamic evolution of the...
phytoecoenoses (Acosta et al., 2000; Giupponi et al., 2013). At plant landscape level, it would be interesting to analyze the spatial distribution of habitats from vegetation maps (Stanisci et al., 2014; Biondi et al., 2005; Penas et al., 2005; Galdenzi et al., 2011). Vegetation mapping works realized in Corsica and particularly those on the Biguglia lake (Gamisans & Piazza, 1992; Gamisans, 2006; Delbosc et al., 2015) and the Haut-Venacais (Gamisans et al., 1981; Tanné, 2014) are examples. The information obtained from these studies allows to assess the response of HCI to different scenario of anthropogenic pressures (frequency, fires, grazing, invasive alien species...) according to a diachronic approach.

Within this context, the maps of vegetation series and geoseries can be used as complementary tools for assessing the potential dynamic of current vegetation, and for bioassessment or conservation of HCI (Biondi et al., 2005; Penas et al., 2005; Biondi et al., 2007; Galdenzi et al., 2011; Batista et al., 2012; Biondi, 2012; Galdenzi et al., 2012).

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Vitex agnus-castus

Vitex agnus-castus