

Vegetation succession of a post-harvested peat bog and survival of moths and butterflies (Lepidoptera): a case study of the Soumarský Most bog (Bohemian Forest, South Bohemia, central Europe)

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Abstract

Moths and butterflies (Lepidoptera) communities were investigated in the post-harvested valley peat bog Soumarský Most in the Bohemian Forest during vegetation season of 2011–2016. Total 371 species of all peat bog ecological categories were recorded. The survival of moths and butterflies was interpreted under natural vegetation succession and revitalization. The Soumarský Most bog seems to be colonized by bog insect specialists (tyrphobionts and tyrphophiles) from surrounding pristine peatlands of the Vltavský Luh complex (including the Mrtvý Luh bog), which is the unique source of recolonization by relict taxa. Only small insect species proportion probably survived the heavy peat exploitation of the Soumarský Most bog in the past time.

Key words: moths, butterflies, peat bog, ecological succession, conservation, Šumava Mountains, Vltavský Luh reserve

INTRODUCTION

Peat bogs of central Europe are relict unique ecosystems existing continuously since the early Holocene period at the same sites. The conservation priorities are the virgin and semi-virgin localities in South Bohemia, namely the peat bogs of the Bohemian Forest (Šumava Mountains) – cf. SCHREIBER (1924), BUFKOVÁ et al. (2005), SPITZER & DANKS (2006), SPITZER & BUFKOVÁ (2013). The extrazonal character of such peat bogs considering the existence of a large zone of similar peatland ecosystems in the North and Northeast Europe, gives the central European peat bogs a large biogeographical context in entomofauna and vegetation (for the list of Lepidoptera and bibliography see SPITZER & DANKS 2006, JAROŠ et al. 2014).

The most important human-made impacts are change of hydrological conditions, extraction of horticulture peat, and forest plantations. Even in the Bohemian Forest are some localities disturbed by human activities. The most important conservation of pristine peatlands needs supplementary projects of restoration ecology including studies of insect bioindicators. The extremely useful seems to be the Soumarský Most bog, which is under a project of revitalization and restoration of hydrological conditions. Hydrology of the Soumarský Most bog was disturbed several times for peat exploitation and forest management (LANTA et al. 2004, HORN 2009, HORN & BASTL 2012). Data of insect bioindicators (namely Lepidoptera) associated with restoration of the Soumarský Most bog are badly needed in continuation of our previous research in virgin/semivirgin peat bogs of the Bohemian Forest.

MATERIAL AND METHODS

Study site

All revised Lepidoptera records from the Soumarský Most bog were noted (2011–2016) in two basic revitalized units of wet and dry parts of the investigated bog (cf. HORN 2009). The locality Soumarský Most bog is a large peat bog (90 ha) – 48°54'N 13°50'E, altitude 745 m a.s.l. The original climax formation had to be association *Pino rotundatae-Sphagnetum* Kästner et Flössner 1933, surrounded by association *Vaccinio uliginosi-Pinetum* Kleist 1949. But only small fragments survived after large scale peat exploitation (HORN 2009). The locality is a part of the large wetland complex Vltavský Luh with several well preserved and mostly pristine valley peat bogs, e.g. the Mrtvý Luh bog (cf. BUFKOVÁ et al. 2005, SPITZER & BUFKOVÁ 2013, JAROŠ et al. 2014). First original description of vegetation was published by SCHREIBER (1924) with notes about partial bog exploitation. The impact of peat exploitation was extremely strong between 1958–1999 (LANTA et al. 2004, HORN 2009). The vegetation of the Soumarský Most bog before revitalization and restoration was described by HORN (2009) who recorded also plant colonization of a peat barren ground. From entomological point of view, the most important have been improvement of hydrological conditions and introduction of basic peat plants: *Sphagnum* spp., *Eriophorum* spp., and *Carex rostrata* (Fig. 1, cf. HORN 2009). Relatively rare records of *Vaccinium* spp. (namely *V. uliginosum*, Fig. 2) form food plants complex for some tyrphobiotic and tyrphophilous insects.

Surveys

The species of Lepidoptera were studied for a period 2011–2016. The main method of sampling moths was UV light trapping by modified Pennsylvanian light trap (8 W UV lamp). The light was placed directly on the ground. Diurnally active butterflies and moths were sampled by netting. Larvae were collected from food plants individually and reared in the laboratory. Nomenclature of Lepidoptera follows JAROŠ et al. (2014).

The four basic ecological categories were used (see e.g. MIKKOLA & SPITZER 1983, SPITZER & DANKS 2006): (1) tyrphobiotic species – bog specialists (stenotopic cold-adapted species of bogs); (2) tyrphophilous species (characteristic for bog, but not confined to them, more abundant on bogs than in adjacent habitat); (3) tyrphoneutral species (resident in bogs, but also common in other habitats); (4) tyrphoxenous species (non resident vagrants, often migratory species that cannot live permanently in bogs).

RESULTS AND DISCUSSION

During our five-year study, 371 species and 2758 individuals of Lepidoptera were recorded: ten species of which are tyrphobionts, 27 species tyrphophilous, 281 species tyrphoneutral, and 53 tyrphoxenous species (Appendix 1). Our results of the Soumarský Most bog conforms low number of tyrphobiotic species and high proportion of tyrphophiles and tyrphoneutrals (cf. JAROŠ et al. 2014). Tyrphoxens are associated with early succession and/or temporary colonization by migrants from other habitat (Appendix 1 – e.g. *Eurrhypara hortulata* and *Inachis io*). The most abundant are tyrphoneutrals in all stages of the succession, wet and dry habitats (see Appendix 1).

From conservation point of view, the most interesting groups are tyrphobionts, which are recorded from pristine bogs, some taxa are common in the nearest large peat bog Mrtvý Luh and adjacent localities. All the Mrtvý Luh moth populations of tyrphobionts are more diverse and abundant compared to Soumarský Most bog populations with exception of *Amphipoea lucens* associated with wet peaty grasslands (see ELSNER et al. 1981, SPITZER &



Fig. 1. The Soumarský Most bog (May 2011) – communities of natural peatland succession, dominant succession of *Eriophorum vaginatum*.



Fig. 2. The Soumarský Most bog (July 2016) – relatively rare communities of *Vaccinium uliginosum*.

Table 1. Tyrphobiotic Lepidoptera of the revitalized Soumarský Most bog (SM) and adjacent pristine Mrtvý Luh bog (ML) and Velká Niva bog (VN)

Species	Family	SM	ML	VN
<i>Glyphipterix haworthana</i> (Stephens, 1834)	Glyphipterigidae	+	+	+
<i>Elachista kilmunella</i> Stainton, 1849	Elachistidae	0	+	+
<i>Coleophora uliginosella</i> Glitz, 1872	Coleophoridae	0	+	+
<i>Athrips pruinosellus</i> (Lienig & Zeller, 1846)	Gelechiidae	0	+	+
<i>Chionodes nebulosellus</i> (Heinemann, 1870)	Gelechiidae	0	+	0
<i>Chionodes viduella</i> (Fabricius, 1794)	Gelechiidae	0	+	0
<i>Apotomis fraterculana</i> Krogerus 1946	Tortricidae	0	0	+
<i>Epinotia gimmerthaliana</i> (Lienig & Zeller, 1846)	Tortricidae	0	+	+
<i>Olethreutes turfosanus</i> (Herrich-Schäffer, 1851)	Tortricidae	0	+	0
<i>Pammene luedersiana</i> (Sorhagen, 1885)	Tortricidae	0	+	+
<i>Crambus alienellus</i> (Germar & Kaulfuss, 1817)	Crambidae	0	+	0
<i>Pediasia truncatella</i> (Zetterstedt, 1839)	Crambidae	+	+	0
<i>Colias palaeno</i> (Linnaeus, 1761)	Pieridae	+	+	+
<i>Boloria aquilonaris</i> (Stichel, 1908)	Nymphalidae	0	+	0
<i>Proclossiana eunomia</i> (Esper, 1799)	Nymphalidae	0	+	+
<i>Vacciniina optilete</i> (Knoch, 1781)	Lycaenidae	+	+	+
<i>Arichanna melanaria</i> (Linnaeus, 1758)	Geometridae	+	+	+
<i>Carsia sororiata</i> (Hübner, 1813)	Geometridae	0	+	+
<i>Acronicta menyanthidis</i> (Esper, 1789)	Noctuidae	+	+	+
<i>Amphipoea lucens</i> (Freyer, 1845)	Noctuidae	+	+	+
<i>Celaena haworthii</i> (Curtis, 1829)	Noctuidae	+	+	+
<i>Coenophila subrosea</i> (Stephens, 1829)	Noctuidae	+	+	+
<i>Coranarta cordigera</i> (Thunberg, 1788)	Noctuidae	0	+	0
<i>Lithophane lamda</i> (Fabricius, 1787)	Noctuidae	+	+	+
<i>Xestia alpicola</i> (Zetterstedt, 1839)	Noctuidae	0	+	0
Total number of tyrphobiotic species		10	24	17

DANKS 2006, JAROŠ et al. 2014, and Table 1). *Glyphipteryx haworthana* (Figs. 3,4) and *Celaena haworthii* are species with high probability associated with early succession of *Eriophorum* spp. and expanding *Sphagnum* cover after revitalization. Several other tyrphobionts are characteristic for drier habitats of relict *Vaccinium uliginosum*, which is the food plant of *Colias palaeno*. Already ELSNER et al. (1981) recorded several peatland Lepidoptera from the Soumarský Most bog including the tyrphobiotic moth *Crambus alienellus*, which disappeared after heavy exploitation and disturbance of water system of the bog. Some forest species (F in Appendix 1) are also associated with *Vaccinium* formations. The tyrphophiles are often common (Appendix 1), some are important for conservation and rare outside peatlands. The only exception is *Crambus uliginosellus* discovered in the Soumarský Most bog, which is a rare species in Czechia and has only one locality in the Bohemian Forest (Appendix 1).



Fig. 3. *Eriophorum vaginatum* and freshly emerged male of *Glyphipterix haworthana*, the Soumarský Most bog, 10 May 2012.



Fig. 4. *Glyphipterix haworthana* is common in all peatlands near Soumarský Most bog (e.g. the Velká Niva bog, 16 May 2013) and strongly associated with the *Sphagnum* and *Eriophorum* spp. complex.

CONCLUSIONS

Revitalization of the Soumarský Most bog (see HORN 2009) seems to be important from lepidopterological point of view. Most of the species colonize the locality (wet parts especially) from near virgin peatlands (Mrtvý Luh bog, Malá Niva bog and some peaty fragments, “stepping stones” for some biota). If the revitalization of the Soumarský Most bog is successful, the territory of the large reserve Vltavský Luh will be completed. The whole Vltavský Luh reserve is one of the most important parts of the core zone of the Šumava National Park with unique Lepidoptera. The preservation of peatland hydrological conditions and elimination of closed spruce forest vegetation are basic implementations for conservation of relict insects, not only butterflies and moths (SPITZER & DANKS 2006).

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Appendix 1. List of Lepidoptera of the Soumarský Most bog. W – Wetland, F – Forest, HG – Heathland-Grassland, typhoxenous species are not classified, their habitat association is not permanent (e.g. many migratory species).

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
Tyrphobionts								
<i>Glyphipterix haworthana</i> (Stephens, 1834)	Glyphipterigidae	0	1	0	1	0	2	W
<i>Pediasia truncatella</i> (Zetterstedt, 1839)	Crambidae	1	0	0	0	0	1	W
<i>Colias palaena</i> (Linnaeus, 1761)	Pieridae	4	10	3	0	9	26	W
<i>Yaccinina optilete</i> (Knoch, 1781)	Lycaenidae	0	0	1	0	0	1	W
<i>Arichanna melanaria</i> (Linnaeus, 1758)	Geometridae	1	0	0	0	0	1	W / F
<i>Acronicta menyihidhis</i> (Esper, 1789)	Noctuidae	1	0	0	0	4	5	W
<i>Amphipoea lucens</i> (Freyer, 1845)	Noctuidae	39	52	1	0	23	115	W
<i>Celaena haworthii</i> (Curtis, 1829)	Noctuidae	1	0	0	0	1	2	W
<i>Coenophila subrosea</i> (Stephens, 1829)	Noctuidae	0	0	1	0	5	6	W
<i>Lithophane lamda</i> (Fabricius, 1787)	Noctuidae	0	0	0	0	1	1	W
Tyrphophiles								
<i>Sterrhopterix standfussi</i> (Wocke, 1851)	Psychidae	0	0	1	0	0	1	W
<i>Pleurota bicostella</i> (Clerck, 1759)	Oecophoridae	0	0	1	0	1	2	W / HG
<i>Biselachista albidella</i> (Nylander, 1848)	Elachistidae	1	1	1	0	0	3	W
<i>Neofacultia ericetella</i> (Geyer, 1832)	Gelechiidae	0	2	0	0	1	3	W / HG
<i>Neofacultia infernella</i> (Herrich-Schäffer, 1854)	Gelechiidae	4	7	1	0	6	18	W / F
<i>Ancylis myrtilana</i> (Treitschke, 1830)	Tortricidae	1	0	0	0	1	2	W / F
<i>Ancylis unguicella</i> (Linnaeus, 1758)	Tortricidae	0	2	0	0	13	15	W / HG
<i>Apotomis sauciana</i> (Frölich, 1828)	Tortricidae	0	1	0	0	0	1	W / F
<i>Bactra lancealana</i> (Hübner, 1799)	Tortricidae	3	2	65	0	11	81	W
<i>Olethreutes micans</i> (Denis & Schiffermüller, 1775)	Tortricidae	0	0	1	0	1	2	W
<i>Olethreutes palustranus</i> (Lienig & Zeller, 1846)	Tortricidae	0	0	1	1	0	2	W
<i>Rhopobota myrtilana</i> (Humphries & Westwood, 1845)	Tortricidae	0	1	0	0	0	1	W / F
<i>Catoptria margaritella</i> (Denis & Schiffermüller, 1775)	Crambidae	4	10	24	6	9	53	W
<i>Crambus uliginosellus</i> Zeller, 1850	Crambidae	1	0	0	0	1	2	W
<i>Saturnia pavonia</i> (Linnaeus, 1758)	Saturniidae	0	0	0	0	1	1	HG / W
<i>Coenonympha tullia</i> (Müller, 1764)	Satyridae	0	1	0	0	3	4	W

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Callophrys rubi</i> (Linnaeus, 1758)	Lycaenidae	0	0	0	0	3	3	HG / W
<i>Ematurga atomaria</i> (Linnaeus, 1758)	Geometridae	10	0	0	0	16	26	W / HG
<i>Eulihis testata</i> (Linnaeus, 1761)	Geometridae	0	1	0	0	0	1	W
<i>Semiothisa brunneata</i> (Thunberg, 1784)	Geometridae	0	1	0	0	0	1	W / F
<i>Anarta myrtilli</i> (Linnaeus, 1761)	Noctuidae	0	0	0	0	1	1	HG / W
<i>Eurois occultus</i> (Linnaeus, 1758)	Noctuidae	1	0	0	1	3	5	W
<i>Hypenodes humidalis</i> Doubleday, 1850	Noctuidae	5	2	5	6	11	29	W
<i>Hyppa rectilinea</i> (Esper, 1788)	Noctuidae	0	1	0	0	0	1	F
<i>Lithomoia solidaginis</i> (Hübner, 1803)	Noctuidae	0	0	0	0	1	1	W / F
<i>Lycophotia porphyrea</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	2	0	1	3	W / HG
<i>Protolampra sobrina</i> (Duponchel, 1843)	Noctuidae	0	0	0	1	0	1	W
Tyrphoneutrals								
<i>Nematopogon metaxellus</i> (Hübner, 1813)	Adelidae	0	0	0	0	1	1	F
<i>Epichnopteryx plumella</i> (Denis & Schiffermüller, 1775)	Psychidae	0	3	0	0	1	4	HG
<i>Caloptilia betulicola</i> (Hering, 1928)	Gracillariidae	0	0	0	0	1	1	F
<i>Caloptilia stigmatella</i> (Fabricius, 1781)	Gracillariidae	0	0	3	0	0	3	F / W
<i>Parornix betulae</i> (Stainton, 1854)	Gracillariidae	0	1	1	5	3	10	F
<i>Phyllonorycter ulmifoliellus</i> (Hübner, 1817)	Gracillariidae	0	0	0	0	1	1	F
<i>Bucculatrix demaryella</i> (Duponchel, 1840)	Bucculatricidae	1	0	0	0	0	1	F
<i>Argyresthia conjugella</i> Zeller, 1839	Yponomeutidae	0	0	1	0	0	1	F
<i>Argyresthia goedartella</i> (Linnaeus, 1758)	Yponomeutidae	0	1	2	0	0	3	F
<i>Ocnerosstoma pinariellum</i> Zeller, 1847	Yponomeutidae	0	0	1	0	0	1	F
<i>Agonopterix angelicella</i> (Hübner, 1813)	Oecophoridae	0	0	0	1	0	1	W
<i>Agonopterix ciliella</i> (Stainton, 1849)	Oecophoridae	0	1	0	0	0	1	W / HG / F
<i>Denisia stipella</i> (Linnaeus, 1758)	Oecophoridae	0	1	0	0	0	1	F
<i>Pseudatemelia josephinae</i> (Toll, 1956)	Oecophoridae	0	1	0	0	0	1	W / F
<i>Elachista canapemella</i> (Hübner, 1813)	Elachistidae	0	0	0	0	2	2	HG
<i>Elachista alpinella</i> Stainton, 1854	Elachistidae	0	0	1	0	0	1	W

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Chionodes electellus</i> (Zeller, 1839)	Gelechiidae	0	1	1	0	0	2	F
<i>Chionodes luctuelus</i> (Hübner, 1793)	Gelechiidae	0	1	0	0	0	1	F
<i>Coleophora allicolella</i> Zeller, 1849	Coleophoridae	16	1	0	0	0	17	W
<i>Coleophora betulella</i> Heinemann, 1876	Coleophoridae	0	0	3	0	0	3	F
<i>Coleophora caespititiella</i> Zeller, 1839	Coleophoridae	4	4	0	0	0	8	W
<i>Coleophora glaucicolella</i> Wood, 1892	Coleophoridae	1	1	11	0	0	13	W
<i>Coleophora mihvipennis</i> Zeller, 1839	Coleophoridae	0	3	17	2	2	24	F
<i>Coleophora serratella</i> (Linnaeus, 1761)	Coleophoridae	0	1	1	0	0	2	F
<i>Coleophora striatipennella</i> Nylander, 1848	Coleophoridae	1	1	0	0	0	2	W
<i>Coleophora sylvaticella</i> Wood, 1892	Coleophoridae	1	0	0	0	0	1	F
<i>Coleophora taeniipennella</i> Herrich-Schäffer, 1855	Coleophoridae	0	2	0	0	0	2	W
<i>Hypatopa binotella</i> (Thunberg, 1794)	Blastobasidae	0	2	0	0	0	2	F
<i>Acanthophila latipennella</i> (Rebel, 1937)	Gelechiidae	1	0	0	0	0	1	F
<i>Acompsia cinerella</i> (Clerck, 1759)	Gelechiidae	1	2	1	0	0	4	F
<i>Anacamptis populella</i> (Clerck, 1759)	Gelechiidae	0	0	1	0	0	1	F
<i>Bryotropha affinis</i> (Haworth, 1828)	Gelechiidae	0	1	0	0	0	1	HG
<i>Bryotropha galbanella</i> (Zeller, 1839)	Gelechiidae	0	0	0	0	1	1	F
<i>Bryotropha senectella</i> (Zeller, 1839)	Gelechiidae	0	0	1	0	0	1	F
<i>Bryotropha similis</i> (Stainton, 1854)	Gelechiidae	0	1	0	1	0	2	F
<i>Exoteleia dodecella</i> (Linnaeus, 1758)	Gelechiidae	1	2	2	1	0	6	F
<i>Helcystogramma rufescens</i> (Haworth, 1828)	Gelechiidae	1	3	5	1	1	11	W
<i>Hypatima rhomboidella</i> (Linnaeus, 1758)	Gelechiidae	0	0	0	0	1	1	F
<i>Sophronia semicostella</i> (Hübner, 1813)	Gelechiidae	0	1	0	0	0	1	HG
<i>Teletodes proximellus</i> (Hübner, 1796)	Gelechiidae	0	1	2	0	4	7	F
<i>Cossus cossus</i> (Linnaeus, 1758)	Cossidae	0	0	0	0	1	1	F
<i>Acleris notana</i> (Donovan, 1806)	Tortricidae	0	3	1	2	2	8	F
<i>Adoxophyes orana</i> (Fischer von Röslerstamm, 1834)	Tortricidae	2	5	1	4	9	21	F
<i>Aethes enicana</i> (Westwood, 1854)	Tortricidae	0	1	2	0	0	3	W

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Ancylis achatana</i> (Denis & Schiffmüller, 1775)	Tortricidae	0	0	1	0	0	1	F
<i>Ancylis geminana</i> (Donovan, 1806)	Tortricidae	0	1	0	0	0	1	W / F
<i>Ancylis laetana</i> (Fabricius, 1775)	Tortricidae	0	1	0	0	0	1	F
<i>Ancylis uncella</i> (Denis & Schiffmüller, 1775)	Tortricidae	0	0	2	0	0	2	F
<i>Aphelia unitana</i> (Hübner, 1799)	Tortricidae	0	0	0	0	1	1	W
<i>Apotomis betuletana</i> (Haworth, 1811)	Tortricidae	0	0	1	0	2	3	F
<i>Apotomis turbidana</i> Hübner, 1825	Tortricidae	0	0	1	1	3	5	F
<i>Archips podanus</i> (Scopoli, 1763)	Tortricidae	0	0	0	0	1	1	HG / F
<i>Celypha striana</i> (Denis & Schiffmüller, 1775)	Tortricidae	0	0	1	0	0	1	HG
<i>Cnephasia asseclana</i> (Denis & Schiffmüller, 1775)	Tortricidae	0	15	0	2	0	17	W / HG / F
<i>Cnephasia stephensiana</i> (Doubleday, 1849)	Tortricidae	3	7	1	2	0	13	W / HG / F
<i>Cochylis dubitana</i> (Hübner, 1799)	Tortricidae	0	1	0	0	0	1	W / F / HG
<i>Epiplasma hepaticanum</i> (Treitschke, 1835)	Tortricidae	0	1	0	0	0	1	W / F / HG
<i>Epinotia brunnichana</i> (Linnaeus, 1767)	Tortricidae	0	0	0	0	1	1	F
<i>Epinotia demarniana</i> (Fischer von Röslerstamm, 1840)	Tortricidae	0	0	0	0	3	3	F
<i>Epinotia nanana</i> (Treitschke, 1835)	Tortricidae	0	0	0	0	1	1	F
<i>Epinotia nisella</i> (Clereh, 1759)	Tortricidae	0	0	3	0	0	3	F
<i>Epinotia solandriana</i> (Linnaeus, 1758)	Tortricidae	1	0	0	0	0	1	F
<i>Epinotia tedella</i> (Clereh, 1759)	Tortricidae	2	2	0	0	4	8	F
<i>Epinotia tetraquetrana</i> (Haworth, 1811)	Tortricidae	0	1	0	0	0	1	F
<i>Epinotia trigonella</i> (Linnaeus, 1758)	Tortricidae	1	0	2	0	0	3	F
<i>Eulia ministrana</i> (Linnaeus, 1758)	Tortricidae	1	0	0	0	1	2	F
<i>Olethreutes dissolutanus</i> (Stange, 1886)	Tortricidae	0	1	0	0	0	1	F
<i>Olethreutes lacumanus</i> (Denis & Schiffmüller, 1775)	Tortricidae	1	0	2	0	1	4	W / F / HG
<i>Olethreutes rivulamus</i> (Scopoli, 1763)	Tortricidae	0	2	1	1	4	8	W / HG
<i>Orthotaenia undulana</i> (Denis & Schiffmüller, 1775)	Tortricidae	1	8	6	7	8	30	W / F
<i>Pandemis cerasana</i> (Hübner, 1786)	Tortricidae	0	0	0	1	3	4	F
<i>Pandemis corylana</i> (Fabricius, 1794)	Tortricidae	0	0	0	0	1	1	F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Pandemis dumerana</i> (Treitschke, 1835)	Tortricidae	0	0	0	0	1	1	W / HG
<i>Retinia resinella</i> (Linnaeus, 1758)	Tortricidae	0	0	0	0	1	1	F
<i>Rhopobota naevana</i> (Hübner, 1817)	Tortricidae	2	9	1	0	12	24	W / F
<i>Rhyacionia pinivorana</i> (Lienig & Zeller, 1846)	Tortricidae	0	0	0	0	1	1	F
<i>Syndemis musculana</i> (Hübner, 1799)	Tortricidae	0	1	0	0	0	1	F
<i>Apomyelois bistriatella</i> (Hulst, 1887)	Pyralidae	1	0	0	0	0	1	F
<i>Dioryctria abietella</i> (Denis & Schiffermüller, 1775)	Pyralidae	1	0	0	0	1	2	F
<i>Dioryctria simplicella</i> Heinemann, 1863	Pyralidae	0	0	0	0	1	1	F
<i>Metriostola betulae</i> (Goeze, 1778)	Pyralidae	1	1	2	2	2	8	F
<i>Pyla fusca</i> (Haworth, 1811)	Pyralidae	0	0	5	0	1	6	F
<i>Agriphila straminella</i> (Denis & Schiffermüller, 1775)	Crambidae	1	0	4	1	0	6	HG / W
<i>Agriphila tristella</i> (Denis & Schiffermüller, 1775)	Crambidae	0	1	0	0	1	2	HG
<i>Catachysta lemnata</i> (Linnaeus, 1758)	Crambidae	0	1	0	0	0	1	W
<i>Catoptria falsella</i> (Denis & Schiffermüller, 1775)	Crambidae	1	0	1	0	0	2	HG
<i>Catoptria oshelderi</i> (de Lattin, 1950)	Crambidae	0	0	0	0	1	1	HG
<i>Catoptria permutatella</i> (Herrich-Schäffer, 1848)	Crambidae	2	0	0	0	0	2	HG
<i>Crambus lathonitellus</i> (Zincken, 1817)	Crambidae	3	8	1	1	15	28	W / HG
<i>Crambus pascuellus</i> (Linnaeus, 1758)	Crambidae	9	8	12	1	8	38	W / HG
<i>Crambus peritellus</i> (Scopoli, 1763)	Crambidae	1	1	0	0	0	2	HG
<i>Dipleurina lacustrata</i> (Panzer, 1804)	Crambidae	11	2	0	2	6	21	F
<i>Donacula mucronellus</i> (Denis & Schiffermüller, 1775)	Crambidae	1	3	0	0	1	5	W
<i>Eudonia pallida</i> (Curtis, 1827)	Crambidae	1	1	2	1	1	6	F / W
<i>Eudonia trunciolella</i> (Stainton, 1849)	Crambidae	13	9	6	0	18	46	F / W
<i>Chrysoteuchia culmella</i> (Linnaeus, 1758)	Crambidae	0	2	2	0	7	11	W / HG
<i>Opsibotys fuscalis</i> (Denis & Schiffermüller, 1775)	Crambidae	0	0	0	0	1	1	F
<i>Scoparia ambiguaalis</i> (Treitschke, 1829)	Crambidae	1	5	4	3	6	19	F
<i>Scoparia ancipitella</i> (La Harpe, 1855)	Crambidae	2	10	1	1	1	15	F
<i>Scoparia basistrigalis</i> Knaggs, 1866	Crambidae	0	1	0	0	0	1	F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Dendrolimus pini</i> (Linnaeus, 1758)	Lasiocampidae	0	3	0	0	0	3	F
<i>Macrothylacia rubi</i> (Linnaeus, 1758)	Lasiocampidae	1	0	0	0	2	3	W / HG
<i>Endromis versicolora</i> (Linnaeus, 1758)	Endromidae	0	2	0	0	0	2	F
<i>Loathoe populi</i> (Linnaeus, 1758)	Sphingidae	1	2	0	1	3	7	F
<i>Smerinthus ocellatus</i> (Linnaeus, 1758)	Sphingidae	0	0	0	0	3	3	W / F
<i>Sphinx pinastri</i> Linnaeus, 1758	Sphingidae	0	0	0	0	2	2	F
<i>Aglaia tau</i> (Linnaeus, 1758)	Saturniidae	3	1	0	0	0	4	F
<i>Cartrocephalus palaemon</i> (Pallas, 1771)	Hesperiidae	0	0	0	0	1	1	HG / W
<i>Anthocharis cardamines</i> (Linnaeus, 1758)	Pieridae	0	0	0	0	1	1	W
<i>Gonepteryx rhamni</i> (Linnaeus, 1758)	Pieridae	1	1	0	3	1	6	F
<i>Pieris napi</i> (Linnaeus, 1758)	Pieridae	8	5	15	1	2	31	HG
<i>Boloria euphrosyne</i> (Linnaeus, 1758)	Nymphalidae	0	0	1	0	0	1	W / HG
<i>Brenthis ino</i> (Rottemburg, 1775)	Nymphalidae	0	0	1	0	0	1	W
<i>Melitaea aethalia</i> (Rottemburg, 1775)	Nymphalidae	0	0	8	0	0	8	W / HG
<i>Nymphalis antiopa</i> (Linnaeus, 1758)	Nymphalidae	0	0	1	0	0	1	W / F
<i>Aphantopus hyperantus</i> (Linnaeus, 1758)	Satyridae	0	0	8	0	1	9	HG
<i>Lasiommata maera</i> (Linnaeus, 1758)	Satyridae	0	0	1	0	0	1	HG
<i>Celastrina argiolus</i> (Linnaeus, 1758)	Lycanidae	0	0	1	0	0	1	F
<i>Drepana falcataria</i> (Linnaeus, 1758)	Drepanidae	0	0	0	0	13	13	F
<i>Falcaria lacerinaria</i> (Linnaeus, 1758)	Drepanidae	0	5	2	5	47	59	F
<i>Habrosyne pyritoides</i> (Hufnagel, 1766)	Drepanidae	6	6	1	0	5	18	F
<i>Ochropacha duplaris</i> (Linnaeus, 1761)	Drepanidae	1	0	0	0	0	1	F
<i>Thyatira batis</i> (Linnaeus, 1758)	Drepanidae	0	0	0	0	1	1	F
<i>Aethalura punctulata</i> (Denis & Schiffmüller, 1775)	Geometridae	0	0	0	0	2	2	F
<i>Alcis bastelbergi</i> (Hirschke, 1908)	Geometridae	0	0	1	2	0	3	F
<i>Alcis repandata</i> (Linnaeus, 1758)	Geometridae	1	4	0	3	2	10	F
<i>Biston betularius</i> (Linnaeus, 1758)	Geometridae	1	3	1	0	2	7	F
<i>Bupalus piniarius</i> (Linnaeus, 1758)	Geometridae	1	0	0	0	2	3	F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Cabera exanthemata</i> (Scopoli, 1763)	Geometridae	1	0	0	2	0	3	W / F / HG
<i>Cabera pusaria</i> (Linnaeus, 1758)	Geometridae	0	1	1	2	1	5	F / W
<i>Campaca margaritata</i> (Linnaeus, 1767)	Geometridae	0	1	0	0	0	1	F
<i>Campogramma bilineatum</i> (Linnaeus, 1758)	Geometridae	1	0	0	0	2	3	HG
<i>Chlorochysta citrata</i> (Linnaeus, 1861)	Geometridae	3	1	0	0	1	5	W / F
<i>Chlorochysta miata</i> (Linnaeus, 1758)	Geometridae	0	0	0	0	1	1	F
<i>Chlorochysta siterata</i> (Hufnagel, 1767)	Geometridae	0	0	2	0	0	2	F
<i>Chlorochysta truncata</i> (Hufnagel, 1767)	Geometridae	0	0	0	0	1	1	F
<i>Crocallis elinguaris</i> (Linnaeus, 1758)	Geometridae	2	0	1	0	0	3	F
<i>Cyclophora albipunctata</i> (Hufnagel, 1767)	Geometridae	0	0	1	1	2	4	F
<i>Deileptenia ribeata</i> (Clerck, 1759)	Geometridae	0	0	0	0	2	2	F
<i>Ecliptopera silaceata</i> (Denis & Schiffermüller, 1775)	Geometridae	0	0	0	0	1	1	F
<i>Ectropis crepuscularia</i> (Denis & Schiffermüller, 1775)	Geometridae	0	1	0	1	4	6	F
<i>Ennomos autumnarius</i> (Werneburg, 1859)	Geometridae	0	0	0	0	2	2	F
<i>Entephria caesiata</i> (Denis & Schiffermüller, 1775)	Geometridae	0	1	0	0	0	1	F
<i>Epione repandaria</i> (Hufnagel, 1767)	Geometridae	1	0	0	1	0	2	F / W
<i>Epirrhoe alternata</i> (Müller, 1764)	Geometridae	0	0	0	0	1	1	HG
<i>Eulithis populata</i> (Linnaeus, 1758)	Geometridae	3	0	1	1	0	5	W / F
<i>Eupithecia tantillaria</i> Boisduval, 1840	Geometridae	1	2	0	0	8	11	F
<i>Eupithecia vulgata</i> (Haworth, 1809)	Geometridae	0	0	0	0	1	1	W / HG / F
<i>Geometra papilionaria</i> (Linnaeus, 1758)	Geometridae	1	2	1	1	1	6	F
<i>Hydrelia sylvata</i> (Denis & Schiffermüller, 1775)	Geometridae	0	1	1	0	0	2	F
<i>Hydriomena furcata</i> (Thunberg, 1784)	Geometridae	2	6	0	0	4	12	F
<i>Hydriomena impluviata</i> (Denis & Schiffermüller, 1775)	Geometridae	0	0	0	0	4	4	F
<i>Hylaea fasciaria</i> (Linnaeus, 1758)	Geometridae	0	0	0	0	1	1	F
<i>Hypomecis punctinalis</i> (Scopoli, 1763)	Geometridae	1	0	0	0	3	4	F
<i>Hypomecis roboraria</i> (Denis & Schiffermüller, 1775)	Geometridae	0	1	0	0	0	1	F
<i>Idaea aversata</i> (Linnaeus, 1758)	Geometridae	3	1	0	4	3	11	F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Idaea biselata</i> (Hufnagel, 1767)	Geometridae	0	0	2	0	3	5	F
<i>Lobophora halterata</i> (Hufnagel, 1767)	Geometridae	0	1	0	0	0	1	F
<i>Lomasipilis marginata</i> (Linnaeus, 1758)	Geometridae	0	1	2	0	3	6	F/W
<i>Lycia hirtaria</i> (Clerck, 1759)	Geometridae	0	3	0	5	1	9	F
<i>Odezia atrata</i> (Linnaeus, 1758)	Geometridae	0	0	3	0	0	3	W
<i>Odontopera bidentata</i> (Clerck, 1759)	Geometridae	0	1	0	0	0	1	F
<i>Orthonama vittata</i> (Borkhausen, 1794)	Geometridae	1	3	0	0	0	4	W
<i>Peribatodes secundarius</i> (Denis & Schiffermüller, 1775)	Geometridae	0	0	0	1	2	3	F
<i>Perizoma affinitatum</i> (Stephens, 1831)	Geometridae	0	2	0	0	0	2	F
<i>Perizoma albulatum</i> (Denis & Schiffermüller, 1775)	Geometridae	19	1	0	0	0	20	HG
<i>Perizoma alchemillatum</i> (Linnaeus, 1758)	Geometridae	1	14	0	0	1	16	F
<i>Perizoma diadymatum</i> (Linnaeus, 1758)	Geometridae	2	0	0	0	0	2	W/F/HG
<i>Plagodis pulveraria</i> (Linnaeus, 1758)	Geometridae	0	0	0	0	1	1	F
<i>Pterapherapteryx sexalata</i> (Retzius, 1783)	Geometridae	0	1	0	0	0	1	W/F
<i>Scopula immutata</i> (Linnaeus, 1758)	Geometridae	0	0	1	0	0	1	W/HG
<i>Scopula nigropunctata</i> (Hufnagel, 1767)	Geometridae	0	0	0	0	2	2	F
<i>Scopula ternata</i> (Schrank, 1802)	Geometridae	0	0	0	1	0	1	W/F
<i>Scotopteryx chenopodiata</i> (Linnaeus, 1758)	Geometridae	1	1	2	2	2	8	HG
<i>Selenia tetralunaria</i> (Hufnagel, 1767)	Geometridae	0	2	0	0	1	3	F
<i>Semiothisa clathrata</i> (Linnaeus, 1758)	Geometridae	2	0	0	0	1	3	W/HG
<i>Semiothisa liturata</i> (Clerck, 1759)	Geometridae	1	0	0	0	1	2	F
<i>Semiothisa signaria</i> (Hübner, 1809)	Geometridae	1	0	0	0	0	1	F
<i>Siona lineata</i> (Scopoli, 1763)	Geometridae	0	1	0	0	0	1	HG
<i>Thera firmata</i> (Hübner, 1822)	Geometridae	2	0	0	0	7	9	F
<i>Thera obeliscata</i> (Hübner, 1787)	Geometridae	0	0	1	0	0	1	F
<i>Thera variata</i> (Denis & Schiffermüller, 1775)	Geometridae	3	2	0	2	0	7	F
<i>Venusia cambrica</i> Curtis, 1839	Geometridae	0	0	0	1	0	1	F
<i>Xanthorhoe birivivata</i> (Borkhausen, 1794)	Geometridae	0	1	0	0	0	1	F/W

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Xanthorhoe designata</i> (Hufnagel, 1767)	Geometridae	1	0	0	0	0	1	W / F / HG
<i>Xanthorhoe montanata</i> (Denis & Schiffermüller, 1775)	Geometridae	0	1	0	0	0	1	F / W / HG
<i>Xanthorhoe quadrifasciata</i> (Clerck, 1759)	Geometridae	3	0	0	0	0	3	HG
<i>Xanthorhoe spadicearia</i> (Denis & Schiffermüller, 1775)	Geometridae	0	0	2	0	0	2	HG
<i>Clostera curtula</i> (Linnaeus, 1758)	Notodontidae	0	1	0	0	0	1	F
<i>Clostera pigra</i> (Hufnagel, 1766)	Notodontidae	1	1	1	0	15	18	F / W
<i>Eligmodonta ziczac</i> (Linnaeus, 1758)	Notodontidae	0	0	1	0	0	1	F
<i>Notodonta dromedarius</i> (Linnaeus, 1767)	Notodontidae	0	1	1	0	0	2	F
<i>Phalera bucephala</i> (Linnaeus, 1758)	Notodontidae	0	0	1	5	9	15	F
<i>Pheosia gnoma</i> (Fabricius, 1776)	Notodontidae	0	1	0	0	1	2	F
<i>Pheosia tremula</i> (Clerck, 1759)	Notodontidae	0	4	0	0	1	5	F
<i>Pterostoma palpinum</i> (Clerck, 1759)	Notodontidae	0	0	0	0	1	1	F
<i>Philonon capucina</i> (Linnaeus, 1758)	Notodontidae	0	0	1	0	0	1	F
<i>Stauropus fagi</i> (Linnaeus, 1758)	Notodontidae	0	0	0	2	0	2	F
<i>Calliteara pudibunda</i> (Linnaeus, 1758)	Lymantriidae	0	1	0	0	1	2	F
<i>Lymantria monacha</i> (Linnaeus, 1758)	Lymantriidae	1	0	0	1	12	14	F
<i>Orgyia antiqua</i> (Linnaeus, 1758)	Lymantriidae	0	0	0	0	1	1	HG / F
<i>Arctia caja</i> (Linnaeus, 1758)	Arctiidae	2	9	3	6	5	25	HG / W / F
<i>Cybosia mesomella</i> (Linnaeus, 1758)	Arctiidae	14	8	14	9	11	56	F / W / HG
<i>Diacrista sannio</i> (Linnaeus, 1758)	Arctiidae	0	0	3	2	5	10	W / HG
<i>Eilema complanum</i> (Linnaeus, 1758)	Arctiidae	49	30	62	70	183	394	F / HG
<i>Eilema depressum</i> (Esper, 1787)	Arctiidae	7	14	3	5	28	57	F
<i>Eilema lurideolum</i> (Zincken, 1817)	Arctiidae	2	8	6	12	10	38	F
<i>Eilema lutarellum</i> (Linnaeus, 1758)	Arctiidae	0	0	1	0	32	33	HG
<i>Eilema sororculum</i> (Hufnagel, 1766)	Arctiidae	0	0	0	0	1	1	HG
<i>Lithosia quadra</i> (Linnaeus, 1758)	Arctiidae	0	0	0	1	18	19	HG
<i>Phragmatobia fuliginosa</i> (Linnaeus, 1758)	Arctiidae	1	1	0	2	1	5	W / HG
<i>Spilosoma lubricipeda</i> (Linnaeus, 1758)	Arctiidae	0	1	0	0	5	6	HG / W / F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Spilosoma luteum</i> (Hufnagel, 1766)	Arctiidae	0	0	0	2	0	2	HG / W / F
<i>Thumatha senex</i> (Hübner, 1808)	Arctiidae	4	6	9	10	21	50	W
<i>Acronicta auritoma</i> (Denis & Schiffermüller, 1775)	Noctuidae	2	2	0	0	4	8	HG
<i>Acronicta megacephala</i> (Denis & Schiffermüller, 1775)	Noctuidae	2	1	0	3	8	14	F / W
<i>Agrotis exclamationis</i> (Linnaeus, 1758)	Noctuidae	1	0	0	2	0	3	HG
<i>Amphipyra pyramidea</i> (Linnaeus, 1758)	Noctuidae	0	0	0	0	1	1	HG / F
<i>Amphipyra tragopoginis</i> (Clerck, 1759)	Noctuidae	0	1	0	0	1	2	HG / F
<i>Anaplectoides prasinus</i> (Denis & Schiffermüller, 1775)	Noctuidae	1	0	0	0	23	24	F / W
<i>Apamea crenata</i> (Hufnagel, 1766)	Noctuidae	0	0	1	0	0	1	HG
<i>Apamea lateritia</i> (Hufnagel, 1766)	Noctuidae	0	0	1	0	0	1	HG
<i>Apamea monoglypha</i> (Hufnagel, 1766)	Noctuidae	1	2	0	0	7	10	HG
<i>Apamea remissa</i> (Hübner, 1809)	Noctuidae	0	0	0	0	1	1	W
<i>Apamea rubritrera</i> (Treitschke, 1825)	Noctuidae	0	1	0	0	1	2	HG
<i>Apamea scolopacina</i> (Esper, 1788)	Noctuidae	0	0	0	0	4	4	W / F
<i>Autographa bractea</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	1	0	0	1	HG
<i>Autographa pulchrina</i> (Haworth, 1809)	Noctuidae	0	1	0	0	0	1	HG / F
<i>Blepharita satara</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	0	0	1	1	F
<i>Brachyolmia viminalis</i> (Fabricius, 1776)	Noctuidae	0	1	0	0	2	3	W / F
<i>Catocala fraxini</i> (Linnaeus, 1758)	Noctuidae	0	1	0	0	2	3	F
<i>Catocala nipta</i> (Linnaeus, 1767)	Noctuidae	0	0	0	0	1	1	F
<i>Celaena leucostigma</i> (Hübner, 1808)	Noctuidae	1	0	0	0	0	1	W
<i>Cerapteryx graminis</i> (Linnaeus, 1758)	Noctuidae	1	1	1	0	0	3	HG
<i>Chortodes pygmina</i> (Haworth, 1809)	Noctuidae	1	2	0	0	1	4	W
<i>Colocasia coryli</i> (Linnaeus, 1758)	Noctuidae	0	0	0	0	10	10	F
<i>Cosmia trapezina</i> (Linnaeus, 1758)	Noctuidae	1	0	0	0	0	1	F
<i>Deltote uncula</i> (Clerck, 1759)	Noctuidae	0	1	0	0	1	2	W
<i>Diarsia brunnea</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	5	1	0	3	9	W / HG
<i>Diarsia mendica</i> (Fabricius, 1775)	Noctuidae	0	2	0	0	1	3	HG / W / F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Diarisia rubi</i> (Vieweg, 1790)	Noctuidae	0	0	0	0	1	1	W / HG
<i>Enargia paleacea</i> (Esper, 1788)	Noctuidae	0	0	0	0	1	1	F
<i>Eriopogodes imbecillus</i> (Fabricius, 1794)	Noctuidae	1	0	2	1	1	5	W / HG
<i>Herminia tarsicrinalis</i> (Knoch, 1782)	Noctuidae	0	0	1	0	0	1	F
<i>Herminia tarsipennalis</i> Treitschke, 1835	Noctuidae	0	1	0	0	1	2	F
<i>Hoplodrina blanda</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	0	3	2	5	HG
<i>Hoplodrina octogenaria</i> (Goeze, 1781)	Noctuidae	0	0	0	2	1	3	HG
<i>Hypena proboscidalis</i> (Linnaeus, 1758)	Noctuidae	0	0	0	0	2	2	F
<i>Lasionycta proxima</i> (Hübner, 1809)	Noctuidae	0	0	1	3	0	4	HG
<i>Laspeyria flexula</i> (Denis & Schiffermüller, 1775)	Noctuidae	1	1	0	2	12	16	F / HG
<i>Lygephila pastinum</i> (Treitschke, 1826)	Noctuidae	0	1	0	0	1	2	HG
<i>Melanchra pisi</i> (Linnaeus, 1758)	Noctuidae	0	0	0	0	1	1	HG
<i>Mythimna conigera</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	0	1	0	1	HG
<i>Mythimna impura</i> (Hübner, 1808)	Noctuidae	25	54	23	36	42	180	HG
<i>Mythimna pallens</i> (Linnaeus, 1758)	Noctuidae	1	0	0	0	0	1	HG
<i>Mythimna pudorina</i> (Denis & Schiffermüller, 1775)	Noctuidae	6	9	9	0	0	24	W
<i>Naenia typica</i> (Linnaeus, 1758)	Noctuidae	1	0	0	0	0	1	HG
<i>Noctua pronuba</i> (Linnaeus, 1758)	Noctuidae	0	0	0	1	0	1	HG
<i>Ochrolepura plecta</i> (Linnaeus, 1761)	Noctuidae	5	8	1	0	0	14	HG
<i>Oligia latruncula</i> (Denis & Schiffermüller, 1775)	Noctuidae	1	0	0	0	0	1	HG
<i>Orthosia gothica</i> (Linnaeus, 1758)	Noctuidae	0	0	0	1	0	1	F
<i>Parastichtis suspecta</i> (Hübner, 1718)	Noctuidae	0	0	0	0	1	1	F / W
<i>Plusia putnami</i> (Grote, 1873)	Noctuidae	15	7	4	0	1	27	W
<i>Polia bombycina</i> (Hufnagel, 1766)	Noctuidae	0	0	4	0	1	5	HG
<i>Polia hepatica</i> (Clerck, 1759)	Noctuidae	0	3	0	0	0	3	W / HG / F
<i>Polymixis gemmea</i> (Treitschke, 1825)	Noctuidae	0	1	0	0	0	1	HG / W
<i>Protodeltote pygarga</i> (Hufnagel, 1766)	Noctuidae	0	1	0	0	4	5	F
<i>Pseudoips prasinanus</i> (Linnaeus, 1758)	Noctuidae	1	0	0	0	0	1	F

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Rivula sericealis</i> (Scopoli, 1763)	Noctuidae	0	0	0	1	1	2	W / HG
<i>Rusina ferruginea</i> (Esper, 1785)	Noctuidae	2	10	7	2	6	27	W / F / HG
<i>Scoliopteryx libatrix</i> (Linnaeus, 1758)	Noctuidae	0	0	0	1	1	2	F / W
<i>Tholera decimialis</i> (Poda, 1761)	Noctuidae	1	7	0	0	0	8	W / HG
<i>Trachea atriplicis</i> (Linnaeus, 1758)	Noctuidae	1	0	0	0	0	1	F
<i>Xanthia icteritia</i> (Hufnagel, 1766)	Noctuidae	0	1	0	0	0	1	F
<i>Xanthia togata</i> (Esper, 1788)	Noctuidae	0	0	0	0	1	1	F
<i>Xestia baja</i> (Denis & Schiffermüller, 1775)	Noctuidae	6	5	1	4	7	23	W / HG / F
<i>Xestia c-nigrum</i> (Linnaeus, 1758)	Noctuidae	1	1	0	0	0	2	HG
<i>Xestia collina</i> (Boisduval, 1840)	Noctuidae	0	0	0	0	1	1	F
<i>Xestia sexstrigata</i> (Haworth, 1809)	Noctuidae	1	1	2	0	0	4	W / HG
<i>Xestia triangulum</i> (Hufnagel, 1766)	Noctuidae	1	1	0	0	0	2	HG
<i>Xylota vetusta</i> (Hübner, 1813)	Noctuidae	0	0	0	0	1	1	HG / W
Tyrphoxens								
<i>Adela croesella</i> (Scopoli, 1763)	Adelidae	0	1	0	0	0	1	
<i>Timeola bisselliella</i> (Hummel, 1823)	Timeidae	0	0	0	0	1	1	
<i>Eucalyptus auroguttellus</i> (Stephens, 1835)	Gracillariidae	1	1	2	0	0	4	
<i>Roestlerstammia erxebella</i> (Fabricius, 1787)	Roestlerstammidae	0	0	1	0	0	1	
<i>Argyresthia trifasciata</i> Staudinger, 1871	Yponomeutidae	1	0	0	0	0	1	
<i>Yponomeuta evonymellus</i> (Linnaeus, 1758)	Yponomeutidae	3	1	0	2	1	7	
<i>Plutella xylostella</i> (Linnaeus, 1758)	Plutellidae	0	0	0	0	3	3	
<i>Agonopterix liturosa</i> (Haworth, 1811)	Oecophoridae	0	1	0	0	0	1	
<i>Agonopterix petasitis</i> (Standfuss, 1851)	Oecophoridae	1	0	0	0	0	1	
<i>Borkhausenia minutella</i> (Linnaeus, 1758)	Oecophoridae	1	1	0	0	1	3	
<i>Depressaria olerella</i> Zeller, 1854	Oecophoridae	0	0	0	0	1	1	
<i>Coleophora laricella</i> (Hübner, 1817)	Coleophoridae	3	0	0	0	0	3	
<i>Coleophora sternipennella</i> (Zetterstedt, 1839)	Coleophoridae	0	1	0	0	0	1	
<i>Batrachedra praeangusta</i> (Haworth, 1828)	Batrachedridae	0	0	1	0	0	1	

Appendix I. Continued.

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Mompha epilobiella</i> (Denis & Schiffmüller, 1775)	Momphidae	0	0	0	1	0	1	
<i>Mompha raschiella</i> (Zeller, 1839)	Momphidae	0	1	0	0	0	1	
<i>Eulamprotes atrella</i> (Denis & Schiffmüller, 1775)	Gelechiidae	0	0	4	0	1	5	
<i>Eulamprotes unicolorella</i> (Duponchel, 1843)	Gelechiidae	0	1	0	0	0	1	
<i>Ilseopsis acuminatella</i> (Sircom, 1850)	Gelechiidae	0	2	0	0	0	2	
<i>Ancylis badiana</i> (Denis & Schiffmüller, 1775)	Tortricidae	0	1	0	0	0	1	
<i>Lathronympha sirigana</i> (Fabricius, 1775)	Tortricidae	0	0	0	0	1	1	
<i>Strophedra weirana</i> (Douglas, 1850)	Tortricidae	0	1	0	0	0	1	
<i>Oncocera semirubella</i> (Scopoli, 1763)	Pyralidae	1	0	0	0	0	1	
<i>Eurhyppara hortulata</i> (Linnaeus, 1758)	Crambidae	0	0	0	1	0	1	
<i>Phlyctaenia perlucidalis</i> (Hübner, 1809)	Crambidae	0	0	0	1	0	1	
<i>Pleuroptya ruralis</i> (Scopoli, 1763)	Crambidae	1	3	0	0	1	5	
<i>Sphinx ligustri</i> Linnaeus, 1758	Sphingidae	0	1	0	0	0	1	
<i>Aglais urticae</i> (Linnaeus, 1758)	Nymphalidae	0	0	0	0	1	1	
<i>Araschnia levana</i> (Linnaeus, 1758)	Nymphalidae	0	2	0	0	1	3	
<i>Inachis io</i> (Linnaeus, 1758)	Nymphalidae	5	2	0	2	0	9	
<i>Issoria lathonia</i> (Linnaeus, 1758)	Nymphalidae	0	1	0	0	0	1	
<i>Vanessa atalanta</i> (Linnaeus, 1758)	Nymphalidae	0	0	1	0	3	4	
<i>Cyaniris semitargus</i> (Rotenburg, 1775)	Lycanidae	0	0	1	0	0	1	
<i>Polyommatus amandus</i> (Schneider, 1792)	Lycanidae	0	0	8	0	0	8	
<i>Wassonalla cultararia</i> (Fabricius, 1775)	Drepanidae	0	0	0	0	1	1	
<i>Aplocera praeformata</i> (Hübner, 1826)	Geometridae	0	0	0	0	1	1	
<i>Eupithecia valerianata</i> (Hübner, 1813)	Geometridae	0	0	0	0	1	1	
<i>Eustroma reticulatum</i> (Denis & Schiffmüller, 1775)	Geometridae	0	0	0	0	1	1	
<i>Chlorochystis v-ata</i> (Haworth, 1809)	Geometridae	0	0	0	0	1	1	
<i>Perizoma taeniatum</i> (Stephens, 1831)	Geometridae	0	0	0	1	0	1	
<i>Plemyria rubiginata</i> (Denis & Schiffmüller, 1775)	Geometridae	0	0	1	0	0	1	
<i>Rhinoprova rectangularata</i> (Linnaeus, 1758)	Geometridae	1	0	0	0	0	1	

Species	Family	2011	2012	2013	2014	2016	Total	Vegetation type
<i>Harpyia milhauseri</i> (Fabricius, 1775)	Noctuidae	0	1	0	0	0	1	
<i>Arctornis l-nigrum</i> (Müller, 1764)	Lymantriidae	0	0	1	0	1	2	
<i>Nudaria mundana</i> (Linnaeus, 1761)	Arctiidae	0	0	0	0	1	1	
<i>Amphipoea ficosa</i> (Freyer, 1830)	Noctuidae	1	0	0	0	0	1	
<i>Callistege mi</i> (Clerck, 1759)	Noctuidae	0	0	0	0	1	1	
<i>Dypterygia scabriuscula</i> (Linnaeus, 1758)	Noctuidae	0	0	0	0	1	1	
<i>Charanyca trigrammica</i> (Hufnagel, 1766)	Noctuidae	0	0	0	0	1	1	
<i>Ipimorpha retusa</i> (Linnaeus, 1761)	Noctuidae	1	0	0	0	0	1	
<i>Meganola strigula</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	0	0	1	1	
<i>Nonagra typhae</i> (Thunberg, 1784)	Noctuidae	0	0	0	0	1	1	
<i>Trisateles emortalis</i> (Denis & Schiffermüller, 1775)	Noctuidae	0	0	1	0	0	1	