

Rediscovery of the rare saproxylic beetle *Peltis grossa* (Linnaeus, 1758), Coleoptera: Trogossitidae, in the Šumava National Park and its occurrence in surrounding area

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Abstract

After about hundred years of absence of the endangered beetle *Peltis grossa* in the area of the Šumava National Park, the species was found at 26 sites in years 2018–2020. Direct search methods such as reporting adults and exit holes, peeling the bark of snags and checking bark beetle pheromone traps were used to find the species. *P. grossa* inhabited mostly dead spruce snags originated by windstorm Kyril in 2007 and subsequent spruce bark beetle outbreak. Similarly to other endangered species non-intervention management in some areas of the national park resulted in restoring the habitat of the rare beetle, known as an indicator for forests with high conservation value. Checking bark beetle pheromone traps that were primarily installed for forestry purposes was found as a useful supplementary method for brief survey of *P. grossa* in large and remote windstorm and bark beetle areas.

Key words: relict species, primeval forest, *Peltis grossa*, Norway spruce, faunistics, Šumava Mts., Czech Republic

INTRODUCTION

The Bohemian Forest is known for hosting several rare saproxylic beetles indicating primeval forests (ECKELT et al. 2018), e.g. *Ceruchus chrysomelinus* (Hochenwarth, 1785), *Derodontus macularis* (Fuss, 1850), *A. melanurus* (Mulsant & Guillebeau, 1855), *A. suecicus* (Palm, 1976) or *Ampedus tristis* (Linnaeus, 1758). Populations of these species are documenting conservation value of old-growth mountain forest remnants in the area such as Boubínský prales National Nature Reserve or Stožec – Medvědice forests (PROCHÁZKA 2018a,b). Despite the conservation efforts which resulted in declaring nature reserves, protected landscape area and even the national park, some species disappeared from the Bohemian Forest during the last century. For instance, *Boros schneideri* (Panzer, 1795) or *Calitys scabra* (Thunberg, 1784) which were

reported from the area by FLEISHER (1930) are now considered to be extinct in the whole area of the Czech Republic (KONVIČKA 2017, VÁVRA 2017). Similarly longhorn beetles *Pachyta lamed* (Linnaeus, 1758) and *Monochamus sartor* (Fabricius, 1787) were known from several sites in the Bohemian Forest, but last records are about 40 years old (SLÁMA 1998).

Similarly, presence of *Peltis grossa* (Linnaeus, 1758) from the family Trogossitidae was reported several times from the Bohemian Forest at the beginning of the 20th century. Distribution of the species in the Czech Republic was summarized by KMENT et al. (2017) and contains several historical records from the Bohemian Forest – mainly from areas of the Boubín Forest and Plechý Mt., but also from Želnavá. HENNEVOGEL (1905) mention a record of *P. grossa* from Bučina. The last record of *P. grossa* from the current area of the Šumava National Park was documented by HEYROVSKÝ (1923) near the Plešné lake. The only recent record was reported in 2003 from Čertova Stráž near the Boubín Virgin Forest by BOHÁČ & MATĚJČEK (2004) outside the area of the Šumava National Park. The closest stable population of *P. grossa* near the Šumava National Park is recently recorded from the South Bohemian Žofín Forest Nature Reserve. Historical records of this species are known also from Blanský les and from Poněšická game enclosure and its surroundings (KMENT et al. 2017). Other population in Bohemia is known from historical and recent records in the Střela NR in the Rakovnická pahorkatina (TÝR 2011) which is about 100 km distant from the Bohemian Forest.

P. grossa is considered to be critically endangered in the Czech red list of threatened species in Czech Republic (KONVIČKA 2017). ECKELT et al. (2018) includes this species in the list of primeval forest relict species *sensu stricto*. Larvae can be found in the soft decaying wood of standing snags or fallen logs infested with fungi. In Central Europe the species inhabits mostly coniferous trees – spruce and silver fir (KMENT et al. 2017). TÝR (2011) mention occurrence of *P. grossa* on birch trees. In other regions of occurrence e.g. Scandinavia or Caucasus *P. grossa* has been recorded on alder, aspen, linden or pine (DJUPSTRÖM et al. 2012, ZAMOTAJLOV & NIKITSKY 2010). Development of the species takes 2–3 years (KOLIBÁČ 2013). Adult beetles create typical oval-shaped exit holes about 5×12 mm in size (EHNSTRÖM 2001). *P. grossa* is known for inhabiting predominantly snags of large diameter colonized by brown rot fungi *Fomitopsis pinicola* (Sw.) P. Karst. and *Piptoporus betulinus* (Bull.) P. Karst. 1881 or white rot fungus *Fomes fomentarius* (L.) Fr. 1849 (SCHIGEL 2002, NIKITSKY & SCHIGEL 2004). *P. grossa* inhabits sun exposed forest habitats in old-growth forests and their clearings or thinned stands with large volume of coarse woody debris, especially snags (NILSSON et al. 2001, DJUPSTRÖM et al. 2012, KMENT et al. 2017).

Aim of our study was to map occurrence of *P. grossa* in the Šumava National Park and its surroundings after revealing the first individual in the pheromone trap. Controlling pheromone traps for presence of *P. grossa* and extensive searching for adult beetles and exit holes was used to determine sites with occurrence of the species. Recording characteristics of trees occupied by *P. grossa* enabled to describe circumstances of its population explosion after hundred years of missing the species in the Šumava National Park.

MATERIAL AND METHODS

In the first part of the study, pheromone traps for collecting bark beetles *Ips typographus* (Linnaeus, 1758) were controlled for the presence of *Peltis grossa* in the area of České Žleby Forestry Administration. In total 36 pheromone traps (with Pheagr IT pheromone lure) from 15 sites lying in the area were used. Traps were controlled 4 times in June 2019 approximately in week intervals. Collected beetles were identified by V. Dvořák and J. Procházka and deposited in the Šumava National Park administration in Vimperk and in the Moravian Museum in Brno.

In the second part of the study, presence of *P. grossa* was checked during the day in several sites in the Šumava National park, the surrounding Protected Landscape Area. Sites with presence of dead spruce or fir snags were checked for the presence of living or dead images or exit holes during the whole season 2019 and in the spring and part of the summer 2020 using direct search for adults, visual control of exit holes and bark peeling. Tree species, DBH of the snag, diameter in the middle of the log, height of the snag and presence of the fruiting bodies of fungus *Fomitopsis pinicola* were recorded in confirmed host wood. This part of the study was conducted mainly by P. Čížková.

RESULTS AND DISCUSSION

The first individual of *P. grossa* was found accidentally in 2018 by L. Černý in a bark beetle pheromone trap at the Stožec – Medvědí cesta site. Subsequent research focused on searching for non-target beetles in pheromone traps in 2019 revealed 8 individuals of *P. grossa*. One individual was accidentally found in a pheromone trap in 2020. Other 131 individuals were gathered by hand collecting mostly on spruce snags, in two cases also on a fir snag (Tab. 1, Fig. 1, Fig. 4). Occurrence of *P. grossa* was confirmed at 26 sites in Šumava mountains. Adult beetles were observed at 24 sites, only exit holes were observed in two sites (Fig. 3). Most of the findings were made on the municipality of Nová Pec, e.g. around peaks Plechý and Třístoličnick. We confirmed occurrence of *P. grossa* outside the Šumava National Park



Fig. 1. *Peltis grossa* (Linnaeus, 1758), Třístoličnick, Šumava National Park, August 2019, photo: J. Procházka.

in Čertova stráž Nature Reserve in Boubín area where the species was found by BOHÁČ & MATĚJÍČEK (2004). Only few exit holes and one imago were found recently at this site, which indicates *P. grossa* can survive in very low abundances for many years. Second site of *P. grossa* outside the national park was confirmed by finding exit holes only in a large lying fir log in a spruce-fir forest on the slopes above the Blanice river near the village Hlásná Lhota (Fig. 2).

Even the species is considered night-active (EHNSTRÖM 2001), several individuals were found active during the day, e.g. in one day (27. 7. 2020) 41 individual of *P. grossa* were observed mostly feeding on *Fomitopsis pinicola*. Beetles were found mostly sitting close to the fungus or they were found directly on the fungus. In some cases both exit holes and individuals were found close together, but beetles were found also sitting on the snag without any evidence of larval development. One individual was found sitting on a stone and one sitting on a bilberry, in both cases close to the spruce log with exit holes of *P. grossa*. Adult individuals were observed out of the bark mostly from from the beginning of June to the end of August, under the bark some beetles were found from April to September. Exit holes were found mostly in snags, in few cases also in logs. Exit holes were found on trees with median value of the DBH 48 cm. Median value of the height of the snag was 1.6 m. 90% of the beetles and 80% of exit holes were found on trees with fruiting bodies of *Fomitopsis pinicola*. We found that individuals of *P. grossa* occurred rather on thick snags, as median of the DBH was 50.5 cm. Median value of the height of the snag with presence of *P. grossa* individuals was 2.5 m but beetles occurred also in about 10 m or even 20 m tall snags.

Most of the host trees were dead due to the windstorm Kyril (January 2007) and subsequent outbreaks of the spruce bark beetle – *Ips typographus*. Our findings are in line with NIKITSKY & SCHIGEL (2004) and WESLIEN et al. (2012) who stated that *P. grossa* prefers snags or high stumps of large diameter at a late stage of decay and with polypore fungi. WESLIEN et al. (2012) found that adults of *P. grossa* started to emerge from spruce stumps



Fig. 2. *Peltis grossa* (Linnaeus, 1758), Třístoličník, Šumava National Park, August 2019, photo: J. Procházka.

10 years after tree death and that beetles were emerging linearly next five years of the study. In most of the sites with presence of *P. grossa* in the Šumava National Park, forest stands were older than 120 or even 140 years and they were usually first generation after the virgin forest. In Třístoličnick area the stand is considered as a virgin forest continuously (P. HUBENÝ – pers. comm.). High conservation value of some sites with presence of *P. grossa* was supported by discovery of another rare saproxylic beetle species *Tragosoma depsarium* (Linnaeus, 1767) and *Ceruchus chrysomelinus* (AOPK ČR 2020) which are similarly with *P. grossa* considered to be indicators of old-growth forests (ECKELT et al. 2018).

After collecting two individuals of *P. grossa* from a bark beetle pheromone trap in Stožec – Bor, there were found both standing spruce log with exit holes and one adult of *P. grossa* in a nearby forest stand distant about 500 m from the pheromone trap. Thus checking pheromone traps could be an efficient method in surveys focused on *P. grossa* in large and poorly accessible areas. Pheromone traps are also known to collect various endangered click beetles (VALKAMA et al. 1997), e.g. *Ampedus tristis* (Linnaeus, 1758), which is considered

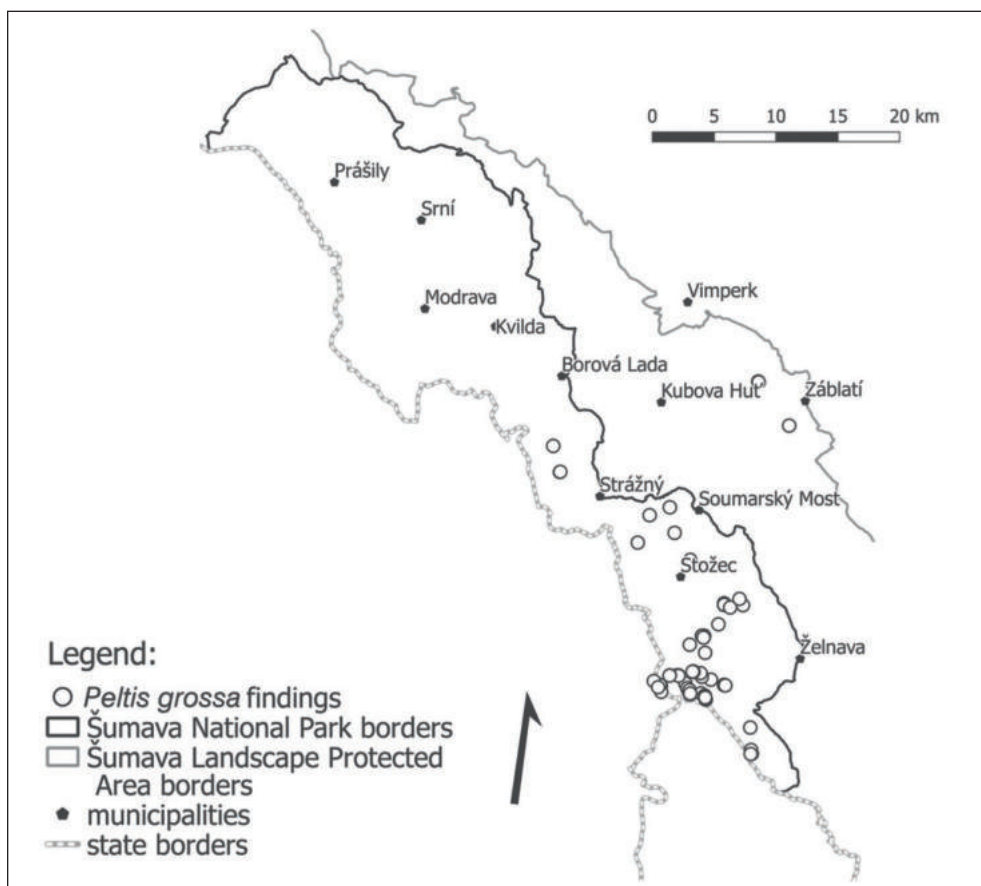


Fig. 3. Occurrence of *Peltis grossa* (Linnaeus, 1758), in the Šumava National Park and surrounding Šumava Protected Landscape Area in years 2018–2020

endangered (ZBUZEK 2017). During our research tens of click beetles *Danosoma fasciatum* (Linnaeus, 1758), other endangered species of click beetle (ZBUZEK 2017), were captured in pheromone traps. Controlling pheromone traps for non-target species was thus found useful supplementary method as pheromone traps were easily accessible and beetles were collected without destruction of their habitat. Looking for typical oval-shaped exit holes (Fig. 2) can also help in finding specific trees with presence of *P. grossa*. Even the beetle is considered night-active species (EHNSTRÖM 2001), our findings show that checking fruiting bodies of *Fomitopsis pinicola* during the day in summer months can be used for collecting adult beetles.

As there are plenty of spruce snags in the Šumava mountains now due to the windstorms and subsequent bark beetle outbreaks, it is obvious that *P. grossa* is spreading from refugia to several places with continuous supply of suitable dead trees like those in Trojmezná old-growth forest or forest stands like Čertova stráň or slopes above the Blanice river that escaped logging mainly due to poor accessibility. In such stands *P. grossa* could persist in low abundances with only a little chance of detecting the species. It seems that the presence of fir snags was crucial for a long time survival of the beetle in the Šumava mountains, which is supported by repeated finding of *P. grossa* in Čertova stráň refuge. Resembling pattern was observed for rare polypore fungus *Antrodiella citrinella* or longhorn beetle *Tragosoma depsarium* in the Bavarian Forest National Park (BÄSSLER & MÜLLER 2010, ECKELT et al. 2018). Similarly with *P. grossa*, both of the species mentioned above benefit from non-intervention management in montane spruce forests. In the case of fungus *A. citrinella* spread from two small relict populations to the whole area of Bavarian Forest National Park was observed (BÄSSLER & MÜLLER 2010).

As all findings of *P. grossa* were made on untouched conifer snags or logs, we can conclude that non-intervention management with no bark peeling and scratching applied in several spruce stands in the national park led to restoring suitable conditions for primeval forest relict species (ECKELT et al. 2018) and its remarkable population growth.

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Fig. 4. Old fir snag with fungus *Fomitopsis pinicola* (Sw.) P. Karst. occupied by *Peltis grossa* (Linnaeus, 1758) in Václavova hora (Nová Pec), April 2020, photo: V. Dvořák.

Table 1. Sites with the occurrence of *Peltis grossa* in the Šumava National park in years 2018–2020 with number of recorded individuals or exit holes of the species. Characteristics of host trees are stated where possible – DBH (or diameter in case of the lying log), height of the snag (NA = not available) and presence of fruiting bodies of fungus *Fomitopsis pinicola* on the wood.

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Buk - Čertova stráň Nature Reserve	49°0'24.2"N, 13°52'33.4"E	17. 4. 2020	1	individuals	fir snag	40	7	yes
České Žleby - Nad Žlebskou cestou	48°53'58.1"N, 13°46'40.8"E	8. 7. 2020	3	individuals	fir snag	85	NA	yes
České Žleby - Radvanovický hřbet	48°54'26.1"N, 13°47'55.7"E	16. 11. 2019	2	exit holes	spruce snag	50	NA	yes
České Žleby - Žlebský vrch	48°52'42.5"N, 13°46'09.9"E	8. 7. 2020	3	individuals	spruce snag	90	NA	yes
Dobrá - Střední cesta	48°53'21.7"N, 13°48'29.0"E	2. 7. 2020	5	individuals	spruce snag	NA	NA	yes
Hlásná Lhota - Jezerní skála	48°58'42.8"N, 13°54'58.6"E	18. 4. 2020	2	exit holes	fir log	45	NA	yes
Horní Planá - Smrčina	48°44'17.3"N, 13°55'33.5"E	5. 9. 2019	3	individuals	spruce snag	41; 74	NA	no
Horní Planá - Smrčina	48°44'28"N, 13°55'32.8"E	21. 5. 2020	1	individuals	spruce snag	60	2	yes
Nová Pec - Hučina	48°48'22.5"N, 13°51'37.4"E	30. 6. 2020	1	individuals	pheromone trap	NA	NA	NA
Nová Pec - Jezerní luh	48°47'15.1"N, 13°52'15.2"E	30. 6. 2020	2	individuals	spruce snag	NA	NA	NA
Nová Pec - Jezerní luh	48°47'27.4"N, 13°52'26.2"E	27. 7. 2020	3	exit holes	spruce snag	65	3	yes

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Jezerní luh	48°47'29.6"N, 13°52'22.5"E	27. 7. 2020	1	individuals	spruce snag	60	10	yes
Nová Pec - Jezerní stezka	48°47'19.0"N, 13°51'38.3"E	30. 6. 2020	3	individuals	spruce snag	NA	NA	NA
Nová Pec - Jezerní stezka	48°47'28.0"N, 13°51'30.9"E	30. 6. 2020	8	individuals	spruce snag	NA	NA	yes
Nová Pec - Kalamitní	48°47'13.0"N, 13°50'6.7"E	3. 6. 2020	1	individuals	spruce snag	40	3	yes
Nová Pec - Kalamitní	48°47'13.0"N, 13°50'6.7"E	3. 6. 2020	1	individuals	spruce snag	40	3	yes
Nová Pec - Kalamitní	48°47'13.8"N, 13°50'1.5"E	3. 6. 2020	1	individuals	spruce snag	42	1.5	yes
Nová Pec - Kalamitní	48°47'13.8"N, 13°50'1.5"E	3. 6. 2020	1	individuals	spruce snag	42	1.5	yes
Nová Pec - Kalamitní	48°47'14.0"N, 13°50'2.5"E	4. 6. 2020	1	individuals	sitting on stone	NA	NA	NA
Nová Pec - Kalamitní	48°47'14.1"N, 13°50'6.9"E	4. 6. 2020	2	exit holes	spruce snag	33	1.3	yes
Nová Pec - Koňský vrch	48°47'5.6"N, 13°53'14.8"E	2. 6. 2020	2	individuals	spruce snag	45	10	yes
Nová Pec - Koňský vrch	48°47'5.6"N, 13°53'14.8"E	2. 6. 2020	2	individuals	spruce log	45	10	yes
Nová Pec - Koňský vrch	48°47'5.6"N, 13°53'14.8"E	2. 6. 2020	1	individuals	spruce snag	35	1.8	yes

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Koňský vrch	48°47'5.6"N, 13°53'15.1"E	2. 6. 2020	1	individuals	spruce log	35	1.8	yes
Nová Pec - Koňský vrch	48°47'5.9"N, 13°53'9.8"E	2. 6. 2020	1	exit holes	spruce log	30	1.5	no
Nová Pec - Koňský vrch	48°47'6.0"N, 13°53'10.7"E	2. 6. 2020	8	exit holes	spruce log	NA	NA	NA
Nová Pec - Koňský vrch	48°47'6.1"N, 13°53'9.7"E	2. 6. 2020	5	exit holes	spruce snag	50	2	yes
Nová Pec - Koňský vrch	48°47'6.4"N, 13°53'9.5"E	2. 6. 2020	1	individuals	spruce snag	35	2	yes
Nová Pec - Koňský vrch	48°47'6.4"N, 13°53'9.5"E	2. 6. 2020	1	individuals	spruce snag	35	2	yes
Nová Pec - Nývtův most	48°45'25.7"N, 13°55'17.0"E	19. 9. 2019	1	individuals	spruce snag	44	2.5	yes
Nová Pec - Plechý	48°47'29.0"N, 13°50'58.9"E	13. 4. 2020	1	individuals	spruce snag	40	1.1	yes
Nová Pec - Plechý	48°46'21.5"N, 13°52'6.7"E	25. 6. 2020	2	individuals	spruce snag	100	5	yes
Nová Pec - Plechý	48°46'25.7"N, 13°52'2.7"E	25. 6. 2020	1	individuals	sitting on bilberry	NA	NA	NA
Nová Pec - Plechý	48°46'27.3"N, 13°52'3.1"E	25. 6. 2020	16	exit holes	spruce snag	32	8	yes
Nová Pec - Plechý	48°46'27.6"N, 13°52'1.1"E	25. 6. 2020	3	exit holes	spruce snag	34	2.5	yes

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Plechý	48°46'28.6"N, 13°52'0.9"E	25. 6. 2020	8	exit holes	spruce snag	65	5	yes
Nová Pec - Plechý	48°46'28.8"N, 13°52'1.1"E	25. 6. 2020	7	exit holes	spruce snag	45	2.5	yes
Nová Pec - Plechý	48°46'31.5"N, 13°52'0.3"E	25. 6. 2020	1	individuals	spruce snag	15	20	no
Nová Pec - Plechý	48°46'23.2"N, 13°52'5.9"E	26. 6. 2020	2	individuals	spruce snag	70	5	yes
Nová Pec - Plechý	48°46'26.6"N, 13°52'3.3"E	26. 6. 2020	1	individuals	spruce snag	40	2.5	yes
Nová Pec - Plechý	48°46'36.0"N, 13°51'43.9"E	8. 7. 2020	7	exit holes	spruce snag	60	1.5	yes
Nová Pec - Stocký potok	48°46'29.2"N, 13°51'1.9"E	22. 6. 2020	3	individuals	spruce snag	NA	NA	yes
Nová Pec - Stocký potok	48°46'31.0"N, 13°51'2.5"E	22. 6. 2020	2	individuals	spruce snag	70	2.5	yes
Nová Pec - Stocký potok	48°46'31.3"N, 13°51'1.8"E	22. 6. 2020	1	individuals	spruce snag	NA	NA	NA
Nová Pec - Stocký potok	48°46'31.4"N, 13°51'3.0"E	22. 6. 2020	3	individuals	spruce snag	60	4	yes
Nová Pec - Stocký potok	48°46'40.7"N, 13°50'51.1"E	22. 6. 2020	1	individuals	spruce snag	60	6	yes
Nová Pec - Stocký potok	48°46'42.3"N, 13°50'49.7"E	22. 6. 2020	1	individuals	spruce snag	60	8	yes

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Stocký potok	48°46'44.5"N, 13°50'47.9"E	22. 6. 2020	26	exit holes	spruce snag	50	2	no
Nová Pec - Stocký potok	48°46'44.7"N, 13°50'47.5"E	27. 7. 2020	4	exit holes	spruce snag	30	1.6	no
Nová Pec - Stocký potok	48°46'38.9"N, 13°50'45.2"E	27. 7. 2020	1	individuals	spruce snag	50	8	yes
Nová Pec - Stocký potok	48°46'38.9"N, 13°50'45.1"E	27. 7. 2020	1	individuals	spruce snag	40	6	yes
Nová Pec - Stocký potok	48°46'38.4"N, 13°50'45.5"E	27. 7. 2020	2	individuals	spruce snag	50	8	yes
Nová Pec - Stocký potok	48°46'38.3"N, 13°50'45.1"E	27. 7. 2020	5	individuals	spruce snag	60	2	yes
Nová Pec - Stocký potok	48°46'38.3"N, 13°50'45.0"E	27. 7. 2020	1	individuals	spruce snag	50	NA	no
Nová Pec - Stocký potok	48°46'38.4"N, 13°50'44.7"E	27. 7. 2020	3	individuals	spruce snag	55	5	yes
Nová Pec - Stocký potok	48°46'38.1"N, 13°50'45.7"E	27. 7. 2020	1	individuals	spruce snag	60	6	yes
Nová Pec - Stocký potok	48°46'37.1"N, 13°50'45.0"E	27. 7. 2020	1	individuals	spruce snag	70	3	yes
Nová Pec - Stocký potok	48°46'37.2"N, 13°50'45.0"E	27. 7. 2020	1	individuals	spruce snag	60	7	yes
Nová Pec - Stocký potok	48°46'37.2"N, 13°50'44.4"E	27. 7. 2020	3	individuals	spruce snag	50	4	yes

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Stocký potok	48°46'38.6"N, 13°50'44.4"E	27. 7. 2020	6	individuals	spruce snag	60	3	yes
Nová Pec - Stocký potok	48°46'40.1"N, 13°50'47.9"E	27. 7. 2020	2	individuals	spruce snag	50	3.5	yes
Nová Pec - Stocký potok	48°46'40.8"N, 13°50'50.5"E	27. 7. 2020	2	individuals	spruce snag	45	5	yes
Nová Pec - Stocký potok	48°46'40.8"N, 13°50'50.4"E	27. 7. 2020	1	individuals	spruce snag	40	2.5	yes
Nová Pec - Stocký potok	48°46'43.0"N, 13°50'50.1"E	27. 7. 2020	3	individuals	spruce snag	50	3.5	yes
Nová Pec - Stocký potok	48°46'43.0"N, 13°50'50.2"E	27. 7. 2020	2	individuals	spruce snag	40	2	yes
Nová Pec - Stocký potok	48°46'43.0"N, 13°50'50.1"E	27. 7. 2020	2	individuals	spruce snag	60	5	yes
Nová Pec - Trojmezenský prales	48°47'10.2"N, 13°49'31.1"E	28. 4. 2020	1	dead individual	spruce snag	53	NA	yes
Nová Pec - Trojmezenský prales	48°46'55.8"N, 13°50'37.2"E	15. 7. 2020	2	individuals	spruce snag	NA	1.7	NA
Nová Pec - Třístoličník	48°46'35.6"N, 13°48'52.8"E	14. 8. 2019	2	individuals	spruce snag	58	NA	yes
Nová Pec - Třístoličník	48°46'42.4"N, 13°48'58.7"E	22. 8. 2019	4	individuals	spruce snag	61	2.5	no
Nová Pec - Třístoličník	48°46'42.5"N, 13°48'58.9"E	22. 8. 2019	1	individuals	spruce snag	53	2	no

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Nová Pec - Třístoličník	48°46'50.0"N, 13°48'32.3"E	22. 8. 2019	1	individuals	spruce snag	51	1.8	no
Nová Pec - Třístoličník	48°46'24.7"N, 13°49'7.6"E	19. 9. 2019	1	individuals	spruce snag	37	1.8	yes
Nová Pec - Třístoličník	48°46'40.4"N, 13°49'2.6"E	27. 5. 2020	2	individuals	spruce snag	50	5	yes
Nová Pec - Václavova hora	48°48'37.6"N, 13°50'32.5"E	17. 4. 2020	2	individuals	spruce snag	52	2	yes
Nová Pec - Václavova hora	48°49'4.8"N 13°51'15.8"E	7. 7. 2020	2	individuals	spruce snag	70	NA	NA
Nová Pec - Václavova hora	48°49'5.4"N 13°51'15.0"E	7. 7. 2020	4	individuals	spruce snag	100	1.4	NA
Nová Pec - Václavova hora	48°49'6.2"N 13°51'23.7"E	14. 7. 2020	1	individuals	spruce snag	NA	NA	NA
Stožec	48°52'17.6"N, 13°49'45.8"E	7. 7. 2020	1	individuals	NA	NA	NA	NA
Stožec - Bor	48°50'29.3"N, 13°52'49.7"E	15. 6. 2019	2	individuals	pheromone trap	NA	NA	NA
Stožec - Hučinka	48°50'34.3"N, 13°52'24.9"E	28. 4. 2020	1	individuals	spruce snag	63	NA	yes
Stožec - Kristiánova stezka	48°50'39.9"N, 13°53'39.0"E	15. 6. 2019	3	individuals	pheromone trap	NA	NA	NA
Stožec - Medvědí cesta	48°49'41.3"N, 13°52'13.3"E	3. 6. 2018	1	individuals	pheromone trap	NA	NA	NA

Table 1. Continued

Site	GPS	Date	Number of <i>P. grossa</i>	Counted	Circumstances	DBH (cm)	Height of the snag/ length of the log (m)	Presence of <i>F. pinicola</i>
Stožec - Medvědí cesta	48°49'41.3"N, 13°52'13.3"E	15. 6. 2019	1	individuals	pheromone trap	NA	NA	NA
Stožec - Medvědí cesta	48°50'55.0"N, 13°53'21.6"E	15. 6. 2019	1	individuals	pheromone trap	NA	NA	NA
Strážný - Častá	48°55'16.3"N, 13°40'24.3"E	20. 8. 2019	3	exit holes	spruce snag	52	2.5	yes
Strážný - Častá	48°55'15.6"N, 13°40'23.2"E	26. 8. 2019	1	individuals	spruce snag	35	2.5	yes
Strážný - Příčná cesta	48°56'20.7"N, 13°39'41.8"E	2. 7. 2020	1	individuals	spruce snag	NA	NA	NA
Zvonková - Smrčina	48°44'18.3"N, 13°55'37.6"E	9. 7. 2020	1	individuals	spruce snag	89	2.5	NA

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