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**Φ/δι κο. Θεόδωρο Φωκά**
**Λεωφ. 28ης Οκτωβρίου 20-22**
**Τ.Θ. 27658**

16 Νοεμβρίου 2020

**ΘΕΜΑ: ΑΡ. ΦΑΚΕΛΟΥ 02.10.011.005.001.002**
**ΜΕΕΠ για την κατασκευή φωτοβολταϊκού πάρκου δυναμικότητας 1.5 MW ιδιοκτησία της εταιρείας BIOLAND στον Μαζωτό ΛΑΡ/583/2018**

Κύριε,

Αναφορικά με το πιο πάνω θέμα και το ερώτημα (β) που αναφέρεται σε επιστολή σας, ημερομηνίας 03/07/2019 και με αριθμό φακέλου 02.10.011.005.001.002 (βλέπε Συνημμένο 1), σας υποβάλουμε στοιχεία στο Συνημμένο 2 που αφορούν την παρουσία και τους πληθυσμούς του είδους *Promacrus Cypriacus* και πιθανή χρήση των χαρουπιών στον ξενιστή του είδους.

Παραμένουμε στη διάθεση σας για οποιαδήποτε άλλη διευκρίνιση.

Με εκτίμηση,

Αμαλία Παπαϊωάννου
Μηχανικός Περιβάλλοντος

**ΣΥΝΗΜΜΕΝΟ 1**

ΚΥΠΡΙΑΚΗ ΔΗΜΟΚΡΑΤΙΑ

ΥΠΟΥΡΓΕΙΟ ΓΕΩΡΓΙΑΣ, ΑΓΡΟΤΙΚΗΣ ΑΝΑΠΤΥΞΗΣ
ΚΑΙ ΠΕΡΙΒΑΛΛΟΝΤΟΣ

ΤΜΗΜΑ ΠΕΡΙΒΑΛΛΟΝΤΟΣ
1498 ΛΕΥΚΩΣΙΑ

Αρ. Φακ.: 02.10.011.005.001.002

Αρ. Τηλ.: 24202864

E-mail: tphokas@environment.moa.gov.cy

3 Ιουλίου 2019

**ΜΕ ΗΛΕΚΤΡΟΝΙΚΟ ΤΑΧΥΔΡΟΜΕΙΟ ΜΟΝΟ**
Πανίκος Νικολαΐδης κ συνεργάτες (nicol@nanda.com.cy)

Αγαπητέ κύριε,

**Θέμα: Συνεδρία Επιτροπής ΕΙΑ στις 18.6.2019 για τις ΜΕΕΠ α)« Φωτοβολταϊκό πάρκο 1.5 MW με αρ. φακ. ΛΑΡ 583/2018 και β) Φωτοβολατικό πάρκο 1.4 MW της εαταιρείας Bioland, σε περιοχές του Μαζωτού.**

Αναφορικά με τα πιο πάνω θέμα σας πληροφορώ ότι κατά την εξέταση των πιο πάνω έργων από την Επιτροπή Εκτίμησης Επιπτώσεων στο Περιβάλλον στις 18.6.2019, τα μέλη της Επιτροπής ζήτησαν την υποβολή των παρακάτω συμπληρωματικών στοιχείων, πριν την τοποθέτησή τους για τα εν λόγω έργα:

**α)** Τα στοιχεία που έχουν υποβληθεί για το βιολογικό περιβάλλον και των δυο έργων είναι πολύ ελλιπή, αφού διενεργήθηκε μόνο 1 επιτόπια επίσκεψη, διάρκειας μερικών ωρών. Να υποβληθούν συμπληρωματικά στοιχεία για το βιολογικό περιβάλλον, μέσω καταγραφών. 'Να διεξαχθούν τουλάχιστον 3 ημερήσιες καταγραφές την περίοδο που να καλύπτει μεταξύ Μάρτιο - τέλη Ιουνίου, από προσοντούχο άτομο το οποίο θα πρέπει να έχει αποδεδειγμένη εμπειρία σε καταγραφές πτηνοπανίδας

**β)** Για το έργο με αρ. φακ. ΛΑΡ583/2018, να διερευνηθεί από εξειδικευμένο άτομο η παρουσία και οι πληθυσμοί του είδους Promacrus Cypriacus και πιθανή χρήση των χαρουπιών ως ξενιστή για το είδος . Σε περίπτωση που διαπιστωθεί η παρουσία του είδους στην περιοχή, τότε να γίνει εκτίμηση των επιπτώσεων στο είδος, από την εκρίζωση των χαρουπιών

**γ)** Για το έργο με αρ. φακ ΛΑΡ 584/2018:

i), να γίνει αποτύπωση των πεύκων και άλλης άγριας βλάστησης που γειτνιάζει με τα σύνορα του τεμαχίου και να ετοιμαστεί χάρτης ο οποίος να δείχνει τα άτομα και τη θέση τους σε σχέση με τα όρια του τεμαχίου και την προτεινόμενη περίφραξη. Σε περίπτωση που η απόσταση είναι τέτοια που ενδεχομένως να επηρεαστεί το ριζικό σύστημα των ατόμων πεύκου ή άλλης άγριας βλάστησης από τυχών εκσκαφές, να γίνει εκτίμηση των επιπτώσεων.

ii) να υποβληθεί σχέδιο με τη θέση των ελαιοδέντρων που εκριζώνονται από τη κατασκευή και συγκεκριμένο σχέδιο μεταφύτευσης με στοιχεία των τεμαχίων που θα φιλοξενήσουν τα δέντρα.

Με εκτίμηση

Θ. Φωκάς
για Διευθυντή

Κοιν. – Αν. Διευθυντή Τμήματος Πολεοδομίας και Οικήσεως(Fax 22302067)
- - Διευθυντή εταιρείας Bioland ltd ( Fax 24534775)

**ΣΥΝΗΜΜΕΝΟ 2**

# Assessing the presence of *Propomacrus bimucronatus cypriacus* in Plot 497 in Mazotos: an area proposed for the construction of a photovoltaic park.

**Assessment report submitted to BIOLAND Energy LTD on 27 October 2020**

**by Marios Aristophanous**

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## Introduction

Construction of a photovoltaic park has been proposed within Plot No. 497 (αρ. τεμαχίου 497 των Φ/ΣΧ: 50/51 και 50/43 στην τοποθεσία Καμίνια) (with coordinates 34°49'7.46"N, 33°29'37.57"E) within the Mazotos region, Larnaca by BIOLAND Energy LTD (for further details see FOSINK, 2018; Nicolaides et al, 2019). This plot of land (hereafter referred to as the study-site) is planted mainly with carob trees and a few olive trees. The Department of Environment has expressed their concern regarding the presence of *Propomacrus bimucronatus cypriacus* Alexis & Makris, 2002 (Coleoptera: Scarabaeidae: Euchirini) within the study-site, as carob trees are known to be host-trees and specifically, large sized trees with the presence of holes and hollows (Alexis and Makris, 2002; Sfenthourakis et al, 2017). The beetle *P. b. cypriacus* is a subspecies endemic to Cyprus and is listed as Critically Endangered by the IUCN Red List at the Mediterranean level, and in category B2ab(iii) under the IUCN Red List Criteria (Garcia et al., 2018). It is also listed as a protected species in Cyprus and categorised in Annex II 92/43/EEC of the insects of Cyprus. It is therefore important that the presence of this beetle is assessed within the study-site.

The author was contacted by BIOLAND Energy LTD to conduct this assessment which was to commence on 11th September 2020. The flight activity period of *P. b. cypriacus* is between July and September (Alexis and Makris, 2002; Sfenthourakis et al, 2017). BIOLAND was made aware that the assessment would take place during the end of the beetle activity period and the assessment began with their recognition.

The results of this assessment are stated and discussed in this report.

## Methods and Results

The presence of *P. b. cypriacus* was evaluated using three techniques 1) installation of wine-traps that attract adult beetles, 2) noting the presence of suitable breeding sites on individual carob trees, and 3) searching for the evidence of beetle body parts (exoskeleton) and larval excrement in hollows. Furthermore, any evidence of the presence of other saproxylic beetles was also assessed. Each carob tree was given a unique number (Fig. 1), evaluated (see Appendix A), and photographed (see Appendix B).

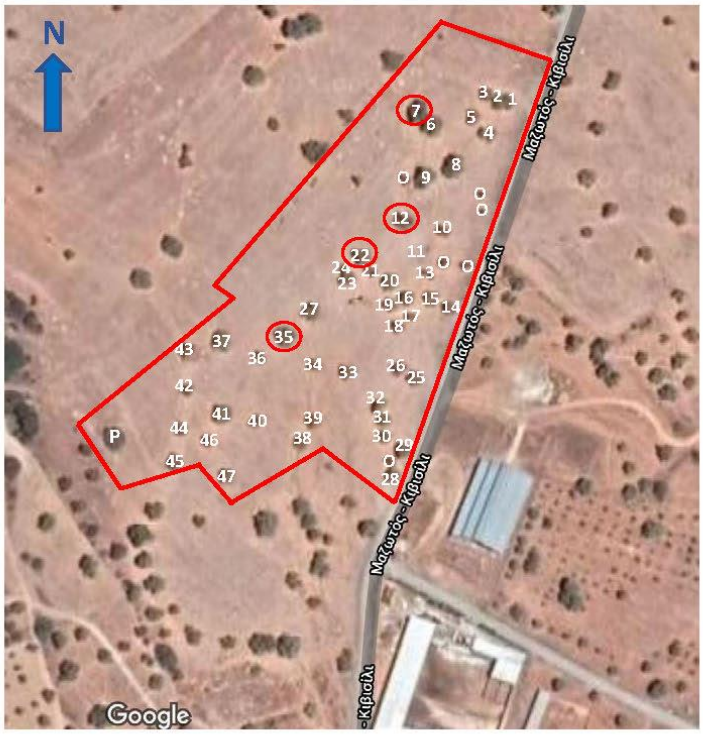


**Figure 1**. Google Earth view of the study-site with individually numbered carob trees (1-47). Olive trees are marked with "O". *Pistacia lentiscus* bush marked with "P". Red line indicates the study-site boundary based on Nicolaides et al. 2019 page 4. Carob trees recommended for conservation/relocation are circled in red (see Conclusion and Recommendations section). The blue arrow indicates North. See Appendix B for photos of all trees.

### Wine-traps

Adult *P. b. cypriacus* beetles are attracted to wine. Therefore, specialised wine-traps were constructed (Fig. 2) to attract and live-trap any beetles present in the study-site. The traps consisted of an inner perforated plastic container filled with wine, and an outer larger plastic container on which a net was placed underneath. Beetles are attracted by the wine, fly into the larger bucket, hit the small bucket of wine, and fall down into the net.

A total of seven wine-traps were placed within the study-site from 11th September until 5th October (25 days). This amounted to a total sampling effort of 175 trap days (7 traps x 25 days). No adult beetles of *P. b. cypriacus* were found in the traps during the sampling period. The only beetle sampled by the traps was a single specimen of *Protaetia (Potosia) cuprea* Fabricius, 1775 (Scarabaeidae: Cetoniinae).

**Figure 2.** Wine trap used to attract and live-trap any *P. b. cypriacus* from the study-site.

### Suitable breeding sites

For each tree, the presence of holes (Fig. 3a) and hollows (Fig. 3b) was noted. The presence and size of holes and hollows was then used to qualitatively assess the possibility of each carob tree being a potential host-tree by offering favourable breeding sites. The probability of a tree being a suitable host-tree was divided into four categories: low, medium, high, very high.

A total of 47 carob trees were located within the study site (Fig. 1). From these, 44 trees (94%) had large hollows and 29 trees (62%) had holes (Table 1). Four large and old trees (8%) have a very high probability of being suitable host-trees and 27 trees (57%) were regarded as having a high probability of being suitable host-trees (Table 1). (See Appendix A for individual tree evaluation and Appendix B for photographs of all trees showing their holes and hollows).

3a

3b

**Figure 3.** Example of (a) tree hole, and (b) hollow.

**Table 1.** The total number and percentage of carob trees that had holes, hollows, and frass (beetle excrement), and the probability of those trees being utilised as host trees (i.e. having good breeding sites for *P. b. cypriacus*).

| | **Trees (Total)** | **Trees (%)** |
|---|---|---|
| Holes present | 29 | 61.70 |
| Hollows present | 44 | 93.63 |
| Frass present | 17 | 36.17 |
| Probability of host tree: Low | 7 | 14.89 |
| Probability of host tree: Med | 9 | 19.15 |
| Probability of host tree: High | 27 | 57.44 |
| Probability of host tree: Very High | 4 | 8.51 |
| Evidence of other saproxylic beetles | 47 | 100 |

**Potential presence of *P. b. cypriacus* based on other evidence**

Tree hollows were searched for the presence of any beetle body parts or frass i.e. larval excrement (Fig. 4) of *P. b. cypriacus*.

No *P. b. cypriacus* beetle remains were found inside hollows or holes of trees. However, an elytron of *Oryctes nasicornis kuntzeni* Minck, 1914 (Scarabaeidae: Dynastinae) was found. Frass was also found in 17 trees (36%) (Table 1) but it was not possible to determine if it belonged to *P. b. cypriacus* or other scarab beetle species. Some of the larger sized frass (Fig. 4) could have belonged to either *P. b. cypriacus* or *O. nasicornis*. Smaller frass size may have belonged to *P. cuprea*.

**Figure 4**. Large sized frass i.e. beetle larval excrement.

**Evidence of other saproxylic beetles**

For each tree, evidence of other species of saproxylic beetles was noted. Evidence was regarded as the presence of exit holes or food galleries (Fig. 5). All 47 carob trees (100%) had evidence of the presence of other saproxylic beetles.

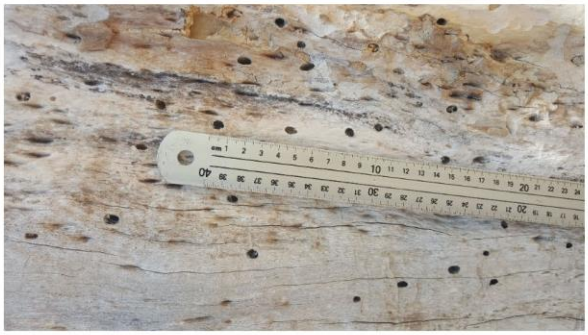

**Figure 5.** Evidence of other saproxylic beetles based on the presence of exit holes.

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## Discussion

*Propomacrus bimucronatus cypriacus* was not found in the study-site during the sampling period 11th September to 5th October 2020.

However, it should be kept in mind that the sampling period corresponded to the end of the activity period of this beetle. The known activity period for this species is from the end of July to the end of September (Alexis and Makris, 2002; Sfenthourakis et al, 2017). Thus, there is a possibility that the beetle is present within the study-site but was not detected due to the late commencement of sampling.

Furthermore, individuals of *P. b. cypriacus* have been found only 2.5km north of the study-site within a similar carob field indicating that the broader region is home to a population of *P. b. cypriacus*. Also, the study-site has a large proportion of carob trees that have a high probability of being host-trees with four old larger trees having a very high probability due to the presence of large hollows and holes that could act as breeding sites.

Although species designation could not be assigned to the frass found, the presence of large frass may indicate the presence of *P. b. cypriacus*. Thus, it is very likely that *P. b. cypriacus* utilises the trees whether or not it was found during this short period.

All carob trees within the study-site showed signs of beetle (not *P. b. cypriacus*) exit holes and have/are been utilised by many other saproxylic beetle species belonging to the Cerambycidae, Elateridae, Buprestidae, Bostrichidae, and Scolytidae families.

## Recommendations

There is a high probability that *P. b. cypriacus* occurs in the study-site but was not detected. Carob trees are known to be host trees for *P. b. cypriacus* and especially old large trees with hollows. The proposed project is seeking to remove a total of 47 carob trees from the study-site. The majority of the carob trees are small in size even though they still have holes and hollows. The most important trees are the four large trees that have a very high probability of being utilised by *P. b. cypriacus*.

There are other carob plantations surrounding the study-site that will essentially act as a buffer to the *P. b. cypriacus* population. However, a concern is that if other projects remove more carob trees from the surrounding area it will further increase the impact on the habitat and population of *P. b. cypriacus*. For example, another photovoltaic park has been constructed just 3.5km NE of the study site between the villages of Alethriko – Kivisili and has removed some trees.

If the Department of Environment is concerned with the above then they may choose to implement the following:

The four large trees can be conserved and not felled. As they are in the centre of the study-site they will cause a problem with shading of the photovoltaic panels. Therefore, they can be relocated and replanted on the north side of the study-site where they will have minimal impact on the panels. The replanting of these trees should be done by experienced and knowledgeable people to ensure a higher chance for their survival. If the trees do not survive the replanting phase then the company will have to ensure the planting of new young carob trees at a location chosen by the Department of Environment or provide funds towards protecting another area of carob trees.

Also, as there will be a zone of 6m along the boundaries of the study site that will not be utilised for photovoltaic panels, any trees that fall within this zone should be conserved where possible.

## References


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## Appendix A.

Raw data table for each individual carob tree noting the presence of holes, hollows, frass (beetle excrement), and the probability of those trees being utilised as host trees (low, med, high, very high). Trees recommended for conservation are shaded. 0 = No, 1 = Yes.

| Tree ID | Holes | Hollows | Low | Med | High | Very High | Frass | Protect | Presence of other saproxylic insects |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 3 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 5 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 6 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 7 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 |
| 8 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 9 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 10 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 11 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 12 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 13 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 14 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 15 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 16 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 17 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 18 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 19 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 20 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 21 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 22 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 23 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 24 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 25 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 26 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 27 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 28 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 29 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 30 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 31 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 32 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 33 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 34 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 35 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 |
| 36 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 37 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 38 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 39 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 40 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 41 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 42 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 43 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| 44 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| 45 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| 46 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 47 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| **TOTAL** | **29** | **44** | **7** | **9** | **27** | **4** | **17** | **4** | **47** |
| **PERCENTAGE** | **61.70** | **93.62** | **14.89** | **19.15** | **57.44** | **8.51** | **36.17** | **8.51** | **100.00** |