

NUTTALL'S BUCKMOTH (*Hemileuca nuttalli*) AND GROUND
MANTID (*Litaneutria minor*) SEARCHES IN THE SOUTH OKANAGAN
VALLEY, BRITISH COLUMBIA, 2009

By

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EXECUTIVE SUMMARY

The Nuttall's Buckmoth (*Hemileuca nuttalli*) and Ground Mantid (*Litaneutria minor*) are two invertebrate species listed for inventory under the BC Conservation Framework (2009). The Nuttall's Buckmoth is listed as a mid priority species on The COSEWIC Candidate List (COSEWIC 2009). The Ground Mantid may be recommended as a COSEWIC candidate (Rob Cannings, COSEWIC Arthropod subcommittee, pers. comm.). These species were included in a list of target species for the BC Conservation Corps grassland species inventory crew. The crew spent 4 days surveying antelope-brush habitats within the Southern Okanagan between August 24th and September 1st 2009. These searches did not result in any detection of either target species. This preliminary attempt to address the lack of data for these invertebrate species will help inform future inventory efforts.

ACKNOWLEDGMENTS

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INTRODUCTION

The Nuttall's Buckmoth (*Hemileuca nuttalli*), also known as Nuttall's Sheepmoth, is not tracked in British Columbia by the BC Conservation Data Centre (CDC 2008). It is a group 2, mid-priority candidate for completion of a status report and ranking for Canada (COSEWIC 2009). The global rank is G5, secure (NatureServe 2009).

Butterflies and Moths of North America (Opler et al. 2009) reports the larvae depend on antelope-brush (*Purshia tridentata*), snowberry (*Symphoricarpos* spp.) and currant (*Ribes* spp.) as host plants. The eggs hatch in May and June. The larvae are quite conspicuous and can be seen on host plants in June (Dennis St. John pers. comm.). Adults emerge in the morning and mate in the afternoon from July-September. Additional information is available at <http://www.butterfliesandmoths.org/species?l=3330>

The Ground Mantid (*Litaneutria minor*) is the only mantid native to Canada. Its range is limited to the dry grasslands of the South Okanagan near Oliver and Osoyoos, where it is associated with sage (*Artemisia* spp.) and antelope-brush (*Purshia tridentata*) habitats (Cannings and Cannings 1995). The Ground Mantid is at-risk in British Columbia (Cannings and Cannings 1995), but is not tracked by the BC Conservation Data Centre (BC CDC 2008). The Ground Mantid may be recommended as a COSEWIC candidate (Rob Cannings, COSEWIC Arthropod subcommittee, pers. comm.). The BC Conservation Framework ranks it as Priority 1 in Goal 3 (Maintain the diversity of native species and ecosystems) and recommends inventory (2009). Very little is known about this cryptic species.

In 2009 the BC Conservation Corps grassland species inventory crew was tasked with searching some protected areas, Crown land parcels and The Nature Trust of British Columbia (TNT) properties for these two invertebrate species. Since both species are associated with antelope-brush habitats, the crew was able to survey for both at the same time. These surveys were conducted as part of a larger multi-species project within the southern interior.

METHODS

Wandering transects were used to survey for Nuttall's Buckmoth and Ground Mantid. Wandering transects are random with no fixed direction and allow surveyors to target suitable habitat that occurs sporadically throughout the landscape. These wandering transects were placed within antelope-brush habitat parcels in the south Okanagan.

Prior to field inventories, surveyors reviewed species details (including photographs, and species attributes) for Nuttall's Buckmoth in Butterflies and Moths of North America (Opler et al. 2009). This provided surveyors with a search image for this large moth (wingspan: 6.9 – 8.3cm). Nuttall's Buckmoth has a yellow dorsal hindwing while the forewing is usually a lighter yellow or cream. Both wings have wide black markings (Opler et al. 2009). These characteristics make Nuttall's Buckmoth easy to identify.

Previous Lepidoptera surveys conducted by the BC Conservation Corps had found

targeting nectar plants to be an effective tactic to locate adults of target species. However, Nuttall's Buckmoth does not feed as an adult (Opler et al. 2009) so targeting nectar plants could not be used as a search strategy.

Surveyors corresponded with Dennis St. John, local Lepidopterist, to determine how best to survey for Nuttall's Buckmoth. Dennis had observed a closely related species, Hera Buckmoth (*Hemileuca hera*). The larvae are large, distinctive and easily observed on vegetation in June (see appendix 1). Unfortunately a higher priority inventory conflicted with this date so adult flight period was targeted for inventory. Dennis observed Hera Buckmoth flying in late August in the White Lake Basin (a sagebrush/bluebunch wheatgrass habitat in the south Okanagan) and found they could be seen in flight (likely searching for pheromone trails) with the naked eye and binoculars. It was assumed that Nuttall's Buckmoth showed similar behaviour and they could be targeted with wandering transects. Orville Dyer, Ministry of Environment reported seeing a Buckmoth, in the past, perching on vegetation, so surveyors also searched for resting moths while conducting wandering transects.

Surveyors would actively search near the ground and low in shrubs for the Ground Mantid. Surveyors also would periodically scan the tops of shrubs for sign of Buckmoths flying. Occasionally, surveyors would hit vegetation with the end of their net in an attempt to flush a target species.

Wandering transects were recorded as a track log using handheld Garmin GPS units (GPSmap 60Cx and GPSmap76Cx). Tracks were recorded for each individual surveyor which consisted of a point placed automatically every 10 metres. This track log records where surveyors searched within a larger area and can be used as null data for the 2009 surveys. Weather conditions were noted throughout the surveys including at the start and end times.

Tracks were uploaded into Garmin MapSource Version 6.15 to be converted to Excel spreadsheets. These were then turned into shapefiles in ArcMap 9.2. These shapefiles will be submitted to the Ministry of Environment's Wildlife Species Database (SPI) in an unchanged format. The track data was also filtered to display points every 100 metres, and a single track was chosen from each survey site. This data was then converted to a .txt document and loaded to an excel spreadsheet to allow null data to be effectively displayed through SPI. All results, including spreadsheets and reports, were submitted to SPI.

RESULTS

The crew searched for 4 days between August 24 and September 1, 2009 (Table 1). This resulted in a length of 13.2 km covered while searching at 6 different antelope-brush habitat sites throughout the Southern Okanagan (Figures 1- 3). Neither Nuttall's Buckmoth nor Ground Mantid was detected during these surveys.

Table 1. Results of 2009 BCCC crew Ground Mantid and Nuttall's Buckmoth surveys throughout the Southern Okanagan.

Location	Date	Search Distance (km)*	Search Time*
Fairview Townsite (near Oliver)	August 24, 2009	2.1	1 hr 40 min
Kennedy Property - TNT	August 24, 2009	2.0	1 hr 35 min
Blue Mountain Property - TNT	August 28, 2009	1.8	1 hr 30 min
Haynes' Lease Ecological Reserve	August 31, 2009	4.6	4 hrs
South Okanagan Management Area (SOWMA) - South	September 1, 2009	2.0	2 hrs 20 min
South Okanagan Management Area (SOWMA) - North	September 1, 2009	0.66	55 min
Total:		13.2	12 hrs

*Searched distance and time presented here represents that of only one crew member in a crew of 2 individuals.

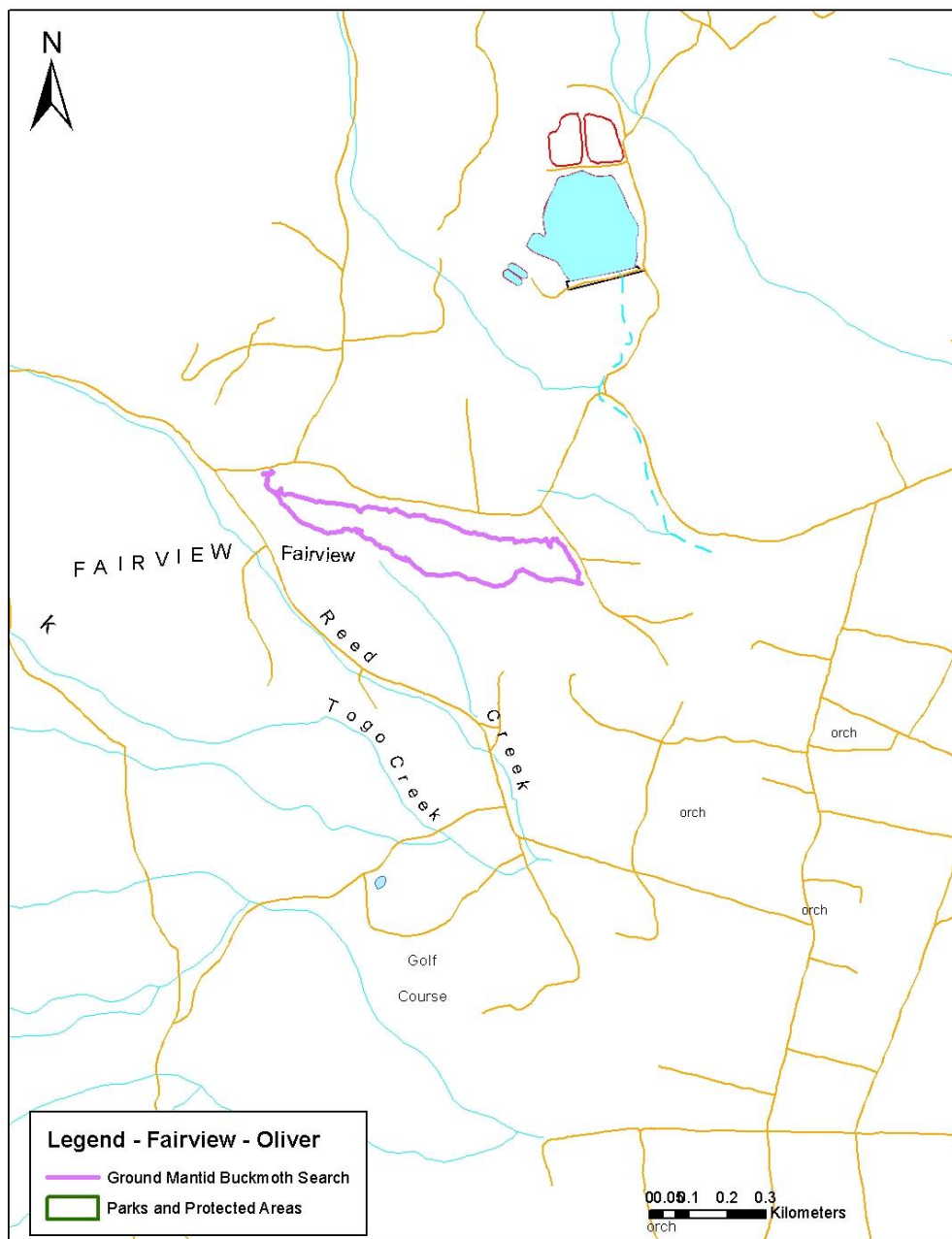


Figure 1. Area searched for Ground Mantid and Nuttall's Buckmoth on the Fairview old town site Crown land parcel during BCCC 2009 surveys.

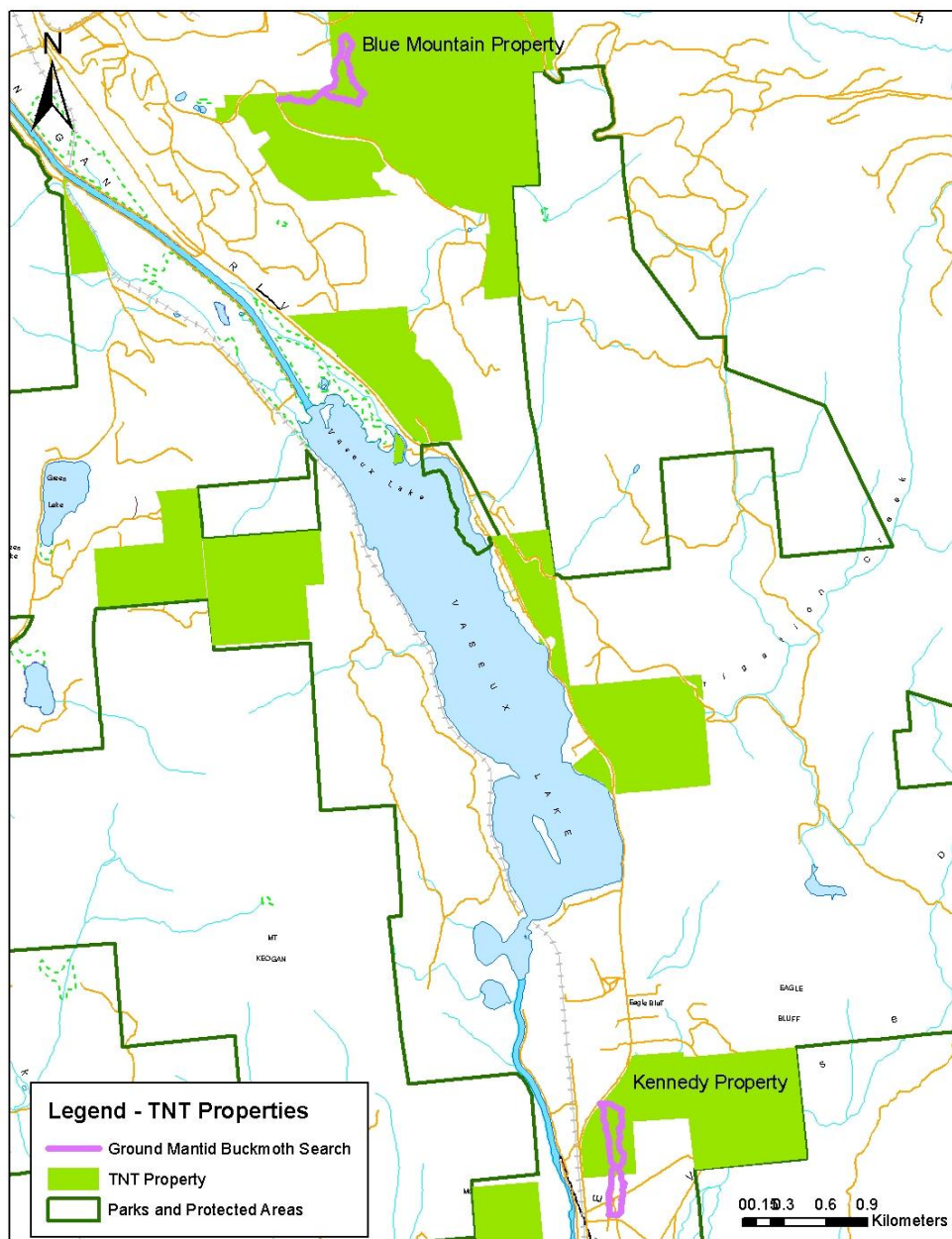


Figure 2. Area searched for Ground Mantid and Nuttall's Buckmoth on Nature Trust properties during BCCC 2009 surveys.

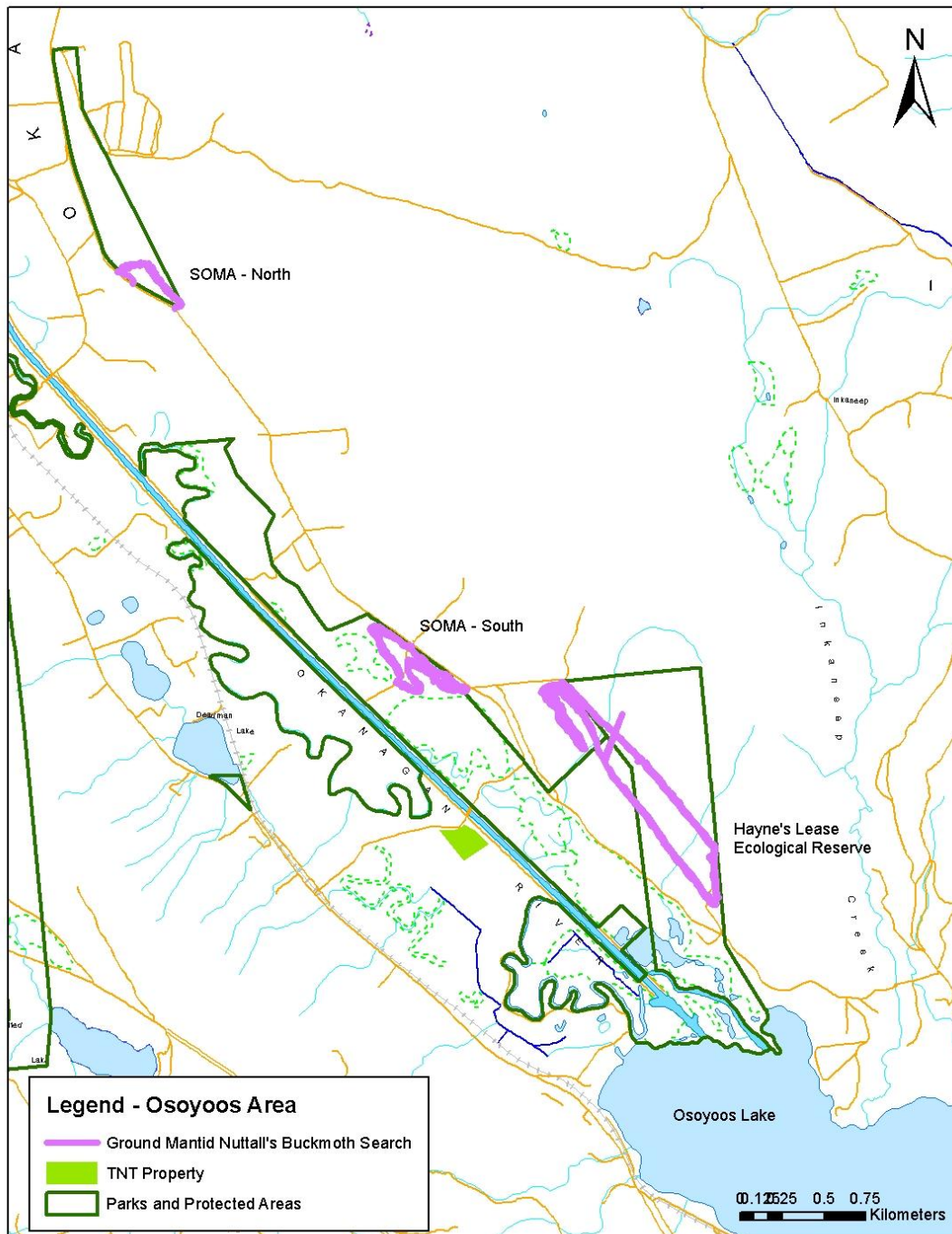


Figure 3. Area searched for Ground Mantid and Nuttall’s Buckmoth in protected areas near Osoyoos during BCCC 2009 surveys.

Hera Buckmoth was not formally part of the inventory but we documented the following sightings. *Hemileuca hera* larvae were observed and recorded from White Lake Basin on two dates by the BC Conservation Corps crew in 2009. On June 12, 2009 one larva was observed on parsnip flowered buckwheat (appendix 1) at the approximate UTM: 11/308561/5466577. On June 24, 2009 a single larva was observed at the following approximate UTM: 11/307331/5465846. A single *Hemileuca hera* larva was also

observed and recorded June 29, 2009 from South Okanagan Grasslands Protected Area - East Chopaka at 11/311175/5432992. Dennis St. John reported 6 adult Hera Buckmoth in about 40 min search effort in sagebrush-steppe at White Lake (UTM: 11/307292/5465784) on the morning of August 26, 2009. They were seen easily with binoculars up to 50m away and had an undulating flight pattern.

DISCUSSION

As mentioned, these surveys were part of a larger multi-species initiative. As a result, the crew were only able to devote a few days of searching for the Ground Mantid and Nuttall's Buckmoth. Since the associated habitat for these species overlapped the crew was able to survey for both species at once.

It is possible that the Nuttall's Buckmoth surveys were too late in the season to view flying adults. As mentioned Hera Buckmoth had been observed flying during this time by Dennis St. John, but no Nuttall's Buckmoth were observed during surveys. Because this species does not feed as an adult, surveyors cannot target nectar plants, a survey method which had proven effective with other south Okanagan lepidoptera species. Surveyors were able to view and identify Hera Buckmoth larvae incidentally (see photo in appendix 1) while surveying for nectaring adult Half-moon Hairstreaks (*Satyrium semiluna*) in sage/bluebunch wheatgrass habitats earlier in the season. Detections were recorded on June 12, June 24 and June 29, 2009. Opler et al. (2009) records Hera Buckmoth larvae hatching from April to June and Nuttall's Buckmoth larvae hatching in May and June. Because of the conspicuous nature of *Hemileuca* larvae, surveys in the May and June targeting the colonial first instar, or larger later instar larvae may be a more effective survey method for Nuttall's Buckmoth (Dennis St. John, pers. comm.).

Given the Ground Mantid's cryptic colouration and behaviour, it is very difficult to detect. Active searches such as this one may not be the best inventory strategy for this species. Flying males are usually attracted to lights and all of the male specimens collected in Canada were collected at or near lights in July and August (Royal BC Museum 2009). Night traps may prove to be a more appropriate survey method for this species.

These surveys were a preliminary attempt at addressing the lack of inventory data for these invertebrate species in British Columbia. Results listed here must only be interpreted as presence/not detected. More work is necessary to determine appropriate survey methods for future Ground Mantid and Nuttall's Buckmoth inventories.

RECOMMENDATIONS

Given the lack of data for both these species and their association with an endangered ecosystem further inventories are highly recommended. Recommendations that have arisen from this survey initiative include:

- Use of light traps to better determine distribution of Ground Mantid
- Search for Buckmoth larvae on plants in May and June as larvae are much more conspicuous.

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Appendix 1



Hera Buckmoth (*Hemileuca hera*) larva on parsnip-flowered buckwheat (*Eriogonum heracleoides*) from White Lake Basin. Photograph taken by BCCC, June 12, 2009.