

NYIKA-VWAZA TRUST RESEARCH STUDY REPORT

BUTTERFLIES OF VWAZA MARSH GAME RESERVE



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1. INTRODUCTION

Malawi is a land-locked country to the east of southern Africa. It is the home of many beautiful parks and game reserves. One such park is the Vwaza Game Reserve. Vwaza is located on low-lying flat ground although the eastern side of the park is hilly. It lies to the southeast of the Nyika plateau and to the north of the floodplains of South Rukuru River and covers an area of 1,000 km². The park is characterised by Mopane and Miombo woodland and marshy wetlands, which attract a significant number of species to the reserve. Vwaza Marsh Game Reserve is rarely visited by tourists, mainly due to poor road conditions and difficult terrain and inaccessibility.

Vwaza Marsh first became a conservation area in 1941, while an area within 5 miles of the centre of Lake Kazuni was proclaimed Lake Kazuni Game Reserve (GN166 of 1941). Some of the animals found in the park are, Elephants, kudu's, sable, eland, impalas, hippopotamus, buffalo, crocodiles, waterbuck, and many other mammals. It also has different species of snakes and birds. The park has a large number of insect species, like ants, wasps, bees, beetles, dragon flies, damsel flies, tsetse flies, fleas, grasshoppers, mayflies, moths and butterflies.

Butterflies are mainly day flying insects of the order Lepidoptera and suborder Rhopalocera. These organisms are from the Animalia kingdom in the phylum arthropoda (Boggs et al. 2003). Butterflies form two superfamilies, the Hesperioidea and the Papilionoidea. Most books group the families of butterflies into eight families, namely Papilionidae, Pieridae, Libytheidae, Danadae, Satyridae, Acraeidae, Nymphalidae and Lycaenidae (Pyle 1992).

Butterflies are holometabolous insects with a life cycle consisting of four parts; egg, larva, pupa and adult. The eggs of butterflies come in different shapes and sizes depending on the species, however they all have a tiny hole at the top through which the sperm from the male enters to fertilize the egg. The female butterfly will normally lay eggs on the food plant that the caterpillars will eat, often on the underside of the leaves for protection. At the end of the egg stage, a larva (caterpillar) emerges from the egg by rupturing the shell. The caterpillars exist simply to eat and survive; they have six segmented walking legs and abdomen supported by false legs. The caterpillar undergoes a series of moults getting bigger with each moult. The last moult however results in the formation of a pupa. During the pupa stage, the organism seems to be in resting stage as there is little to no movement. This is the stage where complete transformation occurs; some of the posterior abdominal segments are fused together. When the caterpillar has been transformed into the adult inside the pupa, the pupa skin becomes a thin transparent membrane, through which the resting adult can be seen. This later ruptures to produce the adult butterfly, which is normally brightly colored with distinguishable head, thorax and abdomen (Abbott & Henning 1984).

1.1 AIMS OF THE STUDY

- The aim of this study was to make a species list of the butterflies found on Vwaza Marsh as part of baseline documentation of Vwaza's biodiversity.
- Check to determine if some of endangered species of butterflies are found in National Parks.
- To make a collection for exhibition of the full species of butterflies found in the park.

1.2 METHODOLOGY

The wet season butterfly survey was done from March 2023 and was followed by the first dry season survey which was carried out in November 2023. Two main methods were used to sample butterflies, an opportunistic sampling method and a systematic sampling method.

1.2.1 Opportunistic sampling methods

Under this method, butterflies were collected on as-encountered basis, within each of the broad habitat sites of Vwaza Marsh. Collected specimens were put into transparent envelopes to be identified using insect and butterfly field guides and other books (Gifford 1965, D'Abrera 1997, Pennington et al. 1997, Picker 2012) and by Raymond Murphy (F.R.E.S) and Top Mandala Museum Collections. Those specimens that were identified easily were released while those that needed further checking were taken to the museum for setting and identification. For each species identified, two specimens – one male and one female - were collected for the display boxes to be exhibited at Vwaza Marsh for further reference and studies.

1.2.2 Systematic sampling methods

This method involved the use of traps (butterfly traps) which were set at different locations within Vwaza Marsh, namely Kazuni, Kawiya and Bambanda Camp. Fermented bananas were used a bait. All specimens collected were put in transparent envelopes for setting and later identification using insect field guides.

1.3 Pictures of data collection



Trap with fermented banana bait

Assistant Entomologist Mwale collecting butterflies from trap



Tent pitched at Kawiya



Beston and Game Ranger Msukwa



Transect for butterfly traps



Raymond Murphy fixing display boxes

2. FINDINGS OF STUDY

Table 1. List of butterfly species collected and IUCN status

Family	Scientific name	Individuals collected	Month	IUCN status
Hesperiidae	<i>Abantis tettensis</i> (Hopffer,1855)	2	March	n/a
Hesperiidae	<i>Astictopterus stellata mineni</i> (Trimen,1894)	2	March	n/a
Hesperiidae	<i>Borbo borbonica borbonica</i> (Boisduval,1833)	2	March	n/a
Hesperiidae	<i>Borbo fatuellus</i> (Hopffer,1855)	2	March	n/a
Hesperiidae	<i>Coeliades forestan forestan</i> (Stoll,1872)	2	November	n/a
Hesperiidae	<i>Kedestes callicles</i> (Hewitson,1868)	3	March	n/a
Hesperiidae	<i>Leucochitonia Levubu</i> (Wallengren,1857)	1	November	n/a
Hesperiidae	<i>Sarangesa lucidella</i> (Mabille,1891)	2	March	n/a
Hesperiidae	<i>Sarangesa seineri</i> (Strand 1909)	2	November	n/a
Hesperiidae	<i>Tagiades flesus</i> (Fabricius,1781)	2	November	n/a
Hesperiidae	<i>Teniorhinus harona</i> (Westwood,1881)	1	November	n/a
Papilionidae	<i>Graphium angolanus angolanus</i> (Goeze,1779)	4	March	n/a
Papilionidae	<i>Graphium leonidas leonidas</i> (Fabricius,1793)	3	November	n/a
Papilionidae	<i>Papilio demodocus demodocus</i> (Esper,1798)	2	November	Least Concern
Pieridae	<i>Belenois aurota</i> (Fabricius,1793)	3	March	Least Concern
Pieridae	<i>Belenois creona severina</i> (Stoll,1781)	4	November	n/a
Pieridae	<i>Catopsilla florella</i> (Fabricius,1775)	1	March	Least Concern
Pieridae	<i>Colotis antevippe gavis</i> a(Wallengren,1857)	2	November	n/a
Pieridae	<i>Colotis euipe Omphale</i> (Godart,1899)	3	November	n/a
Pieridae	<i>Colotis evergore antigone</i> (Boisduval,1836)	1	November	n/a
Pieridae	<i>Colotis evenina casta</i> (Gerstaecker,1871)	4	November	n/a
Pieridae	<i>Colotis pallene</i> (Hopffer,1855)	1	March	n/a
Pieridae	<i>Colotis regina</i> (Trimen,1863)	2	November	n/a
Pieridae	<i>Colotis vesta mutans</i> (Butler,1877)	3	March	n/a
Pieridae	<i>Eurema destarginsi marshalli</i> (Butler,1898)	7	November	n/a
Pieridae	<i>Mylothris chloris agathina</i> (Cramer,1779)	3	November	n/a
Pieridae	<i>Pinacopteryx eriphia eriphia</i> (Godart,1819)	3	November	n/a
Nymphalidae	<i>Acraea acara</i> (Hewitson,1865)	1	March	n/a

Nymphalidae	<i>Acraea acerate</i> (Hewitson,1874)	1	March	Least Concern
Nymphalidae	<i>Acraea acrita</i> (Hewitson,1865)	1	November	n/a
Nymphalidae	<i>Acraea anemosa</i> (Hewitson,1865)	2	March	n/a
Nymphalidae	<i>Acraea calderena</i> (Hewitson,1877)	3	November	n/a
Nymphalidae	<i>Acraea eponina</i> (Cramer,1780)	2	November	Least Concern
Nymphalidae	<i>Acraea natalica</i> (Boisduval,1847)	4	November	n/a
Nymphalidae	<i>Acraea neobule</i> (Doublday,1847)	2	March	Least Concern
Nymphalidae	<i>Acraea serena</i> (Fabricius,1775)	2	March	n/a
Nymphalidae	<i>Pardopsis punctatissima</i> (Boisduval,1833)	2	March	n/a
Nymphalidae	<i>Charaxes achaemenes achaemenes</i> (Felder & Felder,1867)	3	November	Least Concern
Nymphalidae	<i>Charaxes bohemani</i> (Felder & Felder, 1859)	9	November	n/a
Nymphalidae	<i>Charaxes castor flavifasciatus</i> (Butler,1895)	3	March	Least Concern
Nymphalidae	<i>Charaxes candiope</i> (Godart,1824)	1	November	n/a
Nymphalidae	<i>Charaxes howarthi</i> (Minig,1976)	4	March	Least Concern
Nymphalidae	<i>Charaxes guderiana guderiana</i> (Dewitz,1879)	7	November	Least Concern
Nymphalidae	<i>Charaxes jasius Saturnus</i> (Butler,1866)	2	March	Least Concern
Nymphalidae	<i>Charaxes pelias</i> (Cramer,1775)	2	November	n/a
Nymphalidae	<i>Charaxes protoclea azota</i> (Hewitson,1877)	1	March	n/a
Nymphalidae	<i>Charaxes varanes vologesis</i> (Mabille,1876)	1	November	n/a
Nymphalidae	<i>Charaxes violetta violetta</i> (Grose-Smith,1885)	1	March	Least Concern
Nymphalidae	<i>Danus chrysippus aegyptus</i> (Schreber,1759)	3	March	n/a
Nymphalidae	<i>Catacroptera cloanthe</i> (Stoll,1781)	2	November	n/a
Nymphalidae	<i>Crenidomimas concordia</i> (Overlaet,1955)	1	March	Least Concern
Nymphalidae	<i>Hypolimnas misippus</i> (Linnaeus,1765)	4	November	n/a
Nymphalidae	<i>Junonia natalica</i> (Felder,1860)	1	November	n/a
Nymphalidae	<i>Junonia oenone</i> (Linnaeus,1858)	1	November	n/a
Nymphalidae	<i>Precis antilope</i> (Feisthamel,1850)	1	November	n/a
Nymphalidae	<i>Byblia anvatara acheloia</i> (Wallengren,1857)	8	March	n/a
Nymphalidae	<i>Hamanumida daedalus</i> (Fabricius,1775)	4	March	n/a
Nymphalidae	<i>Neptis laeta</i> (Overleat,1955)	1	March	n/a
Nymphalidae	<i>Neptis kiriakoffi</i> (Overlaet,1955)	2	March	n/a
Nymphalidae	<i>Phalanta phalantha</i> (Stoll,1781)	2	March	Least Concern
Nymphalidae	<i>Salamis parhassus</i> (Drury,1782)	7	November	Least Concern
Nymphalidae	<i>Salamis anacardii</i> (Linnaeus,1757)	9	March	n/a

Nymphalidae	<i>Melanitis leda africana</i> (Linnaeus,1758)	2	March	n/a
Satyridae	<i>Bicyclus angulosa selousi</i> (Trimen,1895)	0	March	n/a
Satyridae	<i>Henotesia perspicua</i> (Trimen,1873)	8	November	n/a
Satyridae	<i>Henotesia simonsii</i> (Butler,1877)	2	March	n/a
Satyridae	<i>Melanitis leda helena</i> (Westwood,1851)	2	March	n/a
Satyridae	<i>Physcaeneura pione</i> (Godman,1880)	3	March	n/a
Lycaenidae	<i>Axiocerces joane</i> (Wallengren,1857)	0	March	n/a
Lycaenidae	<i>Azanus jesous</i> (Guerin-Meneville,1849)	1	March	Least Concern
Lycaenidae	<i>Cacyreus lingeus</i> (Stoll,1782)	7	November	n/a
Lycaenidae	<i>Cnodontes vansomeroni</i> (Stempffer & Bennet,1953)	2	November	n/a
Lycaenidae	<i>Deudorix (Pilodeudorix) caerulea</i> (Druce,1890)	7	November	n/a
Lycaenidae	<i>Deudorix (Virachola) diocles</i> (Hewitson,1869)	2	November	n/a
Lycaenidae	<i>Deudorix (Virachola) magda</i> (Gifford,1963)	7	March	n/a
Lycaenidae	<i>Epamera sidus</i> (Trimen,1864)	0	March	n/a
Lycaenidae	<i>Eurychrysops malathana</i> (de Boisduval,1833)	4	March	n/a
Lycaenidae	<i>Hypolycaena auriocostalis</i> (Butler,1897)	0	March	n/a
Lycaenidae	<i>Lachnocnema bibulus</i> (Fabricius,1793)	1	March	n/a
Lycaenidae	<i>Lampides boeticus</i> (Linnaeus,1767)	3	November	Least Concern
Lycaenidae	<i>Spindasis trimeni</i> (Neave,1910)	1	November	n/a
Lycaenidae	<i>Spindasis victoriae</i> (Butler,1874)	3	November	n/a
Lycaenidae	<i>Zizeeria knysna</i> (Trimen,1862)	2	March	n/a
Lycaenidae	<i>Cnodontes vansomereni</i> (Stempffer & Bennett,1953)	4	March	n/a

Table 2. Butterfly species found during the study but not found in previous surveys.

Family	Scientific name	Individuals collected	Month	IUCN status
Nymphalidae	<i>Charaxes candiope</i> (Godart,1824)	1	November	Least Concern
Nymphalidae	<i>Charaxes pelias</i> (Cramer,1775)	2	March	Least Concern
Nymphalidae	<i>Charaxes violetta violetta</i> (Grose-Smith,1885)	1	March	n/a
Nymphalidae	<i>Crenidomimas concordia</i> (Overlaet,1955)	1	November	n/a
Nymphalidae	<i>Neptis kiriakoffi</i> (Overlaet,1955)	2	March	n/a
Nymphalidae	<i>Phalanta phalantha</i> (Stoll,1781)	2	March	n/a
Nymphalidae	<i>Salamis parhassus</i> (Drury,1782)	9	March	Least Concern
Nymphalidae	<i>Salamis anacardii</i> (Linnaeus,1757)	6	March	Least Concern
Nymphalidae	<i>Melanitis leda africana</i> (Linnaeus,1758)	3	November	n/a
Nymphalidae	<i>Melanitis libya</i> (Distant,1882)	1	March	n/a
Pieridae	<i>Mylothris chloris agathina</i> (Cramer,1779)	3	November	n/a

2.1 Some of the butterflies caught at Vwaza Marsh



Graphium leonidas



Junonia oenone



Nymphalidae: *Catacroptera cloanthe*



Nymphalidae: *Acraea eponina*



Nymphalidae: *Acraea natalica*



Nymphalidae: *Acraea natalica*



Nymphalidae: *Acraea natalica*



Nymphalidae: *Acraea* sp.



Nymphalidae: *Charaxes achaemenes* ♂



Nymphalidae: *Charaxes bohemani* ♀



Nymphalidae: *Charaxes bohemani* ♂



Nymphalidae: *Charaxes bohemani* ♂



Nymphalidae: *Charaxes druceanus* ♂



Nymphalidae: *Charaxes guderiana* ♀



Nymphalidae: *Charaxes guderiana* ♂



Nymphalidae: *Charaxes pelias* ♂



Nymphalidae: *Charaxes pelias*



Nymphalidae: *Charaxes protoclea*



Nymphalidae: *Charaxes violetta*



Nymphalidae: *Danaus chrysippus*



Nymphalidae: *Hamanumida daedalus*



Nymphalidae: *Hypolimnas misippus* ♂

2.4 Display box of butterflies from Vwaza Marsh Game Reserve



Display Box 1



Display Box 2

3 DISCUSSION OF RESULTS

The survey conducted at Vwaza Marsh Game Reserve revealed the rich diversity of butterflies inhabiting the area. A total of six butterfly families were recorded during the survey, comprising 80 distinct species. Among the families recorded were Papilionidae, Pieridae, Hesperidae, Nymphalidae, Satyridae and Lycaenidae.

The collection and identification process involved the utilization of various field guides enabling researchers to catalogue the diverse array of butterflies. The study uncovered ten species not documented in earlier studies, highlighting the dynamic nature of butterfly community in the area. These newly recorded species are shown in Table 2 and were: *Charaxes candiope*, *Charaxes pelias*, *Charaxes violetta violetta*, *Crenidomimas concordia*, *Neptis kiriakoffi*, *Phalanta phalanta*, *Salamis parhassus*, *Salamis anacardii*, *Melanitis leda africana*, *Melanitis libya* and *Mylothris chloris agathina*.

It was revealed that 60 taxa of butterflies have not yet been assessed for their IUCN status. This lack of evaluation poses a significant challenge for conservation efforts as it impedes the ability to comprehend the vulnerabilities and threats faced by some species. However, the survey showed that 20 butterfly species recorded are categorized under the IUCN status of Least Concern.

Table 1 shows that there was a zero catch for the following butterfly species – *Bicyclus ena*, *Axiocere joane*, *Epamera sidus* and *Hypolcaena auriocostalis*. These are species that were recorded in previous studies but were not observed or caught during this study.

According to the list by Bampton et al. (2019), Nyika National Park boasts of a rich diversity of butterflies with a recorded count of 250 species, showcasing the park's vibrant ecosystem. In contrast Vwaza Marsh Game Reserve has a count of only 80 butterfly species.

One of the objectives of the study was to find out if there are any species that have an IUCN threat status. It has been observed that there were no Endangered or Vulnerable species found in the area. The absence of threatened species, coupled with the prevalence of butterflies categorized as Least Concern, underscores the importance of continued monitoring and conservation efforts to maintain the ecological balance and diversity of butterfly community in the region. Moreover, the discovery of previously unrecorded species emphasizes the need for ongoing research and documentation to enhance our understanding of the dynamic nature of the Vwaza Marsh ecosystem.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1 CONCLUSIONS

In conclusion, the survey did not find any butterfly species in Vwaza Marsh Game Reserve that are endangered or vulnerable. From the findings it was observed that most of the species that were recorded are not in an IUCN assessed category. In total 80 species of butterflies were documented from the following families – Papilionidae, Pieridae, Hesperidae, Nymphalidae, Satyridae and Lycaenidae.

4.2 RECOMMENDATIONS

Based on the findings of this study, I recommend that management should continue monitoring the marsh even though the current conservation status suggests that there no significant threats to butterflies here.

4.3 LIMITATIONS OF STUDY

We did not have a personal camera that could be used in the field to take good quality pictures. A mobile phone was used resulting in low-resolution pictures.

4.4 ACKNOWLEDGEMENTS

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