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Keywords

herbaceous macrophytes, seasonal floodplains, Okavango Delta, hydroperiod, tropical wetlands, flood pulse, occurrence, relative abundance

Short description of the dataset/summary

This study covered the southern parts of the Okavango Delta - the seasonally flooded Xudum and Boro distributary systems. It was a single campaign aimed at collecting and analysing floodplain vegetation species and abundance data, to establish relationships with hydroperiod for exploratory scenario modelling. A stratified random sample of 30 sites was surveyed for species composition and abundance between mid-March and mid-July 2007, using multiple 1 sq m quadrats along transects orthogonal to the floodplain long axis. Minimum sampled area at each site was 30 sq m. Hydroperiod was established based on three sets of remote sensing data: 1:50,000 analogue aerial photography from 2001, Landsat (annual) and MODIS (monthly) data from 2000-2007, and ground truthing from 2007.

General information

dataset entry ID:	FWM_24
name of the dataset:	
full name of the dataset:	Seasonal floodplain herbaceous plant species in the Okavango Delta, Botswana
dataset short name:	Boro and Xudum Floodplain Vegetation Data 2007
type of dataset:	species (taxonomic group) per site database including environmental information
data type:	point data/observation data
science keywords according to GCMD:	
topic:	Biosphere, Terrestrial Hydrosphere

ISO topic category according to ISO 19115:
Biota, Inland Waters
INSPIRE keywords according to GEMET:
Habitats and biotopes, Hydrography, Species distribution
own science keywords: herbaceous macrophytes, seasonal floodplains, Okavango Delta, hydroperiod, tropical wetlands, flood pulse, occurrence, relative abundance
funding: University of Botswana (Funds for Fieldwork and Travel), University of Florida (Adaptive Management: Water, Wetlands and Watersheds program funded by the National Science Foundation), Biokavango Project (Global EnvironmentFacility), JRS Biodiversity Foundation (Reformatting database to DC standards)

Technical and administrative specifications

data format: txt
others/details: DwC-A
operating system: Linux
others/details: Ubuntu
data language: English
current access level: web (public)
web address:
http://www.monitoringdata.ub.bw/ipt/resource?r=herbaceous_floodplain_vegetation_mmh2007&v=1.0
others/details: https://www.gbif.org/dataset/602b5978-0777-41d7-8c9f-44f459b0f8ef
currently available through GBIF: yes
exchange planned: no
data in data repository: yes
specify repository: http://www.monitoringdata.ub.bw/ipt
Do you plan to publish the data on the Freshwater Biodiversity Data Portal:
no
update level: completed
documentation:
type: internal description
language: English

contact details:
metadata contact person:
first, last name: Michael Murray-Hudson
phone: +267 6817232
email: mmurray-hudson@ub.ac.bw
institution: University of Botswana Okavango Research Institute
address: Private Bag 285
postal code, city: 00000 Maun
province, state: North-West District
country Botswana
web address: https://www.ori.ub.bw/
technical contact person:
first, last name: Kaelo Makati
phone: +267 6817256

email: makatik@ub.ac.bw
scientific contact person:
first, last name: Michael Murray-Hudson
phone: +267 6817232
email: mmurray-hudson@ub.ac.bw

Intellectual property rights and citation

dataset publisher: Okavango Research Institute
dataset creator (data compiler):
contact name: Michael Murray-Hudson
contact email: mmurray-hudson@ub.ac.bw
contact institution: University of Botswana Okavango Research Institute
data contributors to/owners of this dataset:
multiple
number: 3
data contributor/owner 1:
contact name: Michael Murray-Hudson
contact email: mmurray-hudson@ub.ac.bw
contact institute: University of Botswana Okavango Research Institute
criteria for using this part of the dataset:
The dataset is publicly available (data portal, data archive) and can be used without restrictions, but dataset creator/data contributors must be informed prior to publication. Data must be acknowledged and cited correctly.
data contributor/owner 2:
contact name: Frances Murray-Hudson
contact email: fmurray-hudson@ub.ac.bw
contact institute: Peter Smith Herbarium, Okavango Research Institute
criteria for using this part of the dataset:
The dataset is publicly available (data portal, data archive) and can be used without restrictions, but dataset creator/data contributors must be informed prior to publication. Data must be acknowledged and cited correctly.
data contributor/owner 3:
contact name: Wilfred Khaneguba
contact email: wkhaneguba@ub.ac.bw
contact institute: University of Botswana Okavango Research Institute
criteria for using this part of the dataset:
The dataset is publicly available (data portal, data archive) and can be used without restrictions, but dataset creator/data contributors must be informed prior to publication. Data must be acknowledged and cited correctly.
citation of this dataset:
author(s): Makati, K., Murray-Hudson, M.
title and journal (name, number, pages):
Boro and Xudum Floodplain Vegetation Data 2007. Version 1.1. Okavango Research Institute. Sampling event dataset https://doi.org/10.15468/fooskp accessed via GBIF.org on 2019-09-06.
year: 2019
version: 1
doi: https://doi.org/10.15468/fooskp

citation of the metadata:

author(s): Murray-Hudson, M., Makati, K., Mosie, I. & Wolski, P.

title and journal (name, number, pages): Metadata for macrophyte data from the Boro-Xudum seasonal floodplains of the Okavango Delta. Freshwater Metadata Journal 45: 1-8

year: 2019

doi: https://doi.org/10.15504/fmj.2019.45

dataset related references:

reference 1:

author(s): Murray-Hudson, M.

title: Floodplain Vegetation Responses to Flood Regime in the Seasonal Okavango Delta, Botswana. PhD Dissertation, University of Florida, Gainesville

year: 2009

reference 2:

author(s): Murray-Hudson, M., Combs, F., Wolski, P., Brown, M.T.

title: A vegetation-based hierarchical classification for seasonally pulsed floodplains in the Okavango Delta, Botswana. African Journal of Aquatic Science 36:3, 223-234.

year: 2011

doi: https://doi.org/10.2989/16085914.2011.636904

reference 3:

author(s): Murray-Hudson, M., Wolski, P., Cassidy, L., Brown, M., Thito, K., Kashe, K., Mosimanyana, E.

title: Remote Sensing-derived hydroperiod as a predictor of floodplain vegetation composition. Wetlands Ecology and Management 23:4, 603-616.

year: 2015

doi: https://doi.org/10.1007/s11273-014-9340-z

reference 4:

author(s): Murray-Hudson, M., Wolski, P., Murray-Hudson, F., Brown, M.T., Kashe, K.

title: Disaggregating Hydroperiod: Components of the Seasonal Flood Pulse as Drivers of Plant Species Distribution in Floodplains of a Tropical Wetland. Wetlands 34:5, 927-942.

year: 2014

doi: https://doi.org/10.1007/s13157-014-0554-x

reference 5:

author(s): Murray-Hudson, M., Wolski, P., Brown, M.T., Davidson, T.

title: A suite of macrophyte species distribution models for investigating hydrology-driven spatial changes in a large flood-pulsed tropical wetland. South African Geographical Journal 101:2, 141-157

year: 2019

doi: https://doi.org/10.1080/03736245.2018.1541021

reference 6:

author(s): Arias, M.E., Wittmann, F., Parolin, P., Murray-Hudson, M., Cochrane, T.A.

title: Interactions between flooding and upland disturbance drives species diversity in large river floodplains. Hydrobiologia 814:1, 5-17.

year: 2018

doi: https://doi.org/10.1007/s10750-016-2664-3

General data specifications

regional coverage of the dataset:
- spatial extent of the dataset: regional
- continents: Africa

spatial extent (bounding coordinates):
- southernmost latitude [°]: -19.979
- northernmost latitude [°]: -19.067
- westernmost longitude [°]: 22.302
- easternmost longitude [°]: 23.236
- minimum altitude: 940 metres
- maximum altitude: 970 metres
- countries: Africa: Botswana
- comments: Okavango Delta seasonal floodplains

world climatic regions according to Köppen: Group B: dry (arid and semiarid) climates

freshwater ecoregions of the world (FEOW) according to WWF: Africa: Okavango

ecosystem type: wetlands

covered timeframe: 2007 - 2007

Site specifications

coordinate system/grid data: latitude/longitude, format: DD
- grid data available: no
- comments: GPS coordinates for each quadrat. Accuracy +/- 3m.

ecosystem type classification:

wetlands (classification according to GLWD):

wetland type
- freshwater marsh, floodplain

wetland size
- 50 - 100 % wetland

site coding:
- site coding available: yes, alphanumerical
- number of digits: 25
- example: MMH_BOB-1-01_20070417-01

number of sites: <100
- exact number of sites: 30

comments: Samples are 1 sq m quadrats. Sites had 1-5 transects; a minimum of 30 quadrats 20 m apart along transects at each site.

Climate and environmental data

climate related data: no climate data available

environmental data: no environmental data per catchment available

- available parameters per site: information on floodplain inundation duration
  - data source: remote sensing-derived hydroperiod

altitude
data source: from GPS
hydrological regime/flow regime
data source: remote sensing-derived hydroperiod
mean depth
data source: measured at site on date of survey

comments: Shallow, elongate floodplains, which are seasonally pulsed and carry very slow flow. Highly permeable sandy organic soils.

physico-chemical data: no physico-chemical data available

stressors influencing the sites: no stressor data available

reference sites available: no

Biological data

biological data origin: from sampling,
Floodplain vegetation responses to flood regime in the seasonal Okavango Delta, Botswana

comments: Data collected as part of research for a PhD.

organism group addressed: macrophytes

Sample specifications/sample resolution

macrophytes:

sample information:

covered timeframe: 2007 - 2007

historical data: no

palaeo data: no

season: winter

temporal resolution/frequency of sampling:
a single survey campaign from mid-March to mid-July 2007

time series data: no

comments: Field survey work was carried out over the rising flood, for four months between mid-March and mid-July 2007.

taxonomic resolution:

level: species

percentage of species level data: 99

comments: Individuals were identified to species level in the field as far as possible. Where not possible they were pressed as herbarium specimens and submitted to the Peter Smith Herbarium (PSUB) at the University of Botswana Okavango Research Institute for identification. Specific unidentified grass specimens of the sub-family Panicoideae were sent to the Royal Botanical Gardens, Kew, United Kingdom for identification.

taxonomic coding:

taxalist according to: Germishuizen, G., Meyer, N.L. 2007. http://posa.sanbi.org.

reference(s): Germishuizen, G., Meyer, N.L., 2007. Plants of Southern Africa: an online checklist: http://posa.sanbi.org.

Cook, C.D.K., 2004. Aquatic and wetland plants of southern Africa: An identification manual for the stoneworts (Charophytina), liverworts (Marchantiopsida), mosses (Bryopsida), quillworts (Lycopodiopsida), ferns (Polypodiopsida) and flowering plants (Magnoliopsida) which grow in water and wetlands of Namibia, Botswana, Swaziland, Lesotho and Republic of South Africa. Leiden: Backhuys.
Gibbs-Russell, G.E. et al., 1991. Grasses of southern Africa - an identification manual. Memoirs of the Botanical Survey of South Africa No. 58. National Botanic Gardens/Botanical Research Institute, Pretoria.
Clarke, N.V., Klaassen, E.S., 2001. Water Plants of Namibia - an identification manual. Occasional Contributions 2, National Botanical Research Institute, Windhoek, Namibia

coding system: first three letters of genus, first three letters of species, no separator

example: Abihis: Abildgaardia hispidula

sample specifications:

type: quantitative (abundance data)

replicate samples: no

number of samples: 1080

specification of method(s) used for sampling and sorting:

- Step 1 involved the selection of random sites for vegetation sampling. This was based on historic hydroperiod - a flood frequency map derived from remote sensing which assigned a frequency to each pixel. The frequency map was stratified into 5 strata of approximately equal area, and in each stratum 6 sites were selected by randomising the pixel numbers.
- Step 2 involved doing surveys of the vegetation at each site by laying out transects orthogonal to the long axis of each floodplain, and enumerating plant species within 1 square metre quadrats at 20 metre intervals along these transects. Species-area plots from sampling carried out beforehand indicated that a minimum of 25 square metres should be sampled. A minimum of 30 quadrats was thus surveyed at each site. All species in each quadrat were recorded and their relative abundance estimated according to a modified Braun-Blanquet classification.

reference(s): Wolski, P., Murray-Hudson, M. 2006. Reconstruction of 1989-2005 inundation history in the Okavango Delta, Botswana from archival Landsat imagery, Globwetland Symposium. Frascati, Italy. ESA-ESRIN.
Wolski, P., Murray-Hudson, M. 2005. Flooding dynamics in a large low-gradient alluvial fan, the Okavango Delta, Botswana, from analysis and interpretation of a 30-year hydrometric record. Hydrol. Earth Syst. Sci. J1 - HESS 10:1, 127-137.

sample type (e.g. habitat specific samples, composite samples etc.):

Quadrats were sampled along transects which crossed the topographic gradients of each floodplain site. That is, they were designed to sample all microhabitats within each floodplain site.

specific sample location (e.g. littoral, profundal, transect, shoreline, hyporheic zone, etc.):

Multiple transects per site.

Other specifications

GIS layers, shape files related to the dataset: no data available

availability of photos: no

availability of maps: no

quality control procedures:

Were any quality control procedures applied to your dataset? yes

quality control protocols and comments: Relative abundance estimates were made by consensus of at least two field surveyors, and a one-day calibration exercise was carried out at the beginning of the field work to ensure consistency. Data entry was done by M. Murray-Hudson, and F. Murray-Hudson into a custom-designed Microsoft Access relational database; reading of field sheets and typing was done alternately, and data were cross-checked with field sheets after all had been transcribed.

Acknowledgements

Frances Murray-Hudson, Wilfred Khaneguba, Mark T. Brown, JRS Biodiversity Foundation

References

Arias, M.E., Wittmann, F., Parolin, P., Murray-Hudson, M., Cochrane, T.A., 2018. Interactions between flooding and upland disturbance drives species diversity in large river floodplains. Hydrobiologia 814:1, 5-17. https://doi.org/10.1007/s10750-016-2664-3

Murray-Hudson, M., 2009. Floodplain Vegetation Responses to Flood Regime in the Seasonal Okavango Delta, Botswana. PhD Dissertation, University of Florida, Gainesville

Murray-Hudson, M., Combs, F., Wolski, P., Brown, M.T., 2011. A vegetation-based hierarchical classification for seasonally pulsed floodplains in the Okavango Delta, Botswana. African Journal of Aquatic Science 36:3, 223-234. https://doi.org/10.2989/16085914.2011.636904

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Murray-Hudson, M., Wolski, P., Cassidy, L., Brown, M., Thito, K., Kashe, K., Mosimanyana, E., 2015. Remote Sensing-derived hydroperiod as a predictor of floodplain vegetation composition. Wetlands Ecology and Management 23:4, 603-616. https://doi.org/10.1007/s11273-014-9340-z

Murray-Hudson, M., Wolski, P., Murray-Hudson, F., Brown, M.T., Kashe, K., 2014. Disaggregating Hydroperiod: Components of the Seasonal Flood Pulse as Drivers of Plant Species Distribution in Floodplains of a Tropical Wetland. Wetlands 34:5, 927-942. https://doi.org/10.1007/s13157-014-0554-x