



Introduction to managing Ruiswa Spatial data

Iringa

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LUDEWA CLUSTER





- Plan for data collection 1. Manage your data 2. Process your data – done 3. this!
- 4. Share your data

1.Plan for data collection

The data management plan



The Development Corridors Partnership

Data management plan

- Explains how DCP will deal with data to comply with donor and legal requirements
- Describes the data work flow to manage DCP data
- Identifies types of data DCP will produce and defines data standards
- Provides guidance on how to manage different types of data

DCP approach to data management



Design

- Start by designing the data collection protocols: 2-3 page data management plan
- Make sure you comply with your project and funder privacy, ethical and quality control requirements

Process

- Steps to make sure data collected is:
 - Consistent: data is collected in the same way, properly labelled and documented, quality checked (clean) and not corrupt (it works!)
 - Interoperable: data is compatible with your softwares and sharing platforms

Store

- Ensure you store your data in a consistent, systematic manner (more later!)
- In DCP, data has to comply with the project data requirements and UNEP-WCMC securely stores all data relevant to the project. How about you?

Share

- Avoid shelves! How is data going to be disseminated internally and externally?
- This is a fundamental part of disseminating results and influencing decision makers to make a change

Make sure you know what data you need

What data do you need for your research?

- Before you start collecting data define:
 - Research questions
 - Methods and tools you are going to follow to respond to those questions
 - Data you need to implement your methods
 - Expected outputs from your research
 - If relevant: target audience and expected impact what do you want to achieve?

	Α	В	С	D	E	F	Z
	No.	Research questions for each corridor (SAGCOT for sure,	Methods	Data needed	Outputs	Notes/comments	
		others depends on scoping work in June, one in Kenya at					
1		least, possibly SGR):					
2	1	Were potential cumulative impacts assessed and the mitigation hierarchy applied to assess biodiversity risks during planning for these corridors?	Litt review, internet searches, possibly in interviews at the same time as investigating point 2.	Corridors strategies and reports, EIA and SEA available.	Summary documents describing how biodiversity risks where/are considered. Probably through developing a specific taxonomy to classify mitigation measures types that I can use later (or use an existing one)		
	2	What were the key decision points in the planning of these corridors where biodiversity impacts were/were not taken into account and why?	Analyse the documentation gathered to understand the decision making process and what criteria was used to informed decisions (data?, politics? Mix of both?). Conduct semi structured interviews to key stakeholders to further understand that process, complete qualitative analyses using Nvivo (qualitative analyses software).	Data from point 1, interview data, gather relevant conservation plans completed in each country and document their subsequent use.	Summary documents, possibly a paper also using results from 1.		

Activity: what data do you need (research plan excel file)?

In groups and for 30 min use the excel file to think about and fill in (2 volunteers will report back):

- Tab R_questions: Your research questions, the methods you will use, the data you will need, and the outputs you expect
- Tab data gaps:
- Category of data: species, ecosystems, water, employement, people's views
- Format: spatial data (rasters or vectors), tabular data, qualitative, video, audio, reports, pictures, paper maps, etc.
- **Resolution:** 1 km2, 20 m, not applicable
- Sources: collect from the field, from existing databases, processed, etc

2.Manage your data

3 Principles for managing spatial data

- 1. Identify the software and formats that are fit for your purpose: ArcGIS, QGIS and associated software, PostGIS, etc.
- 2. Be systematic and consistent on how you name and store your data: data standards
- 3. Define and stick to your workflow: the steps you will follow to collect, store and manage your data

The world database on protected areas (WDPA): 220,000 records collected from 500 sources and 193 countries

Proportion of land covered by protected areas

Proportion of ocean covered by protected areas

🕥 protected planet

April release of the WDPA

This month's release of the WDPA includes udpates from Eswatini and Solomon Islands.

Search a protected area

Image: Contract of the contr

Discover the world's

protected areas

How is the WDPA managed? **1.Data standards** 2.Clear data collection workflow 3.Metadata standards

Data standards

LOPMENT

CORRIDORS PARTNERSHIP

Defines the database structure,

accepted values and types of

data in it

No	Requirement	Provided by	Field Name	Туре	Length	Accepted values
1	Minimum	UNEP-WCMC	WDPAID	Number (Double)	N/A	Assigned by UNEP-WCMC. Unique identifier for a protected Area.
2	Minimum	UNEP-WCMC	WDPA_PID	Text (String)	52	Assigned by UNEP-WCMC. Unique identifier for parcels or zones within a protected area.
3	Minimum	Data provider	PA_DEF	Text (String)	20	Allowed values: 1 (meets IUCN and/or CBD PA definition); 0 (does not meet IUCN and/or CBD PA definition (currently stored outside WDPA)).
4	Minimum	Data provider	NAME	Text (String)	254	Name of the protected area (PA) as provided by the data provider.
5	Minimum	Data provider	ORIG_NAME	Text (String)	254	Name of the protected area in original language.
6	Minimum	Data provider	DESIG	Text (String)	254	Name of designation.
7	Complete	Data provider	DESIG_ENG	Text (String)	254	Designation in English. Allowed values for international-level designations: Ramsar Site, Wetland of International Importance; UNESCO-MAB Biosphere Reserve; World Heritage Site. Allowed values for regional-level designations: Baltic Sea Protected Area (HELCOM); Specially Protected Area (Cartagena Convention); Marine Protected Area (CCAMLR); Marine Protected Area (OSPAR); Site of Community Importance (Habitats Directive); Special Protection Area (Birds Directive); Specially Protected Areas of Mediterranean Importance (Barcelona Convention). No fixed values for protected areas designated at a national level.
8	Minimum	Data provider	DESIG_TYPE	Text (String)	20	Allowed values: National, Regional, International, Not Applicable
9	Complete	Data provider	IUCN_CAT	Text (String)	20	Allowed values: Ia, Ib, II, III, IV, V, VI, Not Applicable, Not Assigned, Not Reported
10	Minimum	UNEP-WCMC	INT_CRIT	Text (String)	100	Assigned by UNEP-WCMC. For World Heritage and Ramsar sites only.
11	Minimum	Data provider	MARINE	Text (String)	20	Allowed values: 0 (100% Terrestrial PA), 1 (Coastal: marine and terrestrial PA), and 2 (100 % marine PA).
12	Minimum	Data provider	REP_MAREA	Number (Double)	N/A	Marine area in square kilometers.
13	Minimum	UNEP-WCMC	GIS_M_AREA	Number (Double)	N/A	Assigned by UNEP-WCMC.

Data collection workflow

Metadata

Metadata is key for publishing any database. It provides information about the data:

- How it is called
- how it has to be cited
- who has collected it and how
- Which is the coordinate system and proyection
- how can you use it and how has the copyright

Working with geopacakes and QGIS databse manager

Follow the PDF Geopackages_tutorial_2019

Issues with shapefiles

•	Name	Date modified	Туре	Size
	🔊 all_vlfrs_17July08.dbf	23/07/2008 08:06	DBF File	11 KB
	all_vlfrs_17July08.prj	18/07/2008 08:33	PRJ File	1 KB
	all_vlfrs_17July08.sbn	23/07/2008 08:06	SBN File	1 KB
	all_vlfrs_17July08.sbx	23/07/2008 08:06	SBX File	1 KB
	J all_vlfrs_17July08.shp	23/07/2008 08:06	SHP File	7 KB
	🍶 all_vlfrs_17July08.shp.xml	01/08/2008 13:37	XML Document	12 KB
	all_vlfrs_17July08.shx	23/07/2008 08:06	SHX File	1 KB
	Jathymetry_tz.dbf	01/08/2008 09:46	DBF File	9 KB
	🔊 bathymetry_tz.prj	01/08/2008 09:46	PRJ File	1 KB
	Jathymetry_tz.sbn	01/08/2008 09:46	SBN File	1 KB
	Jathymetry_tz.sbx	01/08/2008 09:46	SBX File	1 KB
	🔊 bathymetry_tz.shp	01/08/2008 09:46	SHP File	296 KB
	bathymetry_tz.shp.xml	02/08/2008 09:58	XML Document	10 KB
	bathymetry_tz shx	01/08/2008 09:46	SHX File	1 KB
	• Torest_threats.dbf	01/08/2008 09:51	DBF File	59 KB
	forest_threats.prj	01/08/2008 09:51	PRJ File	1 KB
	orest_threats.sbn	01/08/2008 09:51	SBN File	2 KB
	of forest_threats.sbx	01/08/2008 09:51	SBX File	1 KB
N	of forest_threats.shp	01/08/2008 09:51	SHP File	5 KB
1	forest_threats.shp.xml	01/08/2008 14:22	XML Document	2 KB
	forest_threats.shx	01/08/2008 09:51	SHX File	2 KB
	🔊 indian_ocean.dbf	08/12/2006 07:34	DBF File	1 KB
	🔊 indian_ocean.prj	23/07/2008 14:43	PRJ File	1 KB
	🔊 indian_ocean.sbn	25/07/2008 07:22	SBN File	1 KB
	🔊 indian_ocean.sbx	25/07/2008 07:22	SBX File	1 KB
	🔊 indian_ocean.shp	23/07/2008 14:43	SHP File	532 KB
	🔊 indian_ocean.shp.xml	01/08/2008 13:37	XML Document	9 KB
	indian ocean shy	23/07/2008 14:43	SHX File	1 KB

• Shapefiles cannot hold more than 2 GB of data

- It is not an open source format
- They can easily get corrupted (stop working)
- Only contain one geometry type per shapefile
- They are formed of 7 individual files
- Attribute names limited to 10 characters

What are GeoPackages?

GeoPackage

www.geopackage.org

An Open Format for Geospatial Information GeoPackage is an open, standards-based, platformindependent, portable, self-describing, compact format for transferring geospatial information.

Benefits of GeoPackages (GP)

- 1. Open source
- 2. Compatible with all GIS software packages
- 3. More stable and efficient in geoprocessing
- 4. No space issues (limit of 140 TB for each GP)
- 5. Light and easy to share as it stores all data in one file

How do they look like?

With a geopackage you can manage your data more efficiently and find your files quickly

You can store in the same place as many tables, vectors and rasters as you like (limit 140 TB)

Let's create a GP layer and GP databse

1.Click on the GP Icon OR go to Layer/create layer and choose GP layer

🔇 Untitled Project - QGIS	_	٥	\times
Project Edit View Layer Settings Plugins Vector Raster Database Web CLUZ SCP Processing Help			
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2.A window will open, fill in the fields (see next steps)

🔇 New GeoPac	kage Layer		×	3.Choose a location folder and name
Database	C:\Users\diego.j	uffe\Desktop\Test_GPDB.gpkg	☑	for your CD database. If you already
Table name	Test_table			for your GP database. If you already
Geometry type	e 📰 No geometry			
	Include Z dim	ension 🗌 Include M values		have a GP database choose its
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Name				Iooutoni
Туре	abcText data		•	
Maximum len	lgth		(10)	
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Fields List				4.01005e fiame of the mist me you
Name	Туре	Length		will exects in the CD details
				will create in the GP database
				5. Select type of data for that new file
				If you don't want to create any new
				If you don't want to create any new
				enatial data choose (no geometry)
1			100	Spallal uala chouse (no geometry)
			Remove Field	
Advanced C	Options			
			OK Cancel Help	C Colort music attain
				b Select projection

🔇 New GeoPa	ackage Layer		×
Database	C:\Users\diego.	juffe\Desktop\Test_GPDB.gpkg	B
Table name	Test_table		
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	🗌 Include Z din	nension 🗌 Include M values	
	EPSG:4326 - W	'GS 84	v 🛞
New Field			
Name			
Туре	abcText data		
Maximum le	ength		Add to Fields List
Fields List			
Name	Туре	Length	
Advanced	Options		Remove Field

7.Create fields for the new file. If you want no fields go to next step.

You will have to define name of the field, type of information that field will store and, for text fields, number of characters that will field will allow.

The fields will show in the field list.

Important: in this step you are not creating any geographic features. You are just defining the structure of the dataset. The dataset you will create will be empty.

8. Click OK You have created your first GP layer which is also a GP database where you can add other data you have.

Let's add existing files to the GP database you just created

1. Choose one spatial file you would like to include into a GP

2. Add it to the GP database you created

Option 1 Using an existing file in the layers list: choose export/save as and fill in the table choosing GP database location. A new file will show in your layers list

Option 2 – Using the QGIS Browser: choose the data in the QGIS browser and drag it into your GP database location in the browser

This step does not move the file it creates a new one so don't forget to delete the old one!

Database manager: your GIS database

The database manager allows you to manage all your GIS databases in your computer but also:

- Import new or existing data into or from one database to another
- Export data to other places
- Use SQL query language

Database manager: The interface

🗐 DB Manager		Space to manage your
Database Table		databases Organised by
🔁 🛐 层 Import Layer/File	sport to File	ualabases. Organiseu by
Providers	Info Table Preview PAs_clip	type of database
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PostGIS SpatiaLite Virtual Layers	#NameTypeNullDefault0fidINTEGERN1geomMULTIPOLYGONY2WDPAIDREALY3WDPA_PIDTEXT(80)Y4PA_DEFTEXT(80)Y5NAMETEXT(80)Y6ORIG_NAMETEXT(80)Y7DESIGTEXT(80)Y8DESIG_ENGTEXT(80)Y9DESIG_TYPETEXT(80)Y10IUCN_CATTEXT(80)Y11INT_CRITTEXT(80)Y12MADINIETEYT(90)Y	Space for visualising details about each feature in your databases.
 DCP_field_work.gpkg Gedis_FW_FebMar2019 LAPSSET_FT_2019 GP1.gpkg GP1.gpkg GP1.grkg SCP_course.gpkg NoKm_grid KEN_county PAs_clip Oracle Spatial SpatiaLite Virtual Layers 	General infoRelation type: TableRows:41GeoPackageColumn:geomGeometry:MULTIPOLYGONDimension:XYSpatial ref:WGS 84 (4326)Extent:35.42860, -3.18767 - 37.94580, 0.19689Fields	Space for visualising details about each feature in your databases.

Database manager: What each icon does

Project Edit View Layer Settings Plugins Vector Raster Database Web CLUZ SCP Processing Help

- **Import**: Use this to exchange data between places
- **Export**: Export a file from the DB manager to another location
- Use these 3 tabs to explore each file. I this case we are exploring PAs clip polygon

Info: tell you about the parameters of the file

Table: shows you the attribute table forthat dataset

Preview: shows a preview of the spatial data

How to link an existing GP database you the database manager?

1.Click here to start the DB manager

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$\leftarrow \rightarrow \checkmark \land \downarrow \rightarrow$ This PC >	Windows (C:) > GP test	✓ Ů Search (GP test	م	
Organise • New folder				0	2.Choose you GP location
B 3D Objects	▲ Name	Date modified	Type	Size	
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- Pictures					
🖉 Videos					
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		Op	en Cano	el	
B Manager			- 0	×	
DB Manager Database			- 0	×	
DB Manager Database	e Export to File		- 0	×	

Now you can explore your GP database

Refresh DB manager

- Import: Use this to exchange data between places
- **Export**: Export a file from the DB manager to another location
- Use these 3 tabs to explore each file. I this case we are exploring PAs clip polygon

Info: tell you about the parameters of the file

Table: shows you the attribute table for that dataset

Preview: shows a preview of the spatial data

2. Process your data

Started with it in the morning. This is all about practice. Just remember...

4.Share your data

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 Soncaster Busyey
 North East Link

> Trice along the Eastern Processly will be 406 faster with an overhaul matring from Springer elited with extra cheesio eliminate some of Welbaunds extra battlenesis. Up to seven new construit be added, with new schoology to better manage traffic faster Springers and for through

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Thank you!

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