Interreg
Danube Transnational Programme
SaveGREEN

PERSPEKTIVEN FÜR UMWELT & GESELLSCHAFT umweltbundesamt

Functional Monitoring Approach (FMA): Preliminary solutions for the region

PART I
Application Toolbox-Functional Monitoring Approach (AT-FMA)

Roland Grillmayer, Environment Agency Austria
Moric Jurecka, Field biologist

Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen

Structural vs. Functional Connectivity

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

The **aim** of the developed **monitoring procedure is**

- to **determine mitigation measures** and
- **minimum habitat requirements**

based on the evaluation results and the analysis of ecological corridor segments with functional and non functional connectivity.

Structural vs. Functional Connectivity

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

- Most of the ***existing ecological corridor designations*** are more or less based on the concept of structural connectivity.
- The next logical step forward is therefore, the further development of the designated corridors ***from the structural connectivity*** to the ***functional connectivity perspective.***
- The monitoring concept developed within TI is therefore designed as a ***two-stage process.***
- Stage I covers
  - ***the designation of ecological corridors*** and
  - ***classification of the permeability of segments within the ecological corridors*** based on the ***structural connectivity.***
- Stage II is focusing on the
  - ***field based collection of all required parameters for the evaluation of functional connectivity***

Project co-funded by European Union funds (ERDF)

Functional connectivity ??

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

What we understand by functional connectivity

Definition functional connectivity

"Connectivity" can be broken down into "structural connectivity" and "functional connectivity."

"Structural connectivity refers to **the physical relationship between landscape elements**
whereas
functional connectivity describes **the degree to which landscapes actually facilitate or impede the movement of organisms between areas of habitat**.

© http://www.landscope.org/explore/natural_geographies/wildlife_connections/terminology/, last visit 27.05.2022

© Tumisu-148124, https://pixabay.com/images/id-2004314/

Preparation of monitoring plans

Interreg
Danube Transnational Programme
SaveGREEN

- **Based on the results of the structural monitoring approach and the developed and condensed methodology of the functional monitoring**

NOTES:

- Each PA has its own landscape and ecological characteristic!
- Therefore, PP agreed to define moderate minimum requirements for the functional monitoring

Preparation of monitoring plans

Interreg
Danube Transnational Programme
SaveGREEN

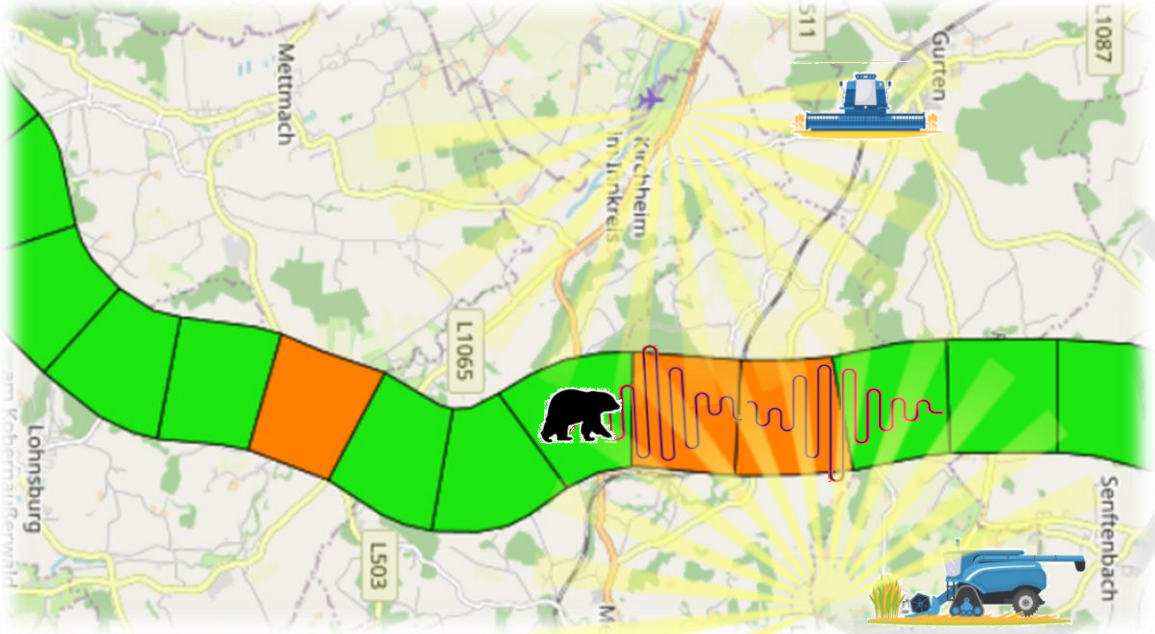
Minimum requirements for each PA

- **Target Species:** Red deer / wild boar / large carnivores
- **Monitoring methods:** Photo traps / tracks / other activity signs
- **Quantity**
    - 10 monitoring sites
    - minimum 1 over- and 1 underpass
    - minimum 3 corridor sites
    - results of the structural monitoring approach should be considered by the selection of the monitoring sites

Monitoring Approach

STAGE II: FUNCTIONAL CONNECTIVITY ANALYSIS

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN



Project co-funded by European Union funds (ERDF)

Monitoring Approach

FUNCTIONAL CONNECTIVITY ANALYSIS

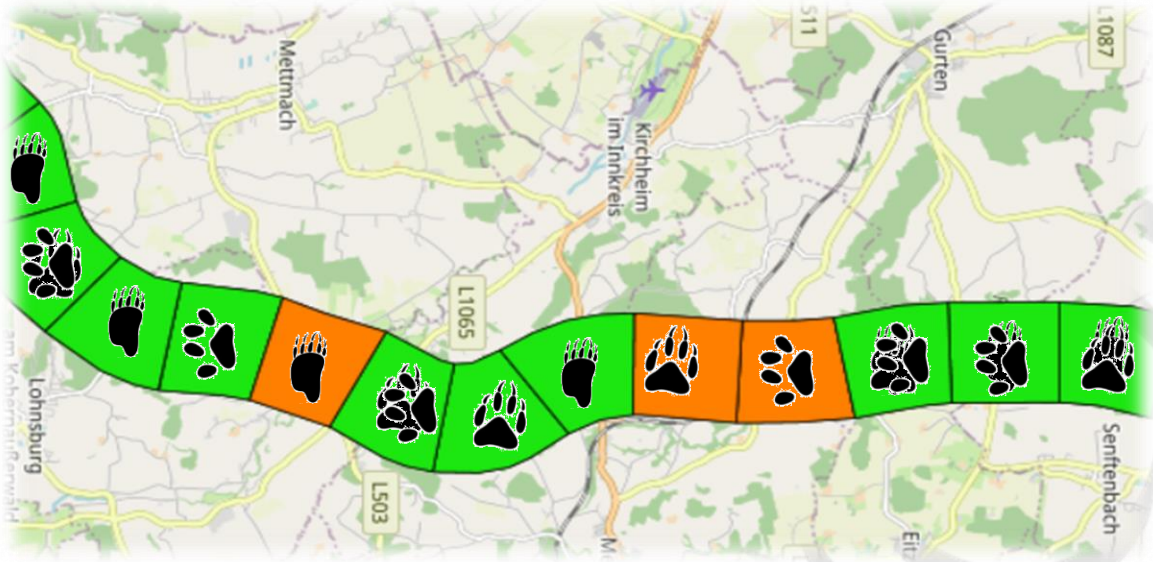
Interreg
Danube Transnational Programme
SaveGREEN

Project co-funded by European Union funds (ERDF)

Monitoring Approach

FUNCTIONAL CONNECTIVITY ANALYSIS – APPLICATION TOOLBOX

Interreg
Danube Transnational Programme
SaveGREEN



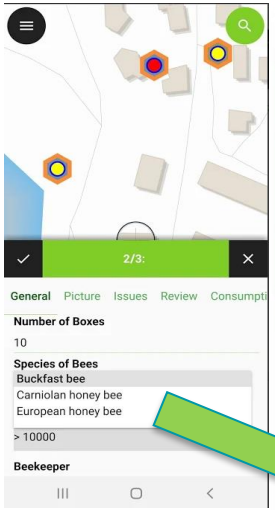
Footprints and other activity signs are collected along the whole length of the corridor

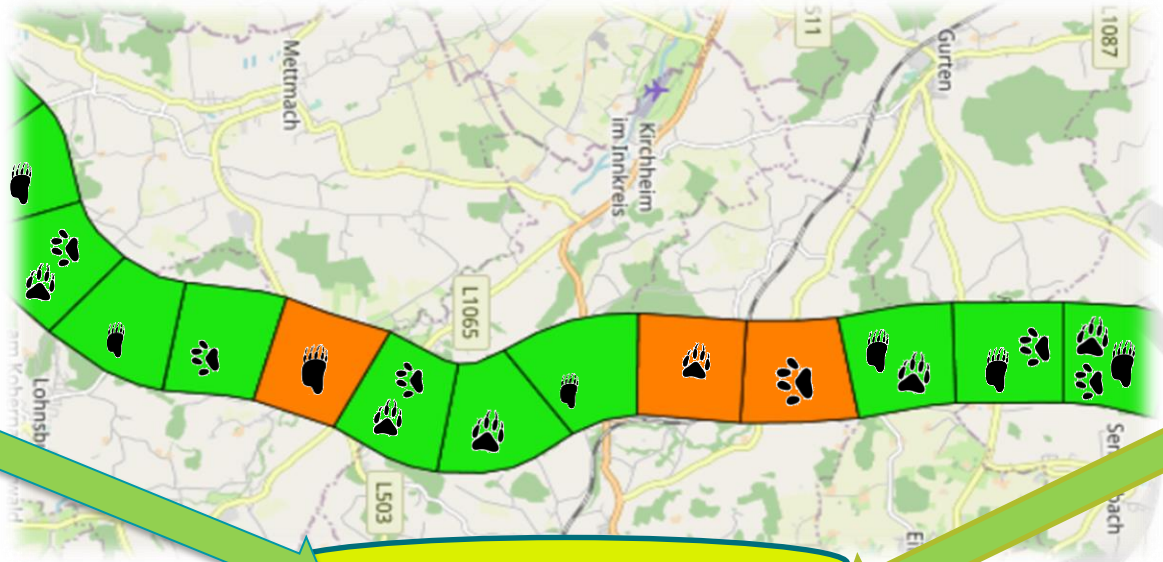
Project co-funded by European Union funds (ERDF)

Monitoring Approach

STAGE II: FUNCTIONAL CONNECTIVITY ANALYSIS – APPLICATION TOOLBOX

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN





Data synchronization procedure
Harmonized Data Model

Project co-funded by European Union funds (ERDF)

Harmonized generic data model

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

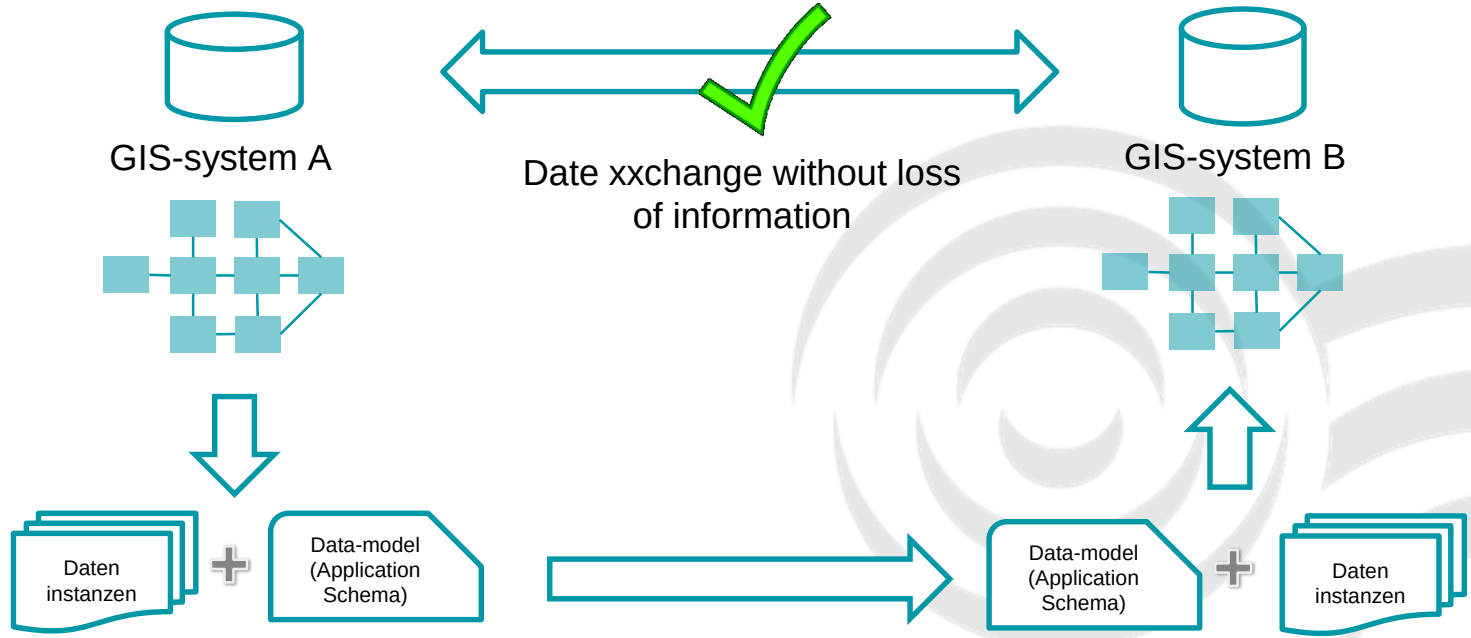
- **The core of the AT-FMA is the harmonised generic data model**

- The gerneric data model defines the essential objects (feature types) and their properties (feature type properties) that must be mapped within the framework of the FMA.
- It defines the model semantic (UML, from which the logical and physical data model can be directly derived
- The generic core model can be easily extended (additional attributes or objects)
- The same physical database schema is always created independently of the database system (= table and attribute names are always named the same).

= Data are interoperable and can be easy used and extended in future projects!

Harmonized generic data model

Interreg
Danube Transnational Programme
SaveGREEN

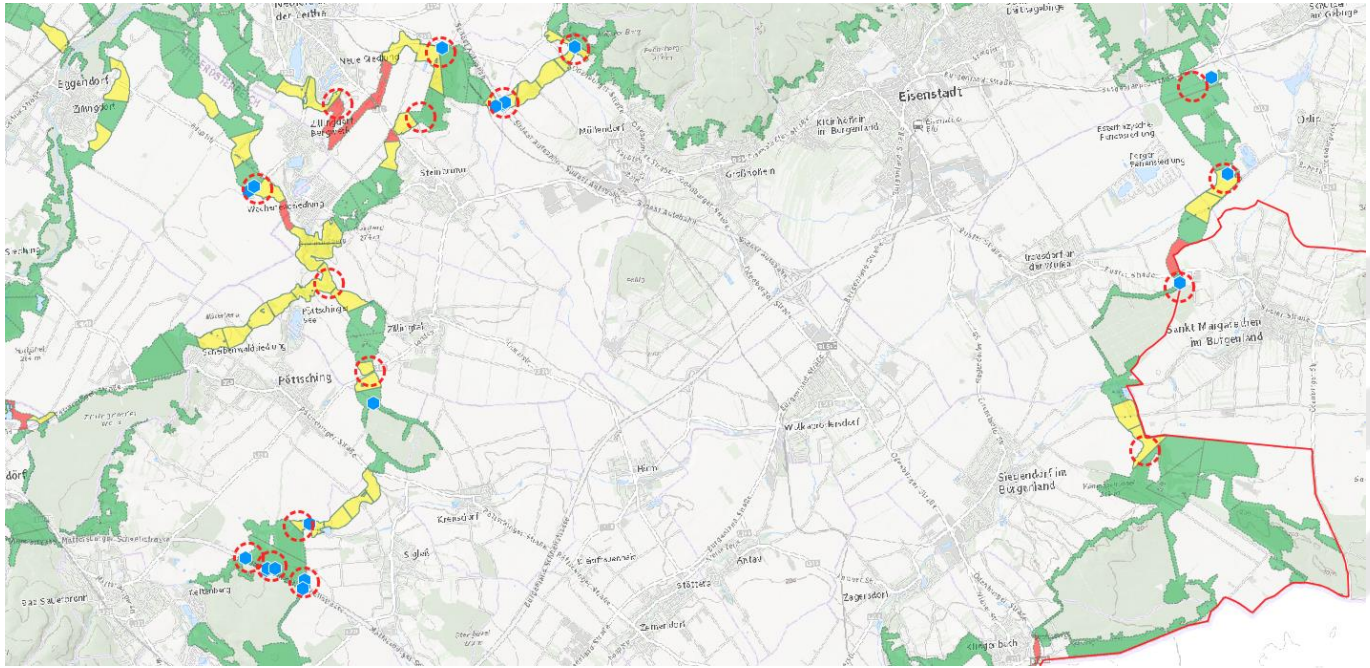


Project co-funded by European Union funds (ERDF)

Monitoring plans for PA-Austria

AT1: PA Pöttsching

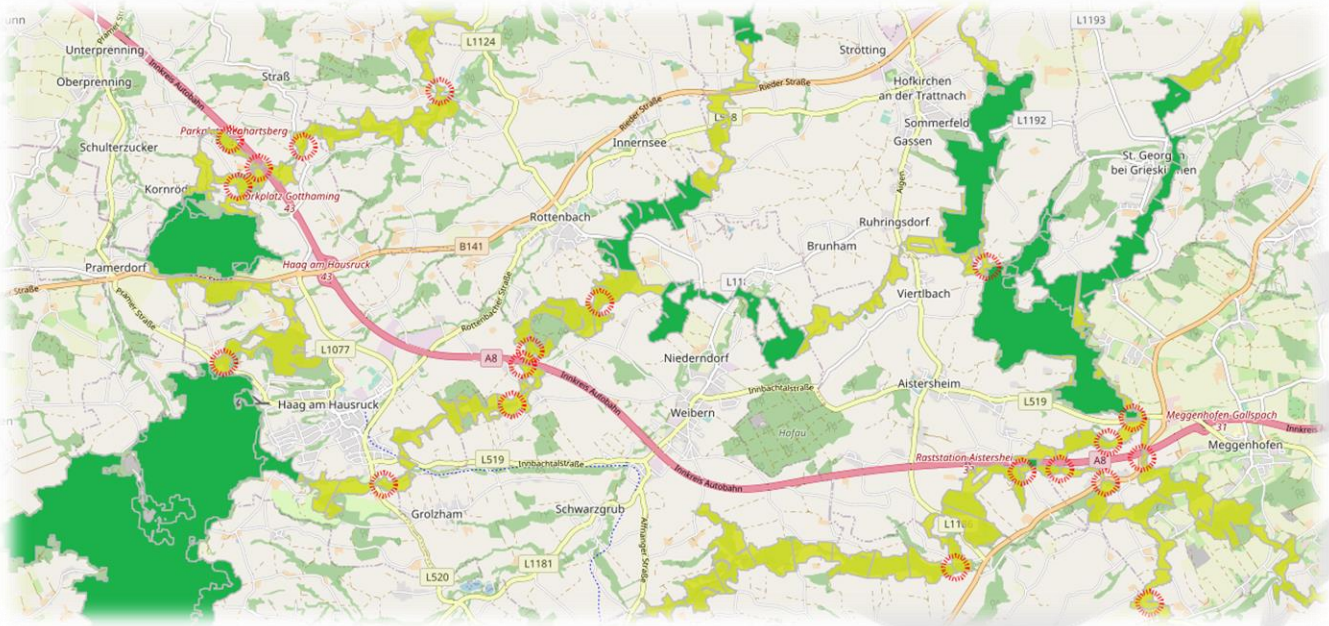
Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN



Monitoring plans for PA-Austria

AT2: PA Kobernausserwald

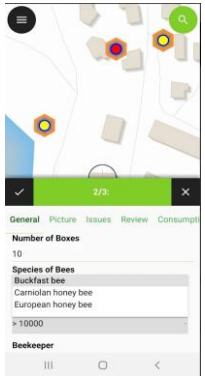
Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN



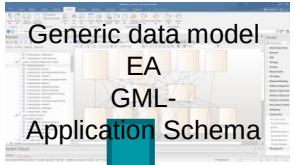
https://maps.savegreen.at/mapstore/#/viewer/openlayers/1

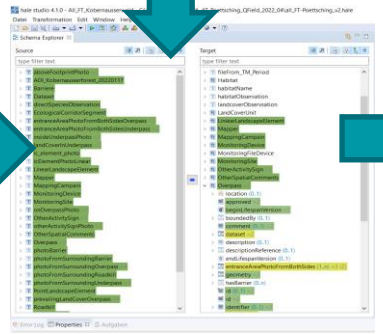
Live demo data flow AT-FMA

Interreg
Danube Transnational Programme
SaveGREEN



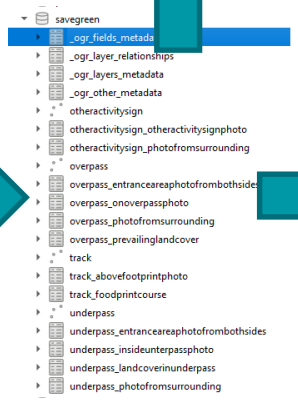
Mapped objects @fieldwork using Qfield-Porjects



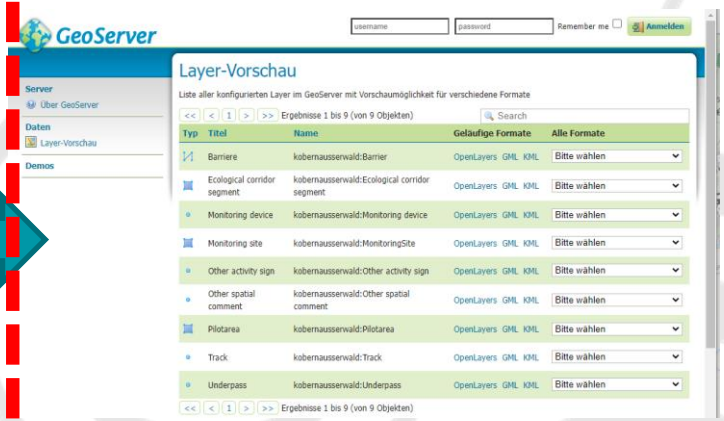


Mapping to generic harmonised data model – Generation of exchange format (GML-encoding)

Export of the database based on GML-transfer



Import into central data base. Generation of database schema and import of the mapped objects



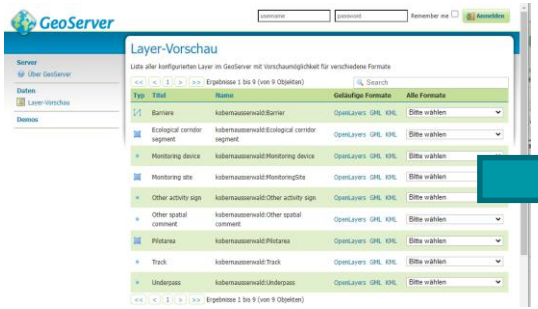
Establishing OGC viewing- and vownload services

Project co-funded by European Union funds (ERDF)

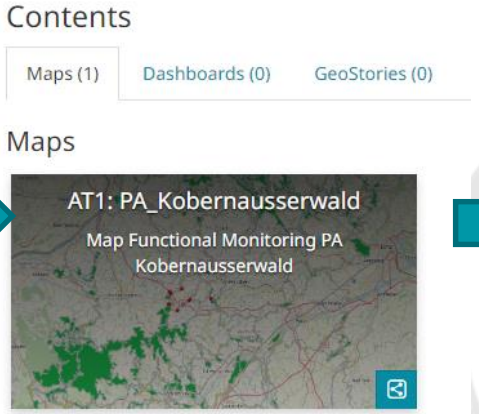
www.interreg-danube.eu/savegreen

Live demo data flow AT-FMA

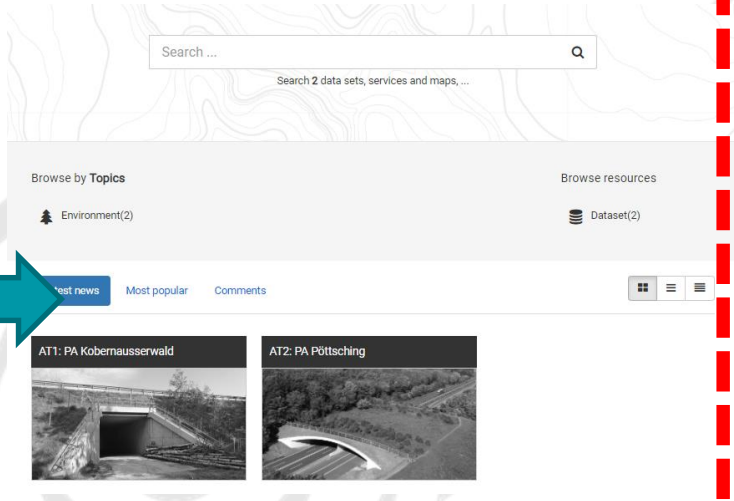
Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN



Establishing OGC
Viewing- and Download-Services



Interactive Maps based
on OGC Web-Services

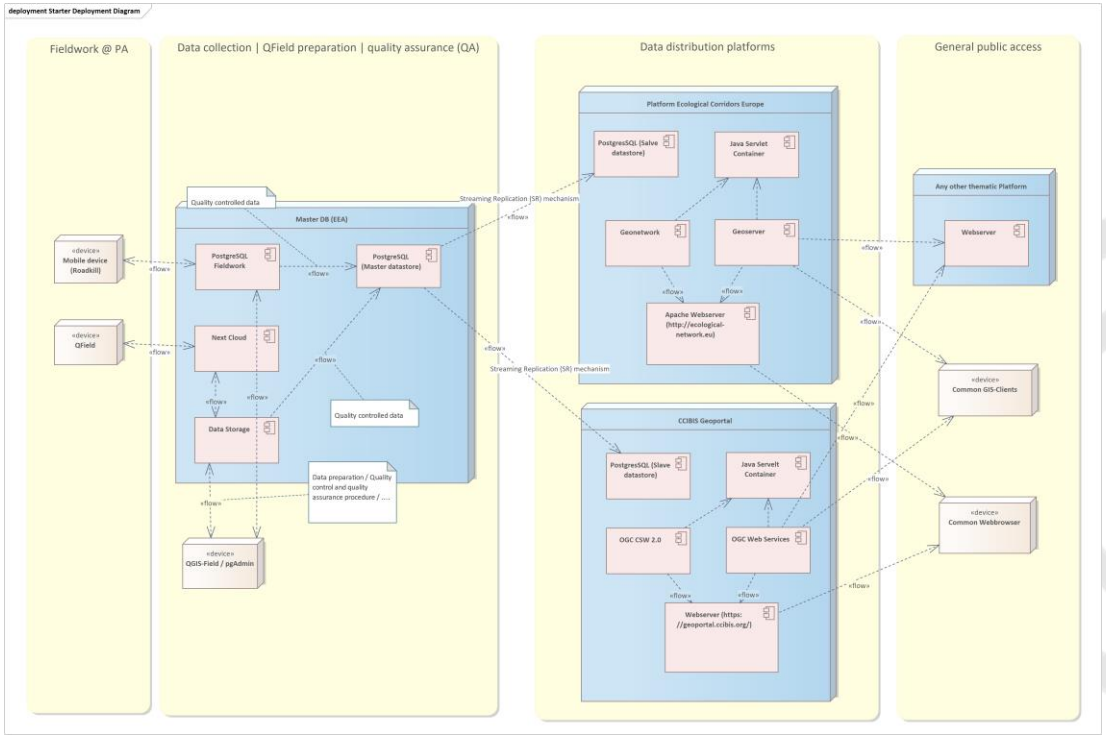


Register Download-Services,
pre-definded Datasets (GPGK) &
Web-Map in SaveGreen
Data-Catalogue

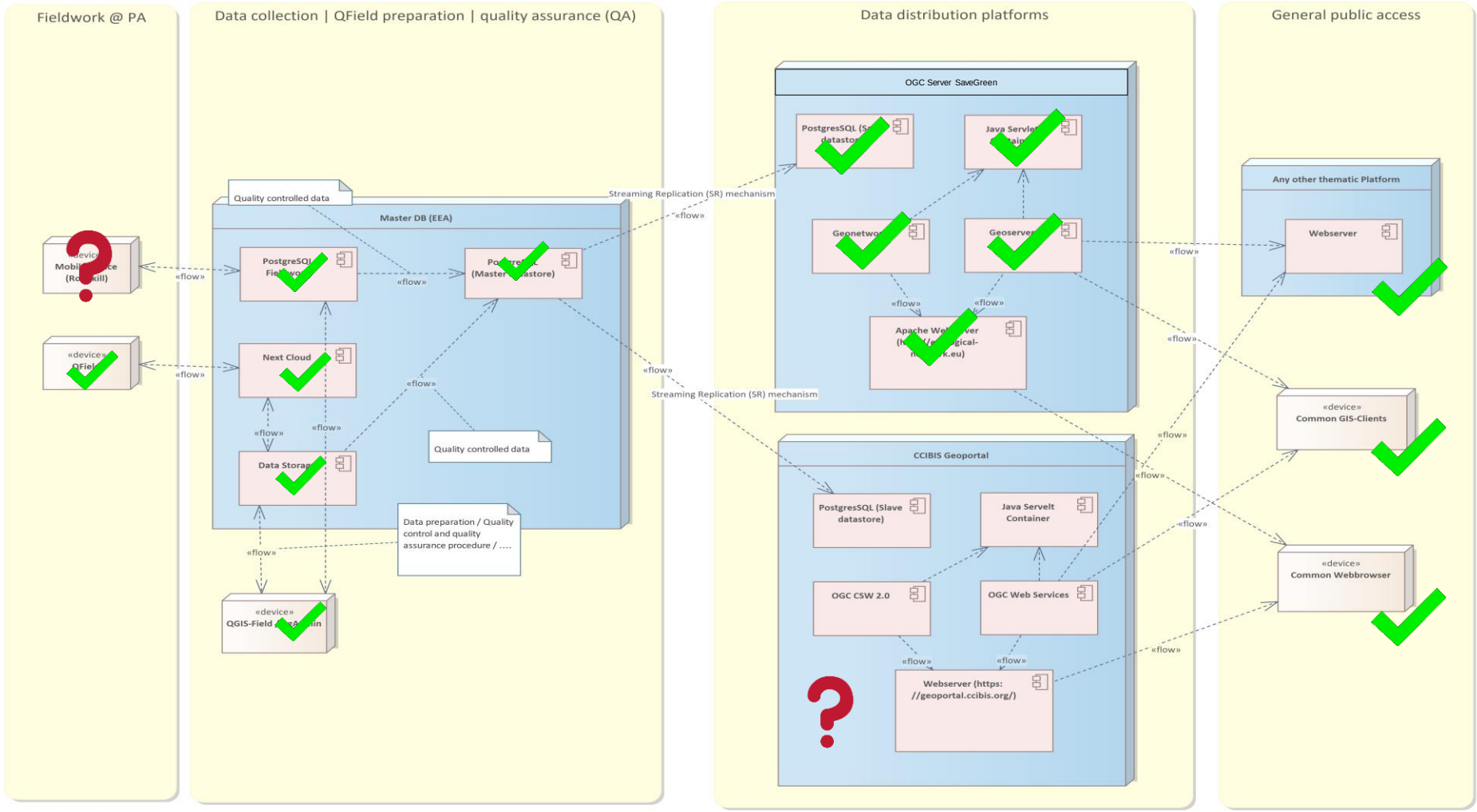
Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen

Outlook

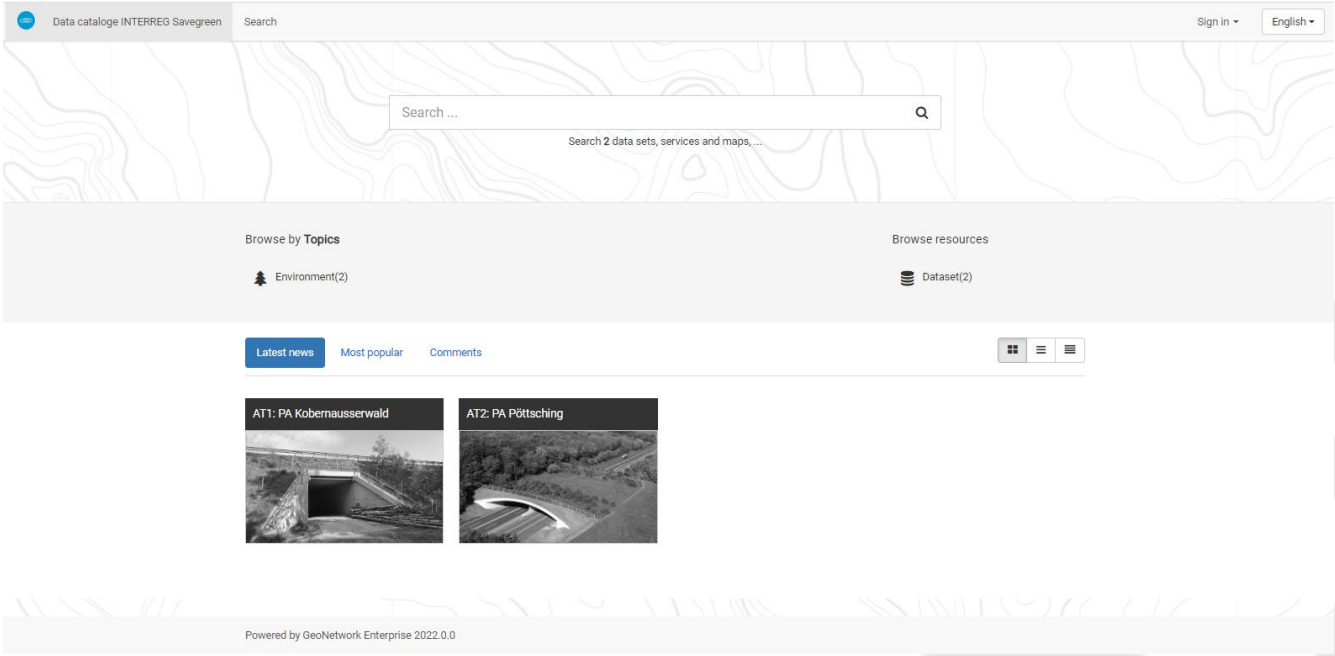


Project co-funded by European Union funds (ERDF)


Fieldwork @ PA
Data collection | QField preparation | quality assurance (QA)
Data distribution platforms
General public access
Quality controlled data
Master DB (EEA)
PostgreSQL Fieldwork
Next Cloud
Data Storage
Quality controlled data
Data preparation / Quality control and quality assurance procedure / ....
«device» QGIS-Field
«flow»
Streaming Replication (SR) mechanism
OGC Server SaveGreen
PostgreSQL (Slave datastore)
Java Servlet Container
Geonetwork
Geoserver
Apache Webserver
CCIBIS Geoportal
PostgreSQL (Slave datastore)
Java Servelt Container
OGC CSW 2.0
OGC Web Services
Webserver (https://geoportal.ccibis.org/)
Any other thematic Platform
Webserver
«device» Common GIS-Clients
«device» Common Webbrowser

LIVE DEMO – SaveGREEN Data Catalogue

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN



https://metadata.savegreen.at/

Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen

LIVE DEMO – Usage GPKG offline

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

AT1: PA Kobernausserwald

Data sets for the Savegreen pilot area AT1: PA Kobernausserwald

On going

Beschreibung | Downloads, Ansichten und Links

Über diese Ressource

Kategorien	Datensets, Umwelt
Andere Schlagwörter	• PA Kobernausserwald
Sprache	• English
Kontakt für die Ressource	Environment Agency Austria • Originator: DI ROland Grillmayer
Status	• On going

Technische Informationen

Überarbeitungsintervall	As needed
Darstellungsart	• Vector
Koordinatenreferenzsystem	• WGS 1984

Informationen über die Metadaten

Metadaten herunterladen

Kontakt	• Point of contact:

Überblick

PA_AT_KOB_entranceareaphotofrombothsidesunderpass_2021092

Keine Bewertungen ★

Alle Bewertungen anzeigen

Fügen Sie Ihre Bewertung hinzu

Räumliche Ausdehnung

Zeitliche Ausdehnung

AT1: PA Kobernausserwald

Data sets for the Savegreen pilot area AT1: PA Kobernausserwald

On going

Beschreibung | Downloads, Ansichten und Links

Downloads und Links

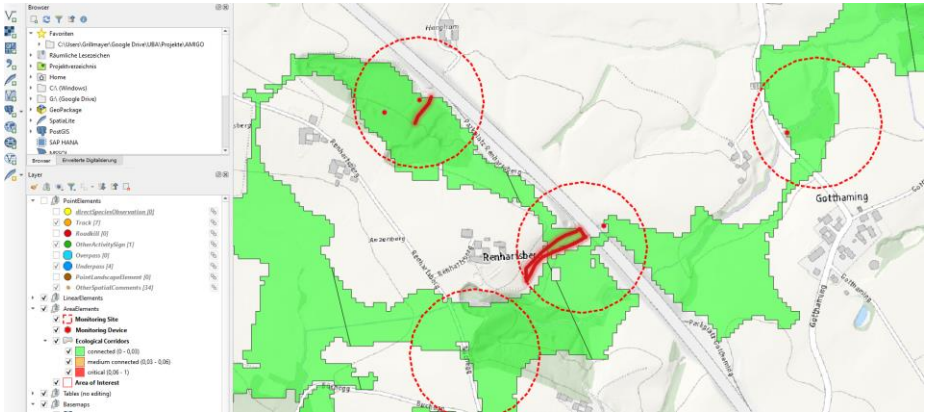
GIS-Datasets & Photos (610 MB) (complete fieldwork data set)

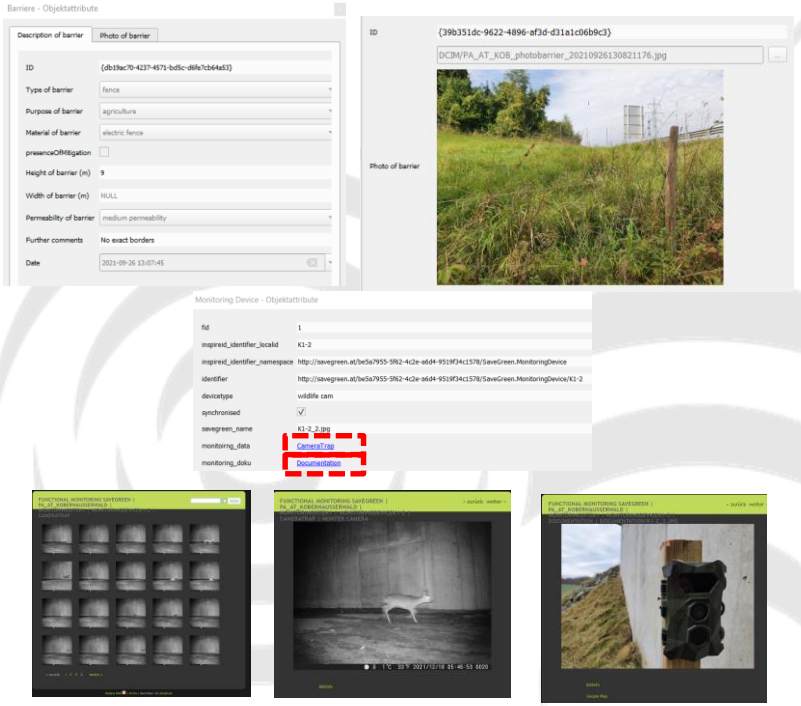
Link öffnen

Data package with all datasets and photos generated while the fieldwork at PA kobernausserwald. QGIS-project file is provided which gurantees that die 1:N relationships of te datasets and the related tables and images are correct established in QGIS-Software client. How to use: Copy Zip to your project folder Extract ZIP file Open QGIS-project file "PA_AT_Kobernausserwald.qgs" or PA_AT_Kobernausserwald.qpz" with QGIS Software (Version 22.2 or higher)
https://datastore.savegreen.at/index.php/s/nGC7APqAAyH2MTY/download/PA_AT_Kobernausserwald.zip

LIVE DEMO – Usage GPKG offline

Interreg
Danube Transnational Programme
SaveGREEN





GeoPackage + all images of mapped objects + QGIS-project file (formulas) + web reference to photo trap images

LIVE DEMO – Usage interactive maps

Interreg
Danube Transnational Programme
SaveGREEN

AT1: PA Kobernausserwald

Data sets for the Savegreen pilot area AT1: PA Kobernausserwald

On going

Beschreibung | Downloads, Ansichten und Links

Über diese Ressource

Kategorien	Datensets, Umwelt
Andere Schlagwörter	• PA Kobernausserwald
Sprache	• English
Kontakt für die Ressource	Environment Agency Austria • Originator: DI ROland Grillmayer
Status	• On going

Technische Informationen

Überarbeitungsintervall	As needed
Darstellungsart	• Vector
Koordinatenreferenzsystem	• WGS 1984

Informationen über die Metadaten

Metadaten herunterladen

Kontakt	• Point of contact:

Überblick

PA_AT_KOB_entranceareaphotofrombothsidesunderpass_2021092

Keine Bewertungen ★

Alle Bewertungen anzeigen

Fügen Sie Ihre Bewertung hinzu

Räumliche Ausdehnung

Zeitliche Ausdehnung

AT1: PA Kobernausserwald

Data sets for the Savegreen pilot area AT1: PA Kobernausserwald

On going

Beschreibung | Downloads, Ansichten und Links

Downloads und Links

GIS-Datasets & Photos (610 MB) (complete fieldwork data set)

Link öffnen

Data package with all datasets and photos generated while the fieldwork at PA kobernausserwald. QGIS-project file is provided which gurantees that die 1:N relationships of te datasets and the related tables and images are correct established in QGIS-Software client. How to use: Copy Zip to your project folder Extract ZIP file Open QGIS-project file "PA_AT_Kobernausserwald.qgs" or PA_AT_Kobernausserwald.qpz" with QGIS Software (Version 22.2 or higher)
https://datastore.savegreen.at/index.php/s/nGC7APqAAyH2MTY/download/PA_AT_Kobernausserwald.zip

Interactive Map: AT1 - PA Kobernausserwald

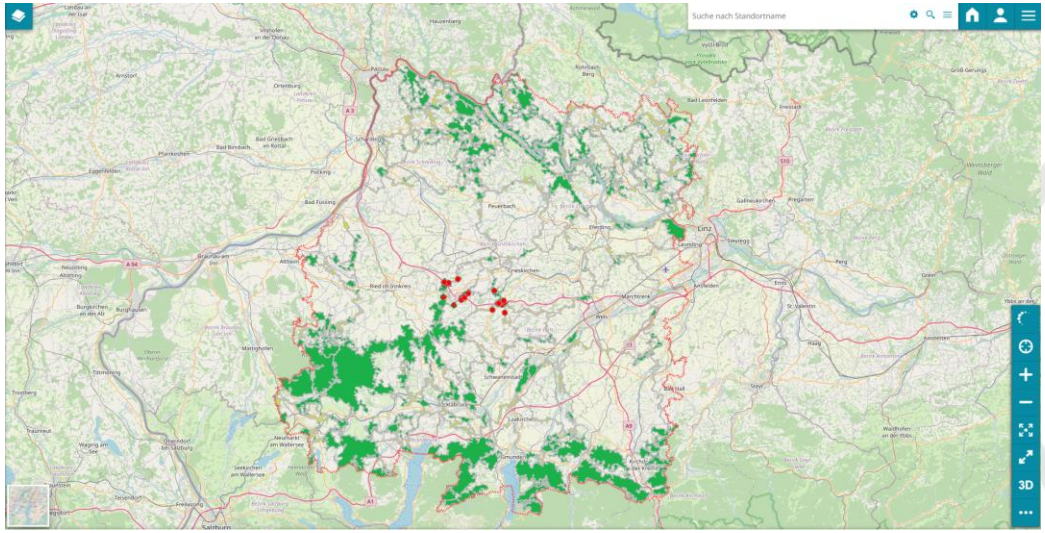
Link öffnen

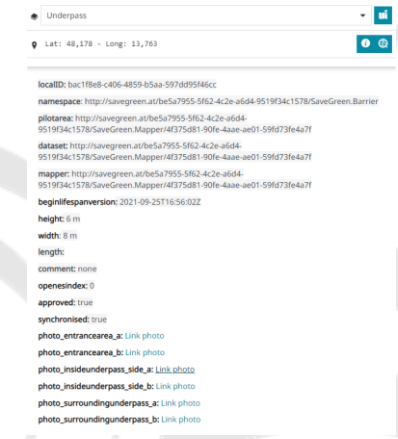
Interactive map of the SaveGreen PA Kobernausserwald
https://maps.savegreen.at/mapstore/#/viewer/openlayers/1

Project co-funded by European Union funds (ERDF)

LIVE DEMO – Interactive Map

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN





Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen

LIVE DEMO – Download Service
Single object provision

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN

AT1: PA Kobernausserwald

Data sets for the Savegreen pilot area AT1: PA Kobernausserwald

On going

Beschreibung | Downloads, Ansichten und Links

Über diese Ressource

Kategorien	Datensets, Umwelt
Andere Schlagwörter	• PA Kobernausserwald
Sprache	• English
Kontakt für die Ressource	**Environment Agency Austria** • Originator: DI ROland Grillmayer
Status	• On going

Technische Informationen

Überarbeitungsintervall	As needed
Darstellungsart	• Vector
Koordinatenreferenzsystem	• WGS 1984

Informationen über die Metadaten

Metadaten herunterladen

Kontakt	• Point of contact:

Überblick

PA_AT_KOB_entranceareaphotofrombothsidesunderpass_2021092

Keine Bewertungen ★

Alle Bewertungen anzeigen

Fügen Sie Ihre Bewertung hinzu

Räumliche Ausdehnung

Zeitliche Ausdehnung

kobernausserwald:Other spatial comment — Herunterladen

ESRI Shapefile kobernausserwald:Other spatial comment

ESRI Shapefile kobernausserwald:Other spatial comment
https://maps.savegreen.at/geoserver/kobernausserwald/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=kobernausserwald%3AOther%20spatial%20comment&outputFormat=SHAPE-ZIP

kobernausserwald:Track — Herunterladen

ESRI Shapefile kobernausserwald:Track

ESRI Shapefile kobernausserwald:Track
https://maps.savegreen.at/geoserver/kobernausserwald/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=kobernausserwald%3ATrack&outputFormat=SHAPE-ZIP

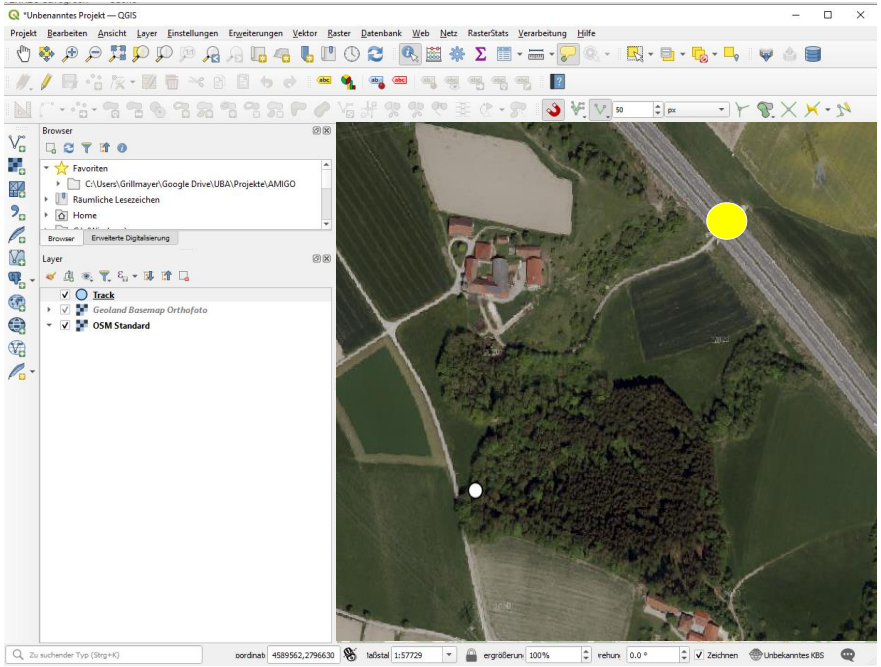
kobernausserwald:Ecological corridor — Herunterladen

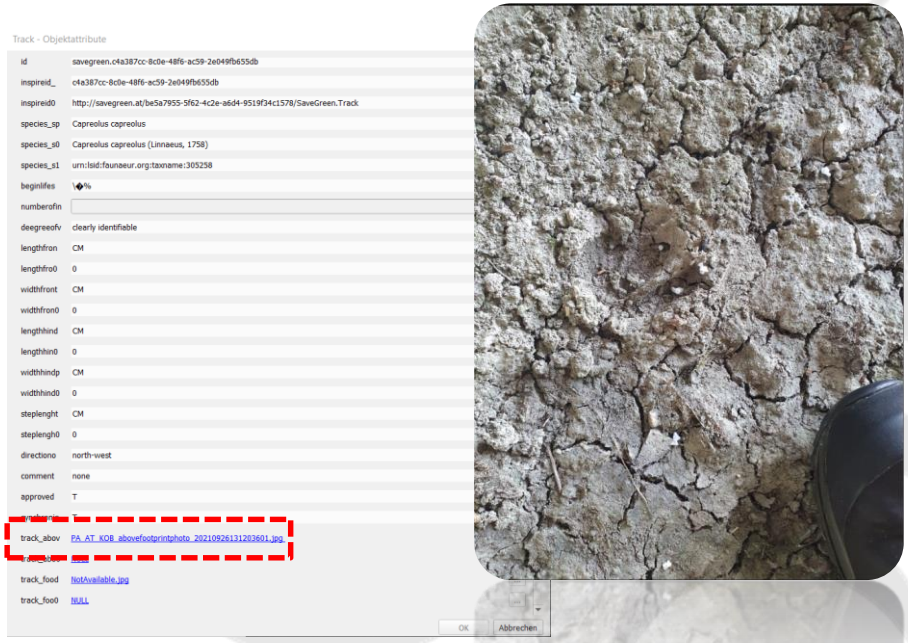
Ecological corridor | Format ESRI Shapefile

Ecological corridor | Format ESRI Shapefile
https://maps.savegreen.at/geoserver/kobernausserwald/ows?service=WFS&version=1.0.0&request=GetFeature&typeName=kobernausserwald%3AEcological%20corridor%20segment&outputFormat=SHAPE-ZIP

LIVE DEMO – Download Service
Single object provision

Interreg
EUROPEAN UNION
Danube Transnational Programme
SaveGREEN





Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen

Discussion

Interreg
Danube Transnational Programme
SaveGREEN

AT-FMA & Data publishing

- Are there any missing objects/objects properties?
- Any feedback/comments/users experience about the Qfield implementation?
- Handlings sensitive species data?
  Feedback from each PP required

Note: AUSTRIA will publish all datasets including the photos & evaluation results of the camera traps & sound/noise sensors

Discussion

Interreg
Danube Transnational Programme
SaveGREEN

Analysis of FMA dataset FMA

- What do we want to make available as final data sets?
- Methodology of the evaluation of wildlife trap records?

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Category	Location and camera information					Information about species							
2	Attribute	Project name	Camera ID	Name of the locality	Location	Feature	GPS coordinates	Species	Nr of ind	Sex	Age	Note	Date	Time
3		SaveGREEN		Transcarpathia	Tyshiv	underpass	48.792788 23.087015	Vulpes vulpes	1				24.01.2022	12:58:04
4														
5		SaveGREEN		Transcarpathia	Natali	underpass	48.714422 23.049924	Vulpes vulpes	1				24.01.2022	13:22:27
6		SaveGREEN		Transcarpathia	Natali	underpass	48.714316 23.050204	Lutra lutra	1				24.01.2022	13:32:51

	O	P	Q	R	S
1	Photo information				
2	Photo ID	Source = fo	File name	Used for public	User
3	{bd096c78-fe47-4f8f-9cd7-bd92cf0be8ca}		PA_UKR_above	Yes	Andriy-Taras Bashta
4					
5	{bbea3b35-1106-4591-bd97-d74d37aecd6a}		PA_UKR_abovefootprintphoto_20220124132844863		Andriy-Taras Bashta
6	{ca855829-d69a-4d1a-b6d9-d40651a08ee9}		PA_UKR_abovefootprintphoto_20220124133417726		Andriy-Taras Bashta

- Do all PP agree with the EXCEL sheet sent out?
- Expansion of the evaluation procedure to include human activities?

Interreg
Danube Transnational Programme
SaveGREEN

PERSPEKTIVEN FÜR UMWELT & GESELLSCHAFT umweltbundesamt

Functional Monitoring Approach (FMA): Preliminary solutions for the region

PART I
Application Toolbox-Functional Monitoring Approach (AT-FMA)

Roland Grillmayer, Environment Agency Austria
Moric Jurecka, Field biologist

Project co-funded by European Union funds (ERDF)

www.interreg-danube.eu/savegreen