TransektCount 5.0.0

Inhalt

1. Introduction

The TransektCount Android app should support transect counters in nature preserving projects according to the Butterfly Monitoring Scheme methodology in Europe (**Fig. 1**). It can be used to record individuals per transect section on a species-specific basis and separated by gender and metamorphic stages according to the European Butterfly Monitoring Scheme. Transect sections must be selected manually but can optionally be indicated automatically via GPS. TransektCount offers prepared data outputs and can substitute your field book and pencil, and if applicable a camera for documentary pictures.

Database files can be created individually for transect sections and expected butterfly species. The internal database is survey-related, i.e. a new database instance is used for each survey. The recorded data (meta data, counts and annotations) can either be read from the results page for input into the butterfly monitoring system or transferred to a PC for your own processing, where they can be better read or edited.

The app is published with source code and documentation on https://github.com/wistein/TransektCount. It is open source, has neither usage tracking nor advertising functions and does not make use of Google Play Services, demands only for permits which are needed for the app's serviceability:

Fig. 1: Starting page

- Storage access for import and export of data files,
- optionally location tracking by GPS to recognize the sections and
- Wakelock to hinder the app from being switched off by the system when inactive, but get dimmed and get an insensitive screen when pocketed or held near the body.

2. Setting Up

For installation hints refer to **chapter 6**.

When starting the app for the first time, permission for saving data must be granted. TransektCount reads and writes exclusively from an to the subdirectories "TransektCount" and "TourCount" in the public directory "Documents".

Later, if you want GPS-controlled section detection, the permission for location recognition must be given. For more reliable location tracking on longer transects, you may optionally activate "**Allow all the time**". This prevents Android from terminating the location tracking service during longer breaks in app usage.

Before initial use you should adapt the app settings to your liking (see **chapter 4**).

Initially ignore the item "**Remind transect sections by GPS**", as certain preconditions have to be met before (see **5. GPS Usage**).

Then adapt the preliminary species list of the 1. transect section to the expected species in your transect with the species list editing functions (Add, Remove or Edit).

For this click on the Starting page "**Counting**" and then on "**SECT 01**" (**Fig. 2**). On the counting page of section 1 (**Fig. 3**), use the editing icons in the app bar of the counting page:
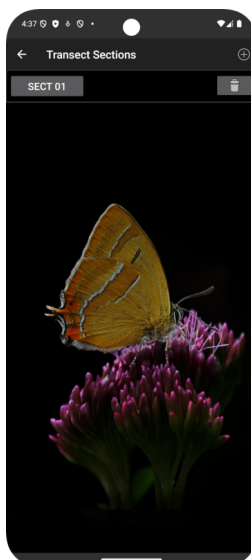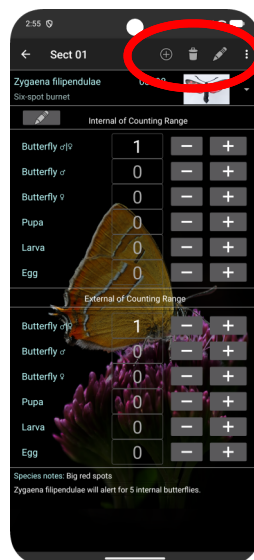

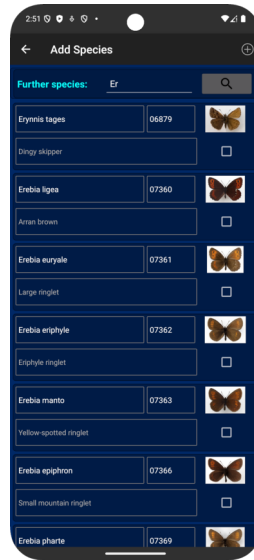Fig. 2: "Transect Sections"

Fig. 3: Counting page menu

Fig. 4: "Add Species" page

- ⊕ (**Add Species**) to the counting list from the integrated large list of European species,
- 🗑 (**Remove Species**) from the counting list or
- ✏ (**Edit Terms**) of current section or species of the counting list.

All 3 editing pages offer a **preselection** to ease the selection of a distinguished species. Enter 2 initial letters of the genus name and then click the 🔍-button to limit the shown list.

On the **"Add Species"** page (**Fig. 4**) select species from the blue scroll-down list of not yet selected species. Changes take effect by the ⊕-**button** in the head line. (The added species then disappear from the selection list).

At the end of the scroll-down list, a placeholder for an indeterminate species (NN) can be adopted and edited later after determination, if necessary.

On the **"Remove Species"** page select species to remove on the red scroll-down list and tip on the 🗑-button.

On the **"Edit Terms"** page you may edit the current section name and the terms of each species. (Scientific and local species names, codes generally five digits with leading zeros, as you can see in the following species list table excerpt).

Changes are applied using the corresponding ⊕, 🗑 or 💾 function buttons.

The codes will be used as an option to sort the list and as a reference to show corresponding butterfly icons. The codes derive from the numbering scheme of Karsholt/Razowski, as used e.g. in the German Lepiforum (https://lepiforum.org/).

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. . .

Fig. 5: Part of the species list

The *-sign attached to code 07001 in **Fig. 5** indicates a complex of species that are difficult to distinguish. For sorting purposes, the largest code within such species complexes should be used for the group.

Caution:
A wrong code will show a "N/A" or a wrong picture. If necessary, see the "**List of coded Butterflies.pdf**" on https://github.com/wistein/TransektCount/tree/master/docs.

In the next step, you should enter the permanent meta data like transect-No. or inspectors name. Click on "**Edit Meta Data**" and save the input by clicking the save icon.

Once this list is complete, you can add copies for all remaining transect sections by the ⊕-**Button** on top of the section list, and name each section appropriately, if possible in the order you will walk the transect, e.g.: Sect 02, Sect 03,… (s. **Fig. 2**, previous page).

When you have created the section lists for all your transect sections and entered the general meta data, the database is ready for export as a "Basic Database". To do this, use the function "**Export as Basic DB**" in the main menu of the starting page.

By that you have a copy of the prepared empty database saved as "Basic Database" (**transektcount0_Tr-No.db**) with 'Tr-No' as transect No. within the app's data directory "**Documents/TransektCount**".
Attention: The file names of the Basic DBs must always start with the string "**transektcount0**".

The data directory "**Documents/TransektCount**" is created during the first app call. When uninstalling TransektCount you will not loose your data as this directory remains untouched.

Exporting as Basic DB ignores all counts, notes and inspection-related meta data. The Basic DB serves as a template for future inspections. To prepare a future monitoring inspection you will only need to enter the inspection-specific meta data (date, start time, temperature, wind and clouds).

The Basic DB can be changed, supplemented and exported anytime. Changes of species always affect all sections to maintain consistency. However, the section name is only changed for the current section.

Alternatively you can import and adapt a created **species list** for your transect. Examples for downloading, partly from other European countries than Germany, are provided on https://github.com/wistein/TransektCount/tree/master/docs.
Copy them to the app's data directory **Documents/TransektCount** and import and edit them in TransektCount suitably. Changes to the species always affect all existing section lists.

3. Usage

Start with "**Edit Meta Data**". Fill in the relevant meta data for the specific transect inspection. You may enter the current date and time by clicking the related field or enter any date and time by long pressing the related field. Finish with the 💾-button.

Then use "**Counting**". The transect sections list appears (**Fig. 6**). Using GPS the name of the recognized section is marked blue. Select the relevant transect section. The counting page for the first species in the sorted section list appears (**Fig. 7**). After clicking the butterfly icon select the respective species from the scroll list (**Fig. 8**).

As counting of butterflies ought to be distinguished between those within the standardized, imaginary counting range (a cubus with edges of 5 m length in front of you) and those that are sighted outside the counting range, you have 2 separate sets of counters (Internal and External of Counting Range).

To count just select the species in the scroll list, and tip on the appropriate (**+**)-button of the corresponding species category (♂|♀, ♂, ♀, pupa, larva or egg). The (**-**)-buttons allow for corrections.

Each count is stored immediately. While storing the first count in a section the current date and time will be stored for the section either.
The date will then be shown in the list of sections and indicates a successful inspection of that section. The time can be helpful later when assigning document photos.

The 🖉-**button** underneath the species name row of the counting page opens the section specific **species editing page** (**Fig. 9**) that lets you add a note for the species in that section and set its counters to any value (e.g. for estimated mass occurrences).

The species related note (e.g.: "Photo") will be shown on the counting page in an extra line beneath the counting field and is inserted into the results table.

Fig. 6: "Transect Sections"

Fig. 7: Counting page

Fig. 8: Scroll-list to select species

Fig. 9: Page "Edit species"

Here you may also set pop-up alerts which show up while reaching a set number of butterflies on the corresponding internal counters (sum of all imagines) e.g. to realize already on site if a certain species is more abundant than on a previous inspection.

Before closing TransektCount after an inspection, you should complete the meta data with the ending values for time, temperature, wind and clouds. Then **export** the current inspection result data as .csv (comma delimited values text) file or .db (database). It will be named with transect No., date and time as **transektcount_Tr-No_YYYYMMDD_hhmmss.csv** oder **.db** and saved in the directory **Documents/TransektCount**.

When **using GPS**, a short message indicating the distance to the transect is displayed after the app is started and after the first GPS fix. When a transect section is reached, an acoustic signal and a message inform you about the current transect section. You are also informed each time there is a change of transect section.

The section must still be selected manually, but GPS detection supports timely switching to the current transect section, so that accidental incorrect section assignment during counting occurs less frequently.
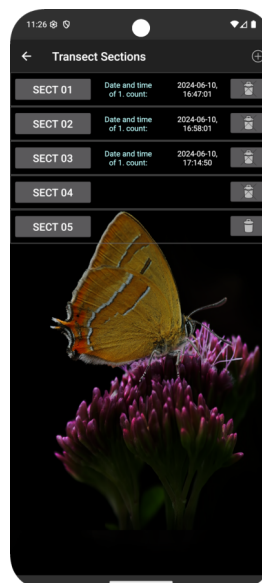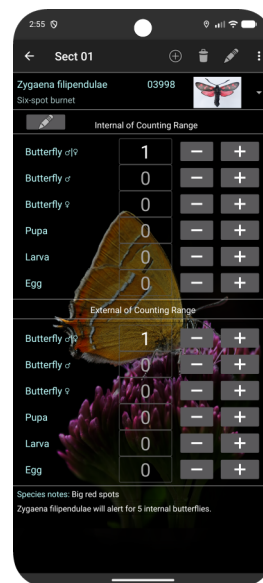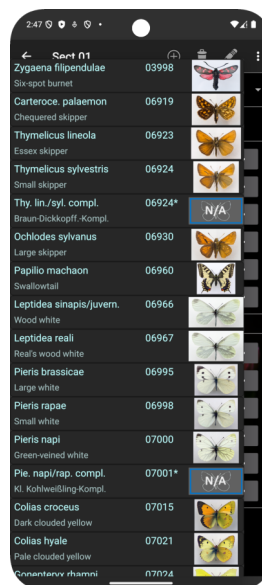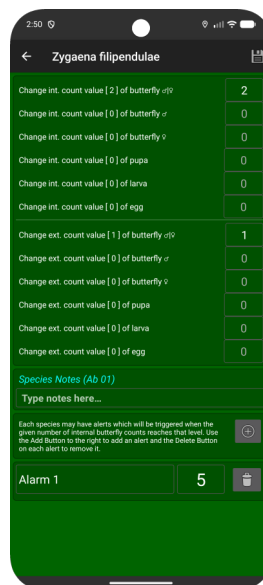
As of Jan. 2026
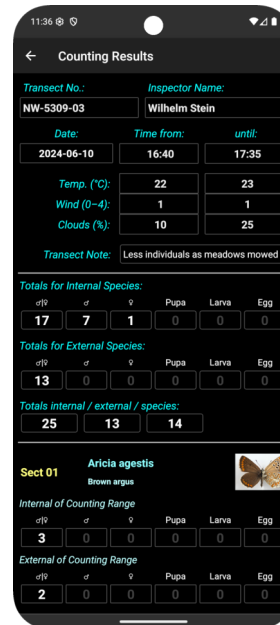
On the "Transect sections" page, the name of the newly recognized section is marked in blue after GPS recognition. (However, the color change does not appear when the page is currently displayed, but only when you switch to this page after GPS section recognition for the purpose of section selection.)

Finally, there is a page showing your results sorted either by species or sections according to the selected Output sort option (**Fig.** 10 and **11**) . Here, in a scroll view you see beneath the meta data of the inspection the totals per category and all the species which got counts.

You can enter this page from the Starting page with the "**Show Results**" button or the 👁-**icon** in the app bar.

When you have large lists or have collected big amounts of data the app may delay the start of pages, especially the results page, as this needs heavy calculations. This will be indicated by a short popup message "View gets calculated...".

If the system message "TransektCount not responding" appears, please reply with "Wait".

Fig. 10: Results page (head)

Fig. 11: Results page (cont.)

4. Further Functions

The system menu on the starting page (**Fig. 12**) has Settings, Reset, Import, Export, Info and Help functions.

In "**Settings**" (**Fig. 1**3) you may adapt the look an feel in some aspects to your wishes, e.g. sorting order of lists and data export, left-/right-hand counting page or sounds. Here you can also optionally activate the GPS function for automatic indication of the current transect section, provided a prepared GPX track file with tracks of all transect sections has been imported. For detailed information see "**5. GPS Usage**".

To prepare for a new inspection, the inspection-specific meta data and all counting data can be deleted using "**Reset Data**". All other transect-specific data remains untouched.

Android-specifically, TransektCount stores the data in an internal SQLite DB within a storage area that is not accessible by the user. Therefore, it is necessary to import/export data to/from files in a user accessible storage area.

The "**Import Basic DB**" function lets you select and import a Basic DB file that was exported as a template for a certain transect. Its name begins with "**transektcount0**".
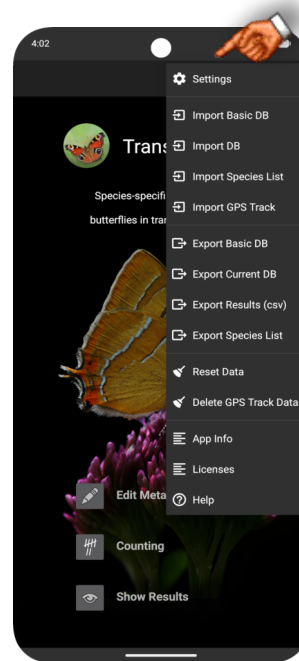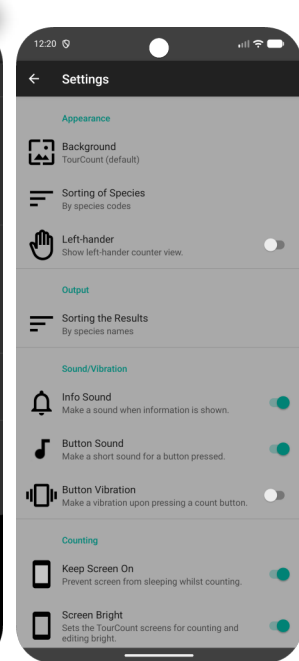
Fig. 12: System Menu   Fig. 13:Settings page (excerpt)

By "**Export Basic DB**" you may export the current internal DB without any inspection-specific data into a Basic DB file **transektcount0_Tr-No.db** with **Tr-No** being the transect No. to **Documents/TransektCount**. This is reasonable if permanent changes have been made to the transect structure or if new species have been removed or added (see "**2. Setting Up**").

With "**Import DB**" a appropriately named TransektCount DB which may contain counting data can be selected and read into TransektCount.
Mind: The file name of a TransektCount-DB with counting data must always begin with "**transektcount_**" (e.g. "transektcount_*transect-No_date*.db"), otherwise the list cannot be imported.

"**Export Current DB**" writes a copy of the complete DB to the file **transektcount_Tr-No_YYYYMMDD_ hhmmss.db** into the directory **Documents/TransekCount/**.

The function "**Import Species List**" (**Fig. 1**4) lets you select and import an available species list. If the **TourCount** app (see "**7.4 References**") is installed, the exported species lists can be imported mutually.
Mind: Importing a species list deletes all current counting data. The file name of a species list must always begin with "**species_**", otherwise the list cannot be imported.

With "**Export Species List**" the current **species list** (without any other data) can be exported as a CSV file (CSV = Comma Separated Values text file) "**species_Transect_Tr-No_YYYYMMDD_hhmmss.csv**". With a file manager you may rename the file as required.

"**Import GPS Track**" reads a prepared gpx Track file (e. g. transektcount_t1.gpx) from directory "**Documents/TransektCount**". In "**5. GPS Usage**" is shown how to create and handle a GPX file.

Fig. 14: Import File Selection

The function "**Export Results (csv)**" writes the current meta data and counting results as a preformatted spreadsheet-readable CSV file **Transect_Tr-No_YYYYMMDD_hhmmss.csv** into the directory **Documents/TransektCount**. This comma separated text file could be imported or edited by a spreadsheet app like **Collabora** (Open Source, based on LibreOffice and obtainable free of charge from the Collabora Office F-Droid Repo, from the Play Store or direct from its home page https://www.collaboraoffice.com/downloads/).
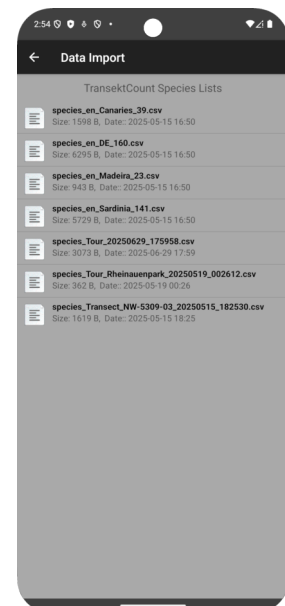
To simplify data entry into a central monitoring website, such as https://web.app.ufz.de/tagfalter-monitoring/ the table can be sorted beforehand (depending on your requirements by species name or section) using the results sorting option in TransektCount.

When loading the .csv data, to ensure that the formats and character sets are displayed correctly, please ensure that

- file origin is "Unicode **UTF-8**",
- delimiter is **comma** and
- quotation marks (**""**) are set for text field recognition.

If the leading zeros of the species codes are to be displayed, the column with the codes (in **Fig. 15**: Column E) must be extra formatted as text within the import dialog.

Fig. 15: In Collabora imported CSV table

Fig. 15 shows a part of the CSV table imported into and formatted in the Collabora Android app.

The exported .csv result files can also be transferred to a PC for further processing (see **7.1 Tips**).
They may be imported into a spreadsheet program (which was tested with MS Excel, LibreOffice Calc, and Softmaker PlanMaker).

IT-affine users may transfer the exported database (**.db**) files from "Documents/TransektCount" to a PC. There you may examine and edit a .db-file manually or per SQL script with a free tool like "**DB Browser for SQLite**" (https://sqlitebrowser.org). Some useful example SQL scripts are published in the docs directory of the GitHub TransektCount project site https://github.com/wistein/TransektCount/tree/master/docs.

Under "**App Info**" you may find general app info, the email address of the author and the history.

Under "**Licenses**" you find the license notes for code and figures.

The option menu of the counting page provides a "**Photo**" function to quickly take a photo and a "**Share**" function for sending TransektCount related notes using a standard app, like SMS or email.

Optionally, the counter view is temporarily switched off by means of the **proximity sensor** when the phone is pocketed or closely held to the body. This saves energy, prevents unwanted input and recalls the app into its current state immediately.

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5. GPS Usage

Automatic section recognition in the transect is performed by comparing the current position with the track coordinates of the transect sections in a transektcount_xxx.gpx file. If the current position is no further than e.g. 5 m (default setting) away from a section track point, the section is indicated for registration.

GPS inaccuracies must unfortunately be accepted. Contact between two transect sections should be avoided and gaps of approx. 5 m between sections are recommended.

The pre-set distance radius (**Max. distance of track deviation**) can be set between 3 and 10 m to match the GPS accuracy of the device.

5.1 Creating the track file for TransektCount

Recording a transect track can be done by a free smartphone app like CoMaps or any mapping app able to export a track in GPX format. Repeat the recording several times, as there will be variations each time. These recordings are intended to serve as a guide for manually created tracks, and their average line may also reveal errors in the underlying map.

Under Windows:
You may use the free BaseCamp program from Garmin. Load a suitable free map based on OpenStreetMap. Import the recorded GPX tracks. Then draw the tracks of all sections individually and, if possible, with a distance of 2 m or less between the individual track points over the imaginary, averaged line of the recorded tracks. Leave a gap of approx. 5 m between the different transect sections.
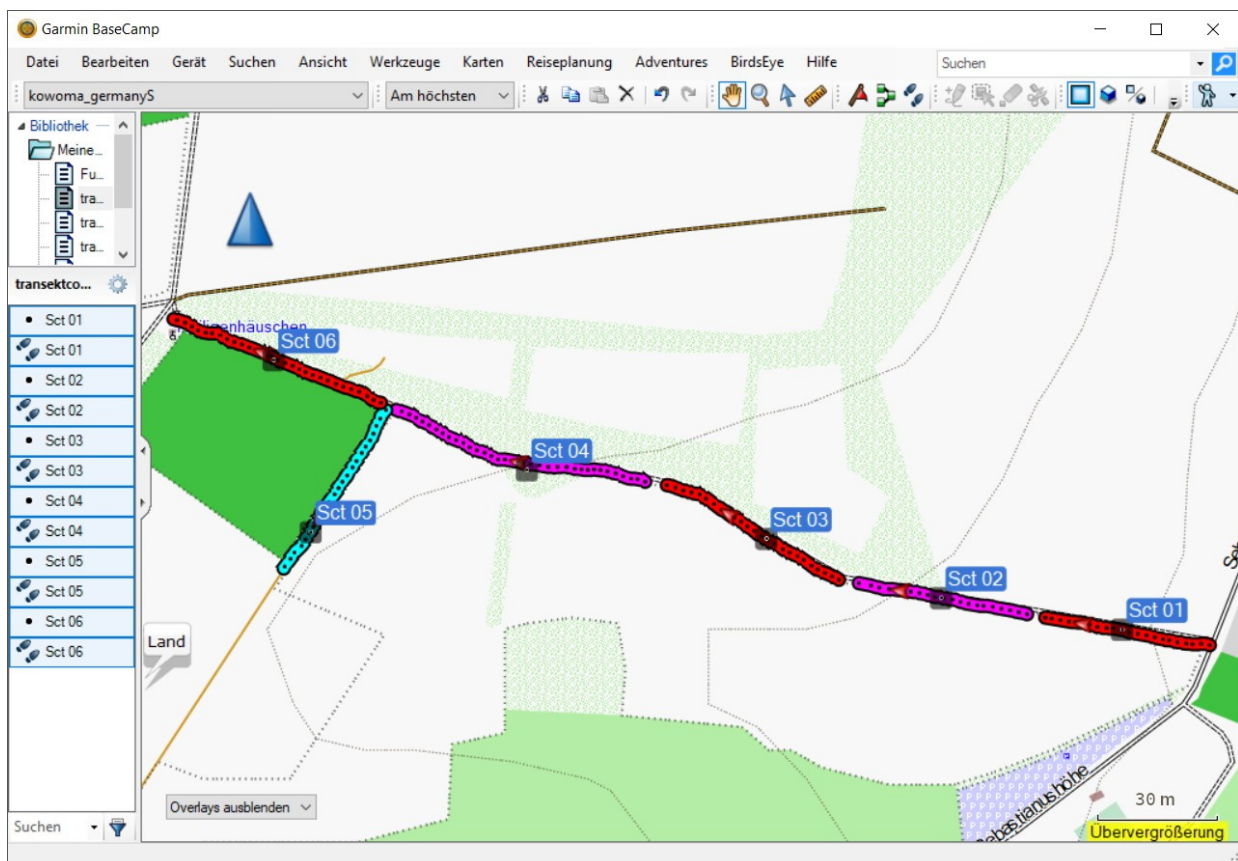

Fig. 16: Track creation in BaseCamp (Section labels and colours in the image are for explanatory purposes only)

Fig. 16 shows a screenshot of BaseCamp with the section tracks of a transect example.

Name the section tracks in the same order as the sections themselves to achieve a correct assignment. Then delete the imported GPX tracks.

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The drawn and named transect tracks can then be exported as a result to the file "**transektcount_xxx.gpx**", with xxx as a placeholder for a transect name.

Under Linux:
You may use the Viking program for this. Its user interface is different from BaseCamp, but it does the job as well. The procedure is the same as described in "**Under Windows**". In Viking, the result must be exported as a "**Single GPX File**".

5.2 Import of the track file in TransektCount

Copy the created **transektcount_xxx.gpx** track file to "**Documents/TransektCount**" on the smartphone. There it is expected by the app for import.

If the track file has been created correctly, the "**Import GPS Track**" command will acknowledge this with the message "**The GPX file has been imported.**"

Finally, activate the item "**Indicate transect section by GPS**" under Settings and, if necessary, adjust the sensitivity under "**Maximum GPS deviation allowed**".

5.3 Track notes

It is advisable to record the transect track a couple of times with your smartphone on site as a control supplement in preparation for manually creating the GPX file. The recorded tracks should correspond as closely as possible to the route on the map. Larger deviations, which are similar for several recordings, indicate inaccuracies in the map.

Manual drawing of track sections in BaseCamp should be done at a zoom level of 20 m, as this ensures optimal spacing of approx. 2 m between individual track points and sufficient accuracy for coordinate matching to determine sections within the app.

The transect sections should be drawn in the same number and sequence as they are listed in TransektCount. During import, they are assigned to the existing transect sections in this order.

As the number of transect sections must be equal to the number of tracks, adding a new transect section is only possible as long as no tracks have been imported. Therefore, before adding a new transect section existing tracks must be deleted from the database using the "**Delete GPS Track Data**" function.

After adding a new section, the track file assigned to the transect must also be supplemented with the track of the new section in BaseCamp, Viking or a similar application and reimported into TransektCount.

When a transect section is deleted, the corresponding section track is also deleted from the database.

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6. Installation hints

6.1. Installation from F-Droid store (released versions)

Get TransektCount without docs or example Basic-DBs but with updates by the F-Droid app store:

https://f-droid.org/en/packages/com.wmstein.transektcount

After installation via the F-Droid store and a first run, you may copy applicable, regional or seasonal sample basic DBs (.db) and species lists (.csv) from the author's GitHub page

https://github.com/wistein/TransektCount/tree/master/docs

into the **Documents/TransektCount** directory, which is created at the 1st start of the app. This is the directory which the app uses to read and write its data and results.

Furthermore, the mentioned GitHub directory contains the documantation, infos (and SQL scripts for editing the .db files, if you like).

Note on F-Droid:
Getting apps from F-Droid is at least as secure as getting them from the Google Play Store.
In contrast to the Google Play Store, all apps are also checked for data protection and compiled by F-Droid itself from the original source code. Advertising and tracking functions are not permitted. Restrictions and other potentially undesirable functions are explicitly indicated.

The source codes of the apps offered by F-Droid are generally published, linked, and licensed as open source.

6.2. Installation from the author's GitHub project pages (current state of development)

The installable app file **transektcount_release_nnn.apk** can be downloaded from the GitHub directory

https://github.com/wistein/TransektCount/tree/master/apk

and manually installed on the Android device.

The version published here may still be in beta.

For further data, documentation, and information, see above.

Note on updates:
In the case of major version jumps with functional additions, structural changes may have been made in the internal database of an app. After such a change, the database version is incremented. This is recognized by the app and the currently used DB is adapted internally.

However, the currently adapted DB version cannot be used after a downgrade to a previous app which uses a previous DB version.

All sample DBs are written and published in the current structure.

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7. Annex

7.1 Tips

Transferring data between smartphone and PC

Connect the smartphone to the PC using a USB cable. In the smartphone notifications find „**Charging this device via USB**", tab for more options and select „**Use USB for file transfer**".

In Windows Explorer or under Linux in Nautilus, Nemo or similar file manager the smartphone is now shown with its technical ID. In the "**Internal shared memory**" area, the "**Documents/TransektCount**" directory can be read and written to for data exchange.

7.2 Error messages

When attempting to delete a section with a crossed-out delete symbol from the section list:

Section nn: To prevent DB corruption it is not possible to delete this section. Only the last created section may be deleted. (If the last created section cannot be deleted then your device has unfortunately not enough free resources to execute the delete function.)

Normally, the last transect section can be deleted (delete symbol is not crossed out). This effect occurs depending on the technical equipment of the device. With current models, however, this restriction should only occur with very many transect sections. Other functions of the app are not affected by this restriction.

Possible solutions:

1. Reverse the sorting of the section list under Settings and try again.

2. Reduce the DB by one section with "SqliteBrowser"
   Copy the exported DB to a PC and reduce it by one section using the "SqliteBrowser" tool.
   - Load the DB in SqliteBrowser.
   - Delete all entries with the highest "section_id" in the "counts" table.
   - Delete all rows in the "alerts" table.
   - Then note the name of the last entry in the "sections" table and delete the line.
   - Finally, in the "tracks" table, delete all rows with this name in the "tsection" column.
   - Save the changes.
   Copy the modified DB back to the Android device. Repeat the process if necessary.

3. Reduce the DB by one section with second Android device with more RAM
   Either connect the two devices directly via USB or WLAN or connect both to a PC and copy the DB from there to the "Documents/TransektCount" directory of the other device.
   - Import into TransektCount there,
   - delete the last section,
   - export the DB and copy it back.
   - Repeat the process if necessary.

4. Set up the DB again
   - Create the species list in section 1 and fill it with the desired species.
   - Duplicate section and name new section accordingly.
   - Export DB.
   - Check the section list to see whether the last section can be deleted.
   - If yes, create another section by duplicating, test and export if ok.
   - If not, the DB can use a maximum of one section less.
   - Repeat until the maximum number of sections is reached.

5. Use the DB with this flaw. There are no other known functional limitations.

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7.3 Glossary

Counting range:
The counting range area corresponds to a cube of 5 m edge length in front of the observation point within a transect section. Individuals sighted are recorded separately inside and outside this imaginary cube.
Due to its Germany-wide standardization (also applies to various European countries), recording in the internal counting range is decisive for comparative evaluations.

CSV file:
Comma-separated values file. Text-based file format for exchanging data in tabular form (e.g. for importing TransektCount result data into spreadsheet programs).

F-Droid:
F-Droid is a repository of Free and Open Source Software (FOSS) applications Android.
The F-Droid client makes it easy to browse, install, and keep track of updates on your device.

File directories of TransektCount:
The public app-specific files directory (for DB files and exported CSV files) is:

 "Documents/TransektCount"

Data stored here can also be read by other apps. The data is not automatically deleted when the app is uninstalled.

The previous app-specific directory for the DB files:

   "Android/data/com.wmstein.transektcount/files/"

is no longer used from TransektCount version 4.0.0 on, as data stored here cannot be read by other apps in newer Android versions and was deleted when the app got uninstalled.

GitHub:
Is a file hosting site for software development projects including version control. It is free of charge for Open Source Projects. It was named after the version control and source code management system Git. Run by GitHub, Inc. from San Francisco, USA. Since December 2018 the company belongs to Microsoft. According to Microsoft GitHub will remain an independent platform.

Numbering scheme according to Karsholt/Razowski:
The entomologists O. Karsholt and J. Razowski developed a numbering scheme for European butterfly species, which is used in the German Lepiforum and elsewhere. According to this numbering scheme, codes are used in TransektCount to identify the species. However, this restricts the use of TransektCount to European faunal areas, as there is no comparable scheme that is valid worldwide.

Open Source:
Source code of software, which can be edited and used publicly. Open Source software can mostly be used free of charge and does not contain propriately licensed or closed source elements.

Transect:
A predetermined route along which someone counts and notes the occurrence of certain species. This route is divided into sections of approx. 50 m in length that are as homogeneous as possible in terms of vegetation. In particular, the individuals within a defined → **counting range** are counted.

7.4 References

TransektCount project:
The repository of the TransektCount project is situated on https://github.com/wistein/TransektCount.
It contains all published files with source code, configuration of the Android Studio Development platform, documentation and installable APK files.

TransektCount Documents:
You find documents, example databases, SQL scripts for manipulating TransektCount DBs and other information under https://github.com/wistein/TransektCount/tree/master/docs.

TransektCount-App:
The released version can be installed from
https://f-droid.org/en/packages/com.wmstein.transektcount/.

TourCount
TourCount is the complementary Android app to support you when recording butterflies in nature.
It allows to register individuals species-specific, separated by gender and metamorphic stages as well as individually localized in the field.

TourCount project:
The repository of the TourCount project is situated on https://github.com/wistein/TourCount.
It contains all published files with source code, configuration of the Android Studio Development platform, documentation and installable APK files.

TourCount Documents:
You find documents, example databases, SQL scripts for manipulating TourCount DBs and other information under https://github.com/wistein/TourCount/tree/master/docs.

TourCount-App:
The released version can be installed from
https://f-droid.org/en/packages/com.wmstein.tourcount/.

As of Jan. 2026