



CyberTracker

Step-by-Step Tutorial How to Customise a Wildlife Monitoring Application

This tutorial will demonstrate how to customise a CyberTracker Wildlife Monitoring and Line Transect Survey Application. This tutorial will show you how to:

Design data capture protocol and fields:

1. Design your study project
2. Why do you need the data – identify the need to gather data
3. What do you want to know?
4. What data do you need to collect?
5. How to collect data: Budget, Person-power, Resources (vehicles, aircraft, computers), Time available, short-term or long-term
6. Who will collect data
7. Study area: Location and size of area
8. Choice of Method: Line transect, Spoor survey, Vehicle patrol, Foot patrol
9. Interpretation of Data: Absence/presence, Index of Abundance, Statistical method (e.g. Line transect, Spoor transect)

How to create a data capture CyberTracker Application:

1. Design data fields for CyberTracker Application on paper
2. Create Screens for CyberTracker Application
3. Link Screens into a Sequence of Screens
4. Add Save Buttons and OK Elements
5. Test Run to check that all Screens are linked correctly
6. Add Icons and adjust Screen Properties to improve User Interface Design
7. Add Field Map to Application

8. Add Transect Lines to Field Map
9. Add GoTo Destinations to Application
10. Add Observer Names to Observer Screens for each division
11. Backup Data onto SD Card in field
12. Download Application onto PDA or Smartphone
13. Collecting data in field, getting to know PDA & SmartPhone hardware
14. View and Edit Data in Field on PDA or Smartphone

How to view data in a Table and Map and Export data:

1. Download data onto pc, view data in Table
2. Query Data in Table
3. Create Multiple Queries in Table
4. Create New Reports to View Data
5. Export data in a Table to Excel
6. Export data in a Table to Google Earth
7. View Data on Maps
8. Export Map Views of Data
9. Create New Applications for Special Projects
10. Copy list of species into CyberTracker
11. Export CyberTracker Database or Data as a CTX File

Design data fields for CyberTracker Application on paper

Data Fields: Date; Time; GPS position; Observer name; Transect name; Species; Total Number; Numbers of sex and age; Age structure (Adult, Sub-adult, Juvenile); Sex ratio (male, female – for those species possible); Age of spoor; Habitat; Habitat condition; Weather conditions (rain, wind); Field notes.

Sequence of Screens: Design links on large sheet of paper – draw screens with links and Save loops (minimum data required before Save and Save options for nice-to-have additional data).

Observers, Date, Time, GPS position (Validation of data); Path data (Meta data that remain same for many observations over time or path, e.g. Patrol Type, Path Type (road, foot path, bush)); Observation data; Environmental Context data (Meta data that may vary for every observation, e.g. habitat, vegetation density, wind).

Start screen with cover page; Observer name; GPS Timer; Survey Type; Transect name; Start, Continue, Stop; Start/Stop; Home Screen (Type of Animal, Plants, Humans, other); Species; Observation type (Sighting/Spoor/Scat/Hear); Spoor Age; Total Count; Estimate Count; Population Count (by sex and age); Habitat; Habitat Condition; Weather; Field Note; Transect Distance

After designing a sequence of screens on paper, create an Application on CyberTracker.

Create Screens for CyberTracker Application

In Applications, select New Screen...

Screen 1 - Monitoring:

To create Start Screen,

Select New Screen, Empty – Title and Navigator screen, rename screen with title “CyberTracker”

In Layout,

Select Panel, drag and drop onto blank space of screen,

Under Properties, select Dock, Top. Add Caption “Wildlife Monitoring.”

Select Panel, drag and drop onto blank space of screen,

Under Properties, select Dock, Bottom. Add Caption “Data Gathering Application.”

Select Panel, drag and drop onto blank space of screen,

Under Properties, select Dock, Left.

Select Panel, drag and drop onto blank space of screen,

Under Properties, select Dock, Right.

Select Image, drag and drop onto blank space of screen,

Under Properties, select Dock, Fill.

Under Properties, Image, find image to add to screen.

For Panels, you have the option to add a Caption and select Font, change Color (yellow), Border color (yellow), etc...

Click “Layout” to close Layout options

Save Database !!!!

Screen 2 - Observers:

New Screen, select Multi Select List - Text, Ok (To select more than one option)

Rename as “Observers”

Properties, Elements, [...],

Under Name, type in Observer name, Enter, etc

Add a name “TEST” to list of Observer names so that you can test Application and later delete junk data captured when testing CyberTracker Application on PDA or Smartphone.

Ok

Screen 3 - GPS Timer:

New Screen, select GPS Track Timer, Ok, rename screen, Enter

Screen 4 - Survey Type:

New Screen, select Single Select List - Text, Ok (Single Select List allows only one option to be selected)

Rename screen as Patrol Type, Enter

Properties, Elements [...],

Under Name, type in Foot Patrol, Vehicle Patrol, Line Transect, Spoor Survey, etc, Ok

Screen 5 - Transect Name:

New Screen, select Single Select List - Text, Ok
Rename screen as Transect Name, Enter
Properties, Elements [...],
Under Name, type in Transect names, Ok

Save Database !!!!

Screen 6 - Start Stop Survey:

New Screen, select Single Select List - Text, Ok
Rename screen as Start Stop Transect, Enter
Properties, Elements [...],
Under Name, type in Start, Enter, Continue, Enter, Distance Covered, Enter, Stop, Enter, Ok

Screen 7 - Start Stop:

New Screen, select Single Select List - Text, Ok
Rename screen as Start Stop, Enter
Properties, Elements [...],
Under Name, type in Start, Enter, Stop, Enter, Ok

Screen 8 - Distance Covered:

New Screen, select Number Keypad, Ok
Rename screen as Distance Covered, Enter
Properties, Result Element [...],
Under Name, type in Distance Covered, Ok

Save Database !!!!

Screen 9 - Type of Animal:

New Screen, select Single Select List - Text, Ok
Rename screen as Type of Animal, Enter
Properties, Elements [...],
Under Name, type in list of Animal Types, Ok

Screen 10 - Hoofed Mammals:

New Screen, select Single Select List - Text, Ok
Rename screen as Hoofed Mammals, Enter
Properties, Elements [...],
Under Name, type in list of Hoofed Mammals, (Species, Enter, Species, Enter, etc), Ok

Screen 11 - Padded Mammals:

New Screen, select Single Select List - Text, Ok
Rename screen as Padded Mammals, Enter
Properties, Elements [...],
Under Name, type in list of Padded Mammals, (Species, Enter, Species, Enter, etc), Ok

Screen 12 - Birds:

New Screen, select Single Select List - Text, Ok
Rename screen as Birds, Enter
Properties, Elements [...],
Under Name, type in list of Birds, (Species, Enter, Species, Enter, etc), Ok

Save Database !!!!

Screen 13 - Type of Observation:

New Screen, select Single Select List - Text, Ok
Rename screen as Type of Observation, Enter
Properties, Elements [...],
Under Name, type in Sighting, Enter, Spoor, Enter, Ok

Screen 14 - Spoor Age:

New Screen, select Single Select List - Text, Ok
Rename screen as Spoor Age, Enter
Properties, Elements [...],
Under Name, type in Very Fresh, Enter, Fresh, Enter, Old, Enter, Ok

Screen 15 - Total Count:

New Screen, select Number Keypad, Ok
Rename screen as Total Count, Enter
Properties, Result Element [...],
Under Name, type in Total Count, Ok

Screen 16 - Estimate Count:

New Screen, select Number Keypad, Ok
Rename screen as Estimate Count, Enter
Properties, Result Element [...],
Under Name, type in Estimate Count, Ok

Screen 17 - Population Count:

New Screen, select Number List Text, Ok
Rename screen as Population Count, Enter
Properties, Elements [...],
Under Name, type in Adult Male, Enter, Adult Female, Enter, Adult Unknown, Enter,
Subadult Male, Enter, Subadult Female, Enter, Subadult Unknown, Enter, Juvenile, Enter, Ok

Save Database !!!!

Screen 18 - Habitat:

New Screen, select Single Select List - Text, Ok
Rename screen as Habitat, Enter
Properties, Elements [...],
Under Name, type in Grassland, Enter, Woodland, Enter, Pan, Enter, etc... Ok

Screen 19 - Habitat Condition:

New Screen, select Single Select List - Text, Ok
Rename screen as Habitat Condition, Enter
Properties, Elements [...],
Under Name, type in Dry, Enter, Mild, Enter, Green, Enter, Ok

Screen 20 - Wind Conditions:

New Screen, select Single Select List - Text, Ok
Rename screen as Wind Conditions, Enter
Properties, Elements [...],
Under Name, type in No Wind, Enter, Mild Wind, Enter, Strong Wind, Enter, Ok

Screen 21 - Weather:

New Screen, select Multi Select List - Text, Ok
Rename screen as Weather, Enter
Properties, Elements [...],
Under Name, type in Sunny, Enter, Cloudy, Enter, Overcast, Enter, Drizzle, Enter, Rain,
Enter, Downpour, Enter, Ok

(NB: Weather elements will depend on the survey method. For example, wind conditions and weather is more important for spoor count than sightings of animals, since it affects spoor conditions and bias of data)

Screen 22 - Field Note:

New Screen, select Note, Ok
Rename screen as Field Note, Enter
Properties, Result Element [...],
Under Name, type in Field Note, Ok

Save Database !!!!

Link Screens into a Sequence of Screens

For each screen that is followed by a single screen, in the Properties panel, select the “Next screen” under Navigator. Click in the blank space and select the appropriate screen from the drop-down menu. For example, the first screen (Start screen title page) will go to the Observers screen, which will go to the GPS Timer screen, which goes to the Survey Type screen.

For a screen that branches out to several screens, select the screen links under Element List. For each screen Element, click on the blank space and select the appropriate screen from the drop-down menu. For example, the Main screen branches out to Large Mammals, Hoofed Mammals, Large Predators, etc.

On the last screen in the sequence of screens, which is usually a Field Note screen, unclick the “Show next” under Navigator, so that the last screen will not show a Forward or Next button.

Add Save Buttons and OK Elements:

A Save Button need to be added to the last screen in each of the sequence branches in order to save the data and capture a GPS position. The last screen is usually a Field Note screen. Sometimes you may have the option to save data before getting to the end of a branch, in which case several screens in a sequence of screens may have Save Buttons. For example, you may not need to make a Field note, in which case you may save your data before reaching the Field Note screen.

When you save data, you need to loop back to the Main screen in order start the next observation. Under Navigator, when you select “Show save 1”, you also need to specify to which screen you need to loop back by selecting a screen under “Save 1 target”.

Sometimes you may have a smaller loop within the sequence of screens. For example, you may wish to record the plants an animal is feeding on, so you want to use a second save button to loop back to the animal activity screen. Or the Start/Stop screen may loop back to different screens, depending on whether you selected Start or Stop. To create a second save button, select “Show save 2” and specify the “Save 2 target”.

Test Run to check that all Screens are linked correctly

Once all the screens have been linked up into a sequence of screens that may contain several branches, and Save buttons have been added that loop back to the Main screen or other screens (if more than one Save button is used), your Application is ready for testing. Select “Test Run” and use the Application simulator to test if all the screens have been linked up correctly and all the Save buttons loop back to the correct screens.

You can also Install the Applications to your PDA or Smartphone to test it on the actual unit itself.

Add Icons and adjust Screen Properties to improve User Interface Design

Icons make it possible for non-literate expert trackers to gather complex and detailed data. However, even for users who are literate, such as scientists, icons make the data capture faster and more efficient. It is much quicker to recognize and select icons than to scroll through text. Icons also reduces errors in data capture.

Under Element List, select Elements. In the Edit Element List window, select Choose Columns and tick off “Icon 32x32”, “Icon 50x50” or “Icon 100x100”. The “Icon 32x32” are for the older Palm PDAs with low resolution screens, for which you need icons that are no more than 32x32 pixels in size. Newer PDAs and Smartphones have higher resolution screens, so select “Icon 50x50” (for icons that are 50x50 pixels) or “Icon 100x100” (for icons that are 100x100 pixels). When you have chosen the appropriate columns, select OK.

Under the Icon 50x50 column (or Icon 100x100 column), click in the blank space and select the [...] button to browse and select the Icon you need for each Element. When you have added an icon to each Element, click OK.

Under Element List, select Attribute Icon50 (if you added Icon 50x50)
Under Columns, select 3 or 4 columns, and press Enter
Increase the Item height to increase to height of the icons
For icon-only screens, unclick “Show caption”

To show both text and icon, click “Show caption” and select 1 or 2 columns.

Add Field Map to Application

In Reports, select New View, Map. If you are connected to the Internet, the default Map View will be Virtual Earth. Zoom into the area you wish to create as a Field Map. Select the “Field map” button and save the map as an ECW file.

To add a Field Map to your Application, go back to Applications and select Application Properties and the Field Map tab. Select the [...] button to browse and select the ECW map file you created.

The Field Map can now be viewed in your Application by selecting the GPS triangle in the Navigator bar on the screen.

You can also Use ESRI Shape File Map Layers (*.shp) to create Field Map or an Image Map (*.bmp) to create Field Map

Add Transect Lines to Field Map

In Reports, Map View, Use Measure tool to draw line on map,
Right-Click, select “Create line layer from measure”.

Type in the File name, and Save line as a Shape File,
Confirm that you want to add this layer to the map (Yes).

The line you created will now be added to Layers of your Shape File map.

You can change the color of the line by clicking on the appropriate “Line” Layer
Now select the Field map button to create a Field Map that contains the line you created.

Add GoTo Destinations to Application

In Applications, Application Properties, Goto, select the Add button

Type in Title, Latitude and Longitude for each Destination, for example, Start Transect 1, End Transect 1, Start Transect 2, End Transect 2, etc... and Home.

OR copy Paste from Excel spreadsheet.

Remember to enter Latitude and Longitude of “Home” (your home base or camp). If something goes wrong and you get lost, you can then select Home to find your way back.

Backup Data onto SD Card in field

To make an automatic backup of your data onto a SD Card in the field, select Application Properties and in the General tab, under System, click “Use SD card for data backup”.

Download Application onto PDA or Smartphone

To download (or “upload”) your Application onto your PDA or Smartphone, connect your PDA or Smartphone to your pc. Select “Install To Mobile Device” and follow the instructions. See Getting Started.

Collecting data in field, getting to know PDA & SmartPhone hardware

Before you go out to collect data in field, play around with your Application and with your PDA or Smartphone to get to know it. Use a “TEST” observer to collect test data, so that you can delete the test data after you have practiced. Make sure you are familiar with both your CyberTracker Application and the hardware before you start to collect data in the field.

View and Edit Data in Field on PDA or Smartphone

To view data on your PDA or Smartphone in the field, select the Options button (the solid round dot in the left bottom corner on the Navigation bar). Select the All Sightings tab to view all the data. Select a particular sighting and then the Active button to view a particular sighting. Select “Edit” to correct a sighting when necessary, and save the corrected sighting.

Download data onto pc, view data in Table

To download data onto your pc, simply connect your PDA or Smartphone to your pc – the data will be downloaded automatically for a Windows Mobile Device. For an Android Device, select File, Get data from connected device (F7). Under Reports, a default Table will be open, showing the Date and Time columns of the data you downloaded.

To add new columns, simply double-click on the required fields in the Inspector. Alternatively, select View Properties and click on Add to add a new column. To remove a column, click on the column heading and drag downwards until a large cross appears, and then let go. Use Drop-down Filter in the heading of each column to query data in each column.

Create Multiple Queries in Table

To view different species in different colours on map, you need to create a separate query for each species or group of species you need to view. Select New Query, and for each new query filter the data to view a particular species or group of species. In the Map view, select “All queries” to view all the queries on the map.

Create New Reports to View Data

To create a new Report, select “Manage Reports” and follow the instructions. This enables you to sort your data in different Reports that makes it easier to view different sets of data or different views of your data. For example, create separate Reports for Hoofed Mammals, Predators, Human Activities, etc.

Export data to Excel

To export a data in a Table to Excel, select the Query of the data you want to export. Select “Export View”, select the folder where you want to “Save in”, type in a “File name”, and under “Save as type”, select “Microsoft Excel Spreadsheet”.

Export Table to Google Earth

To export a data in a Table to Google Earth, select the Query of the data you want to export. Select “Export View”, select the folder where you want to “Save in”, type in a “File name”, and under “Save as type”, select “Google Earth (Keyhole Markup Language)”.

If you are connected to the Internet, you will be prompted “Would you like to launch Google Earth?” Select “Yes” to view your data in Google Earth. In Google Earth, you can now save your data from “Temporary Places” to “My Places”. The default setting in Google Earth will only show one data point. To view all your data, you need to separate the two Time Sliders for the Start Date and End Date in the Show Historical Imagary bar in the top left corner. Or you can select the little tool icon to select the Start date and End date.

View Data on Maps

To view data on Maps you have three options:

1. Virtual Earth (Satellite Image)
2. Map Layers (ESRI Shape Files)
3. Image Map

Select “New View”, Map. If you are connected to the Internet, the default map option will be Virtual Earth. Pan and zoom in to the area you wish to view.

To import ESRI Shape File Map Layers, select “View Properties”, then the “Layers” tab, and use the Add button to add Shape File Layers.

To import an Image map, select “View Properties”, then the “Image” tab, and use the [...] button to add the Image map. If the image has been geo-referenced, CyberTracker will automatically read the required data. If the image has not been geo-referenced, you can use CyberTracker to geo-reference it by typing in the Latitude and Longitude of the Left, Top corner and Right, Bottom corner of the map image.

Export Map Views of Data

When a Map View is selected (and not a Table view), you can select “Export View” to export the map data as:

1. Export Bitmap Image Map (*.bmp)
2. Export ESRI Shape Files to ArcView

Create New Applications for Special Projects

You can create copies of an Application in order to modify the Application for special projects.

In Applications, select “Manage Applications”, then select “Create a new Application”, Next> Select [tick] “Copy screens from current Application” and type in Name of Application, Finish. You have now created a copy of the Application, which can be modified for a different area, with different species, different survey methods, etc.

Copy list of species into CyberTracker

If you need to add a long list of species to your Application and have this list available in an Excel spreadsheet, you can copy and paste the list directly into CyberTracker.

Under Elements, create a “New Category” for “Bird list” and chose the columns for Name and Scientific Name. In Excell, select the columns of bird names, with the common name in the first column and the scientific name in the second column. Select “Edit, Copy” and then in CyberTracker, select Edit, Paste Elements from Excel.

Export CyberTracker Database or Data as a CTX File

The CTX file is a compact CyberTracker file that makes it easy to email and share a CyberTracker database and data. If the other person already have the same CyberTracker database, you can simply export the data as a CTX file, which can then be imported into the other person's CyberTracker database.

To export a CTX file, select "File, Export", and select "Export Data" or "Export Database". To send data or database via email, select "File, Send".