

MSTripES Polygon Search Application User Manual

MSTripES Polygon Search Application is devised to collect ecological data and associated parameters where standard protocol of monitoring tigers, co-predators and prey is not feasible to execute. Please install the application from the “.apk” file provided to you.

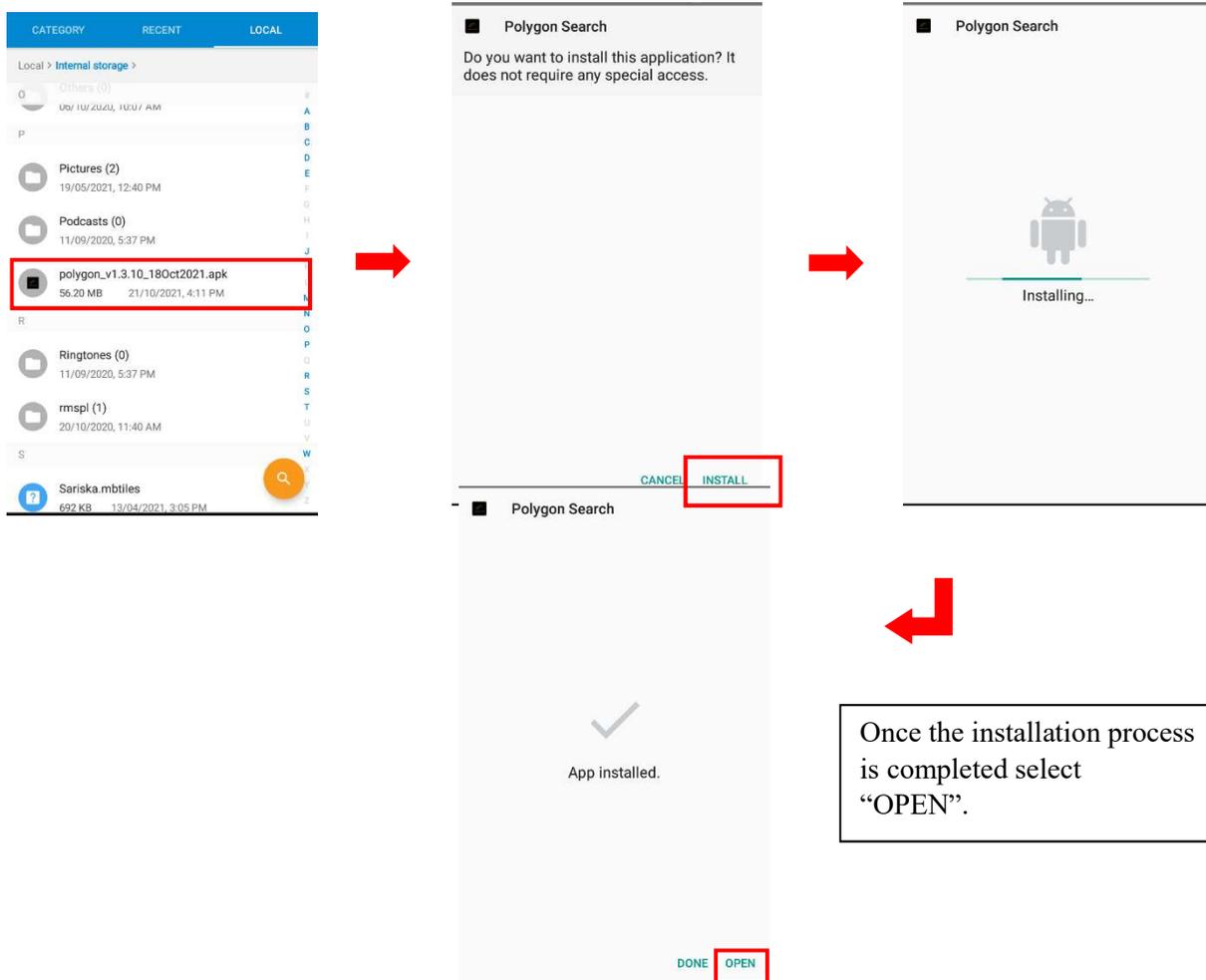
Overview:

1. Prerequisites (these can be seen in “About Phone” in settings of the phone)

- Phone operating system should be Android 7.1 or above. This application is not available for iPhone.
- 3 GB RAM (Preferably 4 GB RAM)
- 32 GB ROM/ Internal Storage
- Standalone/ In-built GPS chip, Gyroscope, Accelerometer, Magnetometer

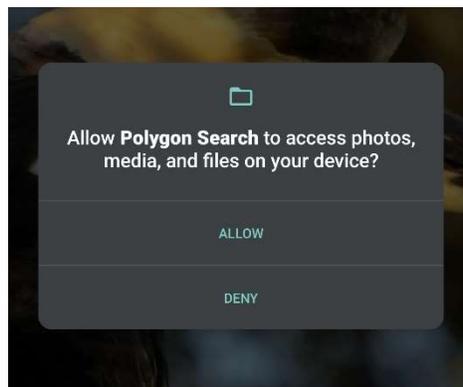
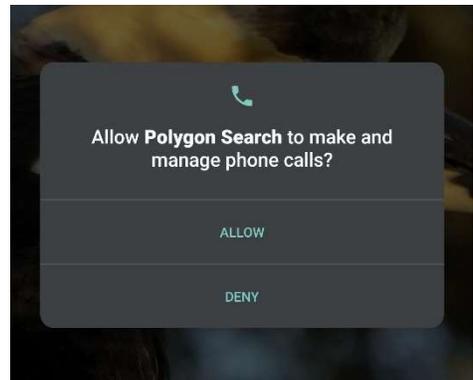
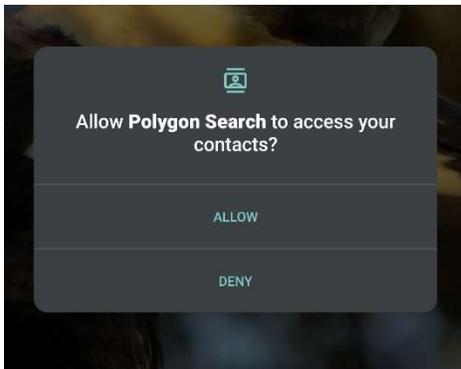
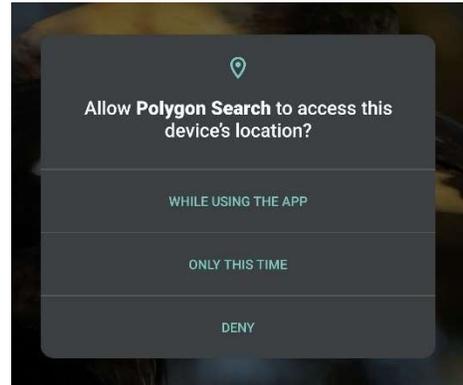
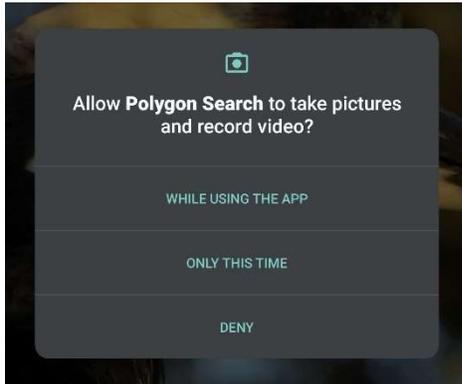
2. Installation

- Locate the “.apk file” in the internal storage of your phone and install the application.



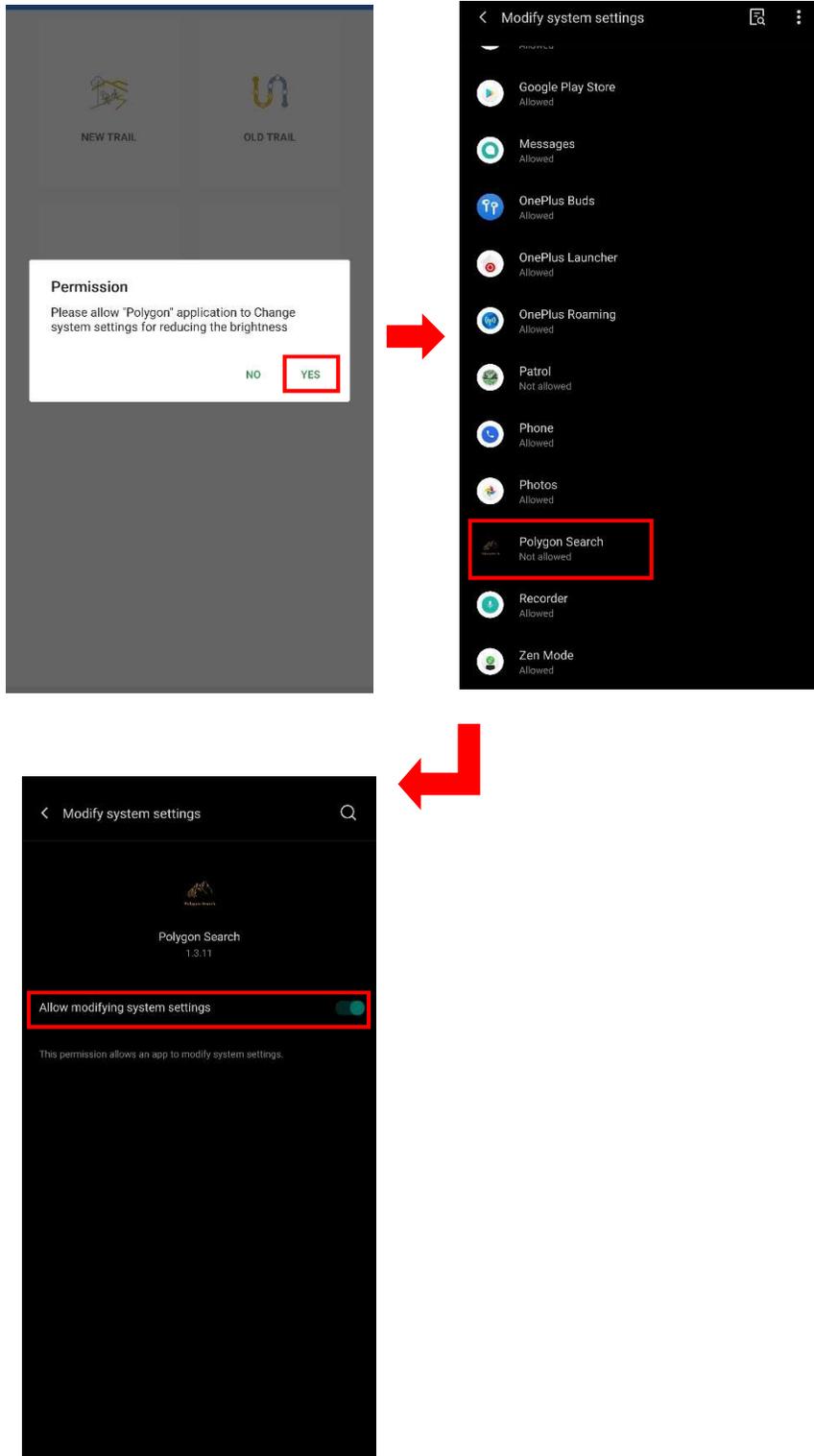
3. App permissions

- After installation when you open the application, you need to provide necessary permissions i.e. camera, location, contacts and storage for smooth functioning of the application. Please allow all the necessary permission by selecting allow/while using the app.



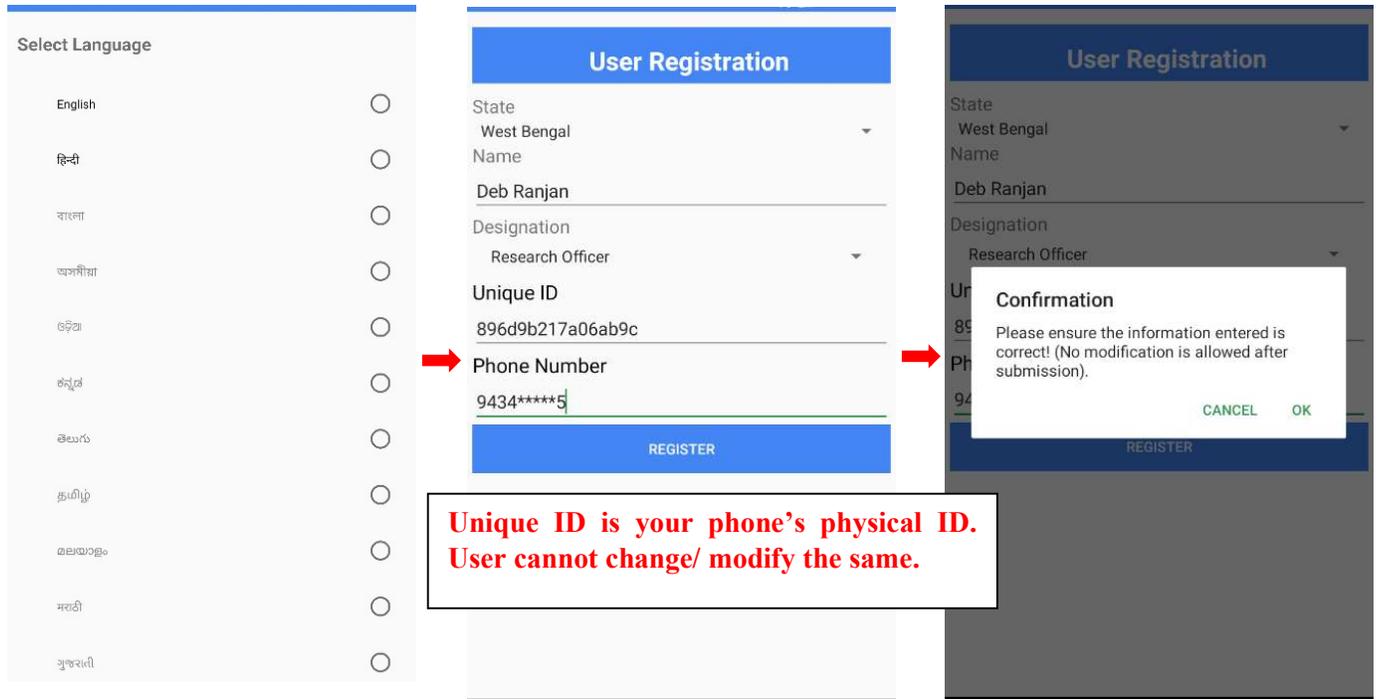
- **Optional permission:** You can provide optional permission to modify the system settings. This is required only to reduce the phone battery consumption while operating the application. It reduces the screen brightness when the Map Page Screen (described later) is locked during ongoing survey/ search path. This option will appear once you tap on New Trail/ New Boat Transect/ New Channel Survey for the first time.

***If you wish to provide the permission, then select “Yes” and follow the steps.**



4. User Registration

- Once you have provided all the necessary permissions, you have to “Register” yourself in the application. **The primary user (Official/Staff /Researcher) who will be using the device should register her/him.**
- This is a multilingual application and can be operated in different languages. Registration procedure is followed by the selection of language.
- Fill the details i.e. name of the state, user’s name, user’s designation and phone number.
- Select the name of the state and designation from the dropdown list. **In case your designation is not listed in the menu, please select “Others”.**
- Once you have filled in all the information, select “Register” and select “OK” if the information provided by you is correct.

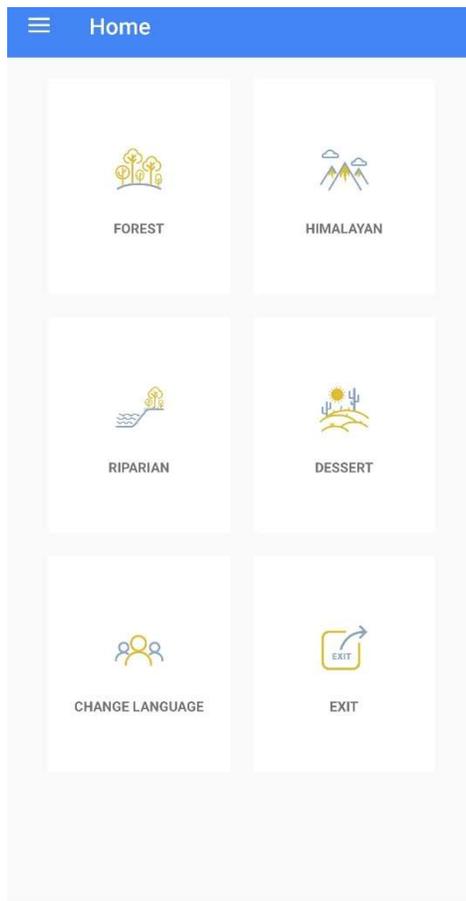


After registration, you will be prompted to the Home page of the application.

Home Page

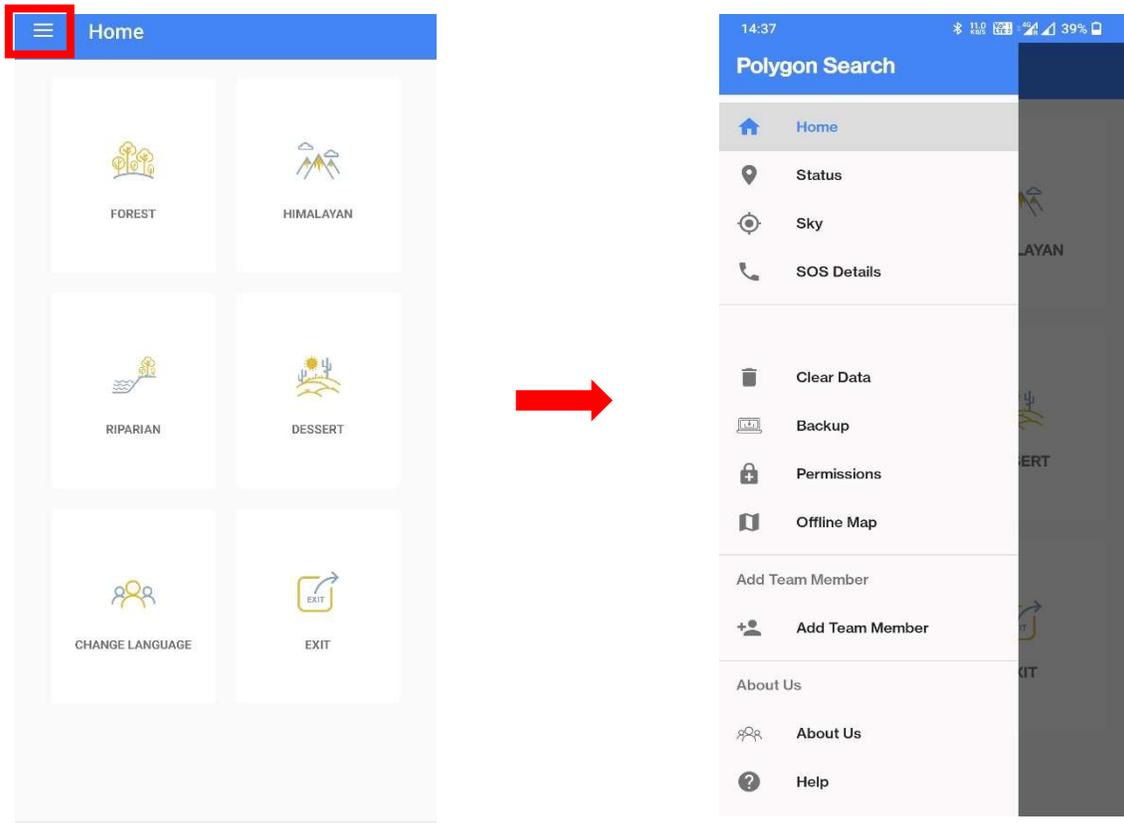
From home page, you can select different module of ecological sampling method depending upon the area you are intending to sample. You can also change to the language of your choice from the home page.

- **Forest:** To carry out ecological sampling in any forested ecosystem, please select “Forest”.
- **Himalayan:** To carry out ecological sampling in Trans-Himalayan region of the country please select “Himalayan”.
- **Riparian:** To carry out ecological sampling mangrove/riparian ecosystem, please select “Riparian”.
- **Desert:** To carry out ecological sampling in desert ecosystem, please select “Desert”.



5. Menu bar options

Please tap on the menu drawer button on the extreme top left to explore additional useful options.

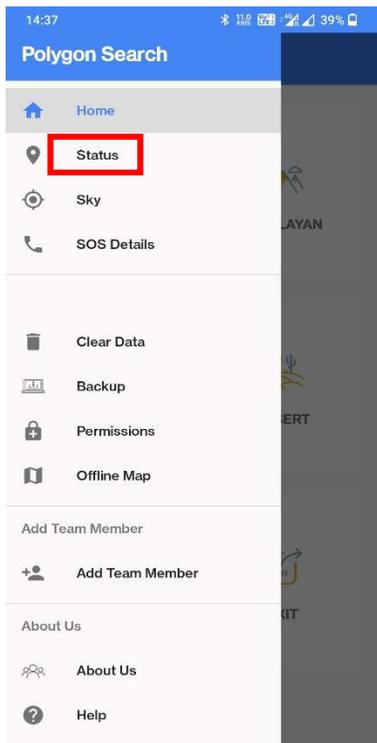


- **Status:** If you are using the app for first time or you are facing problem regarding GPS fix in the app, please click on STATUS to check GPS fix. It shows coordinates of the point, number of satellites used in GPS fix, accuracy and altitude of that point.

#SATS indicates the number of satellites used in GPS fix.

Remember at least five (5) satellites are required to get GPS fix.

If you are not able to get GPS fix, please check location settings in your phone and set it to high accuracy.



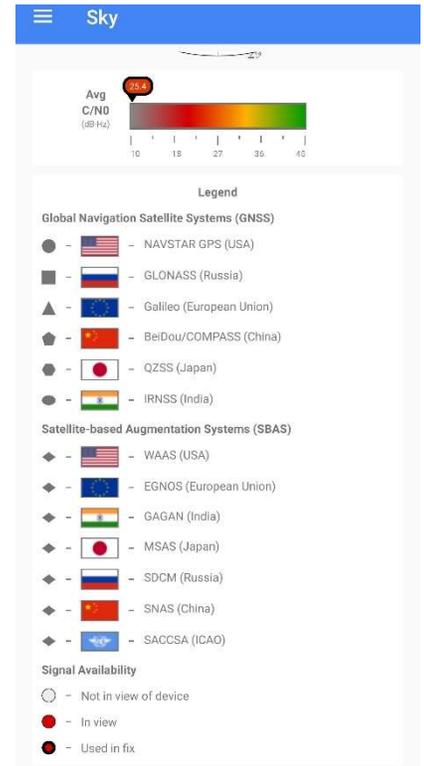
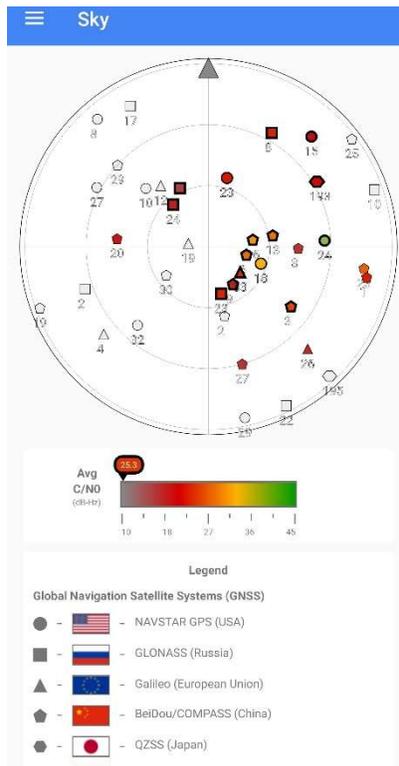
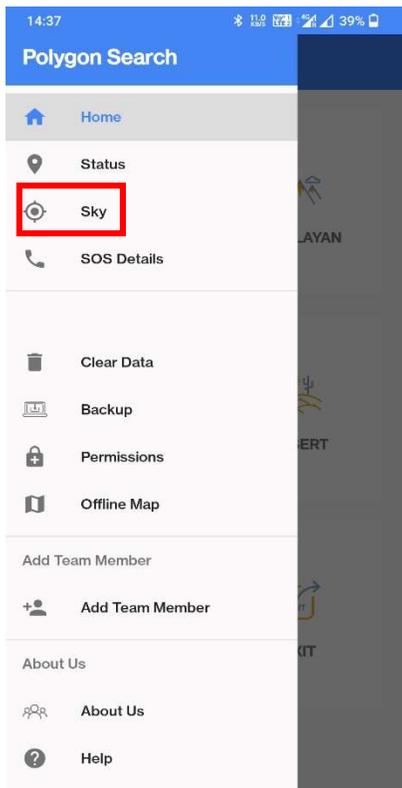
Status

Lat: 30.28364789 Time 22/10/21 10:21 AM
 Long: 77.9729313 TTFF: 4929
 Alt: 558.65 E H Acc: 7.42 m
 Alt (MSL): # Sats: 12/34
 Speed: 0.0 Bearing: 0.0

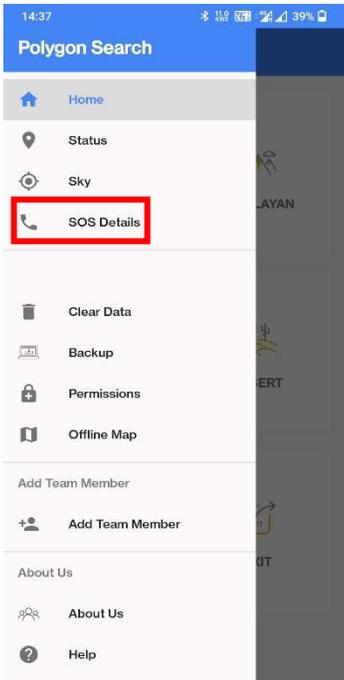
ID	GNSS	CF	C/N0	Flags	Elev	Azim
15	USA	1.57542003E9	26.0	AEU	16.0	43.0
18	USA	1.57542003E9	37.9	AE	63.0	108.0
24	USA	1.57542003E9	39.4	AE	33.0	87.0
8	USA	1.57542003E9	0.0	AE	7.0	319.0
10	USA	1.57542003E9	0.0	AE	48.0	313.0
23	USA	1.57542003E9	0.0	AE	55.0	15.0
27	USA	1.57542003E9	0.0	AE	28.0	298.0
29	USA	1.57542003E9	0.0	AE	4.0	168.0
32	USA	1.57542003E9	0.0	AE	38.0	222.0
18	USA	1.17645005E9	31.8	AEU	63.0	108.0
24	USA	1.17645005E9	33.6	AEU	33.0	87.0
23	RUS	1.60368755E9	21.1	AU	66.0	165.0
8	RUS	1.60537498E9	30.8	AU	26.0	29.0
10	RUS	1.59806246E9	0.0	A	4.0	71.0
2	RUS	1.59975002E9	0.0	A	26.0	251.0
22	RUS	1.60031245E9	0.0	A	3.0	154.0
1	RUS	1.60256256E9	0.0	A	58.0	334.0
24	RUS	1.60312499E9	0.0	A	63.0	320.0
17	RUS	1.60424998E9	0.0	A	11.0	331.0
27	CHN	1.56109798E9	18.3	A	30.0	164.0



- **Sky:** Select this option to check the positions of the satellites in the sky and how many satellites are available for fix.

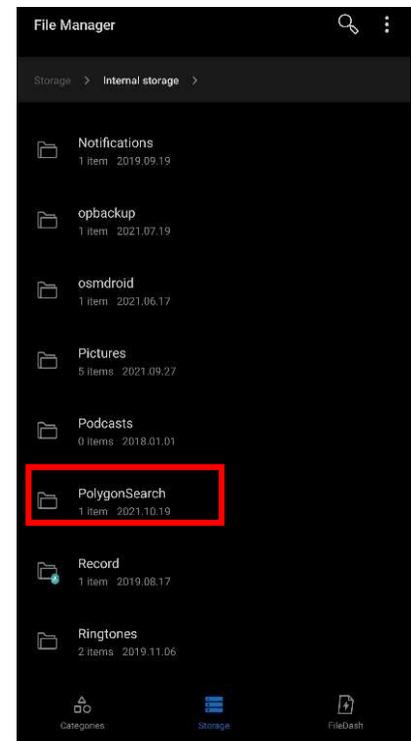
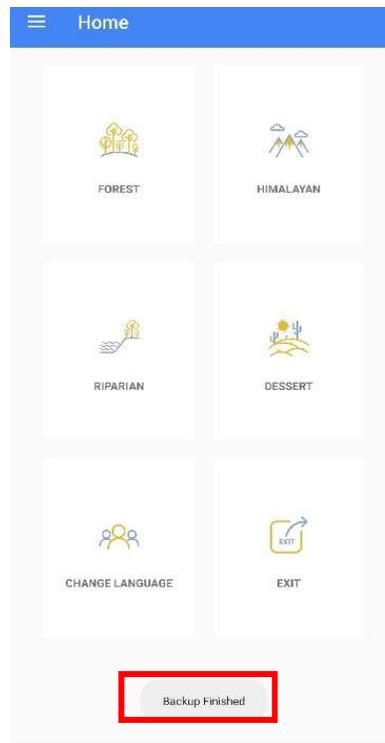
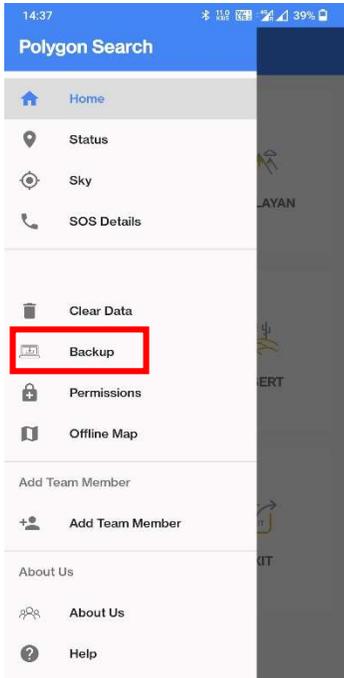


- **SOS Details:** Please add the details of emergency contacts prior to the sampling/ survey. In case of emergency if you tap on SOS it will send an alert text with the coordinates of your location over GSM connection.



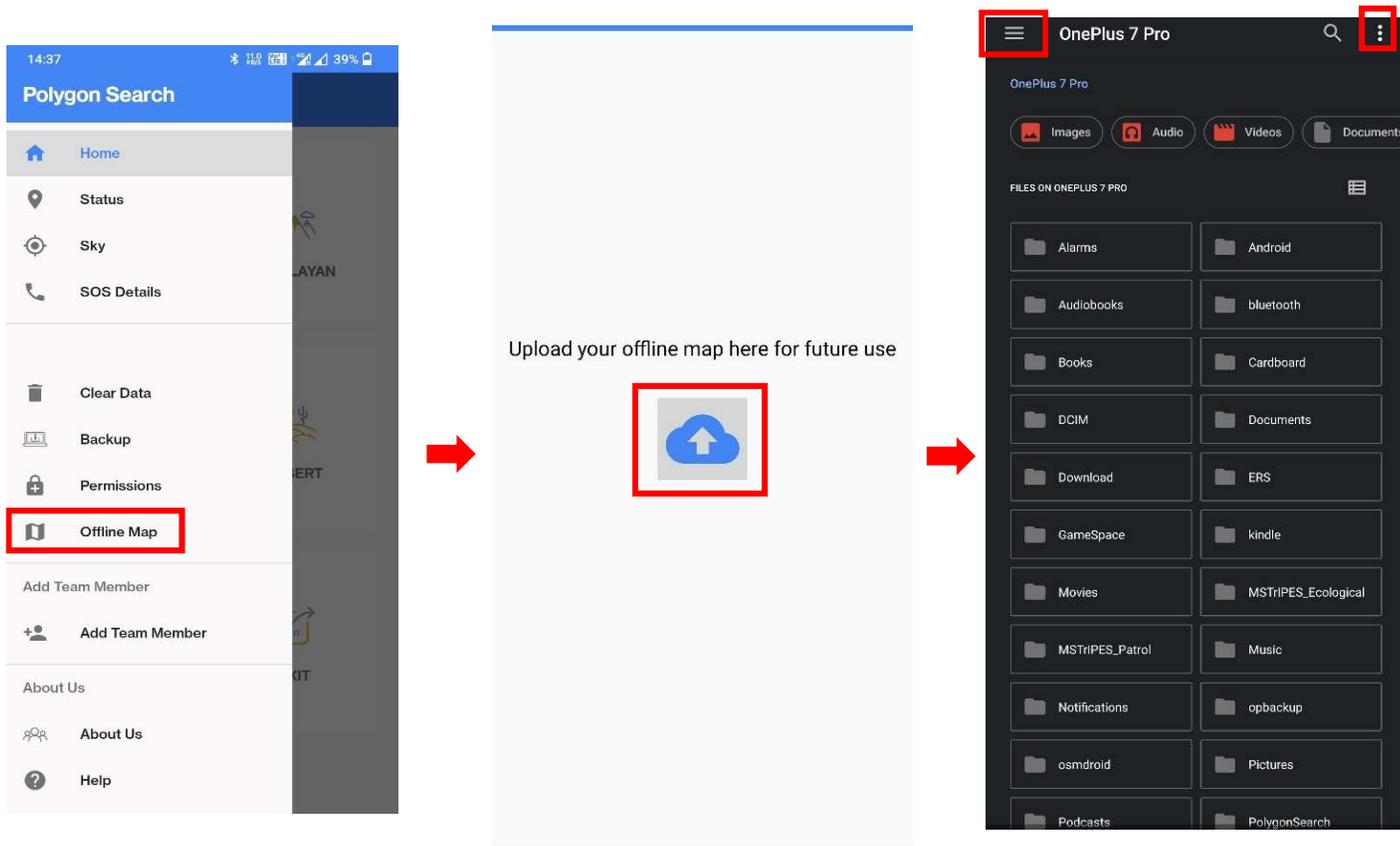
Additionally, you can select contacts from your contact list saved in your phone.

- **Backup:** Once you have completed your survey, please take a backup of your data. This will create a backup folder named “PolygonSearch” in the internal storage. You will need this folder to import the data into desktop software.



- **Permissions:** Click on the permissions to ensure that all necessary permissions are provided.
- **Offline Map:** Select this option to upload offline map of your area. Offline map can be prepared using the desktop software and kept in the internal storage of the phone. **Please remember to select .mbtiles file only. Other file formats are not supported.**

Once you click on Offline Map following page will appear. Please tap on the arrow to browse the file. **Please click on the menu drawer button on the extreme top left to explore internal storage.**

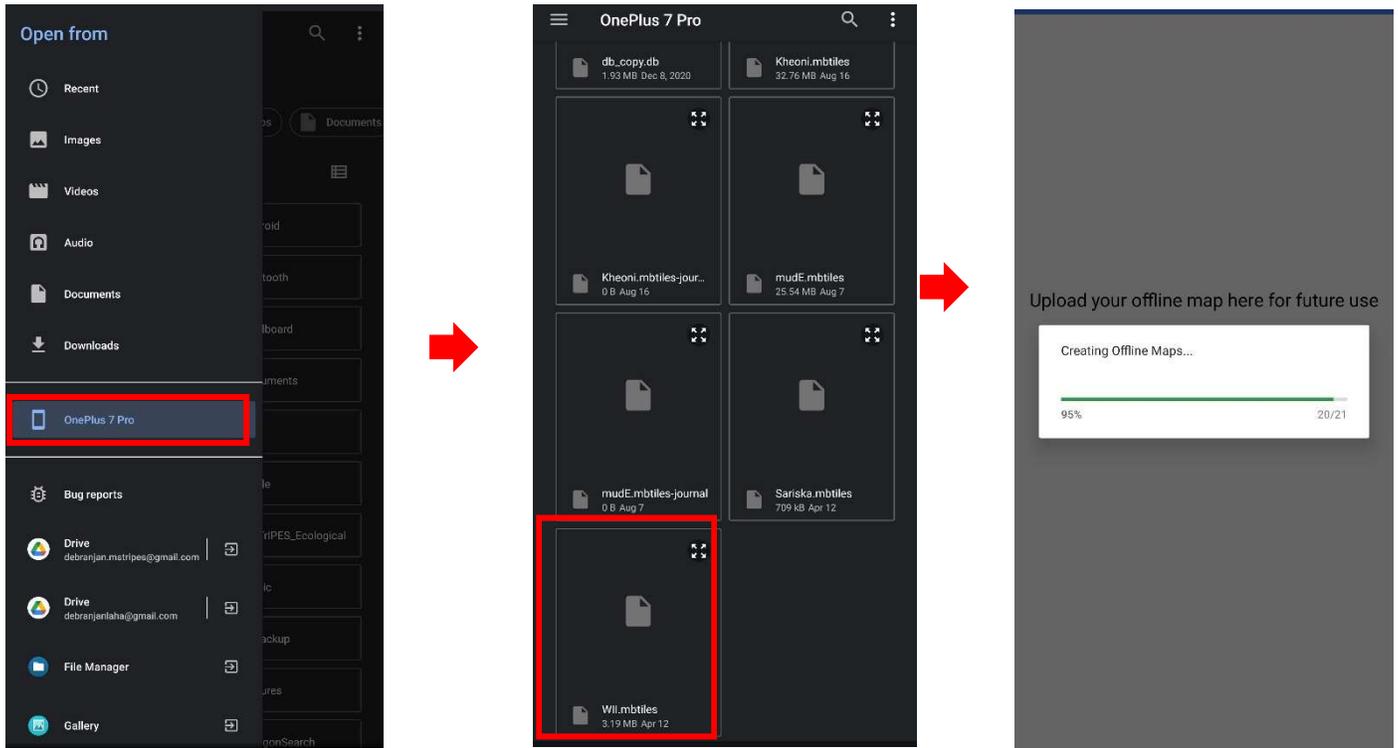


*Internal storage of the phone is typically named after the device name unless changed.

*Please ensure that phone's internal storage is not hidden (This can be crosschecked by clicking on the option button on extreme top right corner. Please refer to the image at extreme left).

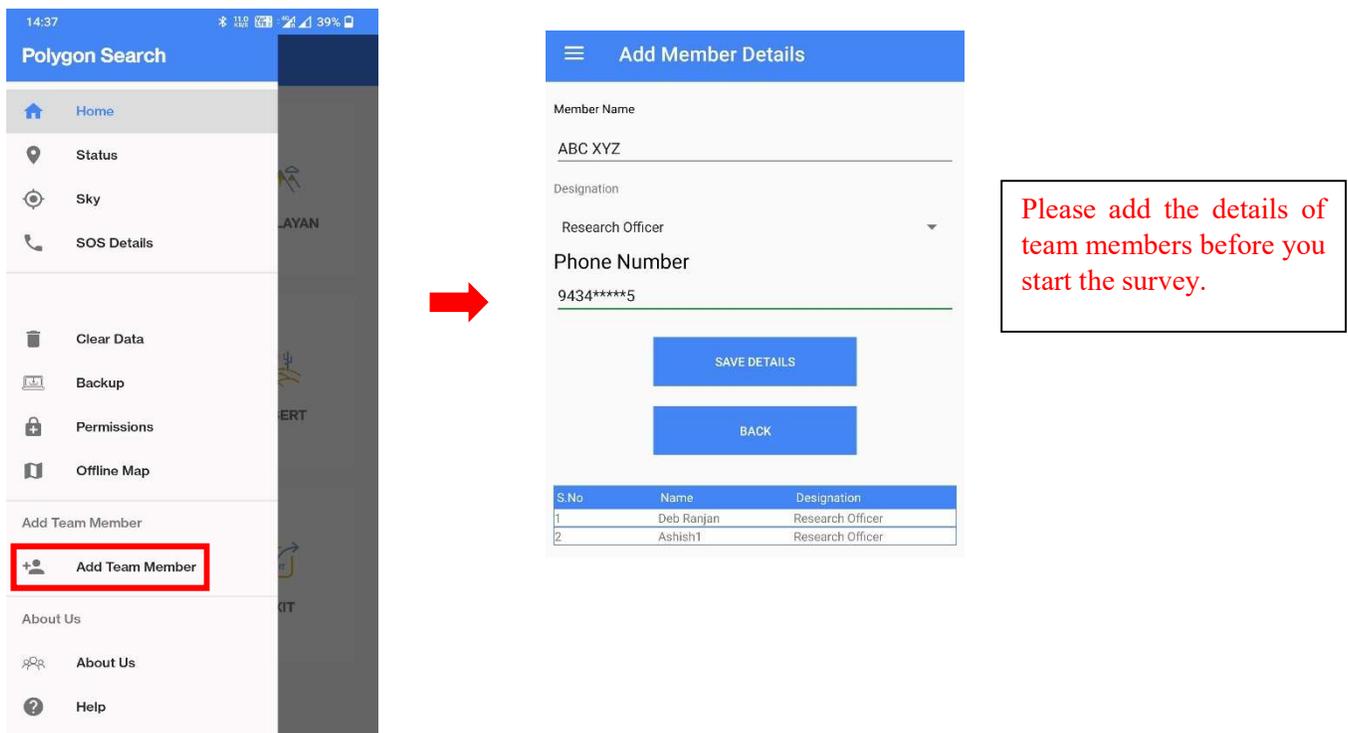
Please browse the internal storage through menu drawer only. The file cannot be selected through file explorer.

Select phone's internal storage and browser for the .mbtiles file. Select the file and wait until the process is completed. Time taken to complete this process depends on the available space and RAM on the phones and hence it varies from phone to phone. **After completion, press the back button to return to home page.**

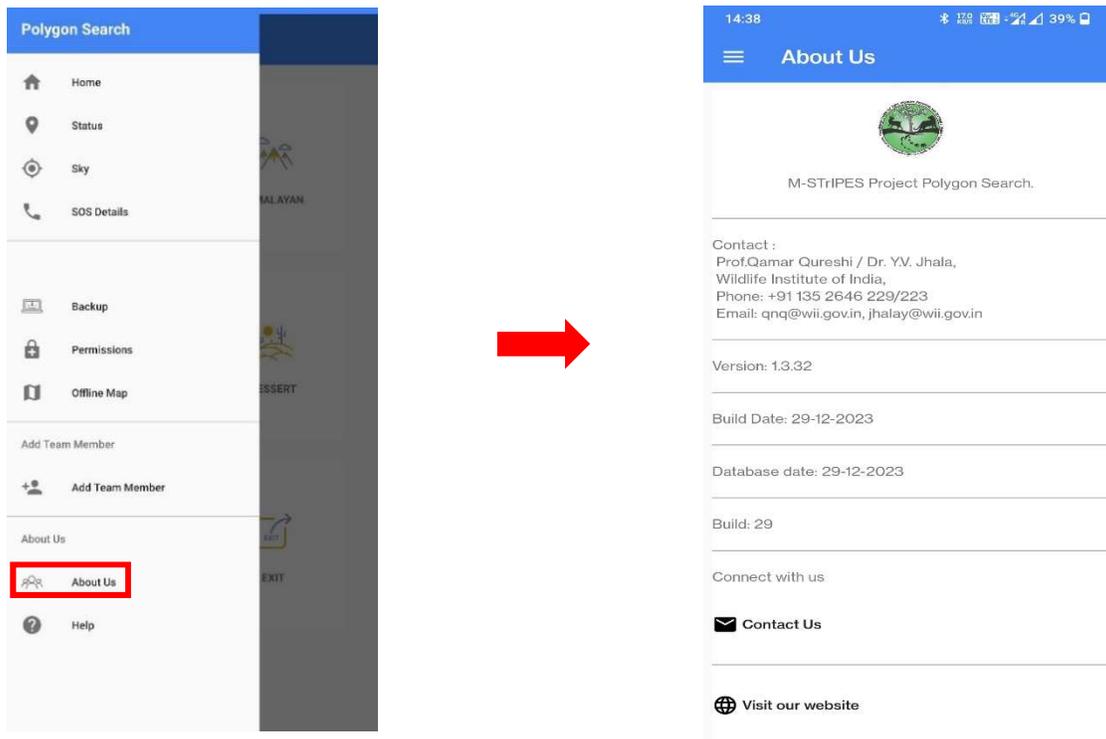


This process has to be done once and offline map can be selected directly from the map selection page. Please update the map if you are going to sample at different area.

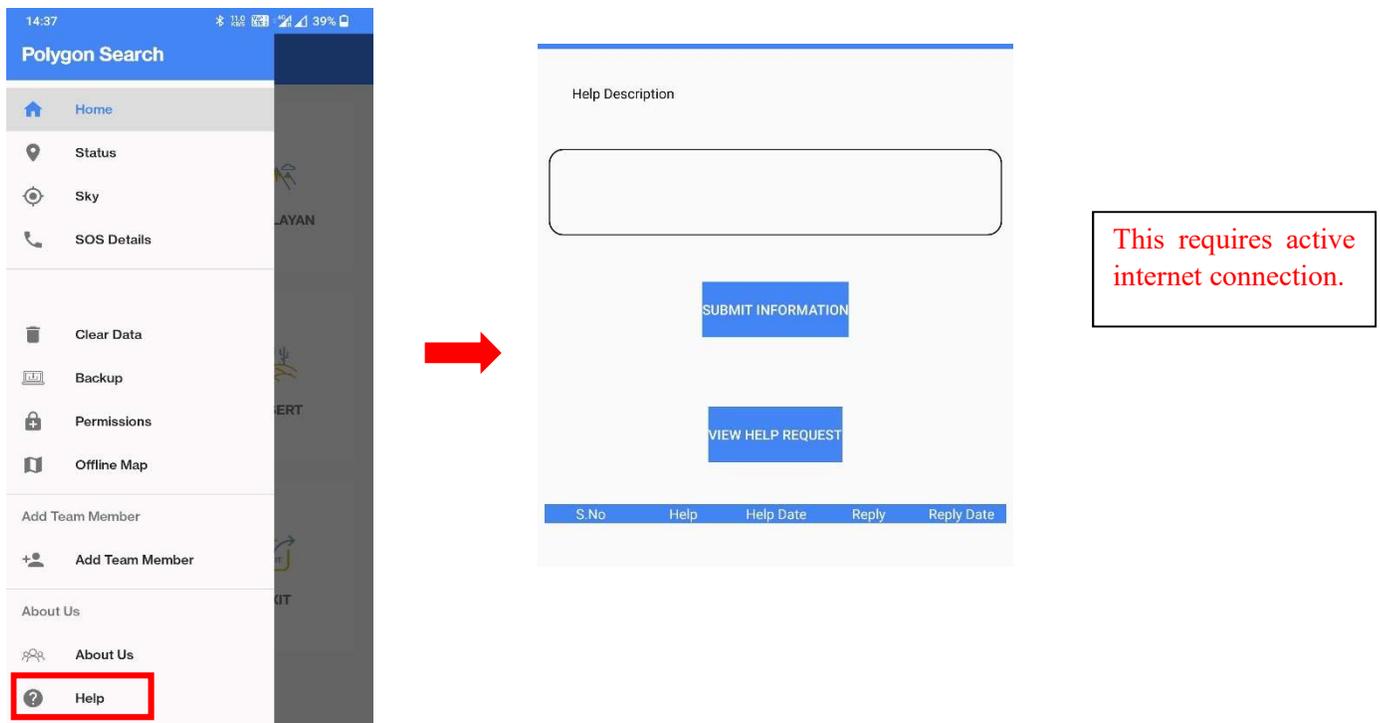
- **Add team member:** To add team members accompanying the survey, please select “Add team member”. These names will appear in the list.



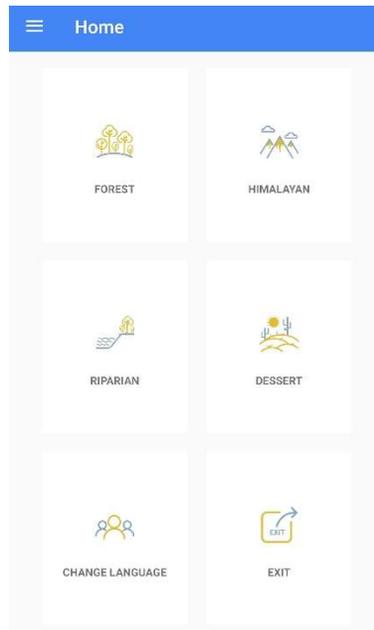
- **About us:** This will provide information about app version, build date, database date, and app build.



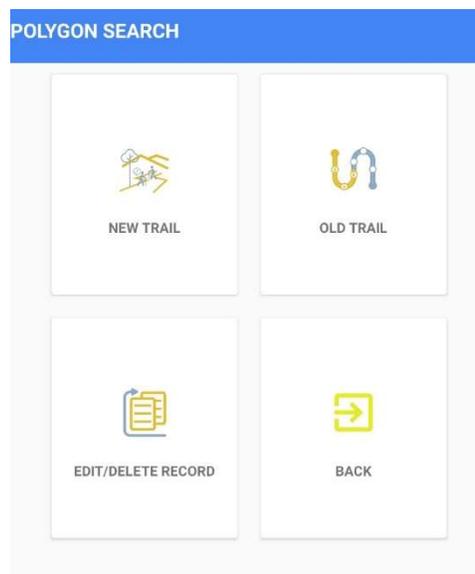
- **Help:** If you encounter any issue while operating the app, please submit your help request to the developer team through this option.



To begin with data collection user should select any of the present mode (user can select any of the modes depending upon the sampling area and purpose of the sampling) and it will open the following window.

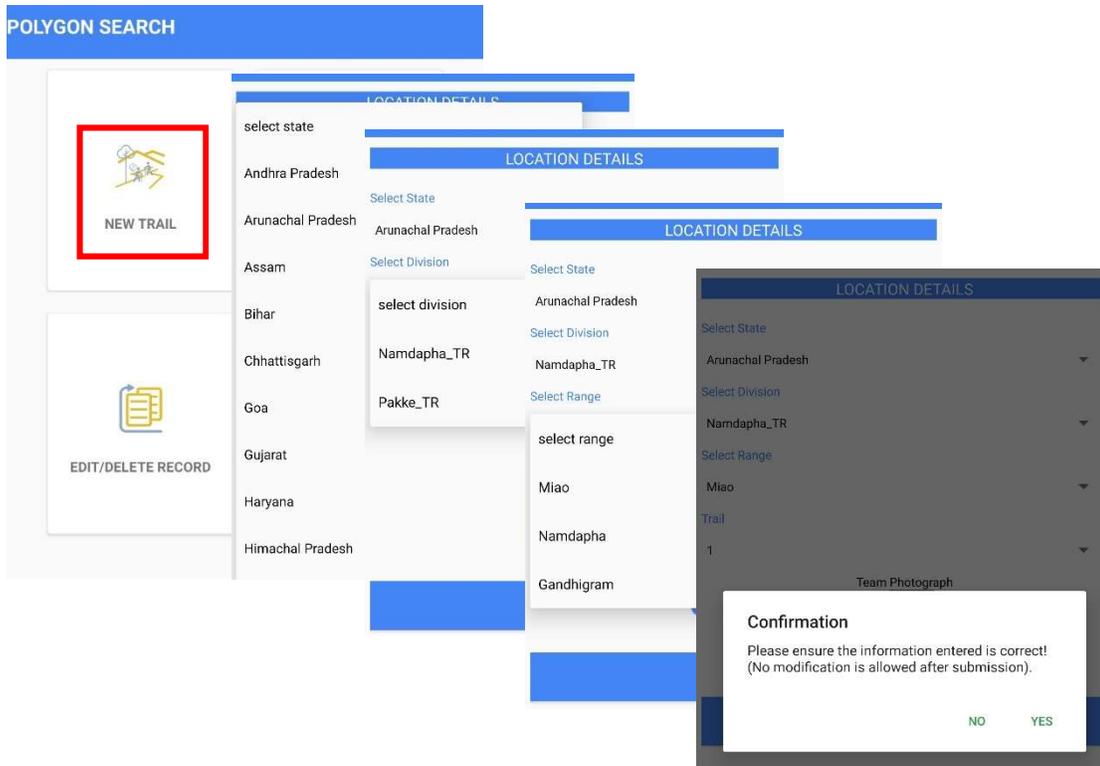


In this window user should select **New Trail** to collect the data for a new search trail as per the protocol of data collection. In case of **abnormal shut down/ unintended closure of the application**, user should select the **Old Trail** to continue the search trail.

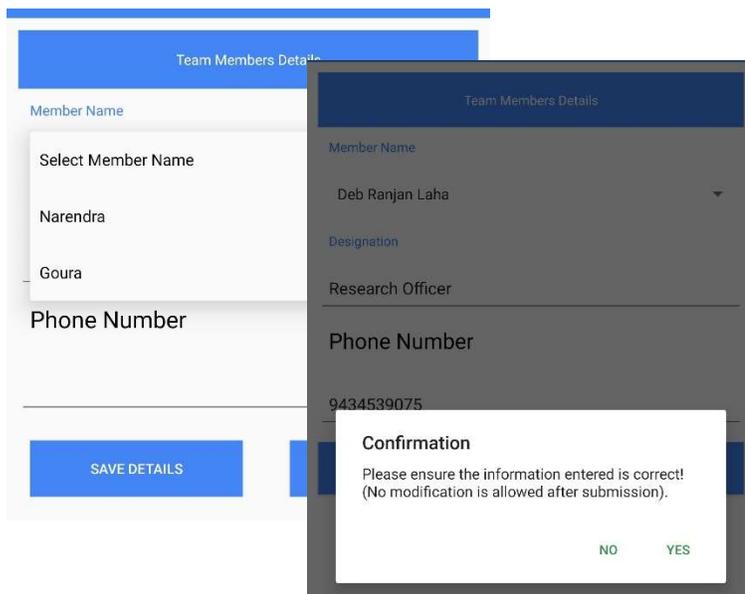


Start New Trail

To begin with new search trail, user should select new trail and it will open a new window where user should fill the **LOCATION DETAILS** of the search trail and take a mandatory photograph of the team (taking the team photograph requires GPS fix) and click on next to proceed further.



Once these information are filled, it will open a new window where the user should select the names of team members who are accompanying for the search trail.



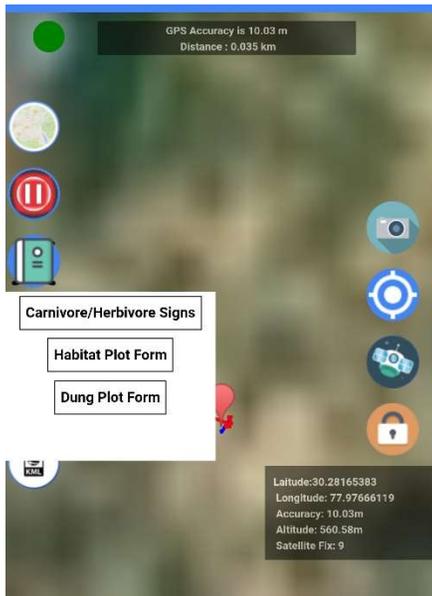
Once all the team members have been selected, user should select **YES** and proceed further. It will open a new window and user should select the map option based on the internet connectivity availability of the device/ phone. User should choose **OFFLINE MAP** in case of no network connectivity in the area where he/ she is intended to collect the data.

Once user select the map option it will open the map page of the application.

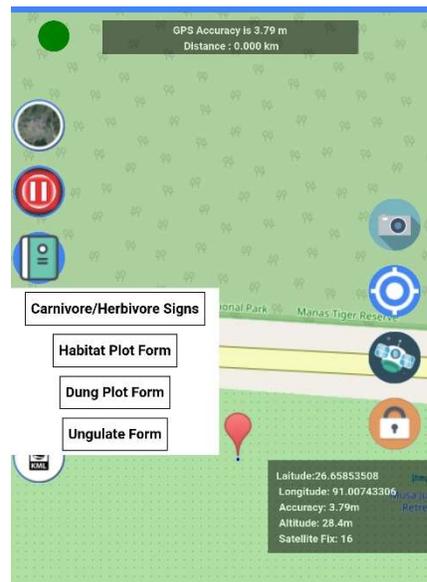
The **green button** at the left top most corner indicates the status of the **GPS signal**. User should wait until the button **turns green** and should start walking the trail/ taking data **after it turns green**.



Data forms are slightly different in both the forms



(a) Forest



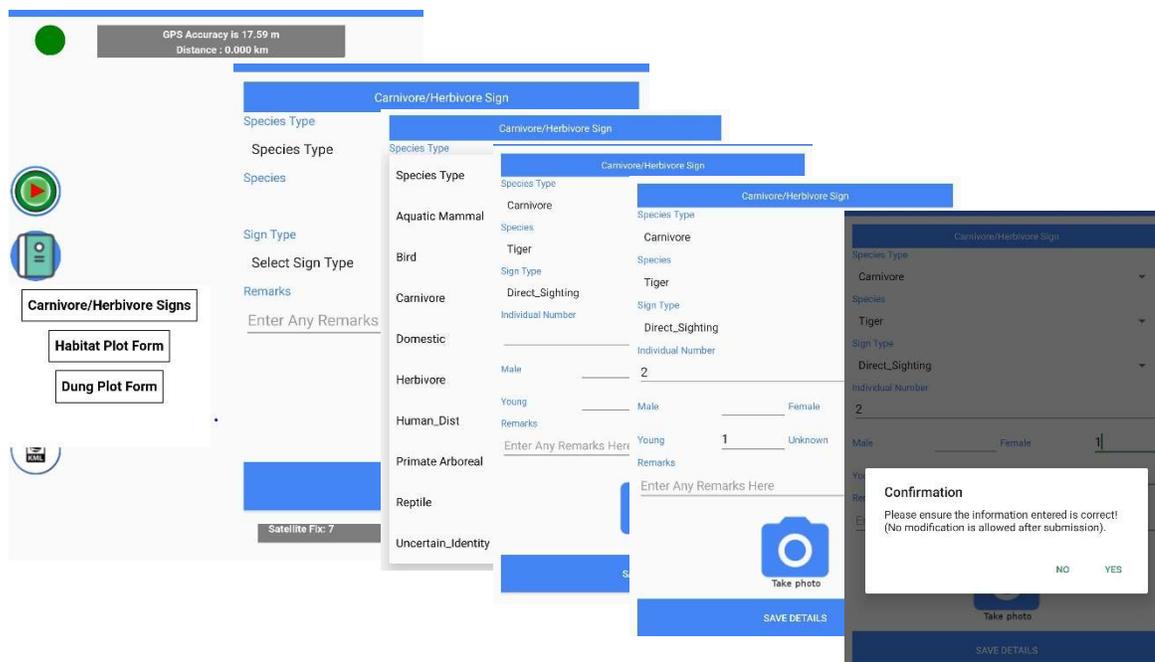
(b) Himalayan

While most of the data forms and data collection procedures are same in both the modes, user can collect data in point transect method using **UNGULATE FORM** from vantage point in Himalayan mode where visibility is higher as compared to eastern Himalayas.

Data collection through data forms:

a) Carnivore/ Herbivore signs:

User should click on the **Carnivore/ Herbivore signs** to enter data upon encountering any signs and save the form.



Species
Tiger

Sign Type
Direct_Sighting

Individual Number
2

Male _____ Female 2

Young 1 | Unknown _____

Remarks
Enter Any Remarks Here

Take photo

SAVE DETAILS

Total number of Animals does not Match with Individual Number

Caution: Total number of animals and individual number should match in case of direct sighting.

In case of indirect sign encountered user should fill the form in the following manner. Taking an image of the sign is optional and user dependent.

Carnivore/Herbivore Sign

Species Type
Herbivore

Species
Sambar

Sign Type
Scat_Pellet_Dung

Age of Tracks and Signs
Fresh

Remarks
Enter Any Remarks Here

Take photo

SAVE DETAILS

Confirmation
Please ensure the information entered is correct!
(No modification is allowed after submission).

NO YES

b) Habitat Plot Form

User should take vegetation data after every 500 meter intervals of the search trail as per the polygon search protocol. Vegetation data or habitat plot consists of details of shrubby weed, human disturbance and ground cover along with number of trees, % shrub cover, canopy cover, habitat type and terrain type.

HABITAT PLOT



SHRUBBY WEED



HUMAN DISTURBANCE



GROUND COVER

Number of trees

Percent(%) cover of shrubs

0

Canopy Cover

Select Canopy

Forest Type

Select Habitat

Terrain Type

Select Terrain

Remarks

Photograph



Caution: User should fill all the details before saving the form.

HABITAT PLOT



SHRUBBY WEED



HUMAN DISTURBANCE



GROUND COVER

Number of trees

56

Percent(%) cover of shrubs

50

Canopy Cover

0.6

Forest Type

Himalayan_Broad_Leaved

Terrain Type

Undulating

Remarks

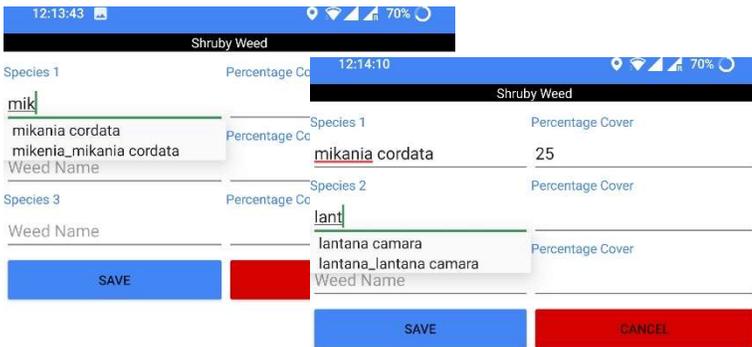
Photograph



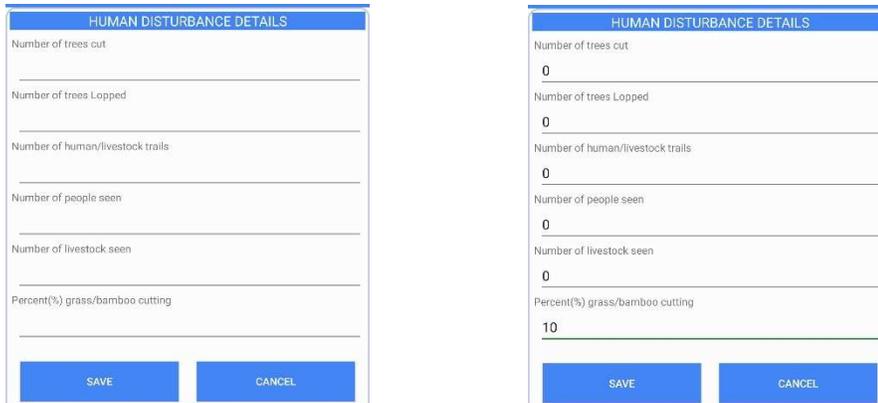
Take photo

Please Fill Shrubby Weed Details

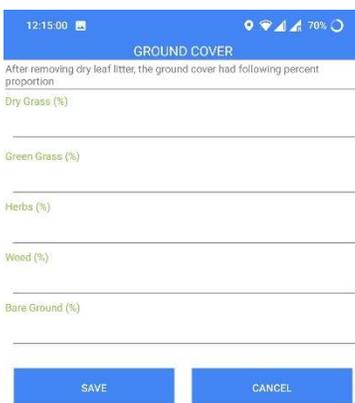
User can search for **species name** using the **smart search** feature and fill the percentage cover of the species before saving the form.



User should fill the Human disturbance form **as observed** at the plot.

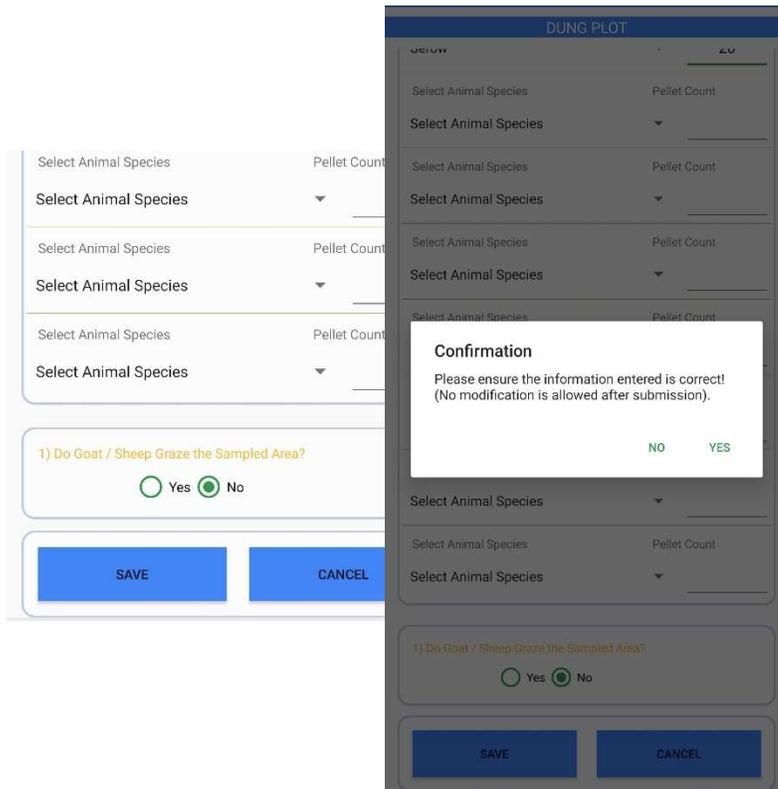


User should fill the ground cover details as observed at the plot.



Caution: Addition of all the value/ total coverage value **should not be more than 100%** as per the protocol.

After filling all the details user should save the plot and proceed for Dung plot at the same location.



d) Ungulate Point:

This data form can only be availed if the user is collecting data using **HIMALAYAN** mode. In this data form user can record the observation of direct sighting of species from a vantage point/ location.

Caution: Number of young individuals should not be more than the total number of individuals observed.

GPS Accuracy is 3.7 m
Distance : 1.728 km

UNGULATE POINT

Species Type: **UNGULATE POINT**

Herbivore: Alpine_Meadows

Species: Himalayan Tahr

Habitat: Alpine_Meadows

Terrain: Hilly

Total Animal: 4

Young Seen: 2

Animal bearing: 123  SET

Animal Distance: 200

Reticle: 1 

Remarks

Reticle

Carnivore/Herbivore Signs

Habitat Plot Form

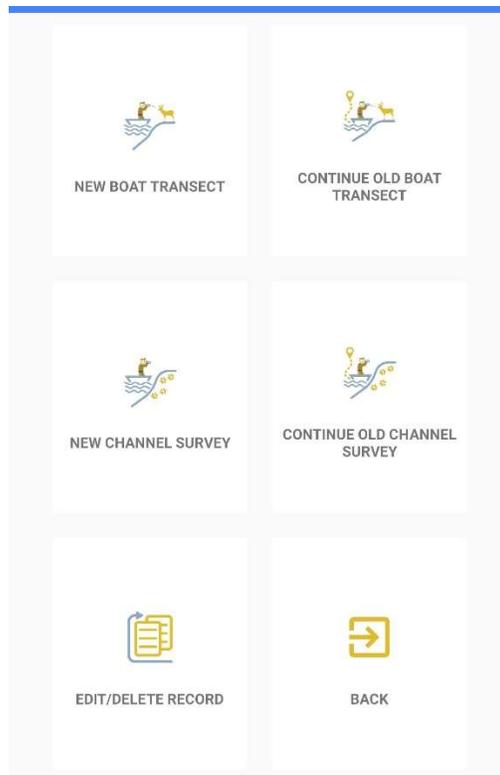
Dung Plot Form

Ungulate Form

I. Riparian module:

To carry out ecological sampling in mangrove/ riparian ecosystem, select Riparian module.

1. Riparian module home page options:



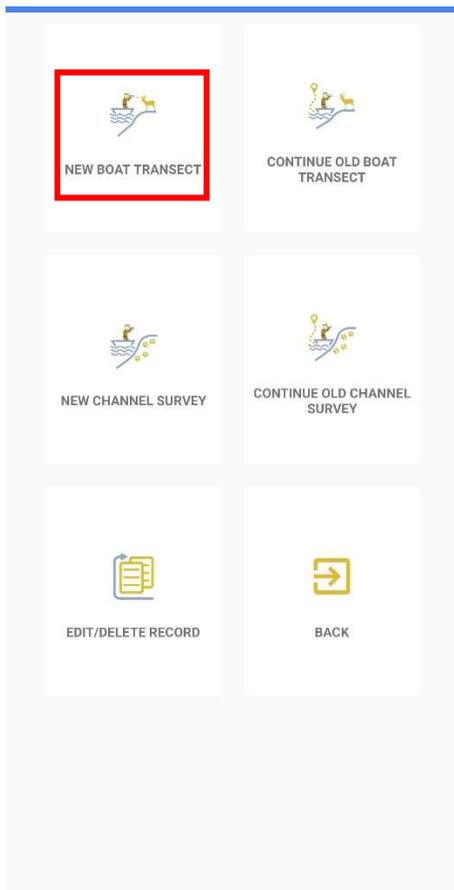
As per the existing protocol prepared by Wildlife Institute of India and National Tiger Conservation Authority for ecological sampling in mangrove areas, user can collect data on prey abundance (Boat Transect) and tiger/ carnivore occupancy (Channel/khal Survey) by using this module.

2. Boat Transect: To collect data to quantify prey abundance please select “**New Boat Transect**”. In case of abnormal shutdown of phone or unintended closure of the application during an ongoing boat transect, select “**Continue Old Boat Transect**” to continue with the existing transect.

***Please do not select “Continue Old Boat Transect” in case you are going to start a new transect on a different channel.**

- **Location Details:** Once you select Boat Transect, following page will appear and you have to fill location details i.e. administrative unit details, channel/ boat transect serial number (1,2,3...n) of that administrative unit, side of the channel, lunar date and time of the past lowest tide. You have to take a mandatory Team Photograph before proceeding to next page. This image would be geo-tagged hence needs GPS fix.

Administrative details and Channel number can be selected from the dropdown list.



The screenshot shows a form for selecting location details. Fields include: 'Select a State' (West Bengal), 'Select a Division' (Sunderban_TR), 'Select a Range' (Sajnekhali), 'Select Channel' (3), and 'Select side of the channel' (Left selected). Below these are 'Lunar Date' (6) and 'Time of the past lowest tide' (2). A 'Team Photograph' section contains a photo of a boat. A blue 'NEXT' button is at the bottom.

If details provided are correct, select next to proceed to next page and select YES to confirmation message.

***Ensure that location setting in your device is on before clicking the mandatory team photograph.**

- **Team Member Details:** After filling in location details, please add the members who are in the team. Team members can be selected from dropdown list (names that are added earlier).

Remember to add team members from menu bar options prior to your sampling.

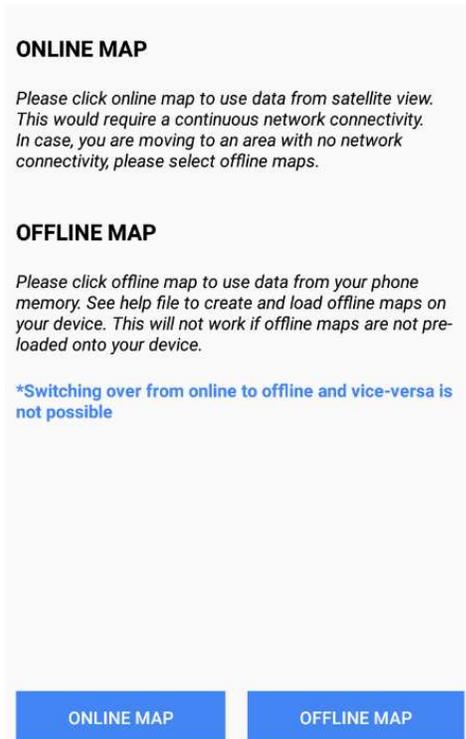
The screenshot shows the 'Add Team Member' form. Fields include: 'Member Name' (Deb Ranjan), 'Designation' (Research Officer), and 'Phone Number' (94*****75). A blue 'SAVE DETAILS' button is at the bottom.

The screenshot shows the 'Team Members Details' form. It features a dropdown for 'Member Name' with options 'Narendra' and 'Goura'. Below is a 'Phone Number' field. At the bottom, there are 'SAVE DETAILS' and 'START TRAIL' buttons, with the latter highlighted in a red box.

The screenshot shows a confirmation dialog box titled 'Team Members Details'. It asks: 'Do You Confirm that Fill All Team Member Detail? Once Go Next Modification Not Allowed.' with 'NO' and 'YES' options.

Select START TRAIL once all the members are added.

- **Map selection options:** Once you select “Start Trail”, it will prompt you to next page where you have to select between Online and Offline map. You can select online map if you have internet connectivity or you can select offline map if you are certain that you will be using the application without internet connectivity. In that scenario you need to have an offline map stored in the internal/ local storage of your phone.

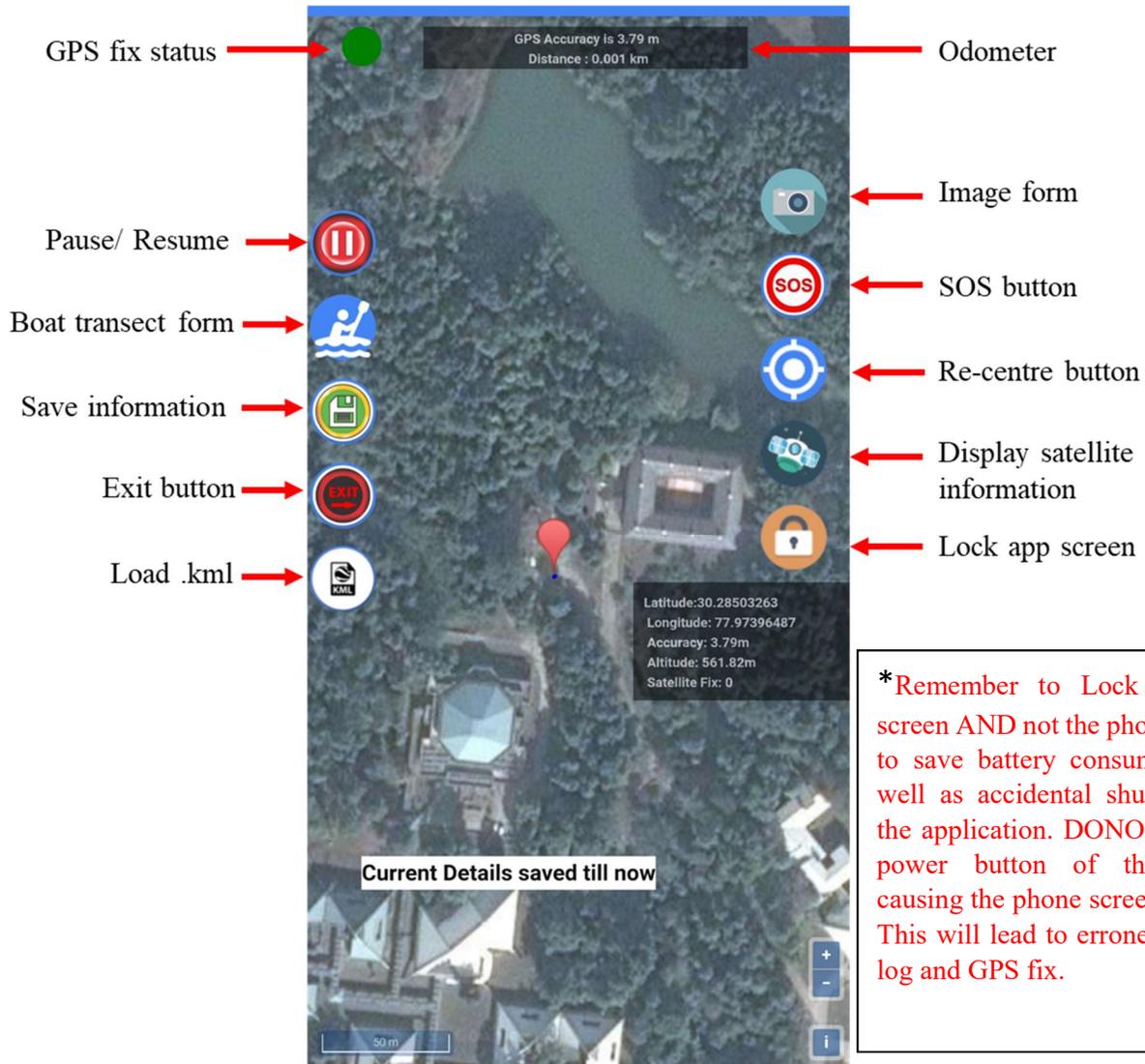


*If you do not have an offline map of your area stored in your phone and also do not have internet connection, you should select online map option. In that scenario the application will still record and save your observation but no base map will be available in the map page.

After map selection, the following page (map page) will appear where you have to record your observations.



- **Map Page options of boat transect:**



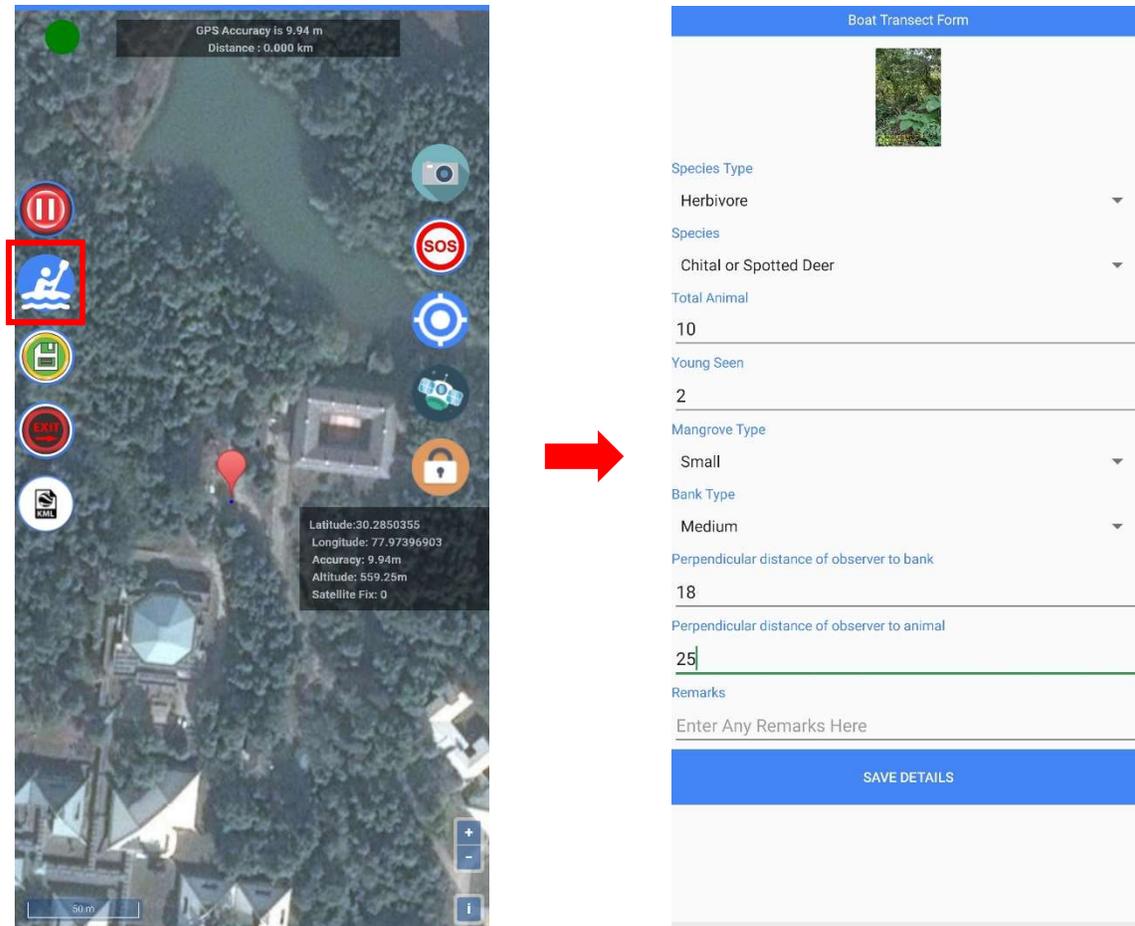
*** Please, wait for the GPS fix status button to be green to start the survey.**

*** Please pause the application if you are standing at a place for longer time and resume when you are about to resume the transect/ survey.**

*** If you have kml files stored in your phone, you can use the kml for your reference by clicking on the “Load .kml” option. Once you click on the option, it will allow you to browse the file. Browse the file same way you have browsed for offline map (through menu drawer option of the phone and locate your file).**

***Click on SOS button to send alert message to selected contacts. This needs GSM connection.**

- **Data collection:** Once you encounter any animal or group of animal (direct sighting), click on the boat transect form and record your observation.



* Select species type and species respectively from the dropdown list according to your observation.

* **Remember that “Young Seen” should not be greater than “Total Animal”.**

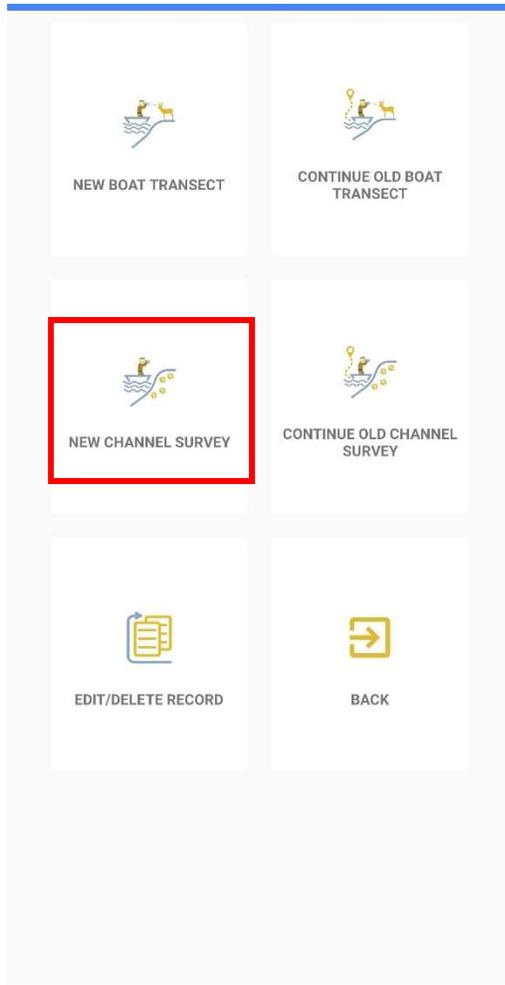
* Select mangrove parameters from the dropdown list.

Once you have filled all the details, click on “Save Details” to save the observation.

* **Please, save the form after you complete the boat transect and Exit from the map page.**

3. **Channel Survey:** To collect data on occupancy of tiger/ carnivores and other species and habitat parameters, select “**New Channel Survey**” from the Home page of Riparian module. In case of abrupt shutdown of phone or unintended closure of the application during an ongoing channel survey, please select “**Continue Old Channel Survey**” to continue with the existing transect.

*** Please, do not select “Continue Old Channel Survey” if you are going to start a new channel survey on a different channel.**



Once you have selected “New Channel Survey” it will prompt you to fill location details, team member details and to select map option. These steps are same as “New Boat Transect”.

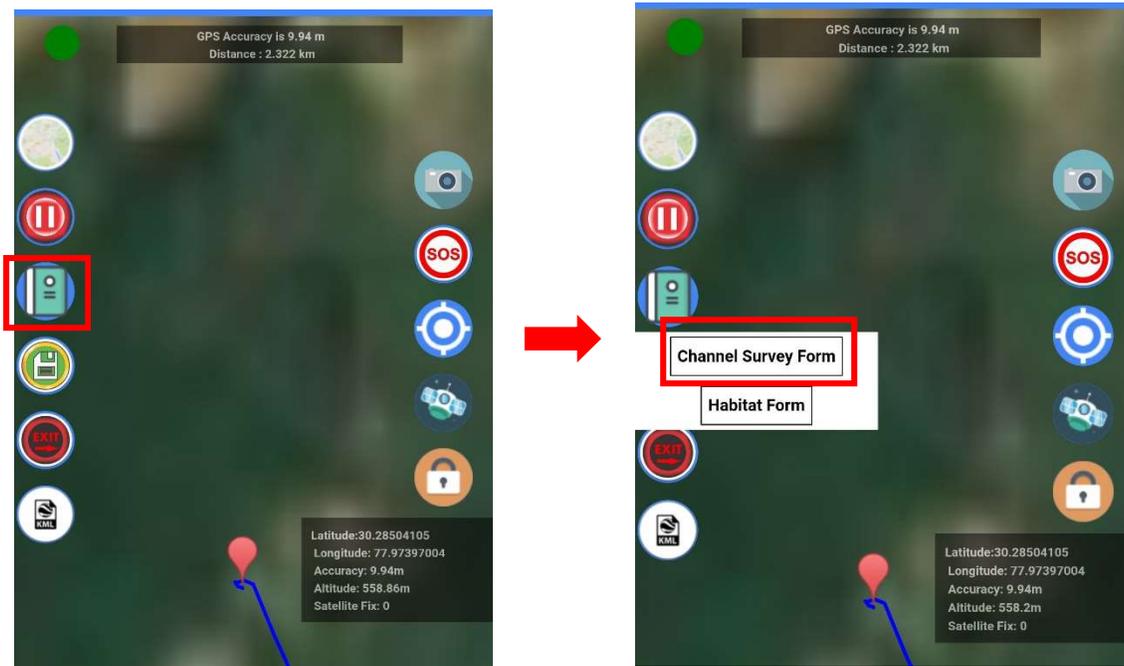
After selection of the map option, map page of channel survey will appear.

*** Wait for the GPS status signal to be green to start the channel survey.**

- **Map page options of Channel Survey:**



- **Recording observation:** Once you encounter any sign (direct/ indirect), select data forms to record the observation.



* Select “Channel Survey Form” to record your observation/s.

Take photo

Sign Type
Select Sign Type

Species Type
Species Type

Species

Mangrove Type
Select Mangrove Type

Bank Type
Select Bank Type

Remarks
Enter Any Remarks Here

SAVE DETAILS

Sign Type
Pugmark_Track

Species Type
Carnivore

Species
Tiger

Age of Tracks and Signs
Very Fresh

Mangrove Type
Medium

Bank Type
Medium

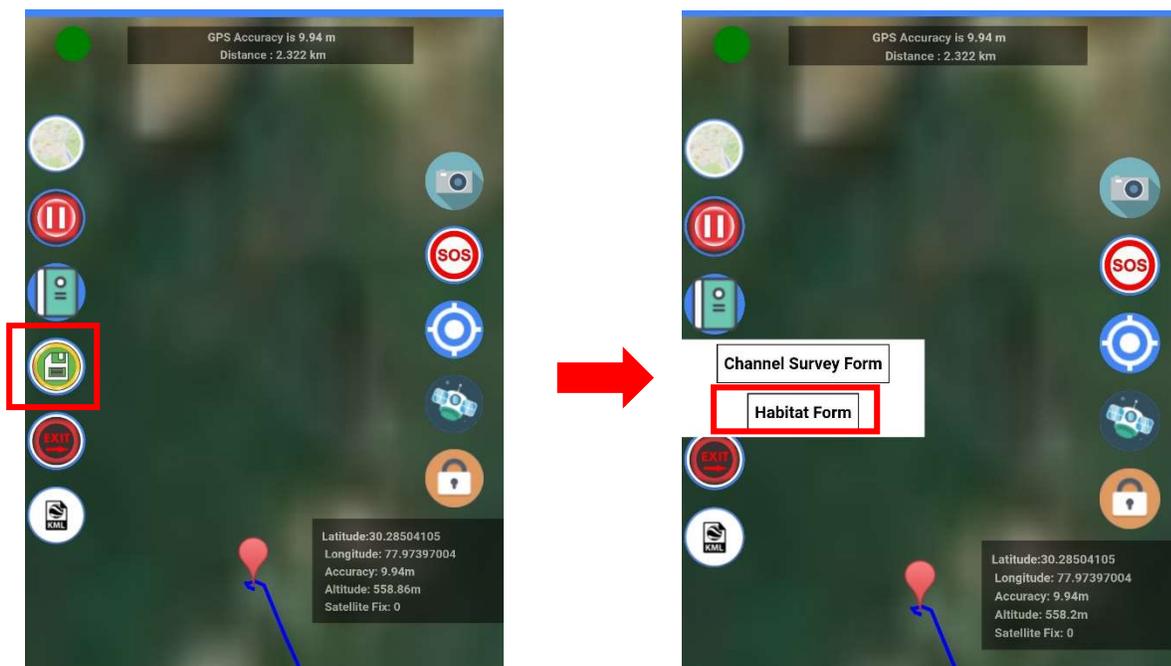
Remarks
Enter Any Remarks Here

SAVE DETAILS

* Select sign type, species type, species and age of tracks and signs from the dropdown list. Also fill the mangrove parameter from the dropdown list. Photographs and remarks are optional.

Please click on the “Save Details” after filling all the details.

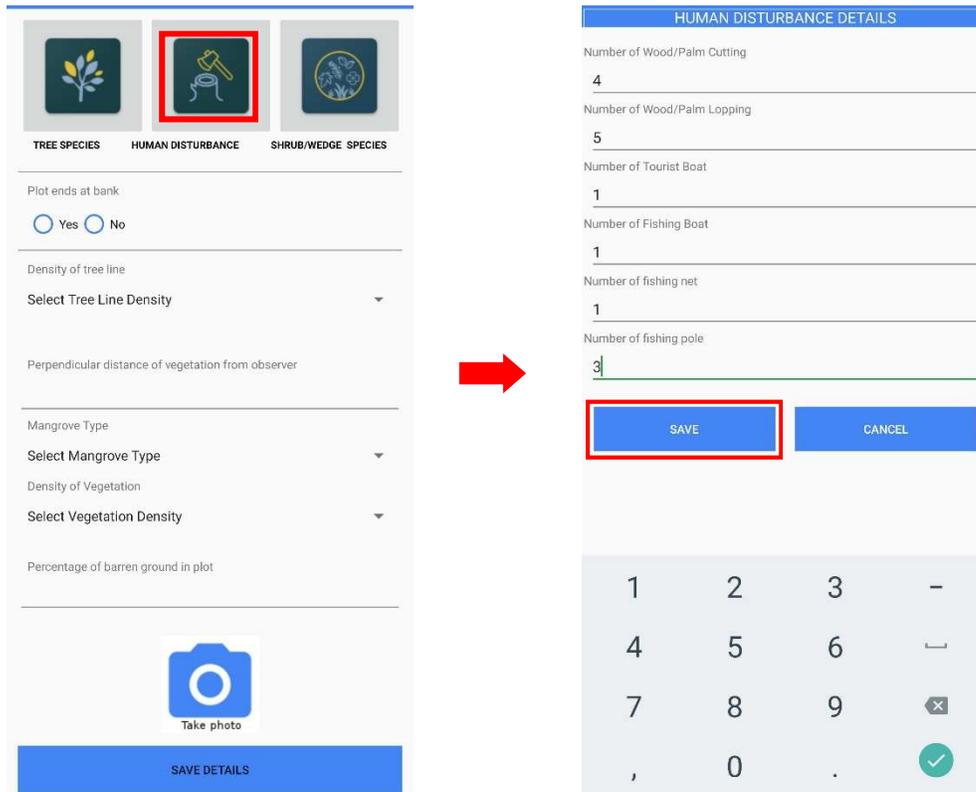
- **Habitat Parameter:** To quantify the habitat parameter and level of human disturbance, please record observations in the habitat plot (10m radius half-circular plot) as per the existing protocol by selecting “Habitat Form’.



*** Please remember that smart search function is available in English only. If you are using any regional language keyboard, please change it to English keyboard while using the application.**

*** Once you have saved “Tree Species”, please select “Human Disturbance” form to record human disturbance parameters in the plot and save the form after recording your observations.**

*** Please remember to record number of tourist boat, fishing boat, fishing net and pole even if these are falling outside of the 10-meter half-circular plot.**



* After recording human disturbance parameters, please select “Shrub/ Sedge Species” and fill the percent coverage of shrub/ sedge species in the plot and save the form.



Shrub/Sedge Species	
Species 1	Percentage Cover
Dhani_ghash	50
Species 2	Percentage Cover
Keora	25
Species 3	Percentage Cover
Wedge Species	
Species 4	Percentage Cover
Wedge Species	
Species 5	Percentage Cover
Wedge Species	
Species 6	Percentage Cover
Wedge Species	
Species 7	Percentage Cover
Wedge Species	
Species 8	Percentage Cover
Wedge Species	
Species 9	Percentage Cover
Wedge Species	
Species 10	Percentage Cover
Wedge Species	

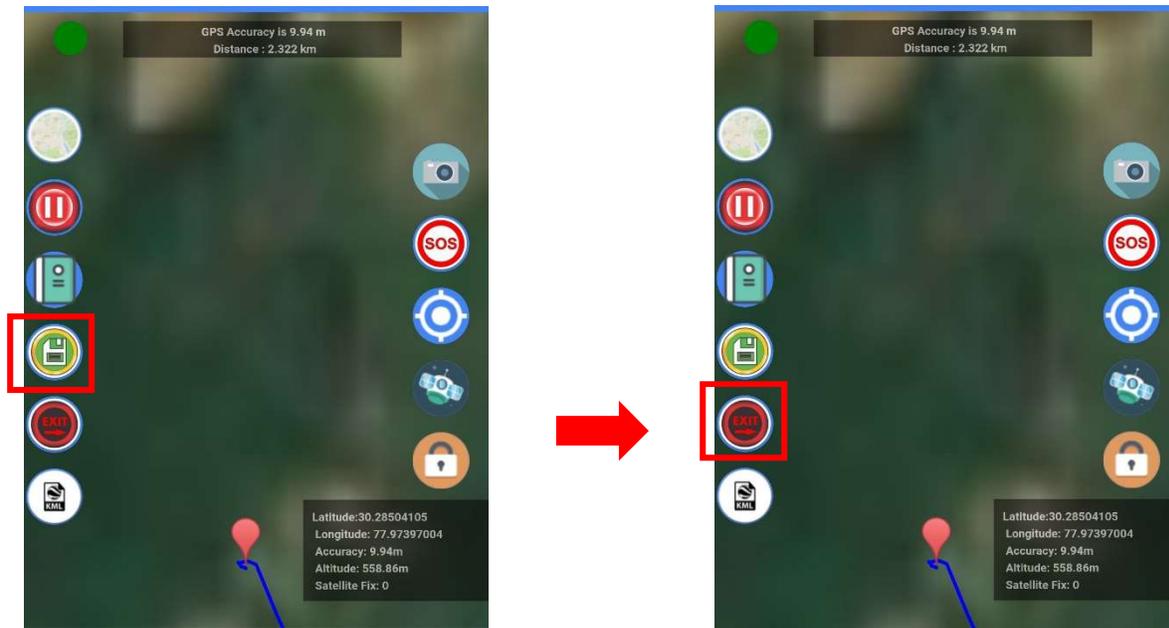
SAVE CANCEL

*After recording these observations, please fill in the information on mangrove parameters and save the form.

* Ensure whether the mangrove forest ends at bank or not.

or

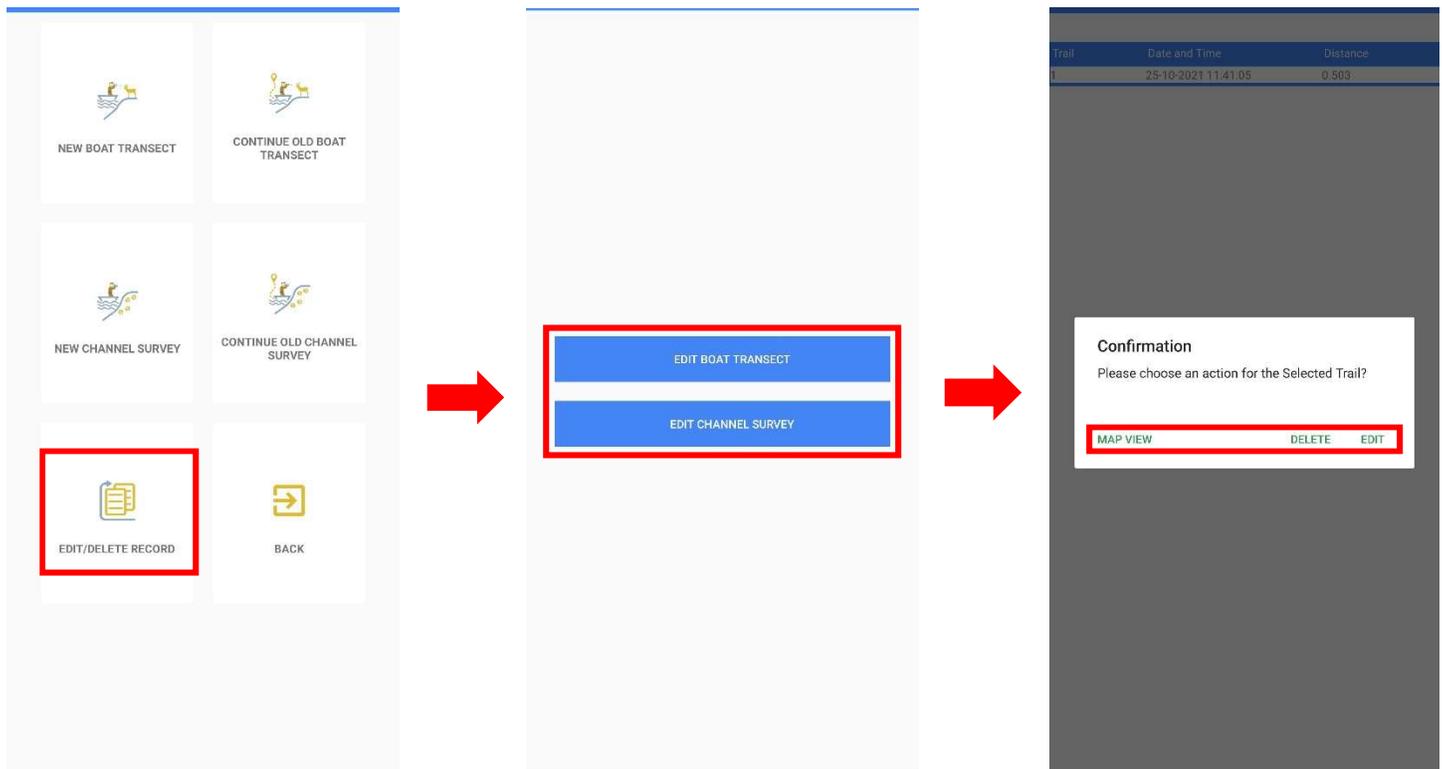
* Once you have completed the survey, please save it from the map page option and Exit from the map page.



4. Edit/ Delete Record: To edit any record to delete any track, please click on “EDIT/ DELETE RECORD”.

* You can edit only the observation made. Date, time and location of the observation cannot be edited.

* **Caution: Data of the track once deleted cannot be retrieved.**



* Select the track you want to edit/ delete.

* **Please take a backup from the menu bar options once you have completed the survey.**