# EARTHRANGER

# EarthRanger Administration Guide

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EarthRanger Administration Guide

# USERS AND PERMISSIONS

## Introduction

This guide describes some fundamental aspects of EarthRanger administration, which includes managing:

- **Users**: The people who use EarthRanger
- **Permission sets**: The various administrative permissions that can be assigned to EarthRanger users
- **Subjects**: The entities that you monitor and manage in EarthRanger, for example, animals and vehicles

## Logging In

The EarthRanger administration home page is at *https://*<your_organization>*.pamdas.org/admin*.
(If you are unable to log in to EarthRanger, you can contact EarthRanger support at support@pamdas.org.)

## Managing Users

The two key activities for user administration in EarthRanger are:

- Adding new users
- Managing existing users

**Adding New Users**



**Figure 1: Adding a User**

**To add a new user:**

1. At the EarthRanger Administration page (*https://<your_org>.pamdas.org/admin)*, under **User Accounts,** select **Add**).
   The **Add user** page appears (**Home > User Accounts > Users > Add user**)
2. Enter required information for the new user:
   - **First name**
   - **Last name**
   - **Username**: 30 characters or less of letters, digits, or the following five characters: @ . + - _
3. Enter any optional information:
   - **Email:** Email address used for password reset
   - **Role:** Select the role this user has within the organization
   - ~~**Phone** Select to have text message alerts sent to the user.~~ [deprecated]
   - **Additional data**: Any custom configuration data from Vulcan goes here.
   - **Password** (It is strongly recommended **not** to create passwords for new users. Instead, let new users create their own passwords.)

- **User profiles**: To enhance security, EarthRanger can be configured to enable selected operators to log in with a user profile instead of a username and password. For details, see *Adding a User Profile* below.
- **Permission sets**: Select the permissions that you want to grant to the new users. To select more than one user, press **CTRL** (the Command key on a Mac).

    **Note:** The **Active** check box is selected by default and should remain so for active users.
4. Select **Save**.

## Managing Existing Users

**To manage users:**

- At the EarthRanger Administration page (usually at
  *https://*`<your_organization>`*.pamdas.org/admin)*, under **User Accounts,** select **Users**.
    The **Home > User Accounts > Users** page appears. You can view all EarthRanger user, their settings, and their alert settings on this page.
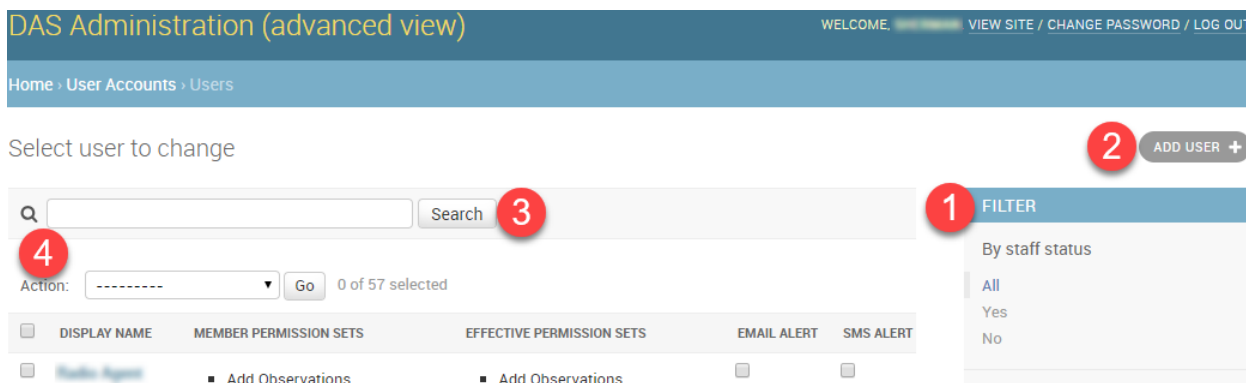


**Figure 2: The User Accounts > Users page**

Some settings on the Users page:
1. **FILTER**: Use to filter the list of users on the page.
2. **ADD USER:** Use to add new users.
3. **SEARCH:** Use to search for text any strings on the page.
4. **Action:** Use to delete selected users.

## Managing Permission Sets

Hundreds of different permissions can be granted to EarthRanger users, including permissions for accounts, activities, analyzers, mapping, and tracking. For example, you can give a user permission to add arrest reports with the **Choices|Arrest Violation|Can add Arrest Violation** permission.

Rather than being granted individual permissions, users are usually granted collections of permissions called *permission sets*. For example, you could create a permission set called *User Admin* that included the following permissions:
- accounts | user | Can add user

- accounts | user | Can change user
- accounts | user | Can delete user

Most users have both *Member Permission Sets* and *Effective Permission Sets.*
- *Member Permission Sets* are those set directly using the EarthRanger Administration web page.
- *Effective Permission Sets* list all permissions the user has. (Inherited permission sets that are embedded in other permission sets "unravel" into Effective Permission Sets.)

## Adding a New Permission Set

You can add a new permission set by entering a name for it in the **Name** box and then doing any or all of the following:
- Add individual permissions to **Chosen permissions**
- Add existing permission *sets* to **Chosen permission sets**
- Add *users* to **Chosen users**, by which you add the permissions of each of those users to the new permission set.

## Viewing Permission Sets

**To view permission sets**:
- Go to **Home › User Accounts › Permission sets**.

## Changing a Permission Set

**To change permission sets**:
1. Go to  **Home › User Accounts › Permission sets**
2. Select an individual permission set to change from the list.
3. On the **Change permission set** page, make the desired changes.
4. Select **Save**.

## Deleting a Permission Set

**To delete a permission set**:
1. Go to **Home > User Accounts > Permission sets**.
2. Select the check box next to the permission set.
3. In **Action**, select **Delete permission sets**.
4. Select **Go**.
5. Select **Yes, I'm sure**.

## Adding a User Profile

To enhance security, EarthRanger can be configured to enable selected operators to log in with a username that is associated a *user profile* that does not have a system password. Logging in with a user profile enables the activities of operators to be tracked and logged just as with any user, but because operators logged in with a profile do not have a system password, they can only access EarthRanger from within the control room. Operators with user profiles log in to and out of EarthRanger by selecting **ControlRoom** (or whatever other name has may have been chosen) in the task bar and then selecting their username from a dropdown list.

**To add a user profile**:
1. If there is already a user named *Control Room* at **Home > User Accounts > Users**, go to step 2. If there is not, using the information in *Adding New Users* above, create a new user named *Control Room* that has all the permission sets that you want the profile users to have. Write down the exact permissions

that you assign to the user named *ControlRoom* because you will be assigning those same permissions to the Control Room profiles that you add.

2. Using the information in *Adding New Users*, above, add a profile by creating a new user with the following settings:
   - **First name**
   - **Last name**
   - **Username**
     **Permissions section:**
       o **Permission sets**: Assign identical permissions to those assigned to user *Control Room* in step 1.
       o Select **Active**.
       o Select **No login** (to prevent the Control Room profile from logging in with a password)
   - **User Profiles section**:
       o Select **ControlRoom**.
   - Select **Save**.

   The user with the profile you created will be able to log in to EarthRanger by selecting ControlRoom in the title bar and then selecting their username, with no password required.

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# ALERTS

You can configure EarthRanger to send you an email or SMS (text) alert when a report is created.

## Creating a Simple Alert

You can create a simple alert in three steps.

1. Select the multifunction button in the title bar, and then **Alerts**.
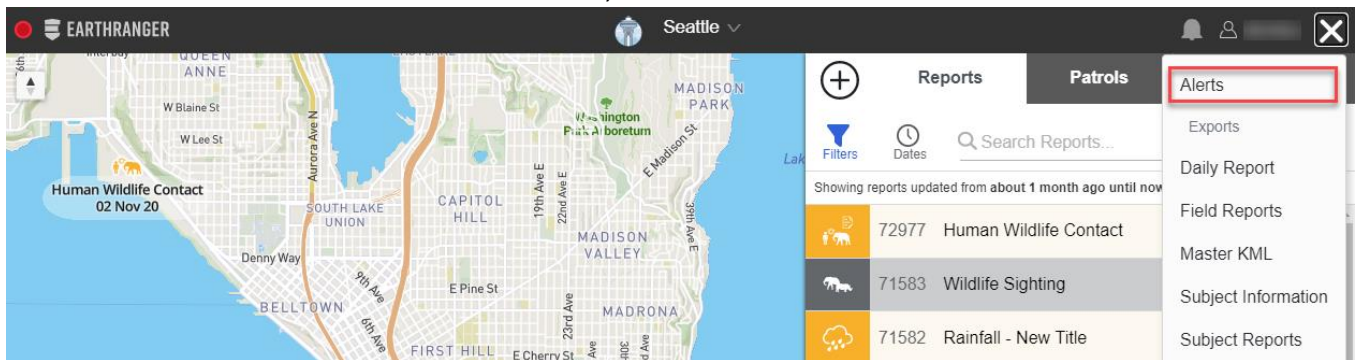


**Figure 3: Multifunction button in the title bar with the alerts option highlighted**

2. In the **Alerts** window, next to **Notification Methods** select **Add new** and then chose **Email, SMS, or WhatsApp**. (You must enter an email address, text phone number, or WhatsApp number to use if you have not entered one already.)
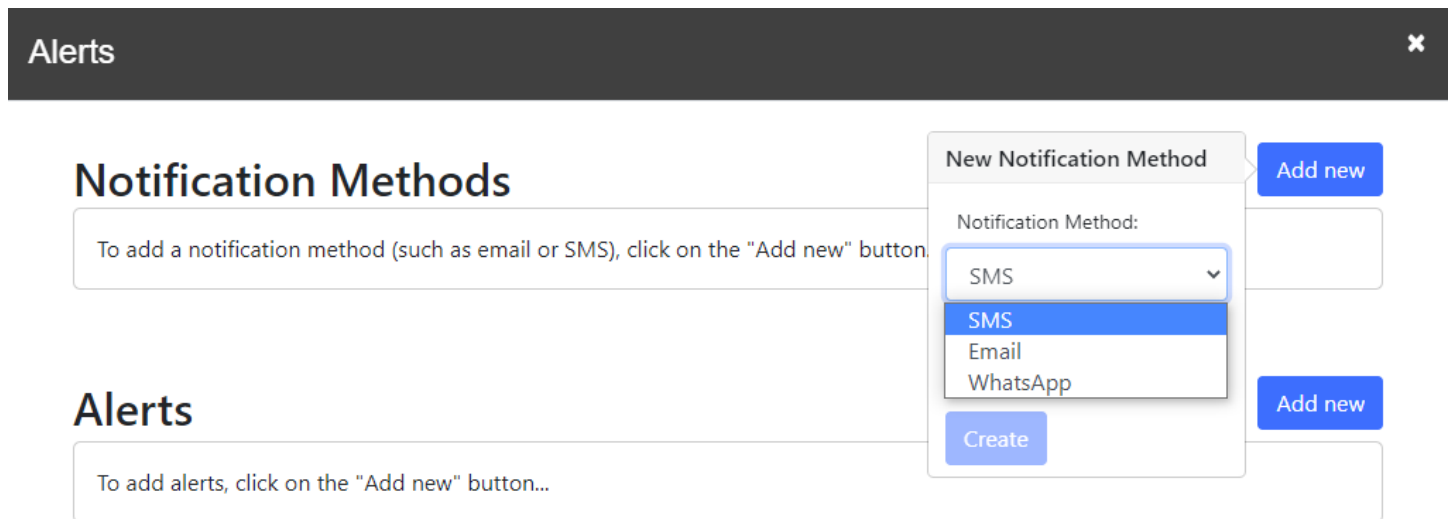


**Figure 4: Adding a new notification method**

3. In **Alerts**, select **Add new**, select the report type to include in the alert, and then select **Create Alert**.
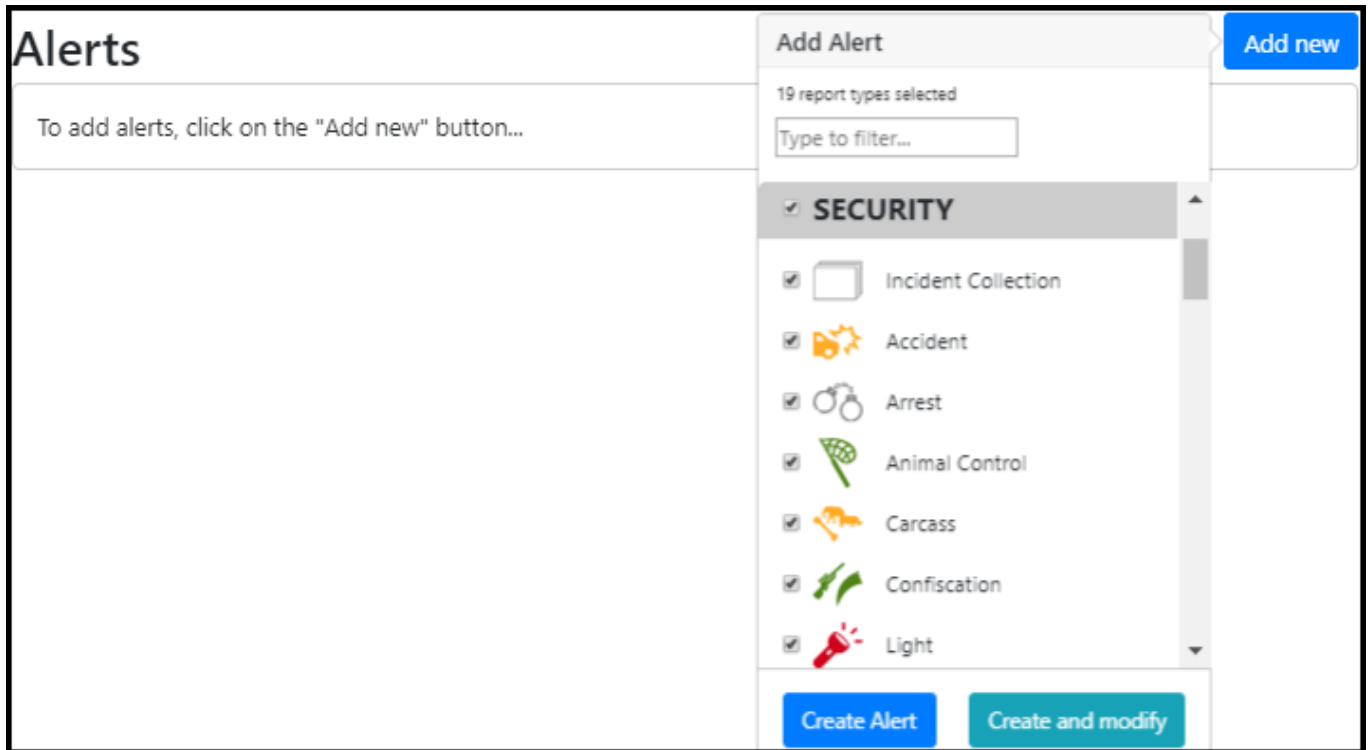


**Figure 5: Adding a new alert**

The new alert appears in the **Alerts** list. (Figure 6)
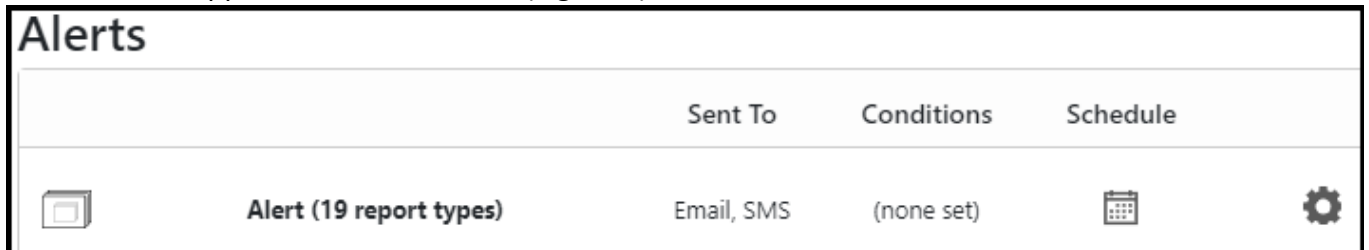


**Figure 6: An alert in the Alerts list**

# Types of Alerts

You can create alerts for most of types of reports. The alerts that you can create will vary with how EarthRanger is configured.

**Creating Alerts for an Entire Category of Reports**
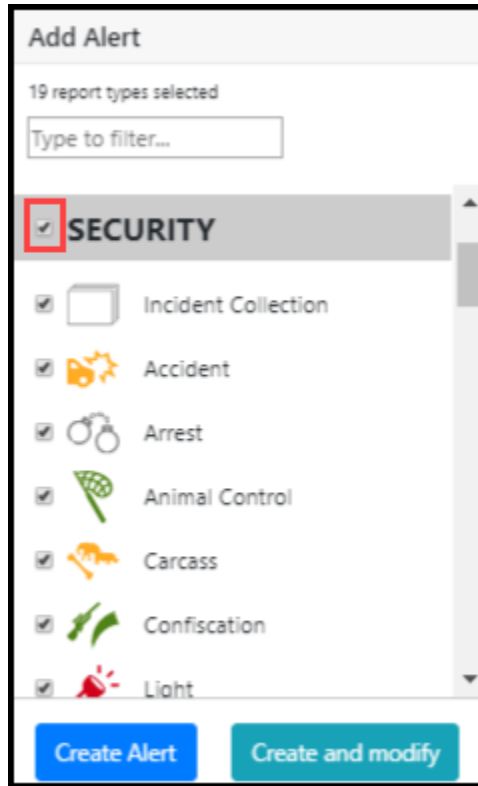


**Figure 7: Selecting a report category (for example, "Security") automatically selects all the reports within that category**

In addition to creating alerts for individual reports, you can also create an alert for an entire category of reports (for example, to be notified when any type of Security report is created).

To create an alert for an entire category of reports, select the check box next to the name of the report category, which automatically selects all of the reports of that type. Then select **Create Alert**.

## Setting Conditions
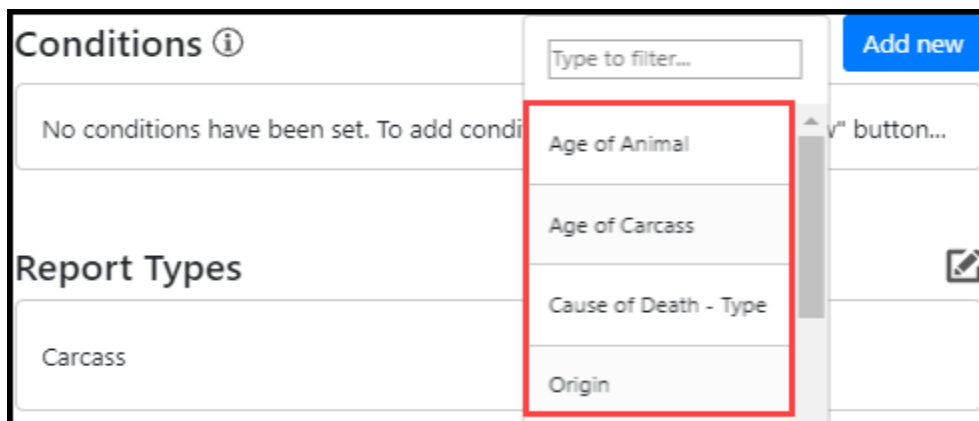


**Figure 8: Some conditions settings for an alert**

ALERTS

You can set conditions for some types of alerts. The number of conditions you can set varies with the type of alert, from limited (for example, only basic information, such as report priority) to extensive (for example, the species, sex, age, etc. in a report about an animal).

**Note:** When you set conditions for an alert that is based on multiple report types (such as a report from an entire category of reports), you can only apply conditions that are common to all the report types.

## Enabling or Disabling Alert Notifications
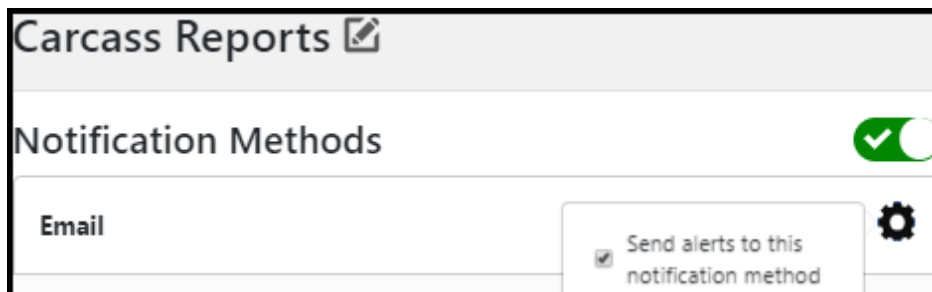


Figure 9: Slider button and gear icon used to turn alert notifications on and off

*To enable or disable all notifications for an alert:*
1. On the **Manage Report Alerts** page, select the alert title.
2. Move the slider button (Figure 9) next to **Notification Methods** to the right or left.

*To enable or disable email or SMS alerts notifications for an alert:*
1. On the **Manage Report Alerts** page, select the alert title.
2. Select the gear icon (Figure 9) next to the notification you want to change, and then select or clear *send notifications to this notification method*.

## Editing Titles

**Editing Alert Titles**



Figure 10: Report title with edit icon

A title is created automatically when you create a new alert. It's usually a good idea to edit automatically generated alert titles to give them a title that is more meaningful and descriptive.

**To edit an alert title:**
1. On the **Manage Report Alerts** page, select the alert title.
2. Select the edit icon.
3. Enter the new name for the alert.
4. Select **Update**.

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**Editing Notification Titles**

You can also edit the titles of the notification methods themselves (for example, changing the default title of *Email* alerts to *Personal Email* and *Work Email*).


Figure 11: Email notification method title

# Scheduling Alerts
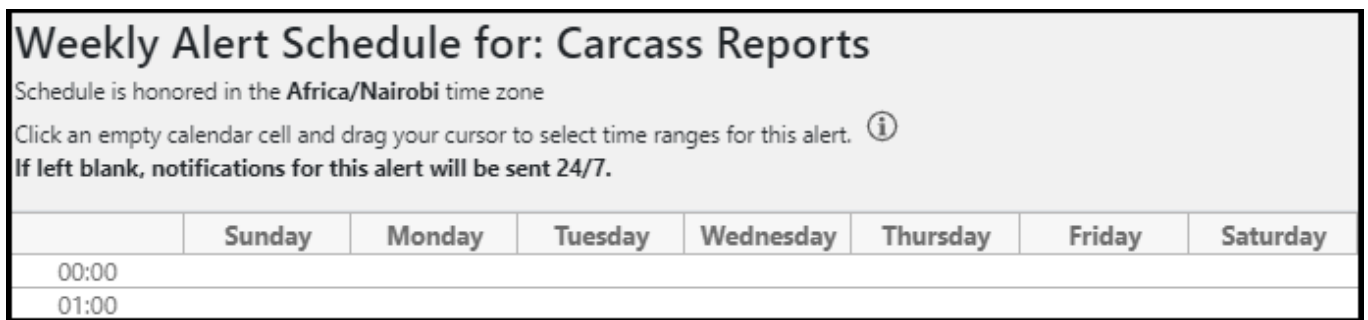

Figure 12: Weekly alert schedule for a report (partial view)

**Note:** *If you do not schedule a time range to receive alerts, notifications will be sent at any time.*

**To schedule an alert**:

1. In the list of alerts, under **Schedule**, select the calendar icon.
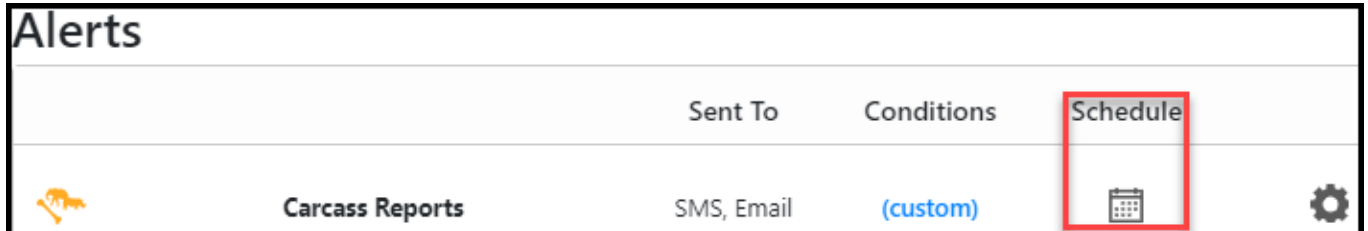

Figure 13: Notifications schedule icon for an alert

2. On the **Weekly Alert Schedule**, click and drag to choose to choose when you want to receive alerts.
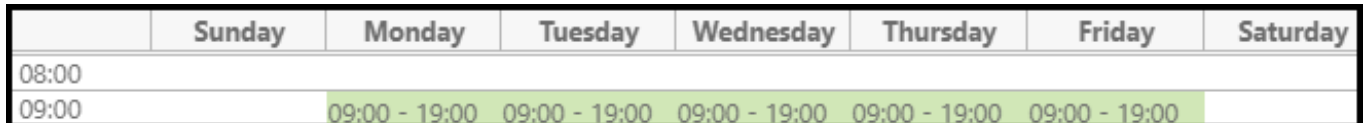

Figure 14: Weekly Alert Schedule with the schedule for an alert

# Deleting Alerts

To delete an alert, select the gear icon next to the alert to reveal its settings and then select **Delete**.
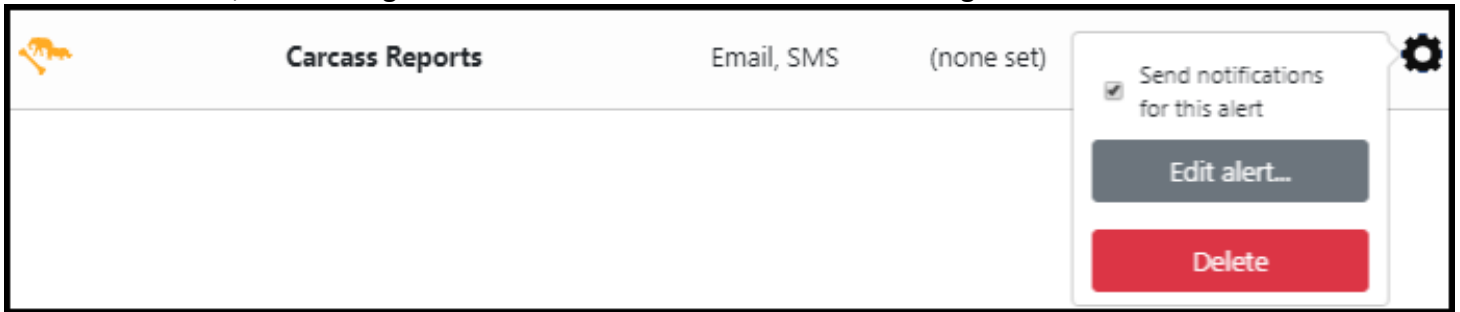


**Figure 15: The *Delete* option in the settings for a report**

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support@pamdas.org.

# Map QuickLinks

## Adding Map Quicklinks to EarthRanger

EarthRanger can be configured so there is more than one map to choose from in the title bar. For example, you can configure EarthRanger so it can display separate maps for the northern and southern regions of a protected area. You select which map is displayed from the region shortcuts dropdown in the title bar (Figure 18).

**To add a map region shortcut to EarthRanger:**

1. Log in to the EarthRanger Administration page (at *https://*<yourprotectedarea>*.pamdas.org/admin*).
2. Go to **Home › Map Layers › Map Quicklinks.**
3. Select **Add Map Quicklink**.
4. In **Name**, enter an administrator's name for the map, for example, *Seattle Map*. (This name is not displayed to users in EarthRanger.)
5. In **Attributes**, enter the required key/value pairs, as described in the following section, Specifying Attributes.
6. In **Center**, click and hold to pan the map and use the mouse wheel to zoom, then select the Point Feature tool (pencil icon on the map) and click on the map to place a circle where you want the map center to be.
7. In **Zoom**, enter the zoom level for the map when it is displayed to the user.
8. The values for **Latitude** and **Longitude** can be ignored because they are set automatically. (You set the map center using the Point Feature tool in step 6.)
9. Select **Save**.



**Figure 16: Using the Point Feature tool (red box) to specify the map center (circle inside green box)**

## Specifying Map Attributes

When you add a map, you enter JSON key/value pairs that specify attributes of the icon and title that appear in the title bar of EarthRanger. Here is an example of the **Attributes** that you specify, and the required format:

```
{
        "id": "seattle",
        "icon": {
                "src": "https://cdn1.iconfinder.com/data/icons/world-top-cities-1/512/18-Seattle-256.png",
                "bottom": 0,
                "height": 34
        },
        "title": "Seattle",
        "menu": "Seattle",
```

```
                    "default": "true"
         }
```

Here is an explanation of the keys and values that you provide:

- **ID**: A unique identifier, for example "seattle_icon"
- **Icon**: This is the icon that is displayed in the title bar of EarthRanger (Figure 17). Note that the "icon" settings (that is, *src*, *bottom*, *height*, *menu*, *title*, and *default*) are enclosed ("nested") in their own set of brackets.
    - **src**: Static location of the image that you want to use for the icon in the EarthRanger title bar, for example:
        - "*assets/static/home-area-nrtcoast.png*" (file location)
        - or -
        - "*https://cdn1.iconfinder.com/data/icons/world-top-cities-1/512/18-Seattle-256.png*" (web address)
    - **bottom**: Position of icon image in title bar in pixels, for example, *"bottom":0*)
    - **height**: Height of the image in the title bar in pixels (for example, *"height":30*)
    - **menu**: Text string that is displayed in the region shortcuts dropdown list
    - **title**: Text string that is displayed in the title in the EarthRanger title bar
    - **default**: Set to "true"



**Figure 17: An icon PNG image for display in the EarthRanger title bar**
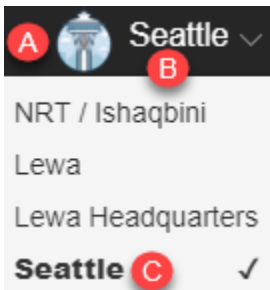


**Figure 18: The EarthRanger title bar and region shortcuts dropdown, showing the attributes (A) " icon" ("Seattle-256.png") , (B) "title" ("Seattle), and (C) "menu" ("Seattle")**

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# EARTHRANGER

# GOOGLE EARTH PRO LOCATION COORDINATES

You can save location coordinates in Google Earth Pro as a .kmz file and then import those coordinates into EarthRanger.

## Adding Location Coordinates to EarthRanger Using Google Earth Pro
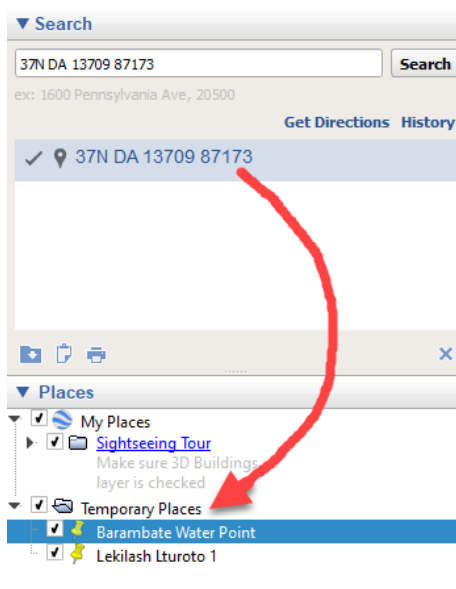


**Figure 19: Dragging search coordinates to the Temporary Places folder**

**To add location coordinates to EarthRanger using Google Earth Pro**:

1. [Download Google Earth Pro](#) from [https://www.google.com/earth/versions/](https://www.google.com/earth/versions/), install it on your computer, and open it.
2. Enter the coordinates of a location in the **Search** box.

**Note**: You can enter coordinates in any of the following formats

- **Decimal Degrees**: such as 37.7°, -122.2°
- **Degrees, Minutes, Seconds**: such as 37°25'19.07"N, 122°05'06.24"W
- **Degrees, Decimal Minutes**: such as 32° 18.385' N 122° 36.875' W
- **Universal Transverse Mercator**: such as 10 S 055974, 4282182

3. Drag the result to **Places / Temporary Places**. (Figure 19)
4. Right-click the location in **Temporary Places** and select **Properties**.
5. In the **Name** box, assign a name to the location.
6. Repeat steps two to five until all of the coordinates are in the **Temporary Places** folder.
7. Right-click the **Temporary Places** folder and select **Save Place As…**
8. Name and save the .kmz file to your computer.
9. Open the EarthRanger administration web page at *https://<yourorganization>.pamdas.org/admin*.
10. Go to **Map Layers > Spatial Files**.
11. Select **Add Spatial File**.
12. On the **Add Spatial File** page, in **Name**, enter a name for the locations.
13. Enter a description (optional).
14. In **Data**, choose the .kmz file.

15. In **Feature set**, select one of the feature sets from the list (for example, *POIs*).
16. In **Feature type**, select one of the feature types from the list (for example, *Point of Interest*).
17. Select **Save**.

The new locations appear in EarthRanger Map Layers in **Features** (for example *Features > POIs > Points of Interest > <your new locations>*.

**Note**: You can also find the new location by entering its name in **Search Layers** at the top of Map Layers.

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# EARTHRANGER

# MAP FEATURES, SHAPE FILES, AND SPATIAL FILES

This guide describes a five-step process for adding map features to EarthRanger using *shapefiles* and *spatial files*, and how to specify a maximum zoom level for a map tile layer.

## Adding Map Features to EarthRanger

To display geographic information in the Map Window and in Map Layers of EarthRanger, you create *geospatial files* to capture that geographic information. Then you import those files into EarthRanger.

Detailed guidance about how to create these files is outside the scope of this guide, however text and video instruction about how to create and publish them are easy to find. Software to create the required files is also readily available (for example the free and open-source QGIS software available at https://qgis.org).

Adding map features to EarthRanger is a five-step process.

1. Prepare a geospatial file
2. Add files to EarthRanger
3. Verify that the features imported into EarthRanger correctly
4. Verify that the features are visible on the map and in the map layers in EarthRanger

Note that you can also customize the appearance of feature types (for example, to make a feature type larger or smaller on the map).

### 1. Prepare a Shapefile

Using the GIS file creation software that you have chosen, create geospatial files that capture the features of your protected area that you want to depict. The currently supported file types are **Spatial Files or GeoJSON** files.

***Using Geospatial data with EarthRanger***
The geospatial data can describe vector features, including polygons, lines, and points.

In EarthRanger:
- **Polygons** describe geographic areas, for example a park boundary or the boundaries of operational regions within the park.
- **Lines** describe linear features, for example, rivers and roads.
- **Points** describe point features, such as outposts, watering holes, and gates.

For use in EarthRanger, each geospatial file must have the following characteristics:
- It uses EPSG:4326 projection
- It has one *Attribute* containing a unique name for the feature*.
- It must have only *one* layer

- o However, a file can contain multiple features
- A shapefile should contain only one feature type (that is, a shapefile should contain only polygons, only lines, or only points).
- A shapefile should contain only features *of the same type*. For example, you could create one file for line features that depict rivers and another file for line features that depict secondary rivers. Similarly, you could create separate files for primary roads and secondary roads, and so on.

## 2. Prepare the Spatial File(s) for import

*Shapefiles*
If using Shapefiles, create a shapefile that describes your protected area, collect its constituent shapefile files into a single **ZIP file** that you can import into EarthRanger.

Be sure to include each of the following file types into the zip file.
- o EarthRanger.**cpg**
- o EarthRanger.**dbf**
- o EarthRanger.**prj**
- o EarthRanger.**shp**
- o EarthRanger.**shx**

**Figure 20: Example of the shapefile files contained in one shapefile (Other shapefiles may have more or fewer shapefile files than this example.)**

**Note**: It is easy to forget this step, but it is an important one. *You can only import shapefile files into EarthRanger when they are collected into a ZIP file.*

*GeoJson Files*
GeoJSON files support all spatial data within one file, so after creation of the file, no further action is needed.

## 3. Add Spatial Files to EarthRanger

***Checking for Appropriate Display Category and Feature Class***
You must assign a Display Category and Feature Class to spatial files that you add to EarthRanger, so before trying to add a spatial file, you can save time by checking to see if a Feature Class that match your spatial file are available. For example, if you are adding a spatial file named *Secondary Rivers*, you would check to see if an appropriate Feature Class (*Primary Rivers)* and Feature Class (*Secondary rivers*) are available, and add them if needed.  Display Category is a grouping of Feature Classes that will create a hierarchy on the User Interface. In this example, you may have a Display Category names *Rivers* that contain the above Feature Classes.

**To check if you need to add a Display Category and Feature Class (and add them if necessary):**
1. At your EarthRanger Administration website (*https://*`your_organization`*.pamdas.org/admin*), select **Map Layers | Feature Classes**.
2. On the **Select feature set to change** page, check to see if a feature set in the list (for example *Rivers* or *Roads*) is compatible with the spatial file that want to add to EarthRanger.

3. If a compatible Feature Set *does not* exist:
   a. Select **Add Feature Class**.
      The **Add feature Class** page appears.
   b. In **Name**, enter a name for the new Feature Class.
   c. For **Display Category**, look through the dropdown for desired grouping and select. If you wish to add a new one, click the '+' key to Add Display Category
      i. Fill in the **Name** field with the name you wish to display on the screen
      ii. Add the Class(es) you wish to show up under that category
      iii. Select **Save** to save the Display Category
   d. Select **Save** to save the Feature Class.

### *Adding Spatial Files to EarthRanger*
When you have verified that you have the Display Category and Feature Class that you need, you are ready to add the spatial file to EarthRanger.

**To add a spatial file to EarthRanger:**
1. At your EarthRanger Administration website (*https://*`your_organization`*.pamdas.org/admin*), select **Map Layers | Feature Import Files**.
2. Select **Add Feature Import File**.
   a. Select the **File Type** of the file you are going to import
   b. Enter the name of the spatial file (for example, *Secondary Rivers*).
   c. In **Description**, enter a brief description of the spatial file if desired.
   d. In **Data**, select **Choose file** that matches the File Type selected above. .
   e. Select the **Feature Class** you will be importing into
   f. [Optional] **Name Field** is the name of the Attribute containing unique feature name. Defaults to 'Name'
   g. [Optional] **Id Field** is an Attribute field with an identifier that is unique across all features in EarthRanger. Defaults to 'ID'
   h. Select **Save**

4. **Verify that Features Imported into EarthRanger Correctly**

After you import the geospatial file, verify that polygon, line, and point features imported correctly. Open your main EarthRanger site. Click on the Map Layers tab, and select Features.
**Note**: You must refresh the browser window before the changes you have made appear.

## Customizing the Appearance of Feature Types

You can customize how feature types are displayed in the Map Window, for example, polygon or point features. For example:
- For polygon and line features, you can change fill, stroke, fill-opacity, stroke width, or stroke opacity:
  o {"fill": "#f4d442", "stroke": "#000000", "fill-opacity": 0.2, "stroke-width": 1, "stroke-opacity": 0.7}

- For point features, you can change image, width, and height:
  o {"image": "/static/ranger_post-black.svg", "width": 20, "height": 20}

**To customize a feature class**:
1. At the EarthRanger administration web page, go to **Home > Map Layers > Feature Classes**, and then select the feature class that you want to customize from the list.
2. At the **Change Feature Class** page, in **Presentation**, select the feature setting that you want to change and change the value.
   a. You can click on one of the default buttons to load a default template for a presentation type, Line, Point, or Polygon.
3. Select **Save**.

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# ArcGIS Online

ArcGIS Online is an ESRI mapping product that allows users to synchronize and share their GIS data on a cloud-based platform while utilizing the entire ArcGIS suite of mapping Tools.  EarthRanger can connect to an account in ArcGIS Online (or ArcGIS Enterprise) and synchronize map features without the need for export/import workflows.

As map data in changed in the cloud-based environment, EarthRanger will automatically synchronize those changes to your EarthRanger system once a day, or allow administrators to import manually on demand.

EarthRanger can import point, line and polygon vector data into Features in EarthRanger which can be used for Map Layer visualization as well as analyzers such as Geo-Fences, Fire, and Deforestation alerts.

Note, the following directions are not authored by an ArcGIS expert.  There are likely better ways to accomplish many of the tasks for you own operation.  For full information on using ArcGIS Online, please refer to the ArcGIS Online documentation.

## Preparing GIS Files

Using the GIS file creation software that you have chosen, create geospatial files that capture the features of your protected area that you want to depict.

### Using Geospatial data with EarthRanger
The geospatial data can describe vector features, including polygons, lines, and points.

In EarthRanger:
- **Polygons** describe geographic areas, for example a park boundary or the boundaries of operational regions within the park.
- **Lines** describe linear features, for example, rivers and roads.
- **Points** describe point features, such as outposts, watering holes, and gates.

For use in EarthRanger, each geospatial file must have the following characteristics:
- Name Attribute:  It has one *Attribute* containing a unique name for the feature.
- Feature Class Attribute:  It must have one Attribute which contains a Feature Class configured in EarthRanger
    - Feature Classes represent the type of data in the file.  Examples would include 'Park Boundary', 'Primary Roads', and 'Outposts'.  For a full list of available Feature Classes, or to add additional ones, go to the EarthRanger Administration page, in the **Map Layers > Features Classes page**. For additional information see the section on 'Map Features, Shape Files, and Spatial Files'
- **Note**: Use the **SAME** 'Name Attribute' and 'Feature Class Attribute' names for all files being imported.
- **Note**: Unlike a direct import of a GIS file into EarthRanger, importing using ArcGIS online does **NOT** require the projection to be EPSG:4326.

# Preparing ArcGIS Online

1. Upload Content to ArcGIS Online
   a. Using the 'Content' tab in ArcGIS Online, use Add Item to upload the files you prepared above.
   b. These uploads will also create an associated item with the same title but of type 'Feature Layer (hosted)' which you will use below
2. Create a Group
   a. Using the 'Groups' tab in ArcGIS Online, create a new group to identify content to be synchronized with EarthRanger.  (ex. 'EarthRanger Group')
   b. In that group use the 'Add Items to Group' button to add the content you wish to share to EarthRanger.  **Important**: Select the **'Feature Layer'** types, not the original file types from the content.

# Preparing EarthRanger for Import

1. At your EarthRanger Administration website (*https://*`your_organization`*.pamdas.org/admin*), select **Map Layers | Feature Service Configurations**.
2. Select the 'Add Feature Service Configuration' Button in the top right corner
3. Configure the Feature Service Configuration
   a. **Configuration Name**: Friendly name to identify this import
   b. **Username**: User name for the ArcGIS Online account
   c. **Password**: Password for the ArcGIS Online Account
   d. Search Text: Typically leave blank (contact EarthRanger support for usage)
   e. **Disable Import Feature Classes**: must be blank for imports t work.  Check if you wish to disable imports.  Useful if you are working on content in ArcGIS Online you're not ready to import. (Remember to re-enable to begin imports)
   f. Optional Attributes:
      i. Service URL: only used for ArcGIS Enterprise configurations
      ii. **Source**: Friendly name to identify the source for these features
      iii. **Type Field**: Name of the 'Feature Class' attribute from above
      iv. ID Field: Name of the field for Global ID (rarely does this change)
      v. **Name Field**: Name of the 'Name' attribute from above
   g. Press **'Save and Continue Editing'**
4. Press **'Test Connection'** to verify access with the above credentials
5. **Groups:** You will notice a new field available called 'Groups' with a drop down containing the ArcGIS Online group created above.
   a. **Select** the group you created above
   b. Press **'Save and Continue Editing'**
6. Download Features: Press the **'Download Features'** button to manually force an immediate download of features.
7. To see new features on EarthRanger user interface, **refresh** and look for the new features under Map Layers.
8. Features will be reloaded automatically every night in addition to the manual download process above.

# Feature Styling and Visualization

EarthRanger can also import the styling for features from ArcGIS Online.

**Important**: ArcGIS does **not** export the styles from the original GIS files.  Instead it uses styles configured from the Visualization Layers.

1. In ArcGIS Online, click the Groups Tab to see your selected layers.
2. Select a content item
3. Click the **Visualization** tab
4. Click 'Change Style' under the column to 'Change the layer's default style, filter, pop-ups and labels.'
5. Click **Options**
6. Click **Symbols**
   a. Fill Tab: Select the Color and Transparency desired
   b. Outline Tab: Select the Color, Transparency, Line Width
      i. Pattern is not currently supported
   c. Click Ok
   d. Click Ok
   e. Click Done
   f. **Important:** Click 'Save Layer' in the top corner
7. If desired, go back to the EarthRanger Administration page to **'Download Features'**


## Help Improve EarthRanger

If you have comments, corrections, or suggestions about this document, please email them to
support@pamdas.org.

# SUBJECT AND SOURCE ADMINISTRATION

## Introduction

An elephant in a protected area wears a collar that periodically radios its position to EarthRanger, which records the animal's location and displays it on a screen.

To an EarthRanger administrator:
- The elephant is a *SUBJECT* of *SUBJECT TYPE* "wildlife" and *SUBJECT SUBTYPE* "elephant."
- The elephant has a *SUBJECT STATUS*, which is its location at a certain time, for example 34°N/-1°E, one hour ago.
- The elephant can be a member of one or more *SUBJECT GROUPS*, for example "elephants," "elephants_male," and "elephants_virunga."

| | | | |
|---|---|---|---|
| **Subject Name** | Nguvu | 20843 | Chester_N |
| **Subject Type** | Wildlife | Vehicle | Person |
| **Subject Subtype** | Elephant | Boat | Ranger |
| **Subject Status** | 34°N/-1°E at 1000 Dec 5 | 33°N/-2°E at 0730 Dec 3 | 35°N/1°W at 2300 Jan 1 |

Table 1: Subject Name, Type, Subtype, and Status

Continuing with the previous example, to an EarthRanger administrator:
- The radio collar that the elephant is wearing is a *SOURCE.* That source has various characteristics (see Table 2), including:
  - *DEVICE MODEL NAME* (for example "AWT")
  - *TYPE OF DATA EXPECTED* (for example "Tracking Device" data or "GPS radio" data).

Managing SOURCES in EarthRanger is covered in the topic **MANAGING SOURCES** later in this overview.

| | | | |
|---|---|---|---|
| **Type of Data Expected** | Tracking Device | GPS Radio | Trap |
| **Device Model Name** | AWT | Motorola | ConservationX |
| **Device Manufacturer ID** | AWT_01 | Motorola_01 | ConservationX_01 |

Table 2: Source characteristics

Finally, an EarthRanger administrator can associate a *SUBJECT* with a *SOURCE* on the *Subject-Source Assignment* administration page. An example would be to assign a particular elephant to a particular radio collar for a particular period of time.

To learn about subject-source assignments in EarthRanger, see the topic **MANAGING SUBJECT-SOURCE ASSIGNMENTS** later in this overview.

| Source | Subject Source Assignment | Subject Name | Subject Type | Subject Subtype | Subject Icon | Subject Status | Subject Group |
|---|---|---|---|---|---|---|---|
| Radio Collar 1 | Collar1 to Nguvu | Nguvu | Wildlife | Elephant |  | Lat/Long/Time | Elephants-bulls |
| Radio Collar 2 | Collar2 to Mkubwa | Mkubwa | Wildlife | Elephant |  | Lat/Long/Time | Elephants-bulls |
| Radio Collar 3 | Collar 3 to Maua | Maua | Wildlife | Elephant |  | Lat/Long/Time | Elephants-cows |
| Radio Collar 4 | Collar 4 to Hekima | Hekima | Wildlife | Elephant |  | Lat/Long/Time | Elephants-cows |
| GPS Radio 1 | Radio1 to John M | John M | Persons | Ranger |  | Lat/Long/Time | Red Team |
| GPS Radio 2 | Radio 2 to Denis R | Denis R | Persons | Ranger |  | Lat/Long/Time | Red Team |

**Table 3: Some examples of entities managed in EarthRanger administration pages**

## Logging in to the Administration Home Page

The EarthRanger Administration home page is at https://*<your_organization>*.pamdas.org/admin. (If you are unable to log in to EarthRanger, contact your administrator. You can also contact EarthRanger support at support@pamdas.org.)

## Mastering the Administration User Interface

**Using Simple View**



**Figure 21: EarthRanger administration simple view**

The EarthRanger Administration home page opens in *Advanced View*. However, selecting **Switch to Simple Administration** opens the home page in *Simple View*, in which only the elements that you really need are

SUBJECT AND SOURCE ADMINISTRATION

displayed. <u>We recommend using *Simple View*</u> (which you can reach directly at *https://<your_organization>.pamdas.org/dasadmin/*).

**How to Sort**



**Figure 22: Performing a four-column sort**

You can sort the contents of a page in a variety of ways.

**To sort page contents:**
- Choose the columns by which you want to sort
- Choose the precedence of the columns in the sorting process
- Choose the sort order within the columns you selected

**To choose the columns by which you want to sort**:
- Select the area at the top right corner of the each column (within the area in the boxes in Figure 22), **selecting the columns in from last in the sort order to first**.

  For example, in Figure 22, **Age of observation** was selected first so it is fourth in sort precedence, and **Subject** was selected last, so it is first in sort precedence. (**Map Marker** was not selected at all, so its contents are not considered in the sort.)

**To choose the order of sorting within each column**:
- Single arrow pointing up ( ⬆ ) is least to greatest (or alphabetical), and single arrow pointing down in greatest to least (or reverse-alphabetical).

**To remove a column from the sort**:
- Select the double arrow, as shown in the large box in Figure 22.

**How to Filter**

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**Figure 23: Filtering page contents using two filters**

You can filter the contents of most Administration pages by selecting words in the **Filter** column.
Filtering selections are cumulative. For example, Figure 23 shows filtering for Tracking Device data from only AWT Satellite devices.

**How to Search**



**Figure 24: Searching page content**

You can search for page contents by entering a text string and selecting **Search**.

**How to Add Items**

Figure 25: An ADD button

You can use an **Add** button, such as the one shown in Figure 25, for:

- Adding a new subject
- Adding a new subject type
- Adding a new subject subtype
- Adding a new subject status
- Adding subject groups
- Adding a source
- Adding a subject-source assignment

**How to Delete**
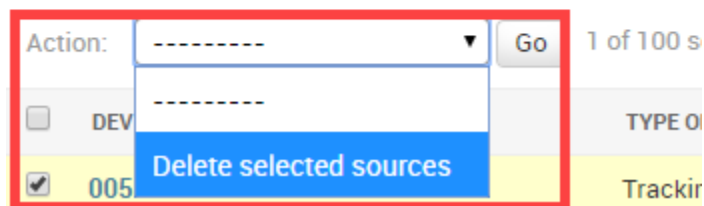


Figure 26: Selecting the Delete option in the Action menu to delete a selected row

**To delete selected EarthRanger Administration features (such as subjects and sources):**
1. Select the item's selection box on its administration page (for example a subject on the **Subjects** page).
2. Select **Delete** in the **Action** menu.
3. Select **Go**.

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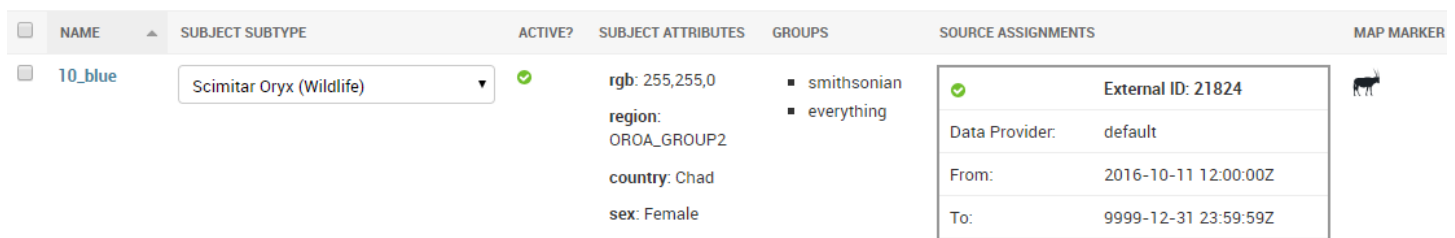
# Managing Subjects

## About Subjects

*Subjects* are the entities that you observe, track, and manage in EarthRanger (for example an elephant named *Nguvu*, or an airplane named *N1121P*).

- To manage Subjects, select **Subjects** on the EarthRanger Administration home page to display the **Home › Observations › Subjects** page.
- To lean about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE later in this overview.

## Viewing and Editing Subjects



**Figure 27: Seven columns of subject information on the Subjects page**

On the **Home > Observations > Subjects** page (Figure 27), you can view every subject in EarthRanger, along with some of their key settings.

*Subject Settings*
- *Basic settings* for every subject are listed on the **Home > Observations > Subjects** page.
- *Detailed settings* that you can edit are displayed on the **Home > Observations > Subjects > <subject name>** page.

    ***To view a subject's detailed settings:***
    o Select a subject's name (for example, "10_blue" in Figure 27) on the **Home > Observations > Subjects** page)

Each subject has the following settings:
- **ID**: A unique, 32-character, system-generated identifier that cannot be edited (for example "000c5333-7e08-4b69-8332-cb9b4ec2460d")
- **Name**: A name for the subject, for example *Nguvu* for an elephant, or *N1121P* for an airplane.
- **Subject subtype**: A more detailed descriptor of the subject, often displayed as *Subtype (Type)* for example "Elephant (Wildlife)." See **Managing Subject Subtypes**.
- **Map Marker**: Icon that is associated with the *Subject subtype, for* example 🐆 for Cheetah/Wildlife. The map marker appears on the map and report entries.

- **Active**: If selected, the subject icon is displayed in the EarthRanger map window and the subject is visible in Map Layers.
- **Common name**: A commonly used name for the *Subject Type*, such as "White Rhino"
- **Groups**: Any *Subject Groups* to which the subject is assigned (See **Managing Subject Groups**)
- **Subject Attributes**:
  - **RGB**: Color of the subject's track when it is displayed on the map; specified in RGB format (for example, "255, 0, 0" for red)
  - **Sex**: Gender of an animal subject
  - **Country**: Country value that is displayed in the EarthRanger Mobile App
  - **Region**: Region value that is displayed in the EarthRanger Mobile App
- **Advanced Subject Attributes**
  - **Additional data**: Subject-value pairs that you can edit. Used only in special situations.
  - **Created at**: Data and time the subject was created. Not editable
  - **Updated at**: Data and time the subject was updated Not editable
- **Source Assignments**: The *Source* assigned to this subject See **Managing Sources** and **Managing Subject-Source Assignments** for more information.
- **Latest Observations**: Selected recent observations for the subject data
  - **Note**: If you select ***See more observations for this subject here***, you can export, filter, and add observations.

## Adding a New Subject

**To add a new subject**:
- On the **Home › Observations › Subjects** page, select **Add a Subject**
  – or –
- On the EarthRanger Administration home page **Subjects** row, select **Add**.
  The **Add subject** page appears.

Only two settings are *required* to create a new subject: **Name** and **Subject Subtype** (for example, "Elephant (Wildlife)"). However, note that *a subject does not appear in map view until that subject is added to a subject group*.

If you have read the preceding section, **Subject Settings**, many of the settings that you can make on **Add subject** page will be familiar. However, there are two additional sets of settings that you can make on the **Add subject** page that are discussed in separate topics:
- **Groups**: You can assign the new subject to a Subject Group.
- **Source Assignments**: You can assign the new subject to a Source.

**Important:** Although you are not required to assign a new subject to a subject group, subjects are not visible in the map window until they are part of a subject group. You can assign a new subject to a subject group on the **Add Subject** page when you create a new subject or on the **Subjects** page in the individual subject.

## Using the Action Menu to Delete, Export, or Assign a Random Trail Color

You can use the **Action** menu on the Subject page to:
- Delete a subject

- Export a subject as a .csv file
- Assign a random color for the subject's trail when it is displayed in the map window.

### Assigning a random RGB trail color to a subject

**To assign a random trail color to a subject:**
1. On the **Home › Observations › Subject** page, select the subject in the list.
2. In the **Action** menu, select **Assign a random color**.
3. Select **Go**.
   A random RGB color, such as *255, 255, 0*, is assigned to the subject. The RGB value is used to color the dots and lines of the subject's trail when it is rendered in the map window.
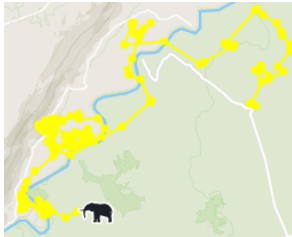


Figure 28: Subject's trail color specified by an RGB value (255, 255, 0)

### Exporting a subject as a .csv file

**To export a subject as a .csv file**
1. On the **Home › Observations › Subject** page, select the subject in the list.
2. In the **Action** menu, select **Export as .csv file**.
3. Select **Go**.
   The subject is exported to the local Downloads directory as a .csv file, for example:

```
created_at,updated_at,id,name,owner,additional,is_active,common_name
,subject_subtype
2017-01-31 19:45:58.600440+00:00,2017-01-31
19:45:58.600440+00:00,115868b0-a02a-4bfc-bd9d-
1801d20d20b2,10_blue,,"{'rgb': '255,255,0', 'sex': 'Female',
'active': 1, 'region': 'OROA_GROUP2', 'country': 'Chad', 'species':
'Scimitar Oryx', 'tm_animal_id': 'W187%DOB=2'}",True,,scimitar_oryx
```

Table 4: EarthRanger subject data exported to a .csv file

## Managing Subject Types



Figure 29: Subject Type Keys and Subject Types on the Subject types page

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**About Subject Types**

The *subject type* specifies what a subject is, for example, whether the subject is an aircraft, a person, a vehicle, a stationary object, wildlife, or unassigned.
- To manage subject types, select **Subject types** on the EarthRanger Administration home page, to display the **Home › Observations › Subject types** page.
- To lean about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE.

**Note:** You can see a list of all EarthRanger subject types and subtypes in the Appendix at List of all Subject Types and Subtypes.

**Viewing, Adding, Deleting, or Renaming Subject Types**

On the **Home > Observations > Subject types** page you can:
- View all the EarthRanger subject types (for example, aircraft, person, vehicle, stationary object, wildlife, and unassigned)
- Add or delete subject types
- Assign a subject type *description* to a subject type system *key*
  **Note**: A subject type system key and its description often have the same value, for example:
  - **Subject Type Key**: "aircraft"
  - **Subject Type**: "Aircraft"

**To add a subject type**:
1. On the **Home > Observations > Subject types** page, select **Add Subject Type**.
   – or –
   On the EarthRanger Administration home page **Subject types** row, select **Add**.
   The **Add subject type** page appears: ***Home › Observations › Subject types › Add subject type***
2. In **Subject Type**, enter the subject type description (for example, "Vegetation").
3. In **Subject Type Key**, enter the name of the system key for the subject type *as one word* (for example "Vegetation" again, because the names of the Subject Type and the Subject Type Key are usually the same or very similar).
4. (Optional) In **Subject Subtype**, enter the name of any subject subtypes that you want to add (for example, "Baobab tree").
5. Select **Save**.

# Managing Subject Subtypes

**About Subject Subtypes**

A subject's *Subtype* is a more specific description of its subject type. For example, for the subject type "aircraft," there may be four subject subtypes: drone, helicopter, hot air balloon, and plane.
- To manage Subject subtypes, select **Subject sub types** on the **EarthRanger Administration** page to display the **Home › Observations › Subject sub types** page.

- To lean about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE.

Subject *subtypes* are often paired with their subject *type* in the format *Subject Subtype (Subject Type)*, displayed for example as "Cheetah (Wildlife)" or "Boat (Vehicle)."

***Subtype key and subtype description***

The nomenclature is slightly more complicated in the EarthRanger administration pages, where there are *two* entities for each Subject Subtype: a one-word subject subtype *key* and a subject subtype *description*. The subtype key and subtype description are usually very similar. See Table 5.

| Subject Subtype Key | Subject Subtype Description |
|---|---|
| weather_station | Weather Sensor |
| ranger_boat | Boat |
| pickup | Pickup |
| research | Research Vehicle |

Table 5: Some EarthRanger Subject Subtype Keys and their descriptions

### Subject Subtype Settings

Basic settings for each subject subtype appear in the **Home > Observations > Subject subtypes** page. Selecting the name of an individual subtype key displays the detailed settings for that key.

Each subject subtype has the following attributes:
- **Subtype key**: The name of the subtype key (for example "weather_station")
- **Subject subtype**: The description of the subtype (for example "Weather Sensor")
- **Subject type**: The subject type, which you select from a drop-down list (for example "Stationary Sensor")

**Note:** If you change any of the settings, click **Save** at the bottom of the page to save them.

### Adding a new subject subtype

**To add a subject subtype**:
1. On the **Home > Observations > Subject sub types** page, select **Add Subject Sub Type**.
   The **Add subject sub type** page appears *(Home › Observations › Subject types › Add subject sub type)*
2. In **Subject Sub-Type**, type the one-word subject type description (for example, "Baobab_tree").
3. In **Sub-Type Key**, type the name of the system key for the subtype (for example "Baobab tree").
4. In **Subject type**, select the name of the subject types that you want to add (for example, "Vegetation").
5. Select **Save**.

## Managing Subject Groups

### About Subject Groups

A *subject group* is a collection of subjects or a collection of other subject groups.
EarthRanger map layers are created from subject groups.
**Important**:
- A subject does not appear in map view until that subject is added to a subject group.

- Users can only view the contents of subject groups to which they have been grated permissions. You control who can view the contents of subject groups by **Granting Permissions to View Subject Groups**.
- To manage Subject Groups, select **Home › Observations › Subject groups** on the EarthRanger Administration home page.
- To lean about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE.

## Viewing Subject Groups

On the **Home > Observations > Subject Groups** page you can:
- View all the EarthRanger subject groups
- Add or delete a subject group

## Adding Subject Groups

A subject group can contain other subject groups. For example, if you have a subject group that contains two male elephants named "elephants-bulls," and you have another subject group containing two female elephants named "elephants-cows," you can add those two subject groups to another subject group named "elephants-all:"

- Subject group "elephant-bulls" contains two male elephant subjects

  | Chosen Subjects |
  |---|
  | elephant-bull-1 |
  | elephant-bull-2 |
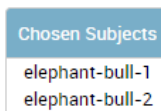
- Subject group: "elephant-cows" contains two female elephant subjects

  | Chosen Subjects |
  |---|
  | elephant-cow-1 |
  | elephant-cow-2 |
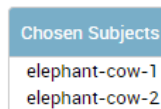
- Subject group: "elephants-all" contains the two subject groups, "elephant-bulls" and "elephant-cows"

  | Chosen groups ❓ |
  |---|
  | elephants-bulls |
  | elephants-cows |
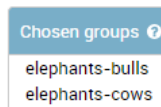
## Map Layers Are Created from Subject Groups

The subject groups and their subjects you created in the preceding example are displayed as map layers in EarthRanger. (Figure 30)

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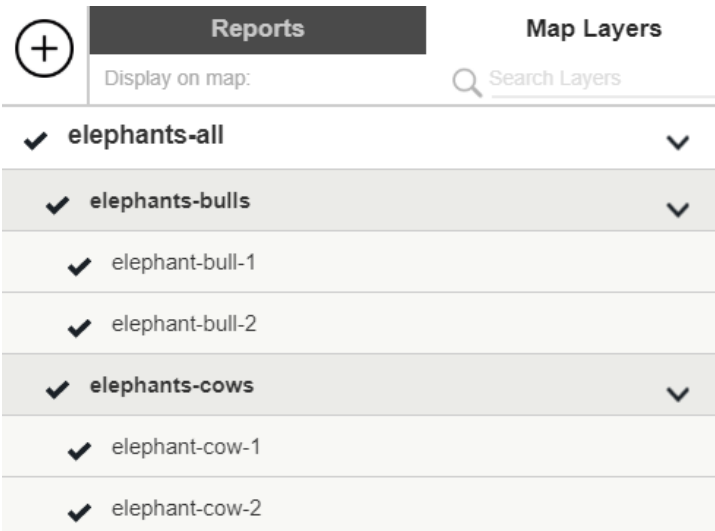
**Figure 30: Three subject groups displayed as map layers in EarthRanger**



**Figure 31: The subjects of the subject groups displayed in the EarthRanger map window.**

## Granting Permissions to View Subject Groups

You control who can view the contents of a subject group by choosing which Permission Sets you apply to the subject group. For example, if in the **Permissions** section of the **Subject groups** page, you apply the "All Users" permission set to a subject group, all users can view its contents. *Users can only view the contents of subject groups to which they have been grated permissions*.
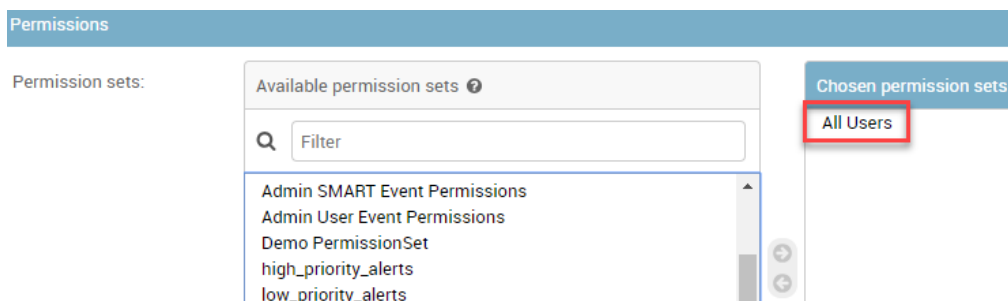


**Figure 32: Applying a permission set named "All Users" to a subject group**

SUBJECT AND SOURCE ADMINISTRATION

# Managing Subject Status

## About Subject Status

Subject status is only used for troubleshooting. It consists of the following basic information about a subject:

- **Subject** (That is, the subject name)
- **Longitude/Latitude** (Subject's location)
- **Location At** (Date and time the location of the subject was recorded)
- **Age of Observation** (Time elapsed since observation was recorded)
- **Map marker** (The icon that represents the subject on the map)

To view or manage Subject Status, select **Subject Status** on the EarthRanger Administration home page, to display the **Home › Observations › Subject Status** page.

To lean about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE.

## Viewing Subject Status

Subject status information displayed at the **Home › Observations › Subject Status**. It can be filtered by:

- Radio status (All, Green, Blue, Red, Offline)
- Source type
- Subject subtype
- Source Provider

# Managing Sources

## About Sources

A *Source* is a device that can be a source of data about a subject, for example a radio collar or a GPS radio. There are five types of sources used in EarthRanger:

- **Tracking devices**: Devices for tracking moving subjects, usually radio collars
- **GPS radios**: Portable radios that can transmit their position
- **Camera Traps**: Cameras that take pictures when they detect activity in their vicinity.
- **Seismic sensors**: Devices that detects ground vibration
- **FIRMS data**: Satellite data about fires that is distributed by the Fire Information for Resource Management System

A source is usually associated with a s*ubject*, as, for example, when you associate a radio collar with the animal Subject that is wearing it (see MANAGING SUBJECT-SOURCE ASSIGNMENTS).

- To manage Sources, select **Sources** on the EarthRanger Administration home page, to display the **Home › Observations › Sources** page.

- To learn about sorting, filtering, searching, adding, and deleting, go to [MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE](#).

## Adding a Source Provider

When you add a new Source to EarthRanger, one of configuration steps is to select a *Source Provider*. A Source Provider is a provider of tracking data for that Source (for example, *Savannah Tracking* providing tracking data to EarthRanger about Savannah Tracking devices).

**To add a source provider:**
1. Log in to your EarthRanger administration website (at *https://*`<yourprotectedarea>`*.pamdas.org/admin).*
2. Go to **Home > Observations > Source providers**.
3. Select **Add Source Provider**.
4. In the boxes, enter the following values:
   - **Natural key for source provider**: This can be any value, but one possible configuration is to enter the site name and sensor type separated by a hyphen (for example, *liwonde-savannahtracking*).
   - **Display name for source provider**: Again, you can enter any value, but one configuration is to enter the site name and sensor type, separated by a hyphen (for example, *liwonde-savannahtracking*).
   - **Notes**: This section is simply for you to add notes about the source provider if you choose. Notes have no effect on operations.
   - **Provider configurations**: Additional configuration information.
5. Select **Save**.

## Viewing Sources

When you view a source at **Home > Observations > Sources** (Figure 33), settings are displayed in five columns:
- **Device Manufacturer ID**: ID of device from manufacturer—the actual ID of the device itself.
- **Type of Data Expected**: For example "Tracking Device" or "GPS radio"
- **Device Model Name**: For examples "Vectronics Iridium" and "AWT Satellite"
- **Source Attributes**: Radio frequency in megahertz (for example "148.94")
- **Provider Display Name**: The display name for the Source Provider (for example *Seattle-inreach*)

| | DEVICE MANUFACTURER ID | TYPE OF DATA EXPECTED | DEVICE MODEL NAME | SOURCE ATTRIBUTES | PROVIDER DISPLAY NAME |
|---|---|---|---|---|---|
| ☐ | 123456789012345 | gps radio | Garmin inReach | | liwonde-inreach |
| ☐ | ST1234-5678 | Tracking Device | Test Collar | | default |

**Figure 33: The Sources page with five columns of settings**

## Adding a source

**To add a source**:
1. At **Home > Observations > Sources**, select **Add Source**.
2. On the **Add source** page:
   a. Enter a **Device Manufacturer ID** (required).

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b. Select the **Type of data expected** (required, for example, tracking device, trap, seismic sensor, FIRMS data, GPS radio).
   c. Enter a **Device model name** (required).
   d. Select a **Provider** (the Source Provider—the source of data about the device, for example, the device manufacturer).
3. In the **Source Attributes** section, you can set up a special case configuration. (Note: Source Attributes are not routinely used.)
   a. Enter a **Collar Status**.
   b. Enter a **Collar Model**.
   c. Select whether or not the device **Has Accelerometer Data**.
   d. Enter the **Data Owners**.
   e. Enter the **Adjusted Beacon Frequency**.
4. Select **Advanced Source Attributes (Show)**
   • In the **Additional data** box, you can enter additional data for special configurations.
5. Select **Save**.

## Configuring Notifications for When Subject Data Is Delayed or Not Received

You can configure EarthRanger to send email notifications to users when messages from a data source are delayed or not received.

- **Lag notifications** alert users when the interval between when a message was sent and that message was received exceeds a specified threshold. For example, if you configure a 20-minute lag notification threshold, EarthRanger sends a lag notification email message if data sent at noon arrives at 12:20 or later.
- **Silent source notifications** alert users when no messages are received within a specified time. For example, if it is 1300 (1 PM) and the last radio message from a source was received at noon, that source has been silent for an hour. If you had configured a silent source notification with a one-hour threshold, EarthRanger would send a notification email at that time.

Note that you must also give each user permission to receive these notifications.

**To configure EarthRanger to send notifications when subject data is delayed or missing:**
1. At **Home > Observations > Source Providers**, select a Source Provider from the list or select **Add Source Provider**.
2. On the **Change** or **Add source provider** page, under **Provider configurations**, enter the threshold at which notifications are sent in *hours:minutes:seconds* format and select **Save**. (Figure 34)
3. For each user who is to receive notifications, at **Home > User Accounts > Users**, assign the appropriate permissions (*Receive silent source notification* and/or *Receive observation lag notification*) and select **Save**.

**Figure 34: Lag and Silence threshold settings for a Source Provider**

# Managing Subject-Source Assignments

## About Subject-Source Assignments

Associating a *subject* with a *source* (for example, associating an elephant with its radio collar) enables EarthRanger to apply data to that subject from that source.
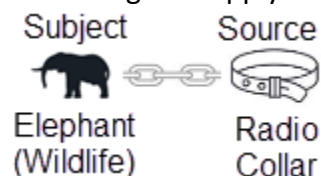


**Figure 35: A subject-source assignment links the data from a Source to a Subject for a specified time**

You assign a source to a subject for a particular period of time, called the **Assigned Range**. Assigned Range times are formatted YYYY-MM-DD HH:MM:SS+HHMM (the "HHMM" at the end being the offset from server time), for example 2019-08-31 06:21:00+0000.

- To manage Subject-Source Assignments, select **Subject Source Assignments** on the EarthRanger Administration home page to display the **Home › Observations › Subject Source Assignments** page.
- To learn about sorting, filtering, searching, adding, and deleting, go to MASTERING THE EarthRanger ADMINISTRATION USER INTERFACE.

## Viewing Subject-Source Assignments

SUBJECT AND SOURCE ADMINISTRATION

| | SUBJECT NAME | MANUFACTURER ID | IS CURRENT? | ASSIGNED RANGE |
|---|---|---|---|---|
| ☐ | Ansell | 214 | ❌ | 2000-02-10 09:35:00+00:00, 2000-12-14 10:00:00+00:00 |
| ☐ | Lolkimaniki | STRF470 | ❌ | 2009-08-06 08:20:00+00:00, 2010-11-08 05:15:53+00:00 |

**Figure 36: Settings for two subject-source assignments**

On the **Home > Observations > Subject Source Assignments** page you can:
- Filter and view all the subject-source assignments
- See if a particular subject-source assignment is current (that is, if the current time falls within the Assigned Range)
- Add or delete subject-source assignments

**Adding a Subject-Source Assignment**

**Note**: If you want to assign more than one source to a subject, you can do so on the **Home › Observations › Subjects › Add subject** by selecting **Add another Source Assignment**.

**To add a subject-source assignment:**
1. On the **Home › Observations › Subject-Source Assignment** page, select **Add Subject-Source Assignment**
   The **Home › Observations › Subject Status › Add Subject-Source Assignment** page appears.
2. Select a subject from the **Subject** menu. (Required)
3. Select a source from the **Source** menu. (Required)
4. In the **Assigned Range** section, enter the starting and ending times of the assignment (YYYY-MM-DD HH:MM:SS+HHMM) (Required)
5. In the **Attributes** section, you can add special setting information when needed for:
   - Data Status
   - Data Starts Source
   - Data Stops Source
   - Data Stops Reason
6. In the **Advance (Show)** section, you can add additional, special setting information when needed.
7. Click **Save**.

SUBJECT AND SOURCE ADMINISTRATION

**List of All Subject Types and Subtypes**

Subject types and subtypes that exist by default in the version of EarthRanger that is current at this writing include:

- o Aircraft
  - Drone
  - Helicopter
  - Plane
- o Persons
  - Dog Team
  - Driver
  - Expedition
  - Manager
  - Ranger
  - Ranger Team
  - Scout
- o Stationary Sensor
  - Camera Trap
  - Weather Sensor
- o Wildlife
  - Antelope
  - Cheetah
  - Cow
  - Elephant
  - Forest Elephant
  - Giraffe
  - Lion
  - Rhino
  - Sable
  - Scimitar Oryx
  - Undeployed
  - Zebra
- o Unassigned
  - Unassigned
- o Vehicle
  - Boat
  - Car
  - Excavator
  - Motorcycle
  - Pickup
  - Research Vehicle
  - Security Vehicle
  - Tourist Vehicle
  - Truck
  - Van

SUBJECT AND SOURCE ADMINISTRATION

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support@pamdas.org.

EARTHRANGER

# REPORT AND EVENT TYPE CONFIGURATION

## Reports and Events Types

EarthRanger *users* read about and record activities within their protected area—fires, poaching, sightings, etc.— using *Reports*.

EarthRanger *administrators*, however, can see those activities the way they are classified behind the scenes in the EarthRanger software, as *Event types*.

It is important to understand that Reports and Event types are essentially the same thing:

- *Reports* are what users see in the EarthRanger web application.
- *Event types* are what administers see at the EarthRanger Administration website.

To make a new type of Report available to users, an administrator adds an Event type to EarthRanger. Similarly, to make a Report of a particular type unavailable to users, an administrator hides the corresponding Event type.

## Configuring Reports

Configuring Reports for users of EarthRanger entails configuring their corresponding Event types by performing the actions described in the sections that follow.

- To configure a new type of Report for users, see Configuring an Event Type.
- To add Report Fields (schema) for a new Event type, see Creating a Schema for an Event Type.
- To hide types of Reports from users, see Hiding Event types.

**Configuring an Event Type**

This section describes how to create an Event type. The section that follows, Creating a Schema for an Event Type, describes how to add a schema to an Event type, by which the labels and text boxes (also called *fields*) that appear on a resulting Report are created. **Note**: An Event type must have a valid schema before you can save it.

**To configure a new Event type**:

1. At your EarthRanger Administration website (*https://*yourorganization.*pamdas.org*), go to **Home > Activity > Event Types.**
2. Select **Add Event Type**.
   The **Add event type** page appears.
3. In **Display**, enter a brief name for the new Event type (*Accident*, for example)
4. In **Value**, enter a unique value. The standard format for this value is a text string followed by "_rep," for example, "accident_rep."
5. In **Category**, choose the category into which the new Event type will be placed (*Security*, *Monitoring*, or *Logistics* for example).
   - The category that you choose determines where the Report appears in the **Reports** list and which permissions are required to access it.
   - You can create a new event category by selecting the green plus sign, but doing so is unusual and should be done only if there is a good reason to do so.
6. **Is collection**: Leave unchecked.
7. **Icon Override**: Select the green plus sign, and then select an icon to use for the report.

- Note: You cannot add new icons using the Admin website; they can added only in new deployments. If you need a new icon, contact support@pamdas.org.

8. **Ordernum** is a numeric value that determines the order in which reports are displayed in the **Add Field Report** window (lowest-numbered report displayed first). You can leave this field blank, or you can assign values to **Ordernum** in your Event types if you want to specify the how the Reports are displayed in the **Add Field Report** window.

9. **Default Priority**: Sets the default priority of a new report: *Gray* (default setting), *Green*, *Amber*, or *Red*.

10. **Default State**: Sets the default state of a new report: *New* (default setting), *Active*, or *Resolved*.

11. **Schema**: Type or paste a valid schema in this box to create the labeled text boxes (the "fields") that are displayed in the Report. See the next section, Creating a Schema for an Event Type, for more information about schemas.

12. Select **Save**.

## Creating a Schema for an Event Type

An Event type's *schema* contains the information about the labels and text boxes (the *fields*) that appear in the resulting Report.

To create a schema in the **Schema** box of an Event type, you can type in the schema information, creating it "from scratch," though it is unlikely that you would do so. Pasting in schema information from an existing Event type or from a sample schema like the one in Table 6 and then modifying that information as needed will most likely give the best results.

Pasting the annotated schema text in Figure 37 into the **Schema** box of an Event type adds fields with annotations that describe them in the resulting report.



**Figure 37: Part of a report created from an Event type with the annotated schema in Table 6**

REPORT AND EVENT TYPE CONFIGURATIONDocument Title

**Adding a Schema to an Event Type**

In Annotated sample schema for use in an Event type later in this section, you will find an annotated schema that you can paste into the **Schema** box of an Event type. Reports generated using this schema have text boxes and labels with annotations that can help you to understand the relationship between schema settings and the resulting Report.

Before that, in About Schemas for Event Types, you will find a brief description of the schemas used in Event types.

### About Schemas for Event Types

You can refer to the sample schema in Table 6 when reading this section.

Schemas for Event types are in JSON format.

- The first section in each schema, "properties," defines the attributes of the fields as stored in the database.
- The second section in each schema, "definition," affects how the Report generated from the Event type and its schema appears to users in the EarthRanger user interface.

*Schema Properties*

Each property must contain at minimum a key, a type, and a title.

- **key**: A unique property that identifies the field in the database and be referenced in the "`definition`" section that follows.
- **type**: The type of data stored--a string or number in most cases.
- **title**: The text title that is displayed in the EarthRanger user interface.

In addition, the following optional keys may appear as well:

- **minimum**: The minimum value for a number field ("0" for a counting field, for example)
- **maximum**: The maximum value for a number field ("360" for a bearing field, for example)
- **enum**: Definition of the values that provide a dropdown list in a Report
  - **enum___xxx___values**: Dropdown values come from the CHOICES table
  - **query___xxx___values**: Dropdown values come from the SUBJECT table and defined in DYNAMIC CHOICES table

*Schema Definitions*

The definition section defines how a field is displayed in a Report in the EarthRanger user interface.

- **key**: Matches a key in the preceding `property` section and determines the order of appearance.
- **htmlClass**: Affects the overall display. Currently, only "col-lg-6" is supported to create two columns.
- **fieldHtmlClass**: Affects the display of the string field (for example "`date-time-picker json-schema`" dislays a calendar/time picker when chosen).
- **type**: "`textarea`" expands the display to two lines and provides text wrapping and scrolling of a text field

Others field definitions may be supported in the future.

*Annotated sample schema for use in an Event type*

```
{
  "schema":
  {
```

```json
        "$schema": "http://json-schema.org/draft-04/schema#",
        "title": "DAS JSON Schema Reference List",

        "type": "object",

        "properties":
        {
            "string_field": {
                "type": "string",
                "title": "String Field (2 Col by using col-lg-6)"
            },
            "number_field": {
                "type": "number",
                "title": "Number Field 0<>360 (2 Col)",
                "minimum": 0,
                "maximum": 360
            },
            "time_field": {
                "type": "string",
                "title": "This is a time field.  Look below in Definition
section to get date-time-picker"
            },
            "textarea_field": {
                "type": "string",
                "title": "String with text area, word wrap and scroll.  2
lines max"
            },

            "enum_field": {
                "type": "string",
                "title": "This is a drop down list populated from the
Choices table where Field = yesno",
                "enum": {{enum___yesno___values}},
                "enumNames": {{enum___yesno___names}}
            },
            "query_field": {
                "type": "string",
                "title": "This is a drop down populated with Subjects
defined by a query in Dynamic Choices table",
                "enum": {{query___blackRhinos___values}},
                "enumNames": {{query___blackRhinos___names}}
            },
            "multi_select_field": {
                "key": "multi_select_field"
            },
            "table_field": {
                "type": "string",
                "title": "(DEPRECATED) This is a drop down list populated
from a Table",
```

```
                "enum": {{table___TrafficType___values}},
                "enumNames": {{table___TrafficType___names}}
            }
        }
    },
    "definition": [
        {
            "key": "string_field",
            "htmlClass": "col-lg-6"
        },
        {
            "key": "number_field",
            "htmlClass": "col-lg-6"
        },
        {
            "key": "time_field",
            "fieldHtmlClass": "date-time-picker json-schema",
            "readonly": false
        },
        {
            "key": "textarea_field",
            "type": "textarea"
        },

        {
            "key": "enum_field"
        },
        {
            "key": "query_field"
        },
        {
            "key": "multi_select_field",
            "type": "checkboxes",
            "title": "Multiple Selection from Choices Table - BUGS on Display
and Export",
            "titleMap": {{enum___carcassrep_species___map}}
        },
        {
            "key": "table_field"
        }
    ]
}
```

**Table 6: Annotated sample schema for use in an Event type**


**Hiding Event types**

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**Important**: **Do not *delete* Event types because doing so will affect your ability to retrieve existing reports.** Instead, use these instructions to *hide* Event types that you no longer want users to be able to access as Reports.

**To hide an Event type**:
1. At your EarthRanger Administration website (*https://*`your_organizaiton`*.pamdas.org), go to Activity | Event Types.*
2. At the **Event types** page, in the **Display** column, select the Event type that you want to hide. The Event type's settings page appears.
3. In **Category**, select **HIDDEN**.
    a. If a **HIDDEN** category does not exist, select the green plus sign and make the following settings: The **Add event category** page appears.
    b. **Id**: Do not change the default Unique ID.
    c. **Value**: Enter "hidden"
    d. **Display**: Enter "HIDDEN"
    e. **Ordernum**: Leave blank
    f. **Flag**: Select **System.**
    g. Select **Save**.
4. Select **Save**.

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# EARTHRANGER

# REPORT AND EVENT TYPE DROPDOWN CHOICES

## Reports and Events Types

EarthRanger *users* read about and record activities within their protected area—fires, poaching, sightings, etc. — using *Reports*.

EarthRanger *administrators*, however, can see those activities the way they are classified behind the scenes in the EarthRanger software, as *Event types*.

It is important to understand that Reports and Event types are essentially the same thing:

- *Reports* are what users see in the EarthRanger web application.
- *Event types* are what administers see in the at the EarthRanger Administration website.

## Changing the Choices in Report Dropdown Menus

You can change dropdown menu choices in Reports in EarthRanger by changing settings in the schema of the corresponding Event type.

For example, to add another choice to the **Species** dropdown menu in the *Wildlife Sighting* report shown in Figure 38, you modify the schema of the *Wildlife Sighting* Event type.
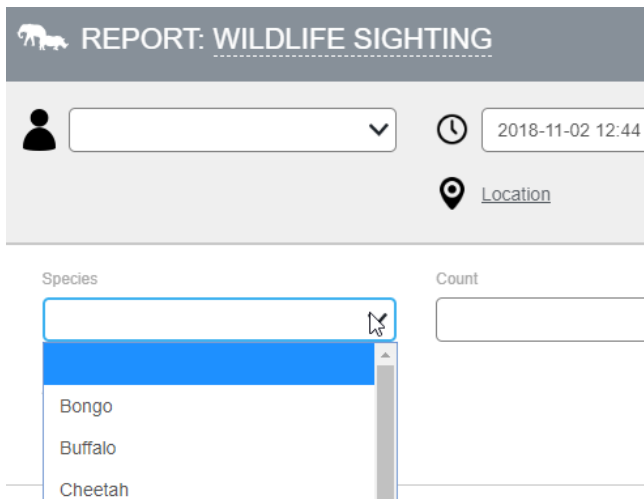


**Figure 38: Wildlife Sighting report with three choices in the Species dropdown menu**

**To change the values in Report dropdown menus:**
- [Find the name of the Choice Field to change](#) in the schema of the Event type for the Report.
- [Change or add the choices available in a dropdown menu](#) by using the value that you got in step 1.
- [Verify that the changes you made are visible in the Report](#).


**Find the Name of the Choice Field to Change**


**To find the name of the choice field to change**:
1. At your EarthRanger Administration website (*https://*`your_organizaiton`.*pamdas.org/admin*), go to **Activity | Event Types**.

2. In the **Display** column, select the Event type that has the name of the report with the field that you want to change (for example, **Wildlife Sighting**).

3. In the **Schema** for the selected Event type, under "`properties`," look for the property in which `"title"` matches the name of the dropdown menu in the Report (*Species* in this example).

4. In "enumNames," copy value between "enum___" and "___names" ("`wildlifesightingrep_species`" in this example). This is the value that you will search for in the next section.

```
"wildlifesightingrep_species": {
            "type": "string",
            "title": "Species",
            "enum":
{{enum___wildlifesightingrep_species___values}},
            "enumNames":
{{enum___wildlifesightingrep_species___names}}
        },
```

## Changing or Adding the Choices Available in a Dropdown Menu

| MODEL | 1 ▲ | FIELD | 2 ▲ | VALUE | DISPLAY | 4 ▲ | ORDERNUM |
|---|---|---|---|---|---|---|---|
| activity.event | | wildlifesightingrep_species | | bongo | Bongo | | 10 |
| activity.event | | wildlifesightingrep_species | | buffalo | Buffalo | | 20 |
| activity.event | | wildlifesightingrep_species | | cheetah | Cheetah | | 30 |

**Figure 39: Search results on the Choices > Choices page.**

**To change the choices available in the dropdown menu and their order:**
1. At the Administration website, go to **Choices > Choices**.
2. In the **Search** box, enter Choice Field from the preceding section (in the example, it was "wildlifesightingrep_species"), and then select **Search**.
   The fields that match the search string appear.
3. Change the strings in the **Display** column and the numbers in the **Ordernum** column as desired to change how the corresponding titles are displayed to users and the order in which they are displayed.
4. Click **Save**.

**To add a choice to the dropdown menu:**
1. At the Administration website, go to **Choices > Choices**.
2. In the **Search** box, enter Choice Field from the preceding section (in the example, it was "wildlifesightingrep_species"), and then select **Search**.
   The fields that match the search string appear.
3. Select **Add Choice**.
   The **Add choice** page appears.
4. In **Id**, accept the autogenerated value.
5. In **Model**, enter "activity.event."
5. In **Field**, enter the Choice Field (in the preceding procedure, Find the name of the Choice Field to change, the value in the example was "wildlifesightingrep_species.")

REPORT AND EVENT TYPE DROPDOWN CHOICES

6. In **Value**, enter the database value for the individual choice (by convention, in lower-case characters, for example: "elephant").
7. In **Ordernum**, enter a number to specify the order in which this entry will appear in the list. (The default order is alphabetic if **Ordernum** values are not entered.)
8. Ignore the **Sub choice of**: settings.
9. Select **Save**.

## Verify that the Changes You Made are Visible in the Report

**To verify your changes:**
1. In EarthRanger, refresh the web page.
2. Add a new Report of the type that you changed (**Wildlife Sighting** in the example).
3. Select the dropdown menu and verify that you changes you made are visible.

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# GEOFENCES AND PROXIMITY ANALYZERS

## Geofence Analyzers and Proximity Analyzers

- A *Geofence Analyzer* is a linear boundary that is defined by a line on a map in EarthRanger.
- A *Proximity Analyzer* is a circular boundary that is defined by a point and radius on a map in EarthRanger.

Both types of analyzer apply to the members of a specified *Subject Group* (for example *Elephants*). When members of that subject group are detected within a defined distance of the analyzer, a report is created and an alert is triggered (if an alert has been configured).



**Figure 40: A Proximity Analyzer and two Geofence Analyzers (*Warning* and *Critical*)**

**To view Geofence or Proximity Analyzers in EarthRanger and go to their settings in the EarthRanger Administration console:**

1. In EarthRanger, select **Map Layers**.
2. Expand the **Features** map layer by selecting its left-facing arrow (<).
   A list of features is displayed, including Analyzers if any have been configured. (Figure 41)
3. Expand **Analyzers** by selecting its left-facing arrow.
   Any configured Analyzers are displayed.
4. Select the location marker ( 📍 ) for an analyzer on the list.
   The analyzer appears in the Map window.
5. Select the gear icon on the analyzer's pop-up window.
   A **DAS Administration** *Analyzers* page opens. (You might be prompted to log in first).
6. Examine the Analyzer settings, change as needed, and select **Save**.
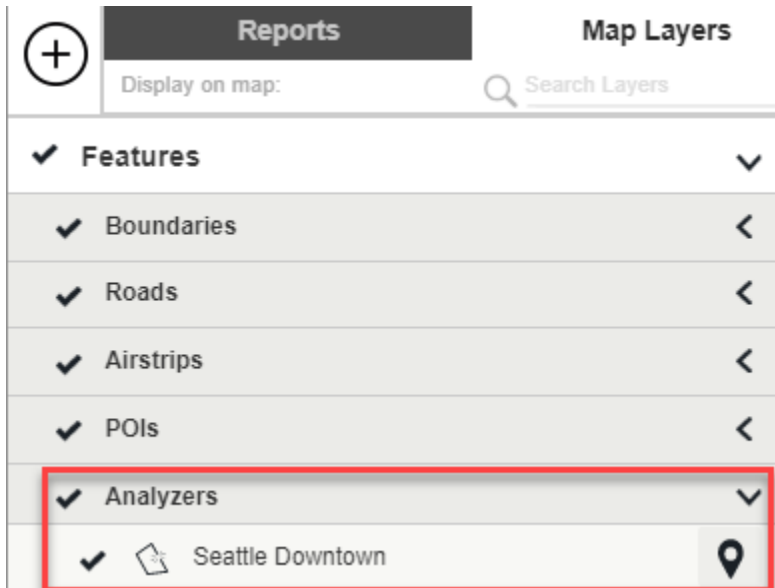
Figure 41: An Analyzer Feature ("Seattle Downtown") and location marker in Map Layers

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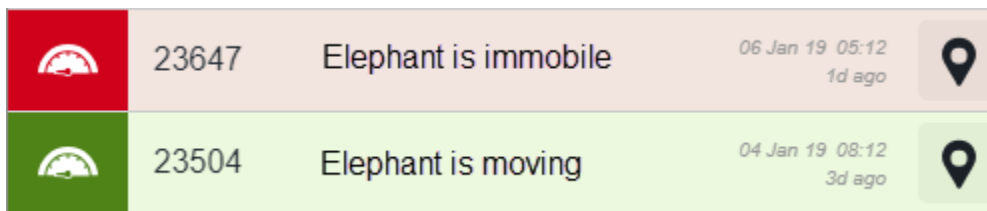If you have comments, corrections, or suggestions about this document, please email them to support@pamdas.org.

# IMMOBILITY ANALYZERS

## About Immobility Analyzers

**Immobility analyzers** in EarthRanger monitor the location of a subject group and can automatically create reports and alerts about the movement or lack of movement of those subjects (for example, to help detect when an animal is sick, injured, or dead). (**Error! Reference source not found.**)

EarthRanger evaluates a subject's mobility each time a location update is received. If a subject does not move beyond a radius or within a time duration that you specify, an immobility report and alert are generated. EarthRanger can also create reports and alerts if an immobile subject becomes mobile again (that is, if a formerly immobile subject moves beyond the specified radius).



**Figure 42: Reports generated by an immobility analyzer**

## Creating an Immobility Analyzer

**To create an immobility analyzer:**
1.  Create a subject group that contains the sensors that you want to monitor if one does not already exist.
2.  Add an immobility analyzer.
    a)  Go to **Home> Analyzers > Immobility Analyzer** and select **Add Immobility Analyzer**.
    b)  At the **Add Immobility Analyzer** page, **enter a unique, descriptive name for the analyzer**, for example, "Elephant Immobility Alert."
    c)  In **This analyzer applies to subjects in this Subject Group**, select the subject group from Step 1.
    d)  Select **Save**.

3.  Add an *Immobility* event type.
    a.  Go to **Home > Activity > Event Types** and select **Add Event Type**.
    b.  On that **Add event type** page, enter the following information:
        *   **Display**: Immobility
        *   **Value**: immobility
        *   **Category**: Select *Analyzer Event*
        *   **Default Priority**: Select a priority level of *Gray (default), Green, Amber, or Red.*
        *   **Schema**: Paste the *Immobility Schema* from the left column of _**Error! Reference source not found.**_.

    c. Select **Save**.

4. Add an *Immobility All Clear* event type.
    a. Go to **Home > Activity > Event Types** and select **Add Event Type**.
    b. On that **Add event type** page, enter the following information:
- **Display**: Immobility All Clear
- **Value**: immobility_all_clear
- **Category**: Select *Analyzer Event*
- **Default Priority**: Select a priority level of *Gray (default), Green, Amber,* or *Red.*
- **Schema**: Paste in the *Immobility All Clear Schema* from the right column of **Error! Reference source not found.**.

    c. Select **Save**.

**Table 7: Schemas for the Immobility Analyzer**

| Immobility Schema | Immobility All Clear Schema |
|---|---|
| <pre>{<br>  "schema": {<br>        "$schema":        "http://json-schema.org/draft-<br>04/schema#",<br>    "title": "EventType Immobility",<br>    "type": "object",<br>    "properties": {<br>      "details": {<br>        "type": "string",<br>        "title": "Details"<br>      },<br>      "name": {<br>        "type": "string",<br>        "title": "Name of animal"<br>      },<br>      "cluster_fix_count": {<br>        "type": "number",<br>        "title": "Cluster Fix Count"<br>      },<br>      "total_fix_count": {<br>        "type": "number",<br>        "title": "Total Fix Count"<br>      },<br>      "cluster_radius": {<br>        "type": "number",<br>        "title": "Cluster Search Radius"<br>      },<br>      "probability_value": {<br>        "type": "number",<br>        "title": "Probability"<br>      }<br>    }<br>  },<br>  "definition": [<br>    "name",<br>    "details",<br>    "probability_value",<br>    "total_fix_count",<br>    "cluster_fix_count",<br>    "cluster_radius"<br>  ]<br>}</pre> | <pre>{<br>  "schema": {<br>    "$schema": "http://json-<br>schema.org/draft-04/schema#",<br>    "title": "EventType Immobility",<br>    "type": "object",<br>    "properties": {<br>      "details": {<br>        "type": "string",<br>        "title": "Details"<br>      },<br>      "name": {<br>        "type": "string",<br>        "title": "Name of animal"<br>      },<br>      "cluster_fix_count": {<br>        "type": "number",<br>        "title": "Cluster Fix Count"<br>      },<br>      "total_fix_count": {<br>        "type": "number",<br>        "title": "Total Fix Count"<br>      },<br>      "cluster_radius": {<br>        "type": "number",<br>        "title": "Cluster Search Radius"<br>      },<br>      "probability_value": {<br>        "type": "number",<br>        "title": "Probability"<br>      }<br>    }<br>  },<br>  "definition": [<br>    "name",<br>    "details",<br>    "probability_value",<br>    "total_fix_count",<br>    "cluster_fix_count",<br>    "cluster_radius"<br>  ]<br>}</pre> |

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# CAMERA TRAPS

There are four steps to configure a camera trap in EarthRanger:
1. ***Error! Reference source not found.***Create (if one does not already exist for that brand of trap)
2. ***Error! Reference source not found.*** (a service account for API access)
3. ***Error! Reference source not found.***
4. ***Error! Reference source not found.***


## 1. Creating a Django Oauth Toolkit Application

**To create a Django Oauth Toolkit Application (if one does not already exist):**
a) Log in to your EarthRanger administration web page at
   *http://*<yourorganization>*.pamdas.org/admin.*
b) Go to **Home > Django OAuth Toolkit > Applications** and select **Add Application**.
c) Make these settings at the **Add application** page:
   - **User**: Leave blank.
   - **Redirect URIs**: Leave blank.
   - **Client Type**:  *Confidential*.
   - **Authorization grant type**: *Client Credentials*
   - **Name**: Enter the display name of the devices, for example *Panthera*.
   - **Skip Authorization**: Checked
d) Select **Save**.

## 2. Creating a User

**To create a user**:
a) Go to **Home > User Accounts > Users** and select **Add User**.
b) AS the **Add user** page:
   - **First Name**: Enter the camera brand name (for example *Panthera*).
   - **Last Name**: Enter *Cameras*.
   - **Username**: Enter a useful username, for example *pantheracams*, and copy the username for use in step 3.
   - **Permissions**: None
   - **Active**: Checked
c) Select **Save**.

## 3. Creating a Long-Lived Token

**To create a long-lived token**:
a) Go to **Home > Django Oauth Toolkit > Access Tokens**.

**Note:** You will need a unique, 30-character-long alphanumeric sequence to use as a token. You can copy one of the tokens in the list on the screen and then modify some characters to make it unique, or you can

create your own 30-character token (for example A1B2C3D4E5F6G7h8i9j0k1l2m3n4o5). Save the 30-character string for use when you install the DAS Radio Agent software later.

b) Select **Add Access Token**.
c) Select the magnifying glass icon next to **User**.
d) In the **Select user** window, enter the username you created in the previous step (for example *pantheracams*) and then select **Search**.
   The username appears.
e) Select the username.
   The UUID of the user appears in the **User** box of the **Add access token** page.
f) In **Token**, enter the unique, 30-character string from step 3a.
g) In **Application**, select the application you created in step 1.
h) In *Expires*, enter an expiration date that is so far in the future that token expiration is not a concern (for example 2099-01-01).
i) Select **Save**.

# 4. Creating a Camera Trap Event Type

**To create a camera trap even type**:
a) Go to **Home > Activity > Event Types** and select **Add Event Type**.
b) At the **Add event type** page:
   - **Display**: Enter a name for the event that will be displayed at **Home > Activity > Event types** (for example *Camera Trap*).
   - **Value**: *cameratrap_rep* **Note:** It is important that you enterer this value exactly.
   - **Category**: Choose a value from the dropdown list.
   - **Schema**: Paste the text from ***Error! Reference source not found.***. (You can fill in the generic property titles in the table, *Camera Name, Camera Make*, and *Camera Version*, with the actual values that were posted to the API.)
c) Select **Save**.

```
{
  "schema": {
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Camera Trap Event Schema",
    "type": "object",
    "properties": {
      "cameratraprep_camera-name": {
        "type": "string",
        "title": "Camera Name"
      },
      "cameratraprep_camera-make": {
        "type": "string",
        "title": "Camera Make"
      },
      "cameratraprep_camera-version": {
        "type": "string",
        "title": "Camera Version"
      }
    }
  },
  "definition": [
    {
      "key": "cameratraprep_camera-name",
      "htmlClass": "col-lg-6"
    },
    {
      "key": "cameratraprep_camera-make",
      "htmlClass": "col-lg-6"
    },
    {
      "key": "cameratraprep_camera-version",
      "htmlClass": "col-lg-6"
    }
  ]
}
```

**Table 8: Camera Trap Event Type Schema with generic vales**

## Help Improve EarthRanger

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support@pamdas.org.

# FIRMS: FIRE INFORMATION FOR RESOURCE MANAGEMENT SYSTEM

The *Fire Information for Resource Management System* (FIRMS) is a satellite-based fire detection system that distributes information about burning fires within three hours after a satellite overpass.
You can configure EarthRanger to report FIRMS data and to display the location of fires in the Map Window.
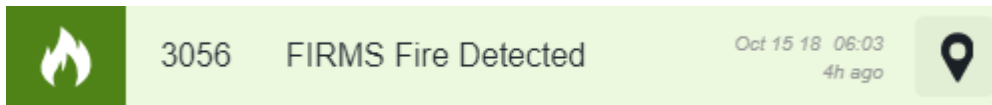

**Figure 43: FIRMS fire notification in the EarthRanger Reports Feed.**


**Figure 44: FIRMS icon showing the location of a fire on the EarthRanger Map Window**

## Configuring FIRMS

3. Get an APP KEY by registering with NASA
    a. Register a user at:  https://urs.earthdata.nasa.gov/home
    b. Use credentials created above to log into the site:  https://nrt4.modaps.eosdis.nasa.gov/
        i. Note: The "Log In" link is located under the Profile link in the top right corner
    c. Retrieve an APP key
        i. Select "App Keys" now available under the Profile link in the top right corner
        ii. Add Description such as "EarthRanger FIRMS APP Key"
        iii. Select "Create New App Key"
        iv. Copy and save the app key for configuration use below

## Configuring FIRMS at the EarthRanger Administration Page

4. Create a Source Provider
    a. At the EarthRanger Administration page, in the **Observations > Source Providers row**, select Add.
        • **Natural key for source provider:**  FIRMS
        • **Display Name for source provider:**  FIRMS Source Provider
        • Select **Save**.
5. Add Display Category
    a. At the EarthRanger Administration page, in the **Map Layers > Display Categories row**, select Add.
        • **Name**: FIRMS Display Category
        • Select **Save**.

6. Create Spatial Feature Type
    a. At the EarthRanger Administration page, in the **Map Layers > Spatial Feature Types row**, select Add.
        - **Name:** FIRMS Spatial Feature Type
        - **Tags:** FIRMS
        - **Display Category:** FIRMS Display Category (created above)
        - Select **Save**.
7. Create a Spatial Feature for the area you wish to receive reports
    a. At the EarthRanger Administration page, in the **Map Layers > Spatial features** row, select **Add**.
        - **Feature Type**: FIRMS Spatial Feature Type
        - **Name**: FIRMS Spatial Feature
        - **Display Category**: FIRMS Spatial Feature
        - **Feature Geometry**:
            - Select the Polygon Tool in the top right corner of the map 
            - Click around the outline of the region you wish to receive reports
            - Double Click to complete the polygon
        - Select **Save**.
8. Create a Static Spatial Feature Group
    a. At the EarthRanger Administration page, in the **Map Layers > Spatial feature group static** row, select **Add**. (**IMPORTANT**: Select the link with **static** in the title)
        - **Name**: FIRMS Spatial Feature Group Static
        - **Feature**: FIRMS Spatial Feature (created above)
9. Add a FIRMS Plugin
    a. At the Administration page, at the **Tracking > Firms plugins** row, select **Add**.
    b. At the **Add firms plugin** page:
        - **Unique name to identify the plugin**: FIRMS Plugin
        - **Status:** enabled
        - **Provider**: FIRMS source provider (created above)
        - **App key**: Enter your NASA FIRMS App key (created above)
        - **FIRMS region name**: [select appropriate region. Reference region map below.
        - **Spatial feature group**: FIRMS Spatial Feature Group Static (created above)
        - Select **Save**.
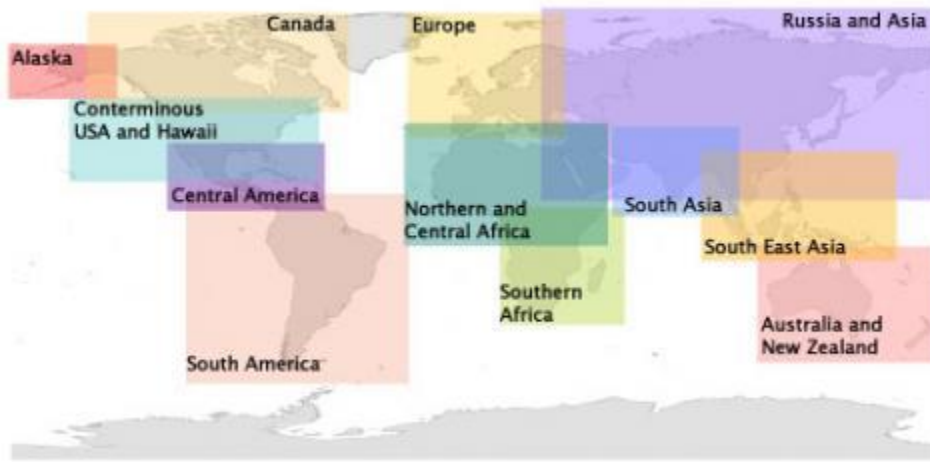
FIRMS: FIRE INFORMATION FOR RESOURCE MANAGEMENT SYSTEM

## Help Improve EarthRanger

If you have comments, corrections, or suggestions about this document, please email them to
support@pamdas.org.

# DEFORESTATION ALERTS AND FIRE ALERTS FROM GLOBAL FOREST WATCH

You can use EarthRanger to subscribe to Global Forest Watch (GFW) alerts about deforestation and fires detected in an area that you specify. Alerts are displayed in the Reports Feed, and the location of the deforestation or fire are displayed in the Map Window. (*Figure 45*)

- **Deforestation data** is created by the Global Land Analysis & Discovery (GLAD) lab at the University of Maryland using high (30 meter) resolution satellite data.
- **Fire data** is derived from high resolution, real-time satellite imagery, detailed maps of land cover, and other sources to show where fires occur and to help understand who might be responsible.



**Figure 45: Map Window showing where deforestation was reported (left), Reports Feed displaying the deforestation alert and a fire alert (right)**

## Subscribing to GFW Alerts Using EarthRanger

**To subscribe to GFW alerts**:
1. Log in to your EarthRanger administration web page (at https://<yourprotectedarea>.pamdas.org/admin).
2. Go to **Home > Analyzers > Global Forest Watch Subscriptions**.
3. Select **Add Global Forest Watch Subscription**.
4. In **Name**, enter a descriptive name, for example *Global Forest Watch Alerts*.
5. In **Alert types**, select the type of alerts you want to receive.
   If you want to receive both fire and deforestation alerts, select SHIFT while clicking (SHIFT+click) the second selection so both alert types are highlighted (Figure 46).
6. In **Subscription geometry**, zoom and pan to your protected area on the map, select the middle icon at the top right corner of the map window, press the SHIFT key, and use the mouse to define the area for which you want to receive alerts. (*Figure 47*) (If you don't like the area definition you make, just repeat the process to draw the outline again.)
7. Select **Save**.
   The new alert appears in **Home > Analyzers > Global Forest Watch Subscriptions**.

**Note**: An alphanumeric value in **Subscription ID** indicates that your subscription has been successfully created with Global Forest Watch. (*Figure 48*)



**Figure 46: Deforestation and fire alerts selected**
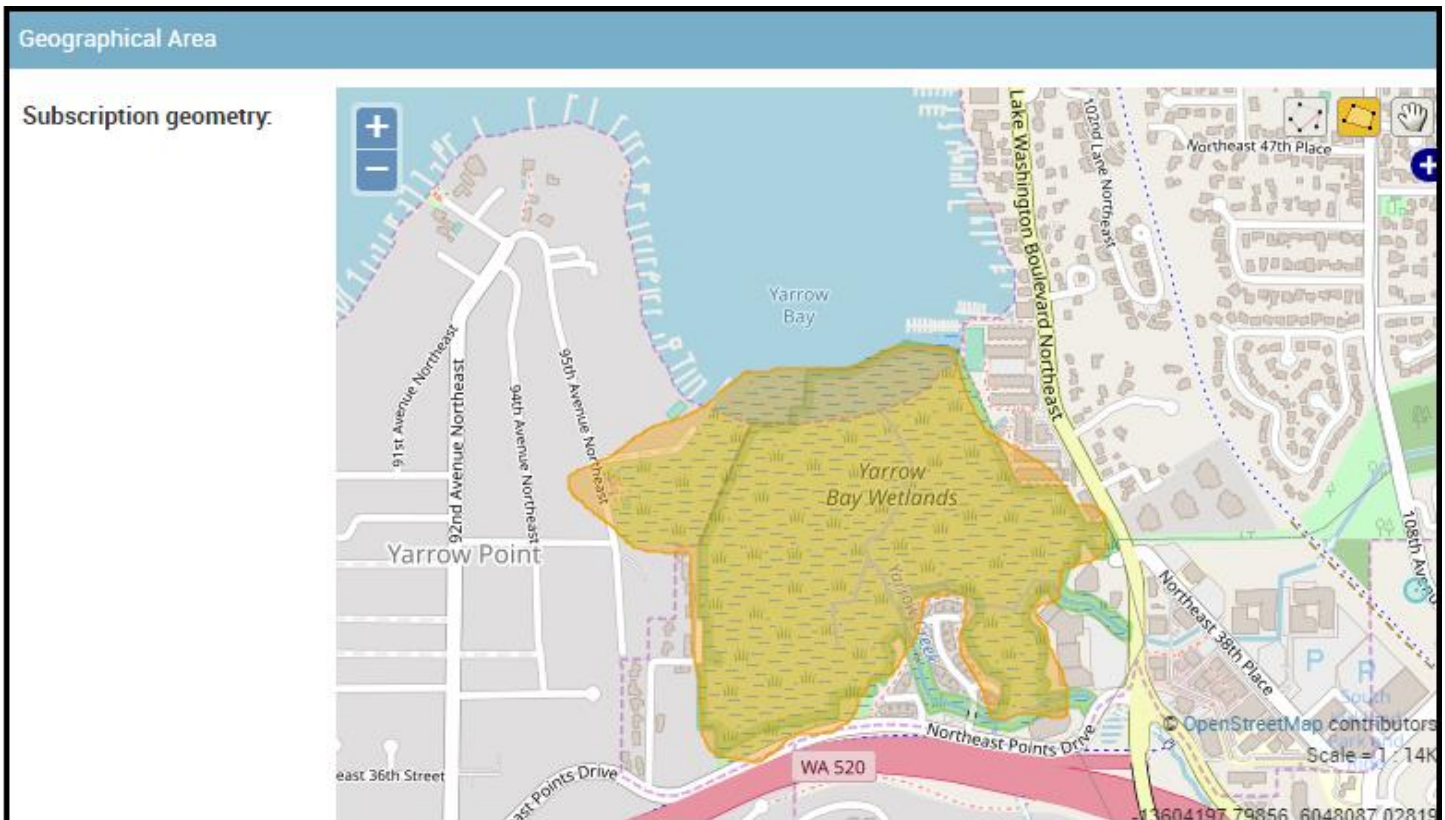


**Figure 47: Defining a geographical area for which to receive alerts**
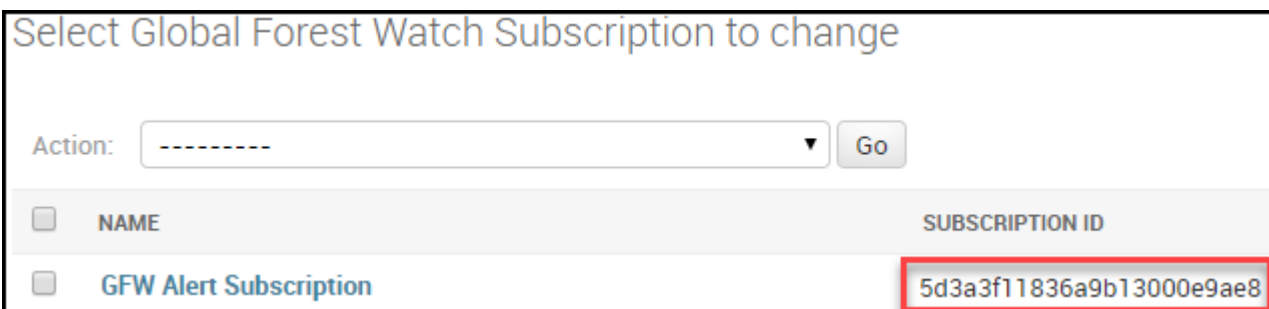


**Figure 48: A subscription ID received from Global Forest Watch indicates that the subscription is active**

## About Global Forest Watch

- **Global Forest Watch website**: www.globalforestwatch.org
- **Fires at Global Forest Watch**: fires.globalforestwatch.org

**Contacting EarthRanger**

- **EarthRanger website**: EarthRanger.com

If you cannot find the information you need in the support documents, contact your EarthRanger representative or the EarthRanger team in Seattle at support@pamdas.org.

# INTEGRATING SMART CONNECT AND EARTHRANGER

(Using SMART Version: 2019.05.07.1)

## Introduction

This article explains how information in the Spatial Monitoring and Reporting Tool (SMART) can be shared with and viewed in Vulcan EarthRanger using SMART Connect (an extension to SMART that enables information in SMART to be exported and thus shared with other platforms, such as EarthRanger).

Using SMART Connect to share SMART data with EarthRanger can give users of EarthRanger an even more detailed, up-to-date, and easy-to-understand view of the status of and activities in the areas that they seek to protect.

At a high level, the relationship between SMART, EarthRanger, and their users looks like *Figure 49*.
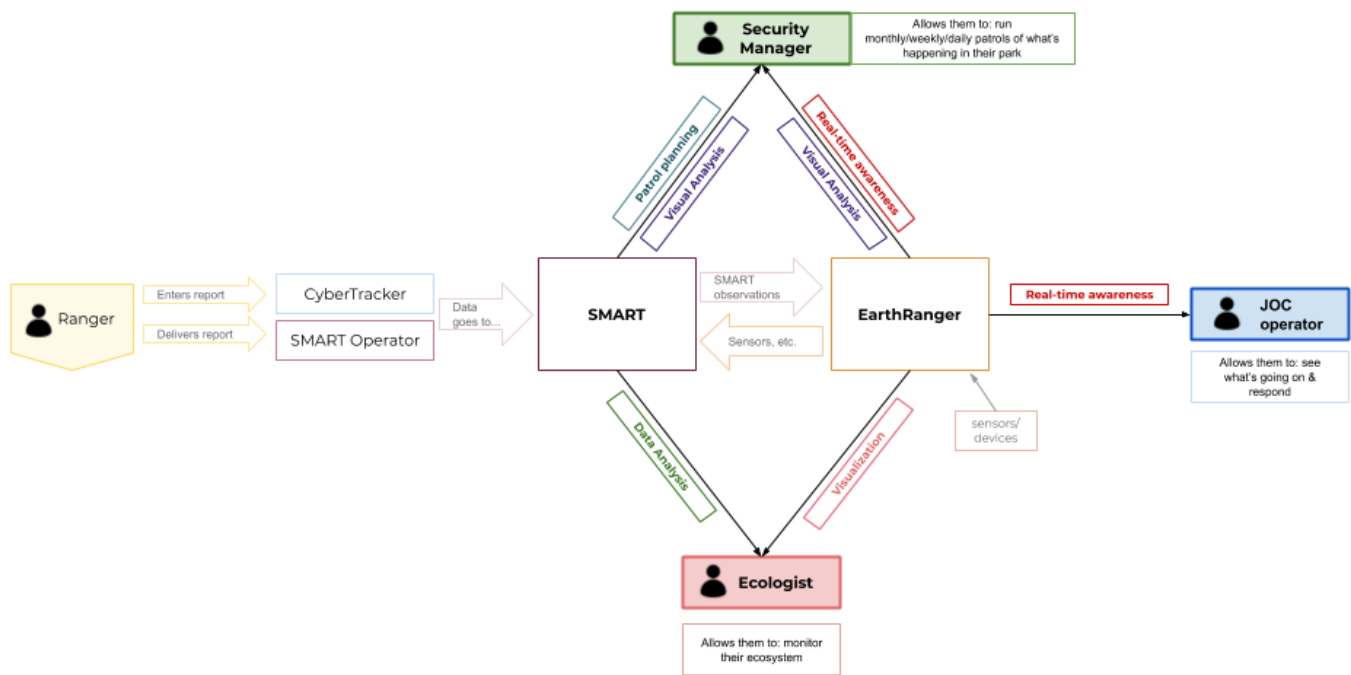


**Figure 49: Relationship between SMART, EarthRanger, and their users**

## SMART, SMART Connect, and EarthRanger

- The Spatial Monitoring and Reporting Tool (SMART) is conservation software used all over the world to measure, evaluate, plan, and improve the effectiveness of wildlife law-enforcement patrols and site-based conservation activities.

- EarthRanger is a software solution developed by Vulcan Technology to integrate and display all the data gathered in a protected area (for example, from patrols, collared animals, satellites, or weather Reports) to provide a single operational picture and to alert managers when critical threats are identified.
- SMART Connect is an extension to SMART that enables information in SMART to be exported and shared with other platforms, such as EarthRanger.

## Sections in this Guide

This guide has four sections:

- Moving Data from SMART to EarthRanger
- Viewing SMART data in EarthRanger
- Getting SMART Connect and EarthRanger to Work Together
- Anticipated Improvements

## Moving Data from SMART to EarthRanger
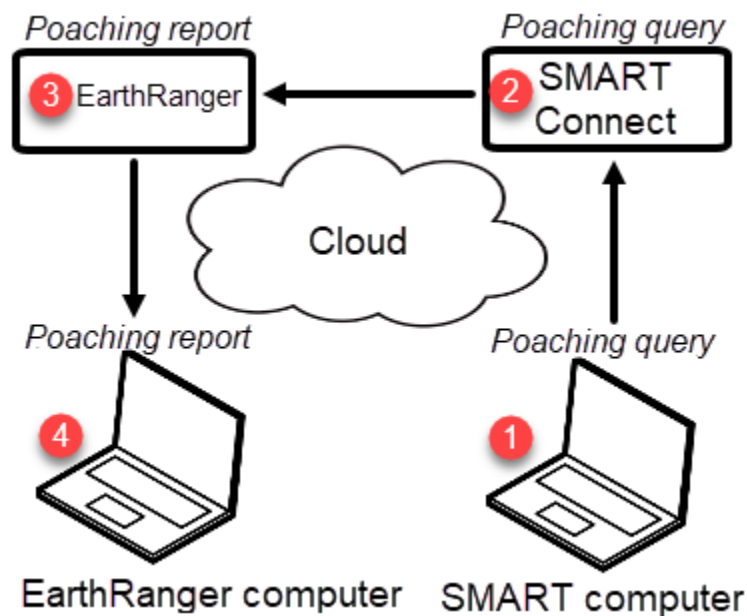


**Figure 50: Transferring data from SMART to EarthRanger**

The four-step data transfer process shown in is:
1. Operator creates a query in SMART (for example, a query that returns the locations of all poaching incidents in the last month).
2. The query is uploaded to the SMART Connect data repository (along with the latest patrol information).
3. EarthRanger polls the SMART Connect data repository periodically for queries, runs the queries, using them to create Reports in EarthRanger.
4. Query information can be viewed in EarthRanger as Reports and in the Map Window.

INTEGRATING SMART CONNECT AND EARTHRANGER

**To synchronize changes between SMART and SMART Connect:**

1. On the menu bar in SMART, select **Connect** (*Figure 51*).
2. Select **Sync All Changes to/from Connect** (*Figure 51*).
   The **Sync changes with SMART Connect** window appears.
3. Enter your Connect username and password.
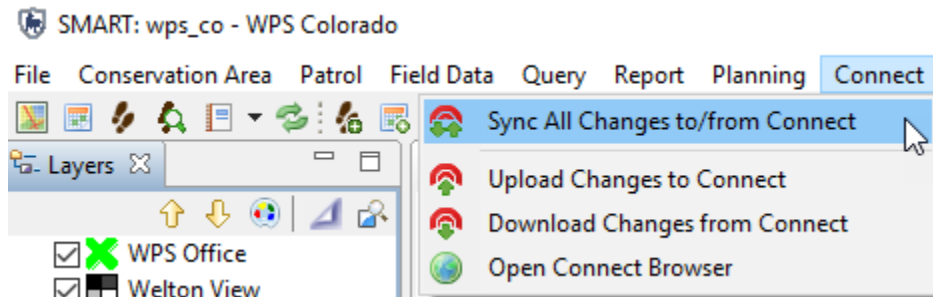4. Select **OK**. All changes are synchronized between SMART and SMART Connect.



**Figure 51: Synchronizing changes between SMART and a remote SMART Connect data repository**

## Example: End-to-end data transfer, from SMART query to EarthRanger Report

The following example traces the transfer of data from SMART to EarthRanger from beginning to end.

1. A SMART user creates a query in SMART and names it *SMART: Black rhino sighting*.
2. The user uploads the query (along with any other changes in the SMART database) to the remote (cloud-based) SMART Connect data repository.
3. An EarthRanger administrator configures EarthRanger to run the *SMART: Black rhino sighting* query periodically and display the results as a series of EarthRanger Reports (*Figure 52*) and to display the results in the EarthRanger Map Window (*Figure 53*).
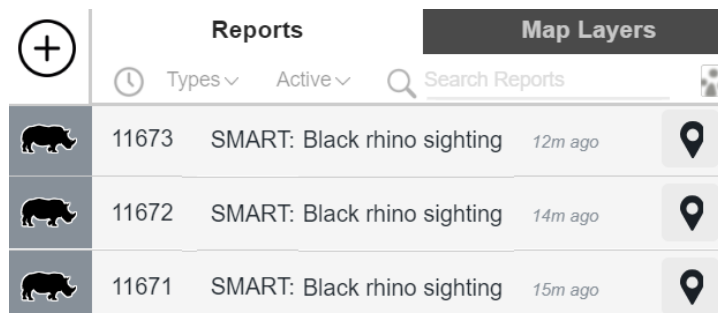


**Figure 52: Reports Feed with three EarthRanger Reports generated from the SMART query "SMART: Black rhino sighting"**

INTEGRATING SMART CONNECT AND EARTHRANGER

## Overview of the EarthRanger User Interface
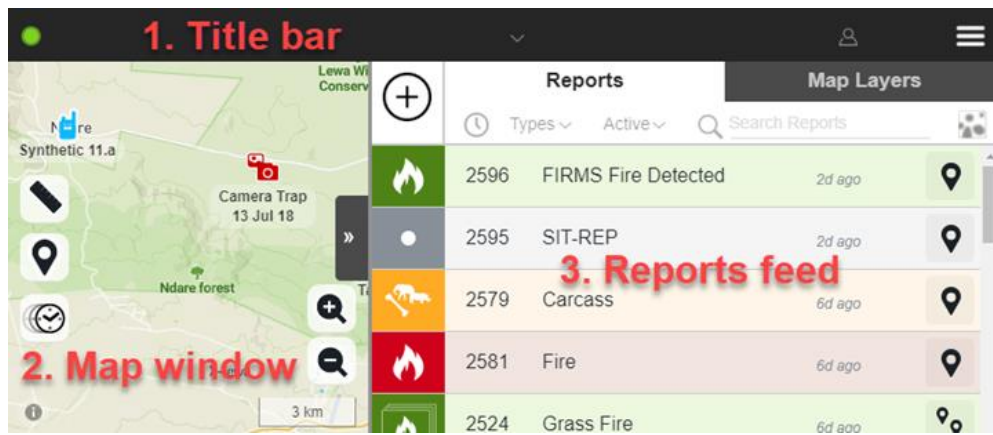


**Figure 53: Title bar, Map Window, and Reports Feed in the EarthRanger user interface**

The EarthRanger user interface has three parts:

**Title bar** – Map title, map selector, online indicator, user name, and multifunction button menu with additional options.

**Map Window** – Map or satellite view of the protected area

**Reports Feed** – Pull-out menu in which you can view Reports and Map Layers

Reports appear in the Reports Feed (_Figure 52_ and _Figure 53_). Icons showing the location of reported information appear in the Map Window (_Figure 53_). Selecting a Report title or a map icon opens the Report.

## Viewing SMART Report Data in EarthRanger



**Figure 54: A basic SMART Report (created from test data) in EarthRanger**

You can open and view Reports created from SMART data (*Figure 54*) by selecting a:

- Location marker (icon) in the Map Window (for example, the Camera Trap icon on the map in Figure 53)
- Entry in the Reports Feed (for example, one of the five Reports shown in Figure 53)

**Optimizing EarthRanger for Use with Data Uploaded from SMART**

EarthRanger can be configured to make it easier to use the data that you import from SMART. For example, you can associate a unique icon with an EarthRanger Report that is created from a particular SMART query, such as the rhino icons in the poaching Reports in *Figure 52*.

You can also associate a default priority level with a SMART query/EarthRanger Report (for example, making a poaching Report high priority).

You can configure other settings as well, for example the **SMART** Report category shown in *Figure 55* makes it easy to show only SMART Reports by selecting the SMART check mark. (You can also search for Reports created from SMART data by filtering Reports by string, as shown in *Figure 56*).
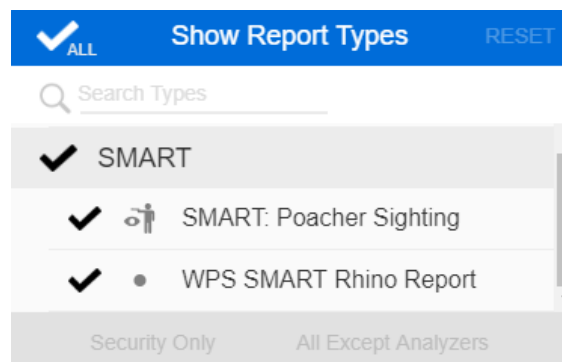


**Figure 55: EarthRanger configured with a separate SMART Report category (and two sub-categories)**

**A Selection of EarthRanger Map Window Features**

The EarthRanger Map Window has a variety of features that make using map information easier. These include zoom, distance measurement, bearing measument, and scale controls.

Three more Map Window features, filtering, heat maps, and time slider are discussed in the following sections.

*Filtering*



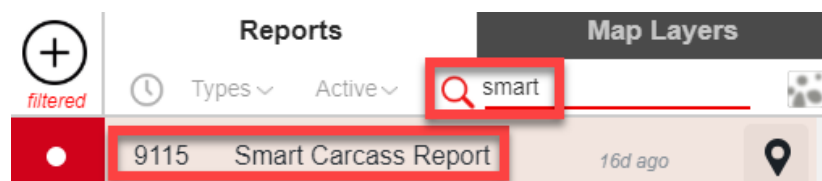**Figure 56: Filtering for Report titles containing the word "smart"**

One way to identify Reports that were created from SMART Connect data (beside the specialized configuration shown in *Figure 55*) is simply to filter Report titles (*Figure 56*). Giving all SMART Connect queries a distinctive titles (for example "SMART: xxx," makes searching by string easier.

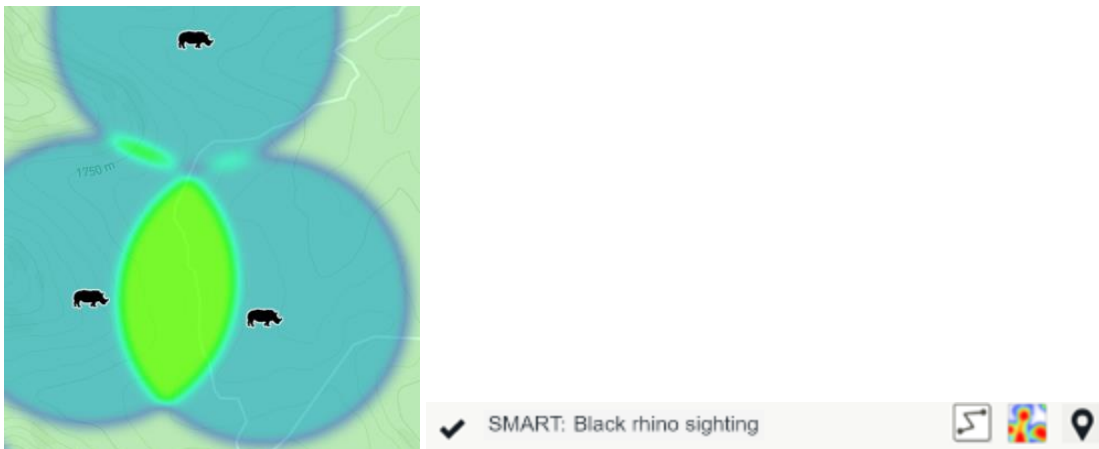INTEGRATING SMART CONNECT AND EARTHRANGER

### Heat Maps



**Figure 57: Heat Map display on a map and Heat Map selector in a map layer entry**

Heat Maps reveal the position of a tracked subject over time as a series of colored circular areas. The more time that a subject spends within a circle, the warmer the color of the circle becomes.

SMART Report data can be viewed using heat maps. You can turn a heat map for a subject on and off by selecting:

•        A subject's icon in the Map Area
•        The Heat Map icon in the subject's Map Layer entry

### Time Slider
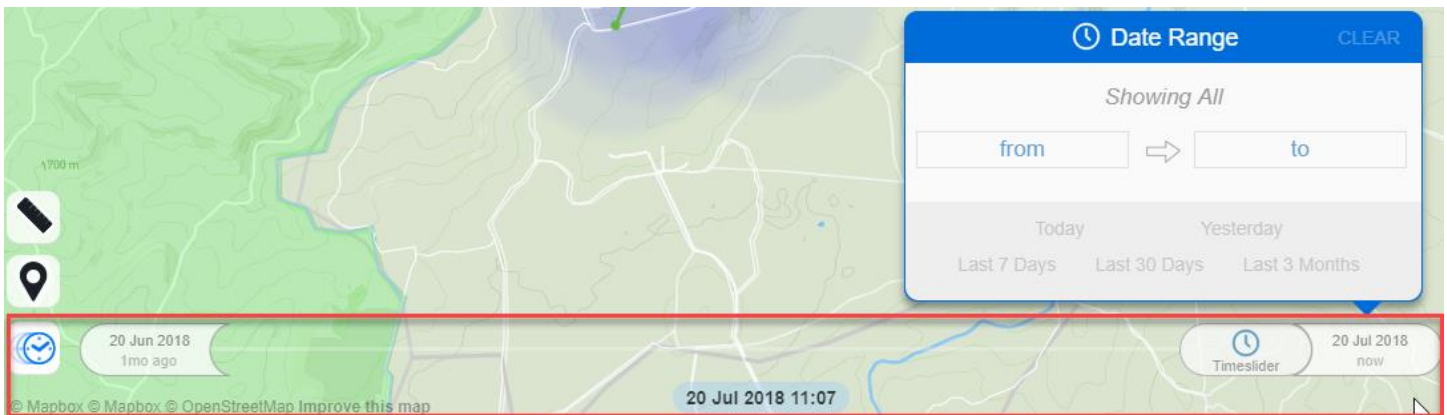


**Figure 58: Time Slider with the Date Range window**

Select the clock icon at the bottom left of the Map area to activate the Time Slider, which gives continuous views of the map and the SMART Report data displayed on it over a time span that you can specify (*Figure 58*).

# Setting Up SMART Connect and EarthRanger to Work Together

This section describes how to connect SMART Connect and EarthRanger so you can view queries of SMART Connect data as Reports in EarthRanger. (Note that only three types of SMART Connect queries are supported for use with EarthRanger: patrol observation queries, patrol waypoint queries, and observation queries.)

Setting up SMART Connect and EarthRanger to work together requires making settings on both systems, though primarily to EarthRanger. (Only step 3 below is performed on Smart Connect.)

**To configure SMART Connect and EarthRanger to work together:**
1. Create an EarthRanger service user to communicate with SMART
2. Create a long-duration access token for the service user
3. Create a SMART Connect user
4. Add an event provider
5. Add a new event type
6. Verify that SMART and EarthRanger are working together

## 1. Creating an EarthRanger Service User to Communicate with SMART

At the EarthRanger Administration website, create a service user that can be used to log into SMART.

**To create an EarthRanger user to communicate with SMART:**
a) Log in to the EarthRanger Administration website (at
   https://`<yourprotectedarea>`.pamdas.org/admin>).
b) Go to **Home › User Accounts › Users**.
c) Select **Add User**.
   The **Add user** page appears.
d) Enter the following minimum required information to create an EarthRanger service user to log in to SMART Connect. (Note that you can enter dummy personal information for this service user.)
- First name
- Last name
- Email
- Phone
- Username
- Permission sets: No permissions required
e) Select **Save**.

## 2. Creating a Long-Duration Access Token for the Service User

At the EarthRanger Administration website, create an access token for the service user.

**To create a long-duration access token for the service user:**
a) At the EarthRanger Administration website, go to **Home › Django OAuth Toolkit > Access Tokens**.
b) Select **Add Access Token**.
   The **Add access token page** appears.
c) In **Token**, enter a descriptive name for the token, for example *SMART_User_Access_Token*.
d) In **Expires**, set a token expiration date and time far in the future, so it will not expire.
e) In **Scope**, enter `read write`.
f) Click **Save**.

INTEGRATING SMART CONNECT AND EARTHRANGER

## 3. Creating a SMART Connect User

Log in to SMART and create a SMART Connect user using the EarthRanger service user you created in step 1. Creating an EarthRanger Service User to Communicate with SMART. You can refer to the documentation for SMART and SMART Connect at http://smartconservationtools.org/.

## 4. Adding an Event Provider to EarthRanger

At the EarthRanger Administration website, add an event provider.

**To add an event provider to EarthRanger:**
a) Log in to the EarthRanger Administration website (at
   https://<`yourprotectedarea`>.pamdas.org/admin>).
b) Go to **Home › Activity › Event providers**.
c) Select **Add Event Provider**.
   The **Add event provider** page appears.
d) In **Description**, enter "*Smart Connect*."
e) In **Owner**, select the EarthRanger service user that you created for SMART in step 1.
f) The **Whether this Event Provider is active** check box is selected by default and should remain checked.
g) In **Provider API**, enter the SMART Connect URL (for example *https://smartaws.wlpt.org:8443/)*.
h) In **Provider API Username**, enter the name of the SMART Connect user you created in step 1.
i) In **Provider API Password**, enter the SMART Connect user password.
j) **Provider Authorization Token**: Leave blank.
k) **Advanced**: No settings required.
l) Select **Save**.

## 5. Adding a new event type in EarthRanger

At the EarthRanger Administration website, add a new event type. (These steps use a rhino sighting as an example of an event type.)

**To add a new event type in EarthRanger:**
a) At the EarthRanger Administration page, go to **Home > Activity > Event types**.
b) Select **Add Event Type**.
c) At the **Add event type page**, in **Display**, enter a name for the event, (for example *SMART: Rhino Sighting*).
d) In **Value**, enter *Smart_rhino_sighting*.
e) In **Category**, select the green plus sign to add a new event category.
   The Add event category page appears.
f) In **ID**, an ID value is automatically generated so no further action is required.
g) In **Value**, enter **Smart_rhino_sighting**.
h) In **Display**, enter **SMART Reports**.

i) Leave **Ordernum** blank.

j) In **Flag**, select **System**.

k) Click **Save**.
The **Add event type** page reappears.

l) In **Icon Override**, select the green plus sign.
A collection of icons appears.

m) Select **rhino sighting**.

n) Leave **Ordernum** blank.

o) **In Default priority**, select **None**.

p) **In Default state**, select **Resolved**.

q) In Schema, select the Use Generic Key-Value schema button.
A schema automatically appears in the **Schema** box.

r) Click **Save**.

## 6. Verifying that SMART and EarthRanger Are Working Together

The final setup step is to verify that SMART Connect and EarthRanger are working together as intended.

In the Reports Feed in EarthRanger, monitor the resolved Reports for the appearance of SMART Connect query results to validate that the systems are working together as intended. (Note that some time will pass before the event provider runs, however).

# Anticipated Improvements in the Second Phase of SMART Integration

In a second phase of the integration, the following improvements are anticipated.

## Push Integration

The phase 1 integration is based on EarthRanger polling the SMART APIs periodically to retrieve data. To reduce the frequency of connections and to eliminate the lag in getting new data due to the polling interval between requests, it would be preferable for SMART to have a push API to EarthRanger. When SMART receives new data, that data should be pushed to EarthRanger immediately.

## Tighter Integration of Data Models

Instead of having separate Reports, one set of which are preceded by "SMART:" and one which isn't, it would be better if a mapping could be defined for how a site's SMART data model for a Report can be transformed into their EarthRanger data model. EarthRanger could then import those Reports and add that data into the existing feeds and Report types.

That mapping would have a number of benefits:

- Users would not have to know whether a Report came from SMART or not; they could react to it the way they would any Report.

- Analysis would not have to be divided between two different sources for the same type of information. A snare Report from SMART would be treated the same in the analysis as a snare Report from EarthRanger.
- Any notification rules that users created regarding Report types would work regardless of the source.
- Preventing duplication of Report types would also prevent Report type filters and layer selections doubling, which would reduce crowding in the user interface.

For scenarios in which the distinction is important, a field would be added to every Report that is titled something like "Report Source". Potential values for that field might be "Direct EarthRanger Entry," "Integrated Sensor," "SMART Integration," etc.

## Two-Way Edits

In phase one, after a Report is transferred from SMART to EarthRanger, if that Report is changed in some way, synchronization between SMART and EarthRanger is lost. What should happen instead is that whenever a Report is edited in EarthRanger, those modifications should also be sent to SMART via API, and SMART could update its version so that everything is synchronized.

## Patrol Planning

Users of SMART are able to plan patrol objectives and routes. Through the anticipated integration, those patrols would be shown on the map in EarthRanger, and teams could be monitored as they proceed through the route and objectives. Their positions could be followed and recorded based on personal, radio, and/or vehicle GPS integrations. Events that result from their patrol could be viewed within the context of the patrol. EarthRanger could also inform SMART of the progress of the patrol for analysis and tracking in SMART.

## Help Improve EarthRanger

If you have comments, corrections, or suggestions about this document, please email them to support@pamdas.org.