# Exercise – Enumeration Areas

In this exercise you will work with an existing file geodatabase and create new enumeration areas within the established larger census area maintaining geographic integrity between areas. Attributes will be updated within the feature class. Finally, you will join a database containing census attributes with wards feature class, allowing you to further map and analyze the census attributes in a future exercise.

Step 1: Create a new enumeration area within the already established larger census area (ward, administrative) by tracing the boundary of a ward.

- Open ArcMap document exerciseEA.mxd found in the c:\un\exerciseEA\ directory.

- Activate the bookmark **Ward Njanji** from the View menu.
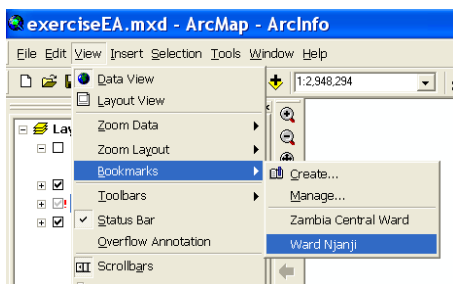
- Turn on the Editor Toolbar by selecting it from the **View -> Toolbars** menu.

- **Start Editing**.
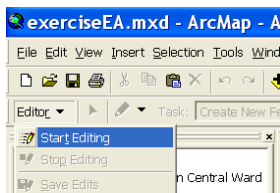
- For Task select **Create New Feature** and for Target: **Enumeration Area in Central Ward.**

- Set the snapping of features. Click on the **Editor** drop-down menu and select **Snapping**. The snapping dialog window will appear.

- In the snapping dialog window, activate the Zambia Central Wards **and** Enumeration Area snapping to **Vertex** and **Edge**. (see example window ->)

- Close **Snapping** toolbar.

- Click the **Edit** tool on the Editor Toolbar.

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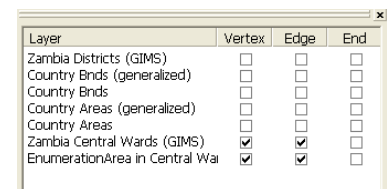
- Click the polygon you want to trace. In this case, click on the Njanji Ward.
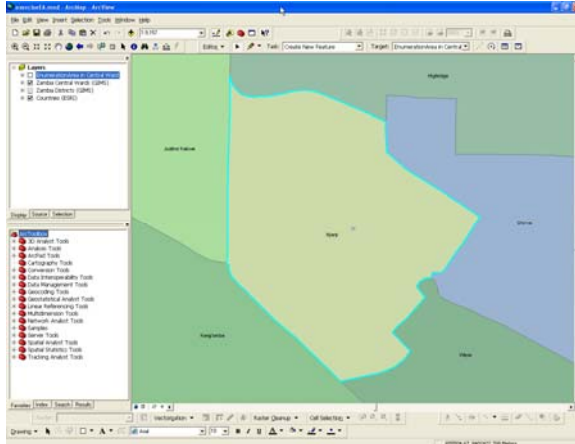
- Click the tool palette drop-down arrow and click the **Trace** tool [icon].

- Click to start tracing and trace the entire ward.

Note: Optionally, press the O key to set an offset value and other options as desired.

- Click to stop tracing.

- When you are finished tracing, right click and select **Finish Sketch**.

- On the Editor Toolbar, select the Editor drop-down menu, and select **Save Edits**.

Tips

   o *If you traced too far or traced in the wrong direction, move the pointer backward over what you have traced. If you have clicked to stop the trace, click Undo to remove all vertices added during the trace.*
   o *As you are tracing, you can change which features are selected by clicking the Edit tool, changing the selection, then clicking the Trace tool again.*
   o *Press the Esc key to cancel a trace.*
   o *Press the Spacebar to temporarily suspend snapping while you are tracing along the selected features.*

- Turn on the EnumerationArea in Central Ward feature if not already on by c**licking the box next to the feature class** in the table of contents.

- Keep ArcMap open for the next step.

Step 2: Create an enumeration area by dividing the large polygon from 1 into individual polygons.

- Click the **Edit** tool [icon] on the Editor Toolbar.

- Click the polygon you want to split. In this case, click on the **new enumeration area** encompassing all of Njanji Ward that you created in Step 1.

- Click the current Task: drop-down arrow and click **Cut Polygon Features**.
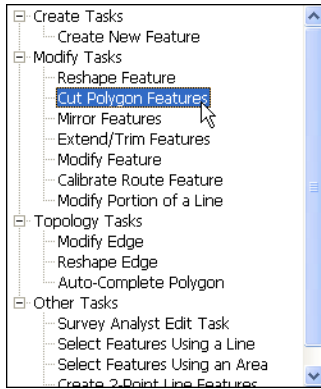
- Click the tool palette drop-down arrow and click the **Sketch** tool .

- Construct a line sketch that cuts the original polygon as desired. You should start and finish by clicking outside of the border to ensure that a complete polygon is created. See picture below for approximate shape of the new enumeration area. This shape was created with three clicks.

Note: If imagery data or other spatial data like roads is available, use this data as a guide for splitting this polygon.

- Right-click anywhere on the map to stop and click **Finish Sketch**. The polygon is split into two features/two enumeration areas.

- On the Editor Toolbar, under Editor drop-down menu, select **Save Edits**.

**Step 3: Create second enumeration area within the ward.**

- Click the **Edit** tool on the Editor Toolbar.

- Click the polygon you want to split. In this case, click on the **larger enumeration area** encompassing the remainder of the Njanji Ward.

- Click the tool palette drop-down arrow and click the **Sketch** tool .

- Click on the **top left point** and move the pointer away.

- **Right click** to activate the dialog window as shown in the graphic.

- Select **Direction,** type in **285** and press **Enter**.
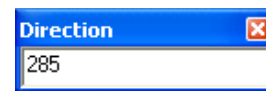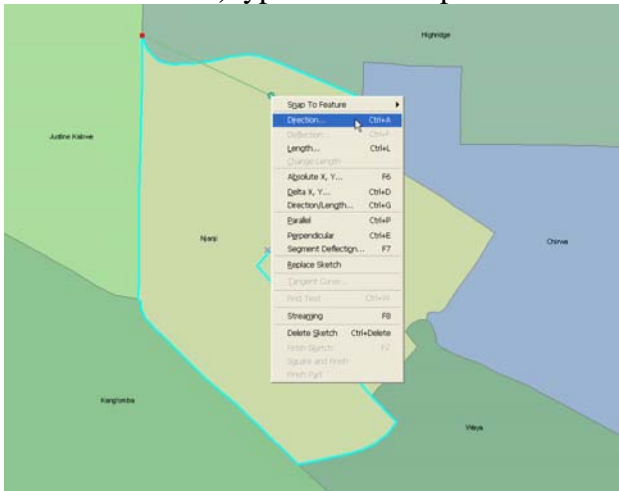
- Move the pointer back and forth to experience how the segment stays along the same angle.

- Right click to activate the **dialog** window again.

- Select **Length**, type in **670** and press **Enter**.

- Move pointer to the corner of the previously created enumeration area, click to place a node.
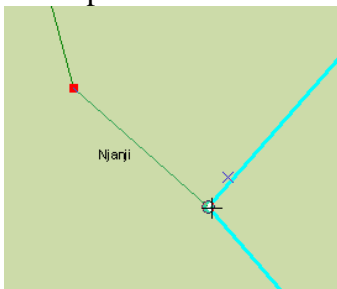
- For the remaining sides of the polygon, click the tool palette drop-down arrow and click the **Trace** tool .

- Click on starting point to start tracing.
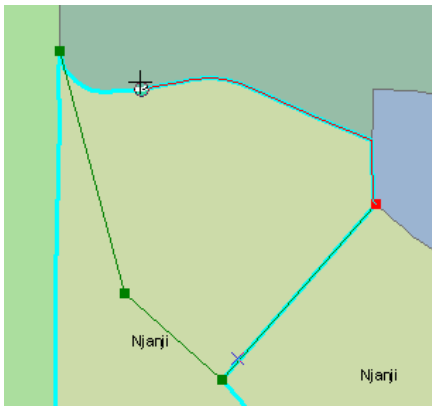
- Click to stop tracing.

- Right click and select **Finish Sketch.**

- The result is 3 separate enumeration areas within Njanji Ward.

- Click **Save Edits** in the Editor drop-down menu.

Step 4: Editing Attributes for the new features using the Attributes dialog box.

You created three enumeration areas in the Njanji Ward and each needs a UniqueID (which can be created automatically by a custom program). This UniqueID is *not* the EACode, but it is utilized by the file geodatabase by ArcGIS for management of data. In addition, the EACode should be populated.

- Click the Editor menu and click **Start Editing**, if not already started.

- Click the **Edit** tool [▶] on the Editor toolbar.

- Select one of the new features whose attributes you want to edit. In this case, select the new enumeration area in the **top left** corner. You may have to clear selected features then select then select the intended features.

- Click the **Attributes** button [▦] on the Editor toolbar.

- Click the **feature** on the left side of Attributes dialog box.

    The layer's attribute properties appear on the right side of the dialog box, and the feature flashes on the map.

- Click in the Value column on the right side and type the attribute value as follows
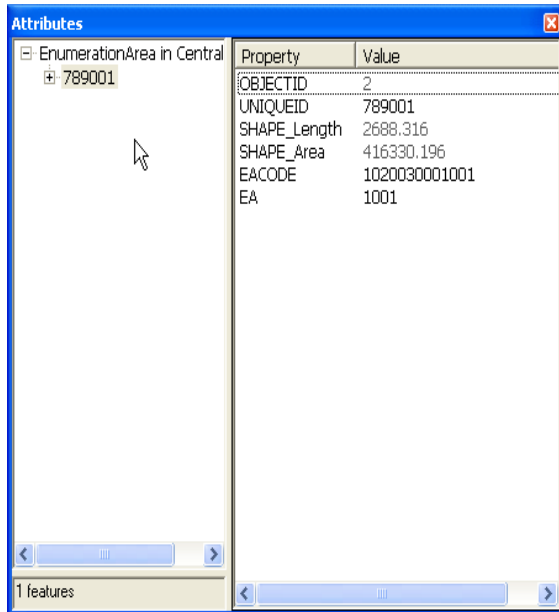
    UNIQUEID = **78900**
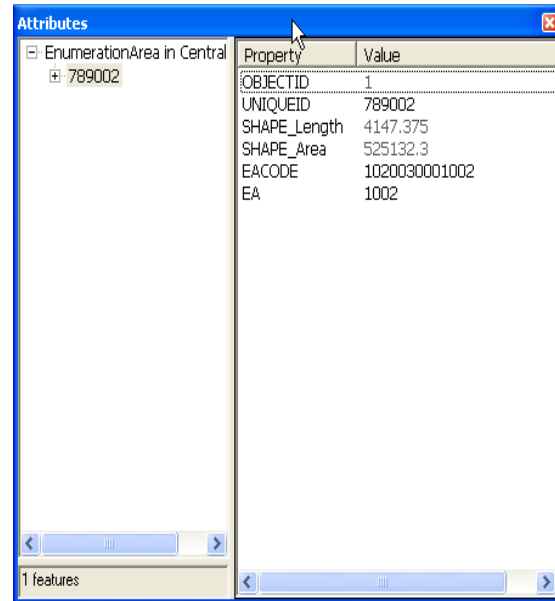
    EACODE = **1020030001000**

    EA = **1000**

NOTE: During the exercise, the EACODE format will adhere to a common format of Province (2 digits), District (3 digits), Locality/Ward (4 digits) and EA (4 digits). In this exercise, the

EACODE is stored as a text field. The EACODE for your country may vary. The format used in the exercise for EACODE is not necessarily the format used in Zambia. The format was changed for exercises only.

- The attribute dialog should include the values above. Your SHAPE_Length and SHAPE_Area will be different. This is automatically calculated.

- For remaining two new enumeration areas, enter the following information.

Attributes		
⊟ EnumerationArea in Central	Property	Value
⊞ 789001	OBJECTID	2
	UNIQUEID	789001
	SHAPE_Length	2688.316
	SHAPE_Area	416330.196
	EACODE	1020030001001
	EA	1001
1 features		

Attributes		
⊟ EnumerationArea in Central	Property	Value
⊞ 789002	OBJECTID	1
	UNIQUEID	789002
	SHAPE_Length	4147.375
	SHAPE_Area	525132.3
	EACODE	1020030001002
	EA	1002
1 features		

- **Save Edits** and **Stop Editing** in the Editor drop down menu.

Step 5: Join Spatial Features to Databases which contain Census Attributes

When determining the structure of the census geographic region spatial database in relationship to census attributes, you may find that it is best to manage the census attributes in a table separate from the spatial features. The link between the two will be a Unique Id. In this exercise, we utilized the Central Wards feature class and joined to Census Attributes in a table stored within the same file geodatabase.

- Open **exerciseEA.mxd**, if not already open.

- Turn off layer EnumerationArea in Central Ward (**click in its checkbox**).

- Zoom to bookmark **Zambia Central Ward**.
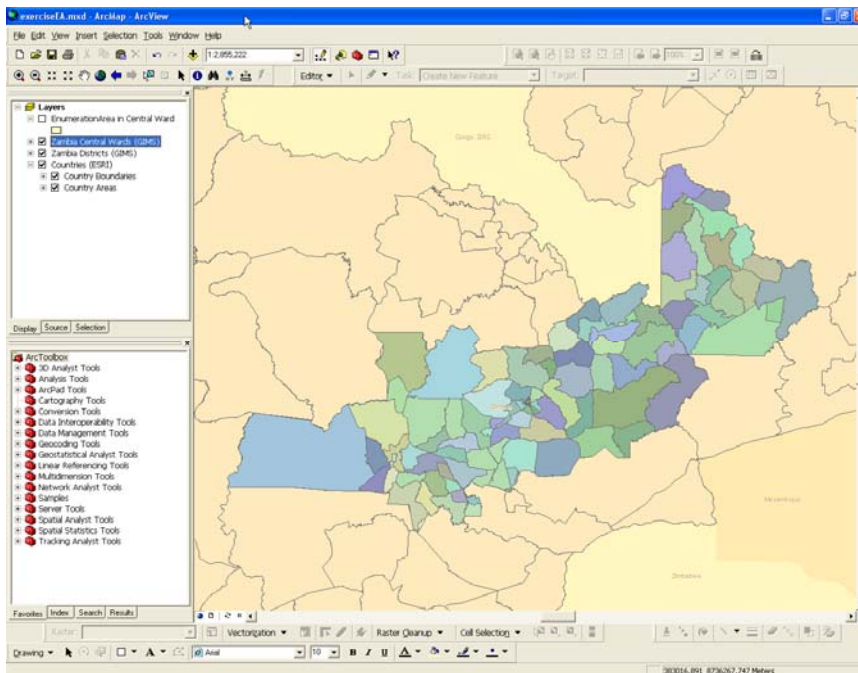
- Click the **Add Data** button ✛ on the Standard toolbar.

- Click the **"Look in:"** drop-down arrow and navigate to the folder **C:\un\exerciseEA** that contains the file geodatabase **exerciseEA_FGDB**.

- Double click the file geodatabase **exerciseEA_FGDB**.

- Click the table **Wards_Cent_PopTbl**.

- Click **Add**. *(The Source tab on the Table of Contents will automatically be selected)*.

- Open table to view the attributes. **Right click** table name **Wards_Cent_PopTbl** and select **Open**.

- Compare to attributes in the feature class Zambia Central Wards (GIMS). **Right click** Zambia Central Wards (GIMS) and select **Open Attribute Table**. *The feature class for the ward does not contain census data at this time*.

- Again, **right click** the layer Zambia Central Wards (GIMS), point to **Joins and Relates**, and click **Join**.
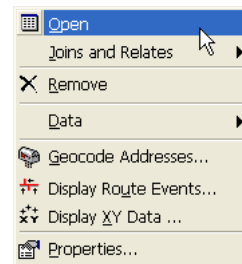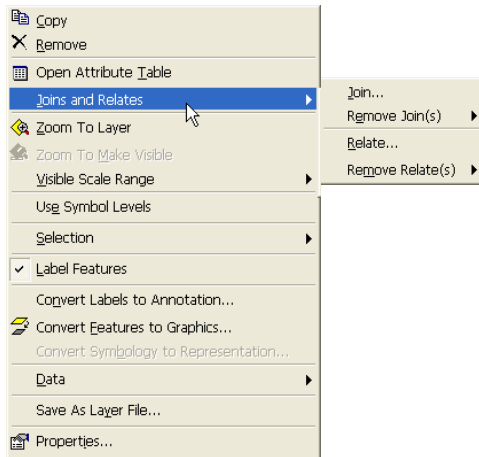
- Click the first drop-down arrow and click **Join attributes from a table**.

- Click the second drop-down arrow and click the field name **ID** – this is the field on which the join will occur in the Zambia Central Wards (GIMS) layer.

- Click the third drop-down arrow to choose the table **Wards_Cent_PopTbl** to join to the layer.

- Click the fourth drop-down arrow and click the field **AREA_ID** – this is the common field from the Wards_Cent_PopTbl. (**see graphic below**)

- Click **OK**.

    The fields of the Wards_Cent_PopTbl table are *appended* to the Zambia Central Wards (GIMS) layer's attribute table.
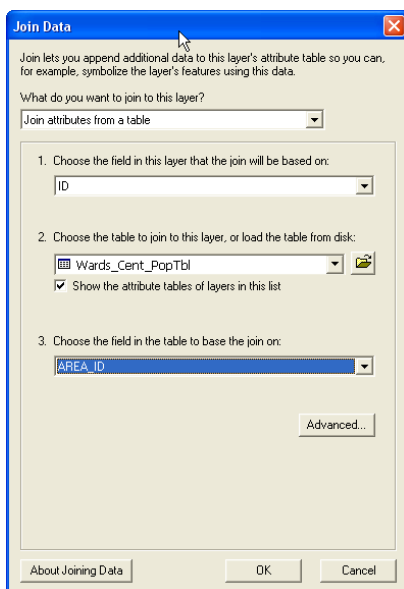
Tips

> o *If you want to permanently save joined data with your geographic features, export the data to a new feature class, right-click the layer in the table of contents, point to Data, and click Export data.*
> o *When editing joined data, you cannot edit the joined columns directly. However, you can directly edit the columns of the origin table. To edit the joined data, you must first add the joined tables or layers to ArcMap. You can then perform edits on this data separately. These changes will be reflected in the joined columns.*

- Click the **Identify** tool ⓘ on the Tools toolbar. The Identify window opens.

- Click the mouse pointer over the Zambia Central Wards map feature you want to identify. The features in the topmost layer (by default) under the pointer will be identified. You may need to change the **Identify from**: box to **Zambia Central Wards (GIMS).**

- Right-click the *left side* of the **Identify window** to interact with the identified **features**, or the *right side* to work with their *attribute values*.

- In the Identify window, the joined attribute fields, such as Wards_Cent_PopTbl.POP_2000 are visible (see below)
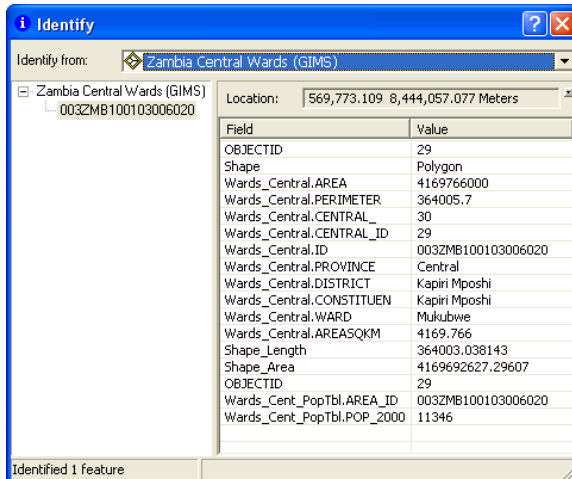
Tips with Identify

- *Hold down the Shift key while clicking the map to keep the results of your previous clicks in the Identify window.*
- *You can drag a box with the Identify tool to identify all the features inside the box.*
- *Feature geometry is needed to perform Flash, Zoom To, Pan To, and Create Bookmark. In some cases, feature geometry is not available, so these commands are disabled. These*

cases include the identification of features from any WMS layer and features from an ArcIMS image service that does not include geometry in any query results.

- *Click a feature in the Identify Window to flash it on the map. Clicking a layer will flash all identified features for that layer.*
- *Click a field name on the right side of the Identify window to select it. When a field is selected, it will remain highlighted in the right side of the Identify window as you identify additional features from that layer. Alternatively, switch between features from one layer in the left side of the window by clicking them in sequence. This makes it easy to compare the attributes for multiple features, especially when the layer has a large number of fields.*
- *You can hide unwanted fields to simplify the listing. Right click on the field name in the Identify window and click the Hide Field(s) command. Use Show All Fields to unhide fields that you have hidden. Hiding fields in the Identify window is temporary and only affects your current Identify session. It does not affect field visibility in any other dialog boxes, or when you open the attribute table for the layer.*
- *Hold down the Ctrl key and click on any + or - to expand/contract all entries in the identified results tree. This makes it faster to work with the tree.*
- *When you right-click a feature in the left side of the window, the context menu has several options that make it easy to work with features you have identified. For example, you can sort the features and remove unwanted ones from the window. Copy Record copies all the attributes of the feature you right-clicked.*
- *To change the Primary Display Field for a layer, double-click the layer in the table of contents, and click the Fields tab in the Layer Properties dialog box. Specify and different field, and it will be used as the Display Field the next time you identify a feature.*
- *The "Identify from: <Selectable layers>" option can be useful as your default, because it restricts Identify to the same set of layers on which the interactive selection operates. In this way, you can use the Selection tab in the table of contents or the Selection > Set Selectable Layers dialog box to specify exactly which layers you want to identify.*

Thanks to

  and

for data and materials for this exercise.

Data note: The GIMS, Ltd. data was modified to fit the scenario of this exercise.