

<b>1</b>	<b>INTRODUCTION.....</b>	<b>1</b>
<b>2</b>	<b>WAYPOINT MANAGEMENT .....</b>	<b>2</b>
<b>3</b>	<b>ROUTE DIGITIZING .....</b>	<b>12</b>
<b>4</b>	<b>GARMIN TO SHAPE.....</b>	<b>17</b>
4.1	How to Make a Simple Shape from Garmin MapSource for Free.....	18
4.2	Complex Polygons From Garmin .....	26

## 1 Introduction

The purpose of this guide is to enable you to use Garmin's retired but very useful MapSource software to digitize lines from waypoints.

MapSource used to ship free with all Garmins. It is now discontinued. An ISO disk image of an old MapSource install disk can be obtained from:

<http://www.woodfor.com/GPS/MapSource/TRIPWPT2.iso>

An upgrade to Version 6.8 is in the same directory.

[http://www.woodfor.com/GPS/MapSource/MapSource\\_680.exe](http://www.woodfor.com/GPS/MapSource/MapSource_680.exe)

Install the old version first from the ISO<sup>1</sup>, then upgrade if you wish.

Why bother to do this?

If you collect waypoints in the field with your GPS to map a feature, you are the person who best knows how those waypoints should be joined by lines to create line (road, stream) or polygon (block, SU) features. Flinging a digital handful of data at a mapping consultant for them to figure out is not cost effective. Doing it yourself enables you a) to save money, b) to get it right and c) to notice locations (if any) that need more field work.

---

<sup>1</sup> Makes no sense? Find someone under 30 to ask for advice, or google Daemon Tools Lite

## 2 Waypoint Management

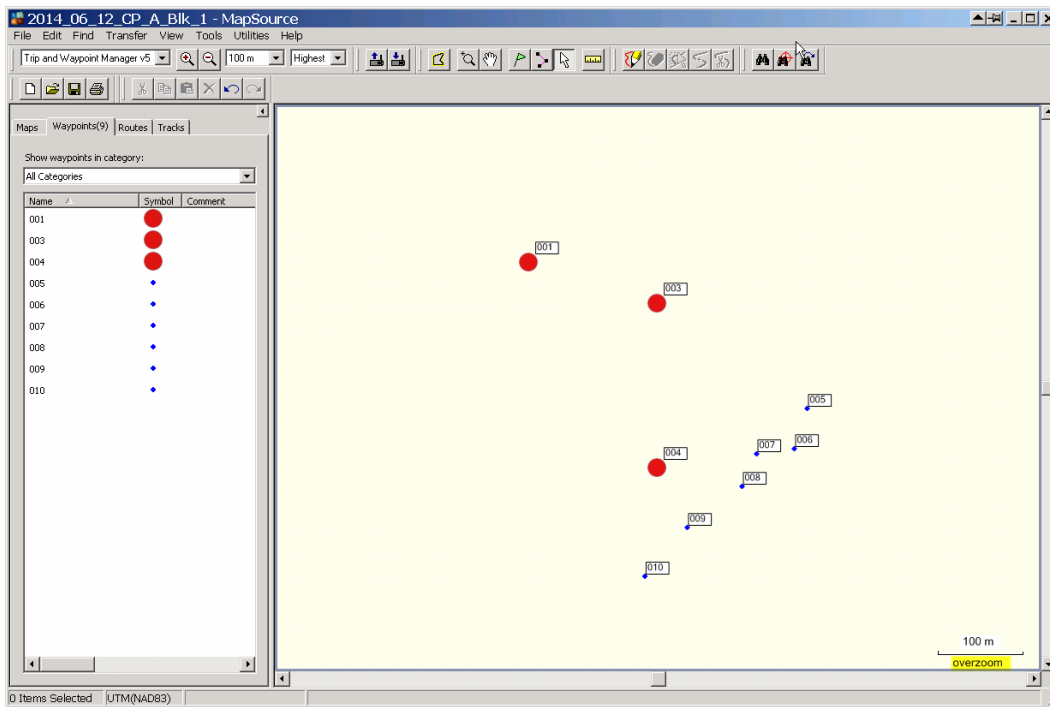
Garmins record tracks very easily. Tracks do not equal traversing. Tracks record where the Garmin thinks you went, while it was frantically trying to find satellites and deal with the changing reception as you walk. And if you walk off the line, it records that too.

Waypoints are recorded when you halt, give the thing a chance to get its bearings, check that the location reading is stable, and deliberately record a point that defines a corner or point of inflection on a feature. The WP Averaging feature on older Garmins can also be a help.

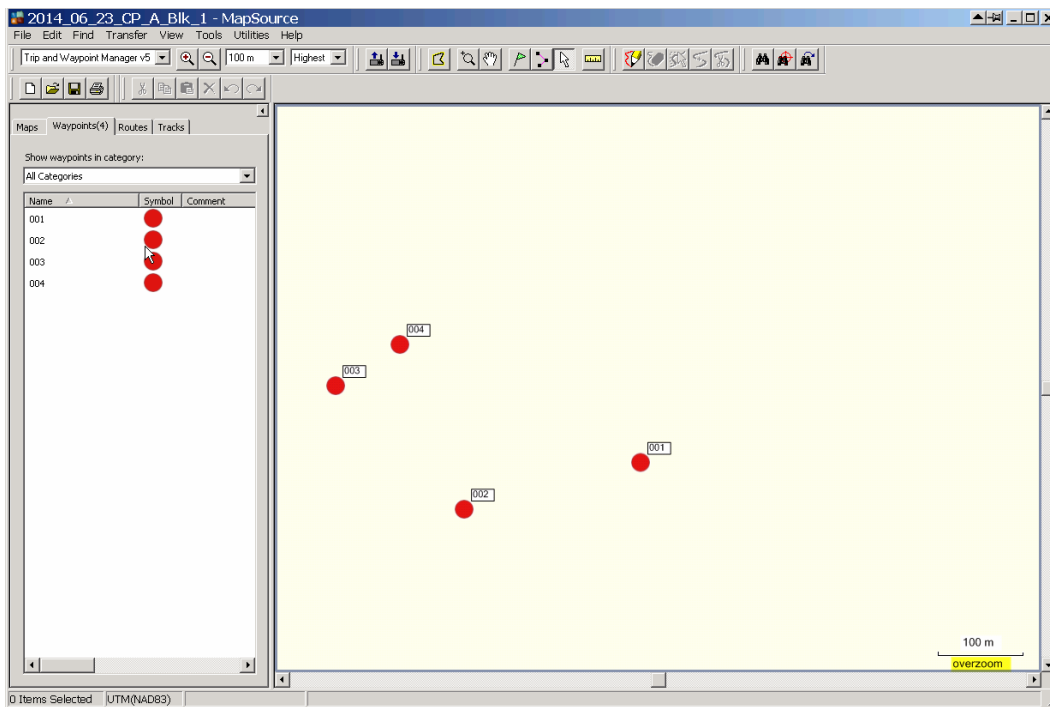
The waypoints you need to map a feature can easily end up in different GBD files that were downloaded to and saved on your computer on different days. This discussion covers how to manage such information.

Lets say you went out on June 12 to map a block boundary, but got distracted and ended up mapping a nearby S6 stream that did not seem to be on your base map correctly.

Points 1, 3 and 4 below are boundary, rest are stream.



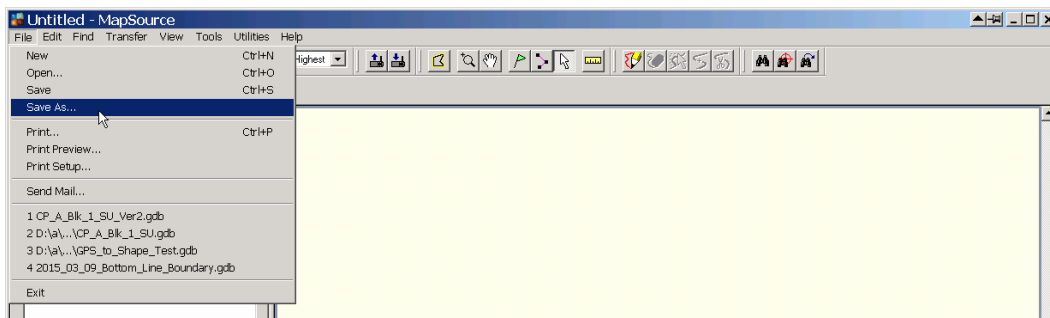
OK, on June 23 you get back out there and finish the block traverse.



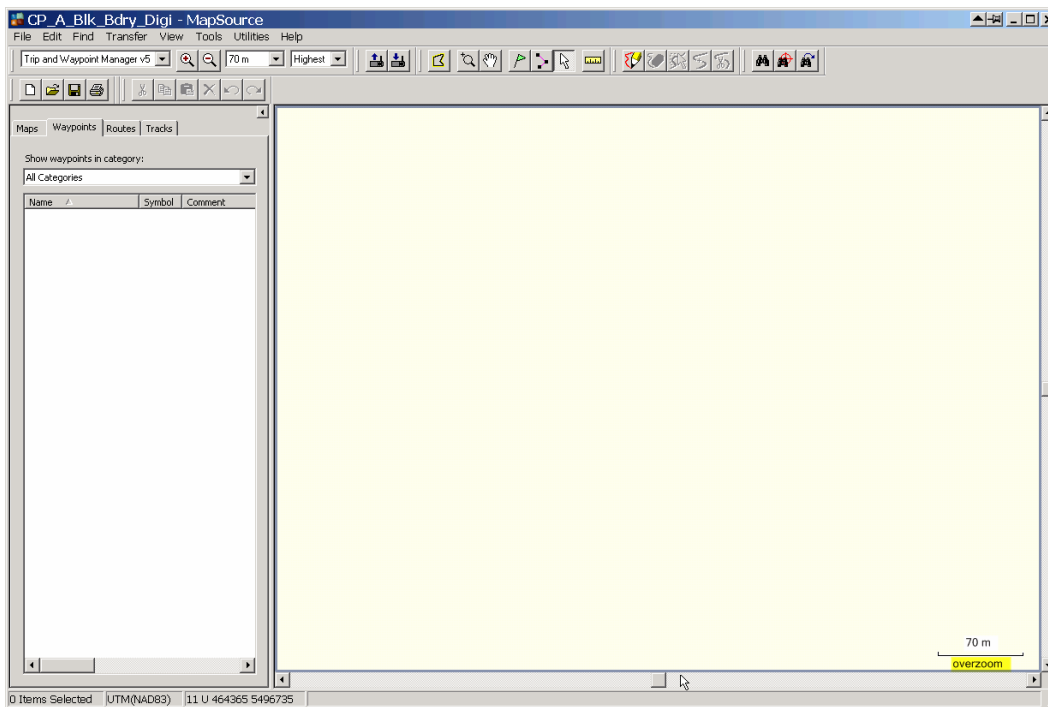
As noted, your work is spread across 2 GDB files saved on your computer. The solution? You need a third file! Seriously.

So open up the June 12 file again, then open another blank instance of MapSource. (MapSource does not seem to care how many copies of it you open.)

Save As the empty file in the blank MapSource window as something like CP\_A\_Blk\_Bdry\_Digi.GDB.

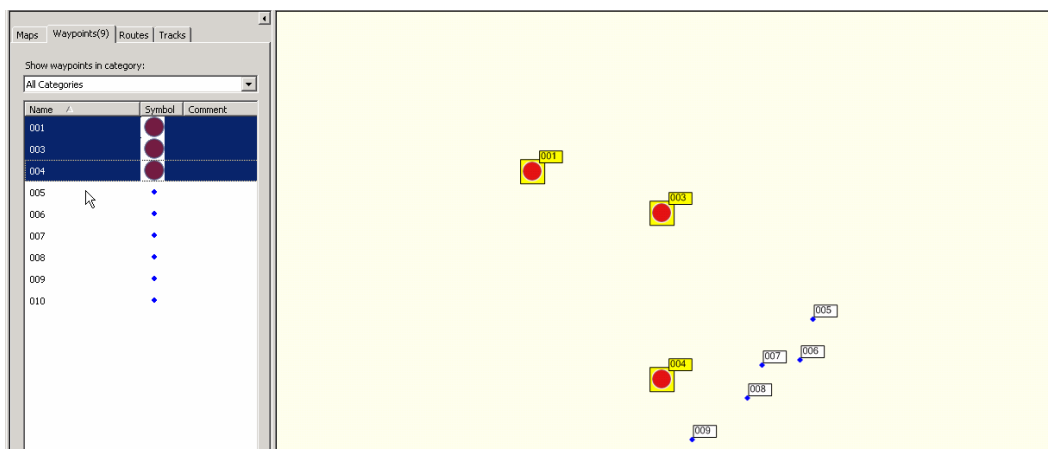


to create:

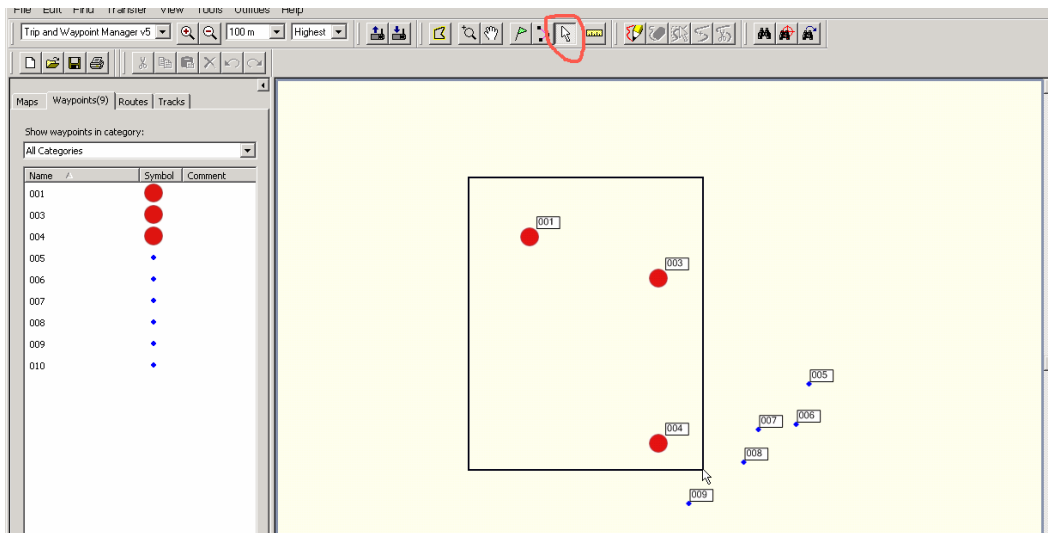


Now, go to the June 12 file window.

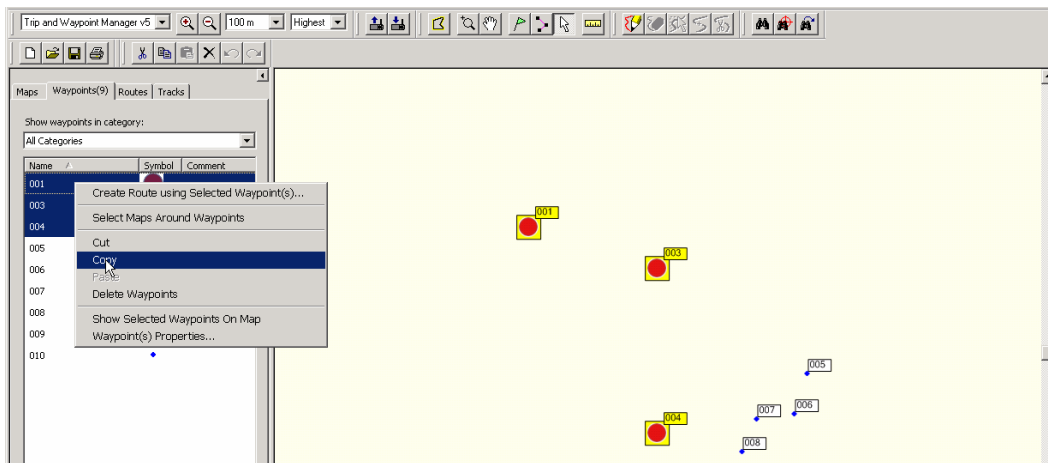
Select the boundary waypoints using Control-Click or Shift-Click in the waypoint list



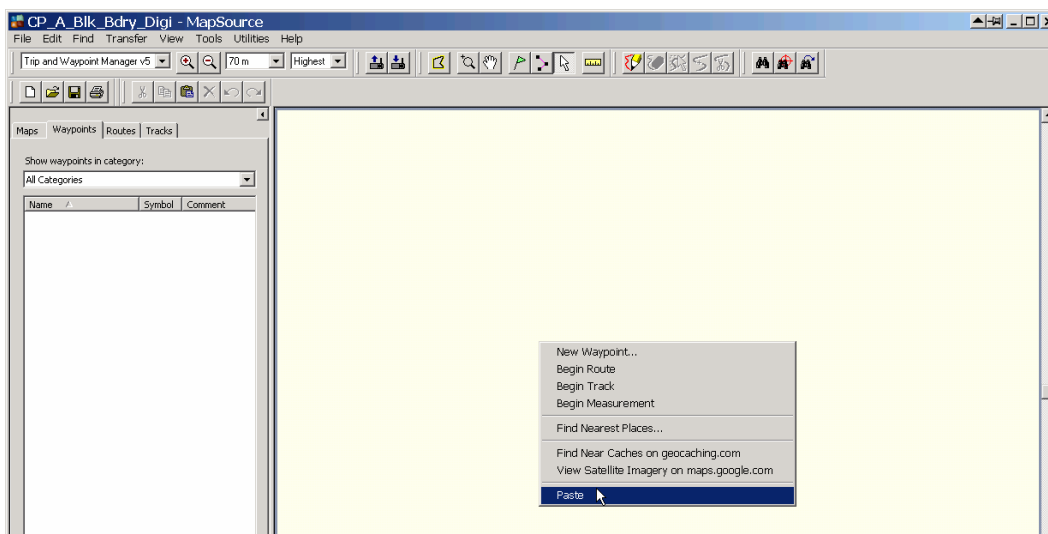
or use the "arrow tool" to capture them with a selection box.



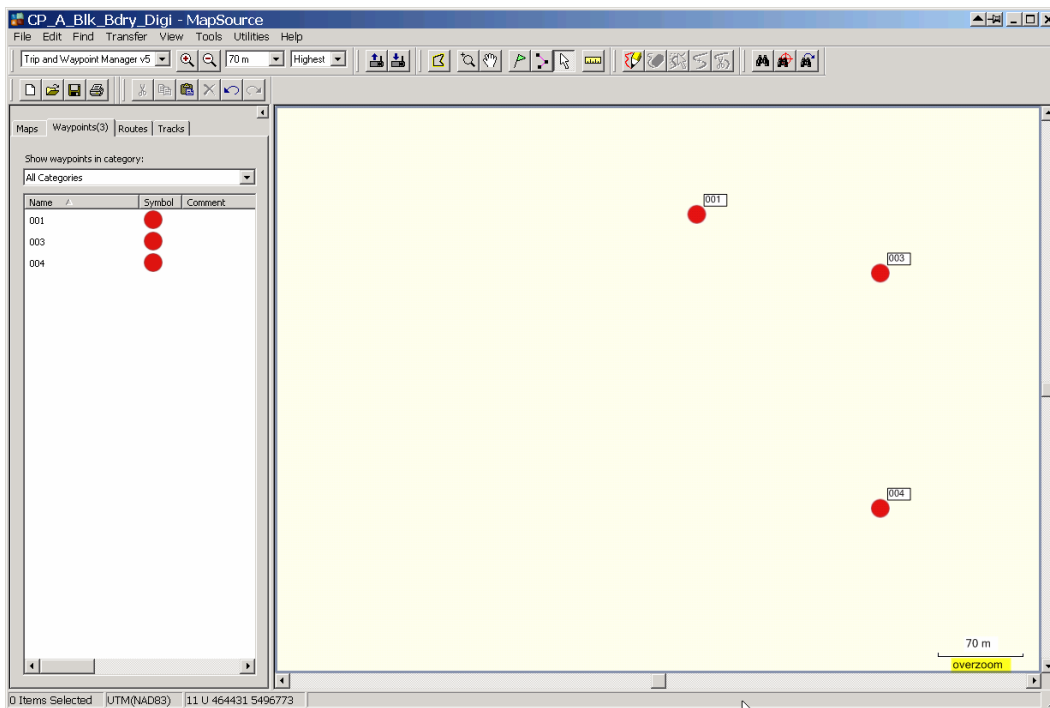
Alternate-Click on the selected waypoints in the waypoint list, and Copy.



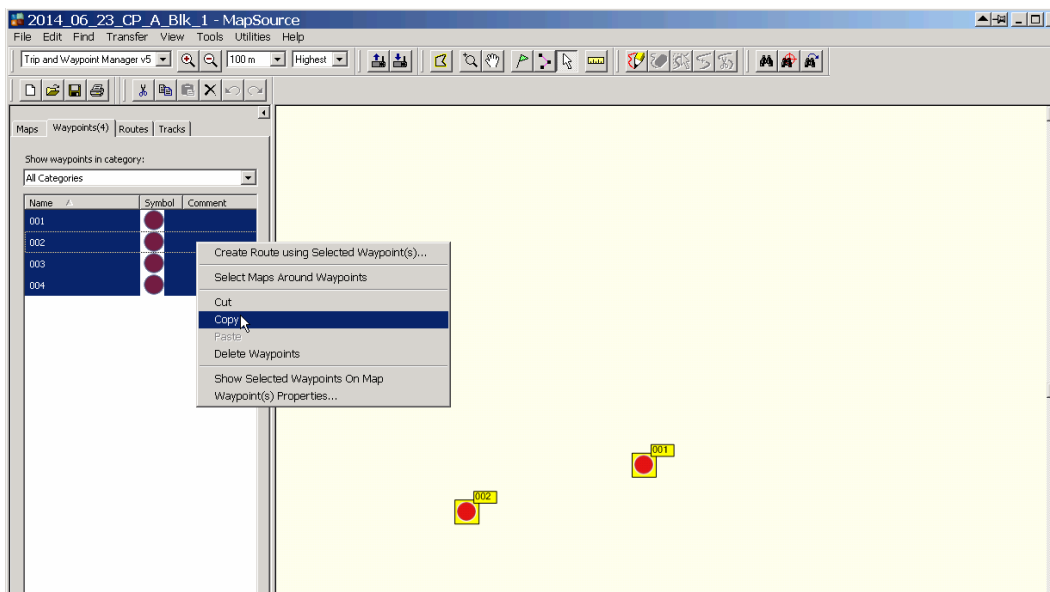
Go to the empty CP\_A\_BlK\_Bdry\_Digi window, Alternate Click in the space, and Paste.



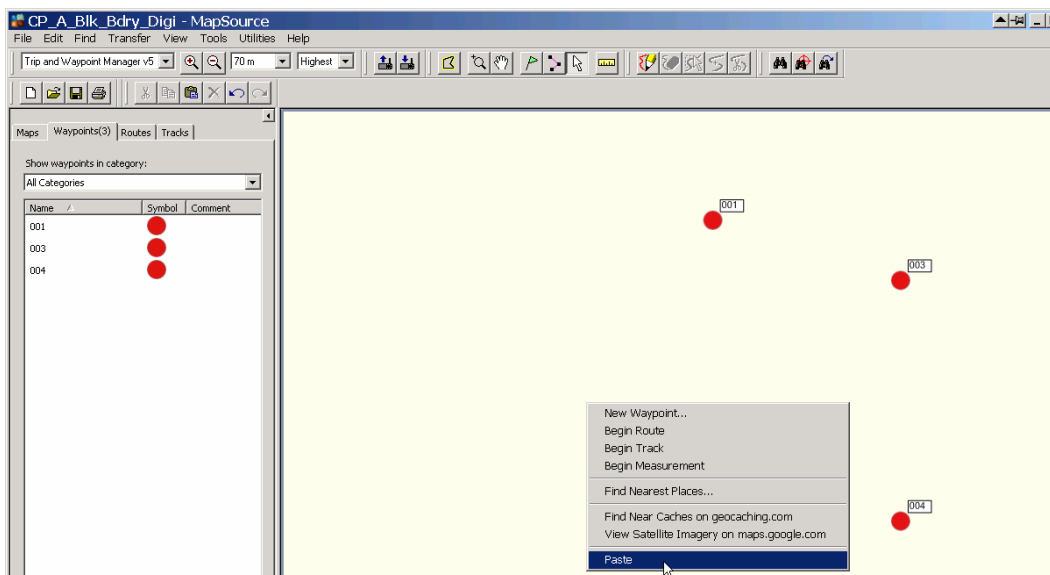
Your block boundary waypoints are transferred. This can of course be done in multiple steps when things are complex.



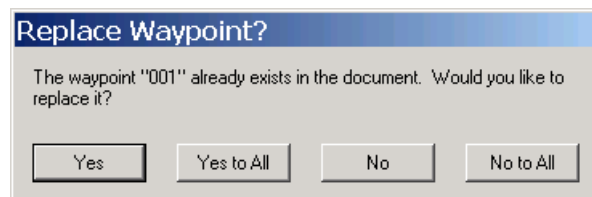
Save CP\_A\_Blk\_Bdry\_Digi , and then open up the June 23 work in another instance of MapSource. Select your waypoints, Copy



and go to the CP\_A\_Blk\_Bdry\_Digi and Paste



and the wheels fall off:

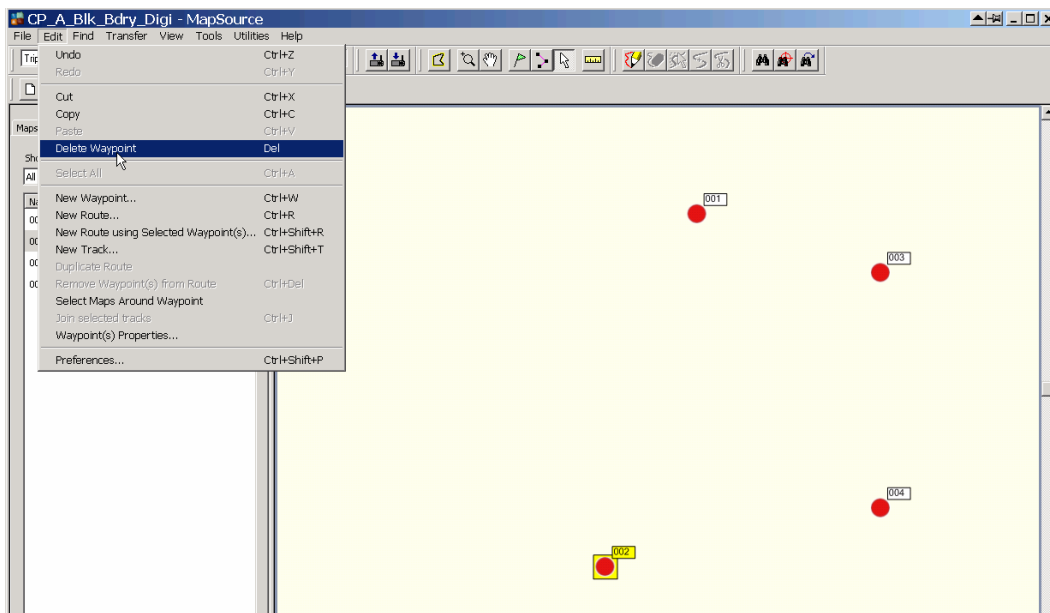


NO! I do not want to replace Waypoint 1 - I need it to map the block. As well as WP 3 and 4. So No to All.

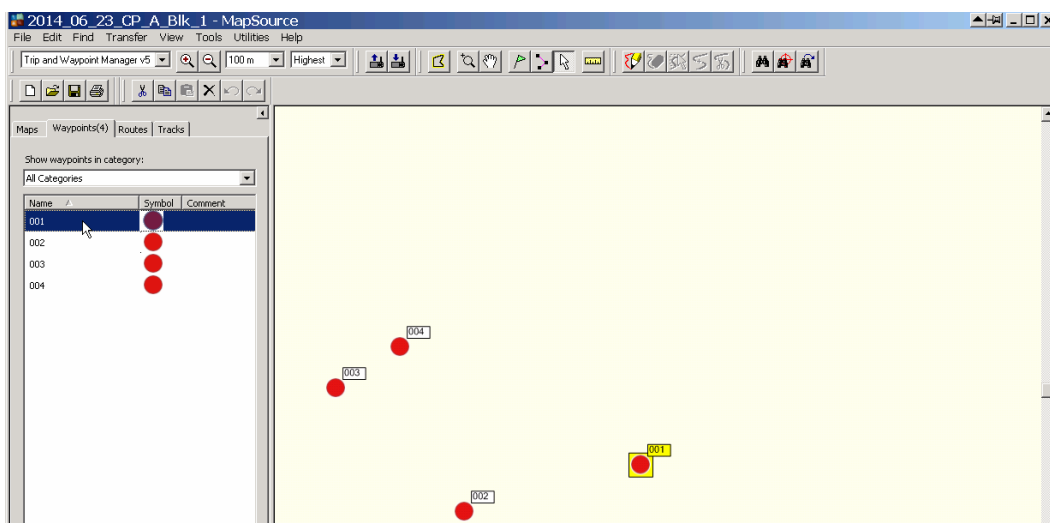
OK, its beef is legit - you can not have 2 waypoints with same name in a file. Older Garmins will let you set the Waypoint Number to start recording at in the field at (very useful if you remember on Day 2 to start at WP050 or WP200 or whatever you need) but as that was not done, you need to:

1. Erase WP 2 that did get copied, and
2. Renumber the waypoints in the June 23 data set.

So, hilite and delete WP 2 from the CP\_A\_Black\_Bdry\_Digi file:

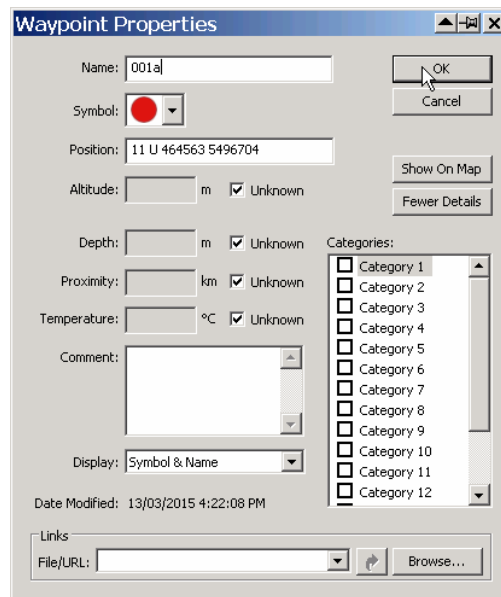


Then, back to the June 23 file. Double Click WP001 in the WP list



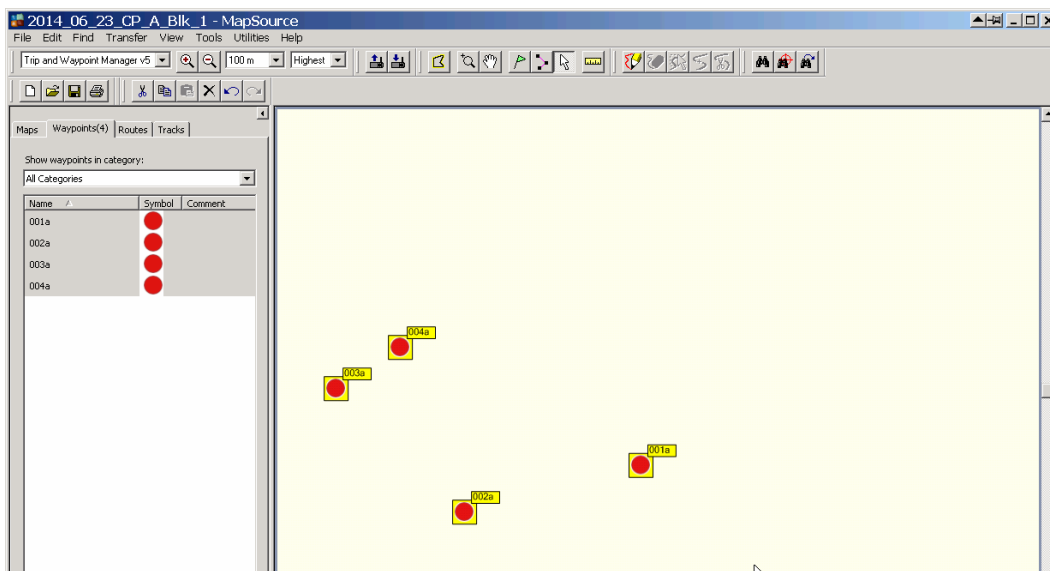
and a menu comes up. Rename the WP to something like 001a, and click OK:



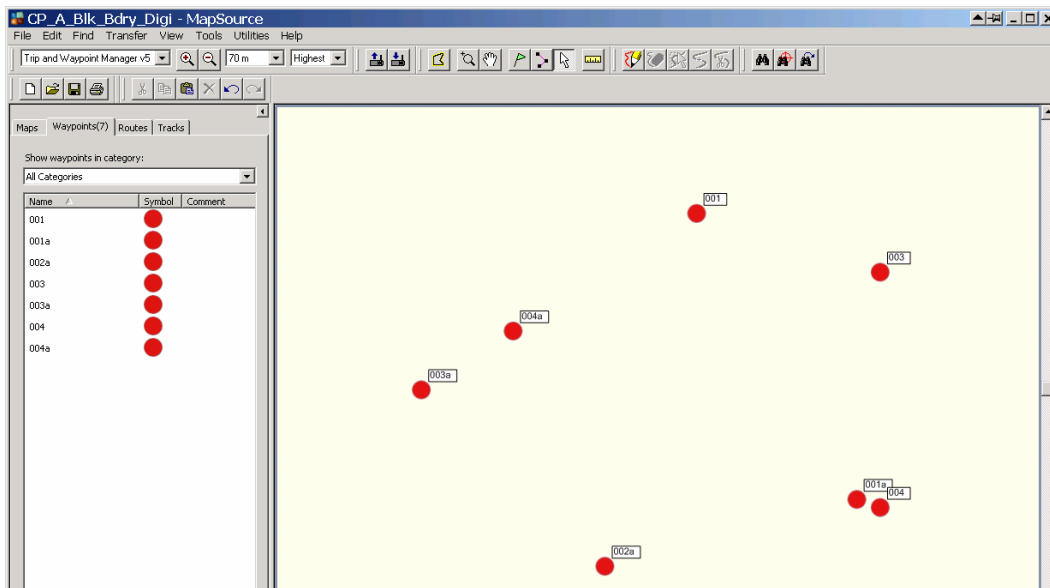


Repeat for your duplicate WP. This can take awhile, but it is the price one pays for a moment of forgetfulness.

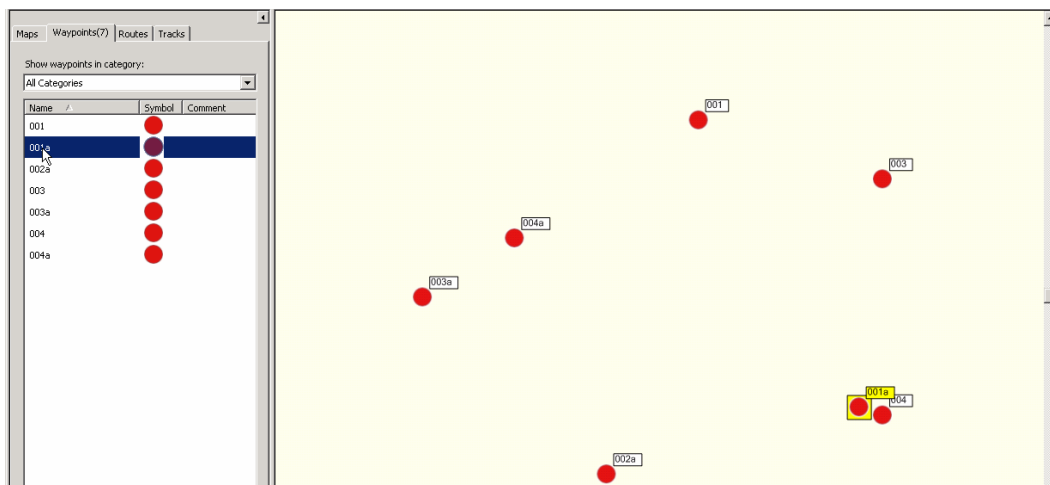
Once you are done, Copy from June 23



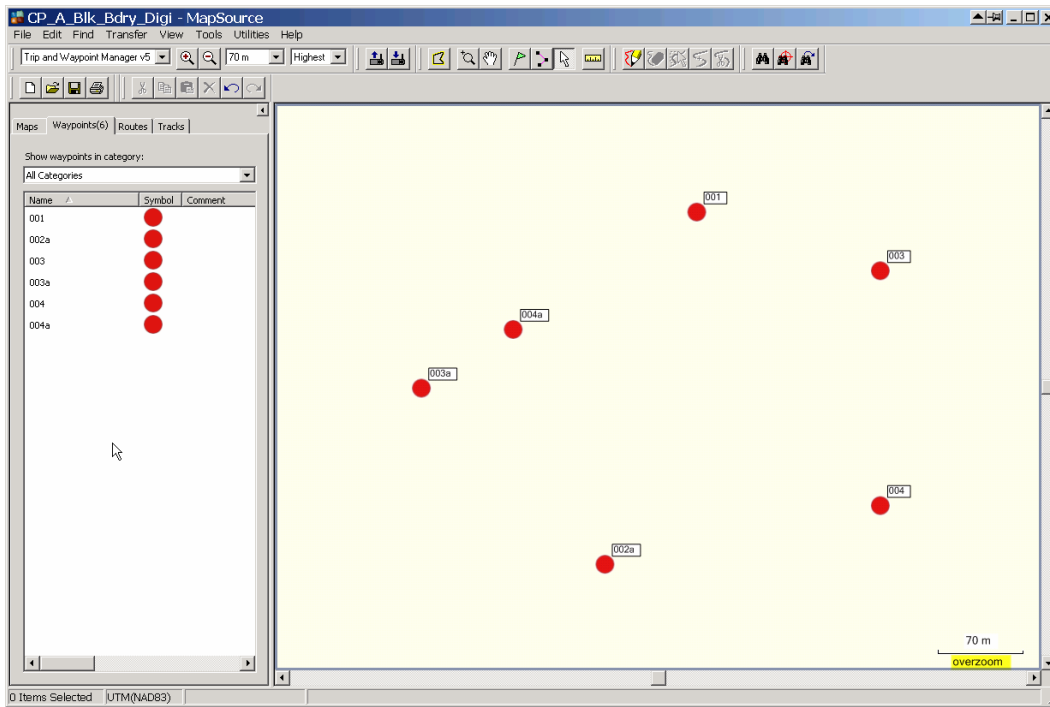
and Paste into CP\_A\_Blz\_Bdry\_Digi:



Wait a sec. Why are there 2 WP close together at 004 and 001a? Because you recorded it on both days, and they do not quite agree. Choose one to reject and Delete it.



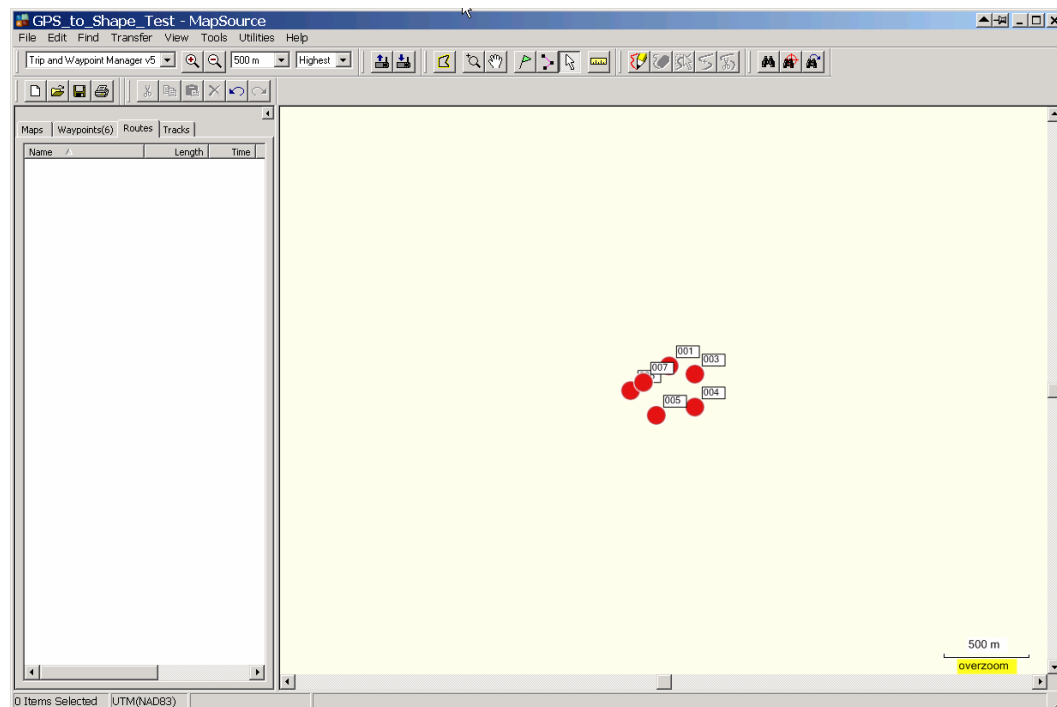
to create a WP data set that defines the Block boundary:



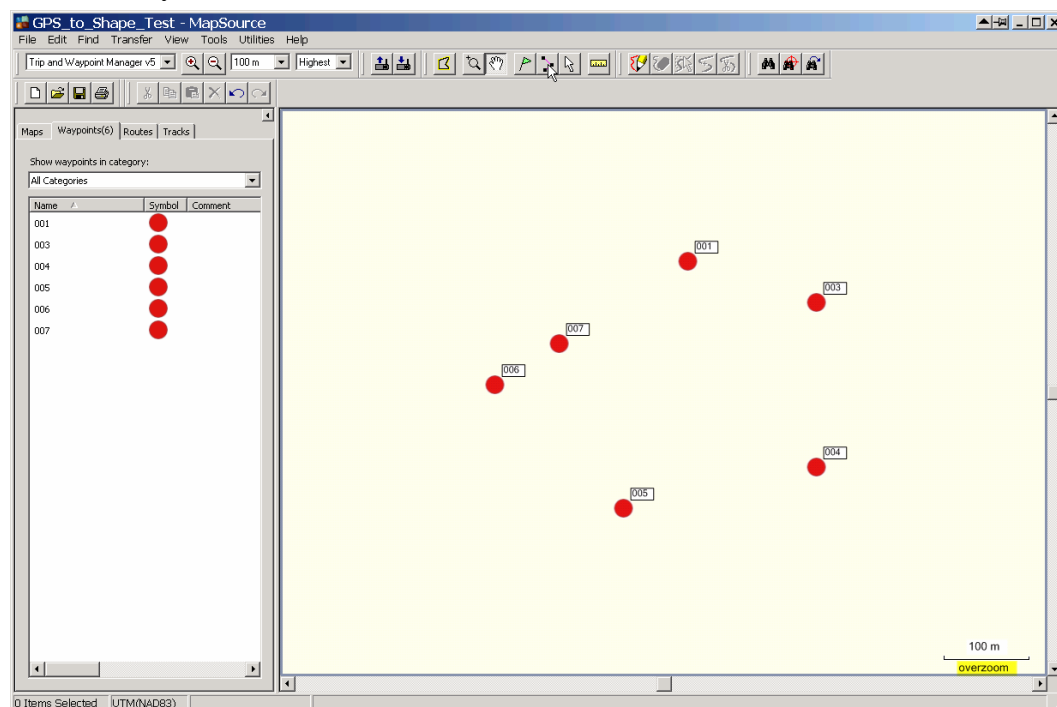
Onwards.

### 3 Route Digitizing

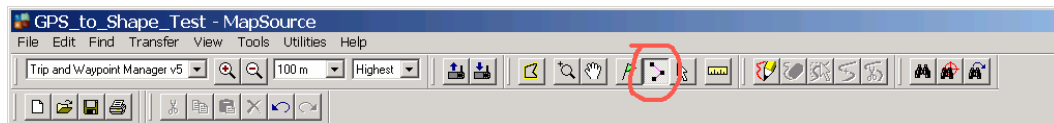
1. Open the map you want to digitize on in MapSource.



2. Zoom in to your work area - this does not work "zoomed out"

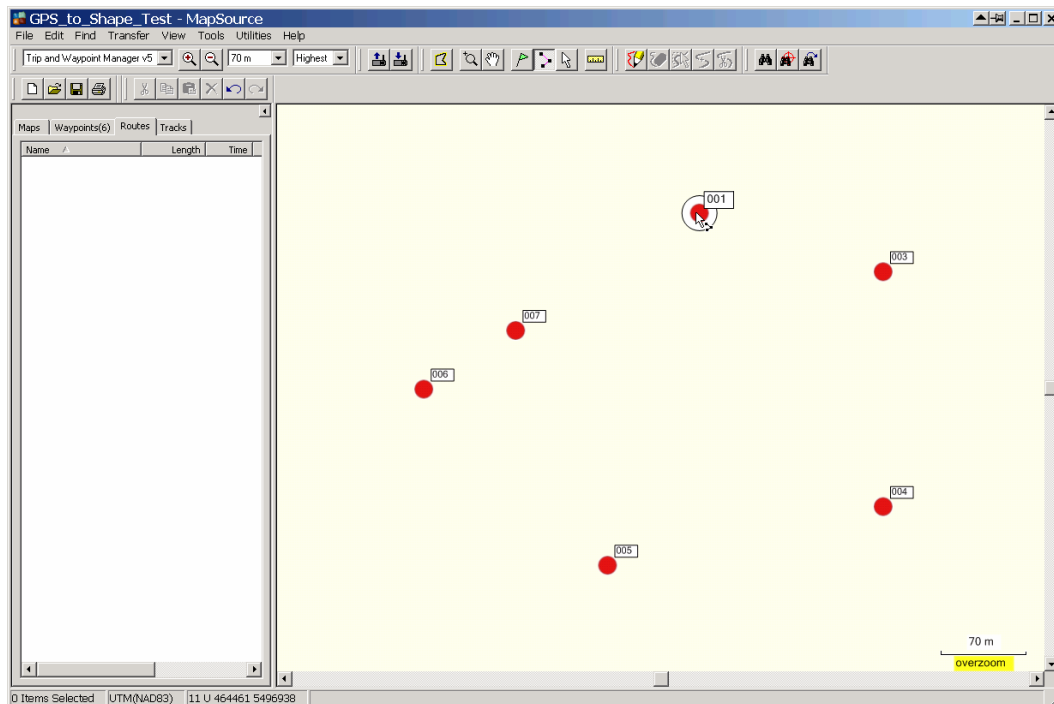


3. Select the Route tool from top toolbar.



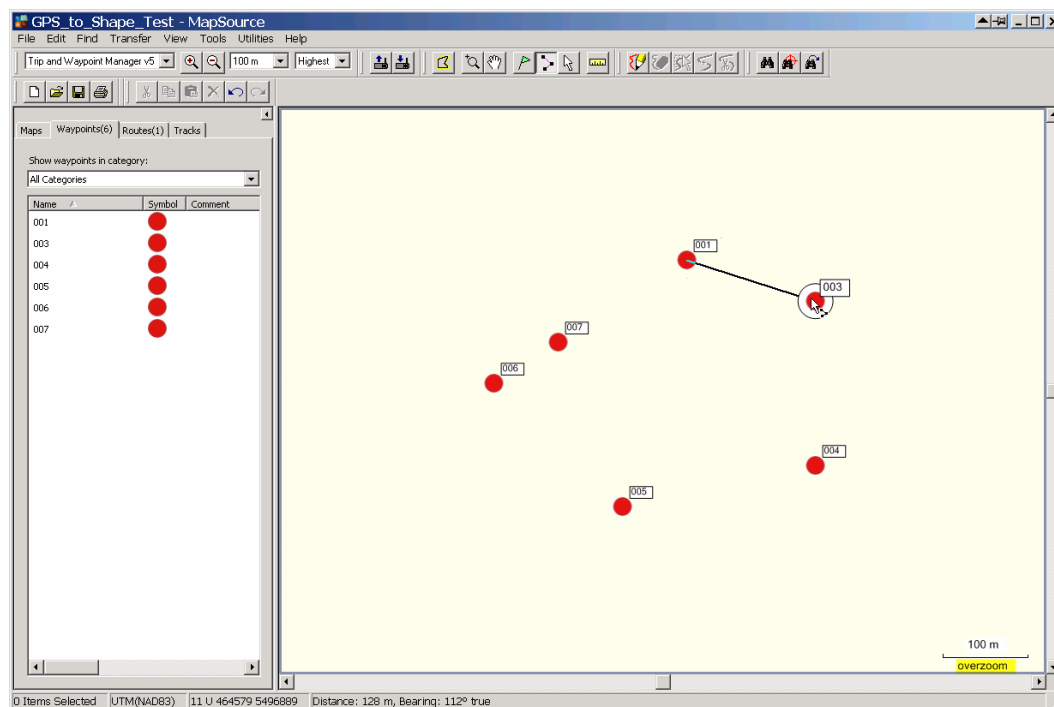
If no Route tool, <View> <Show Toolbars> and turn on the Tools bar.

4. Move cursor to your approximate starting place.

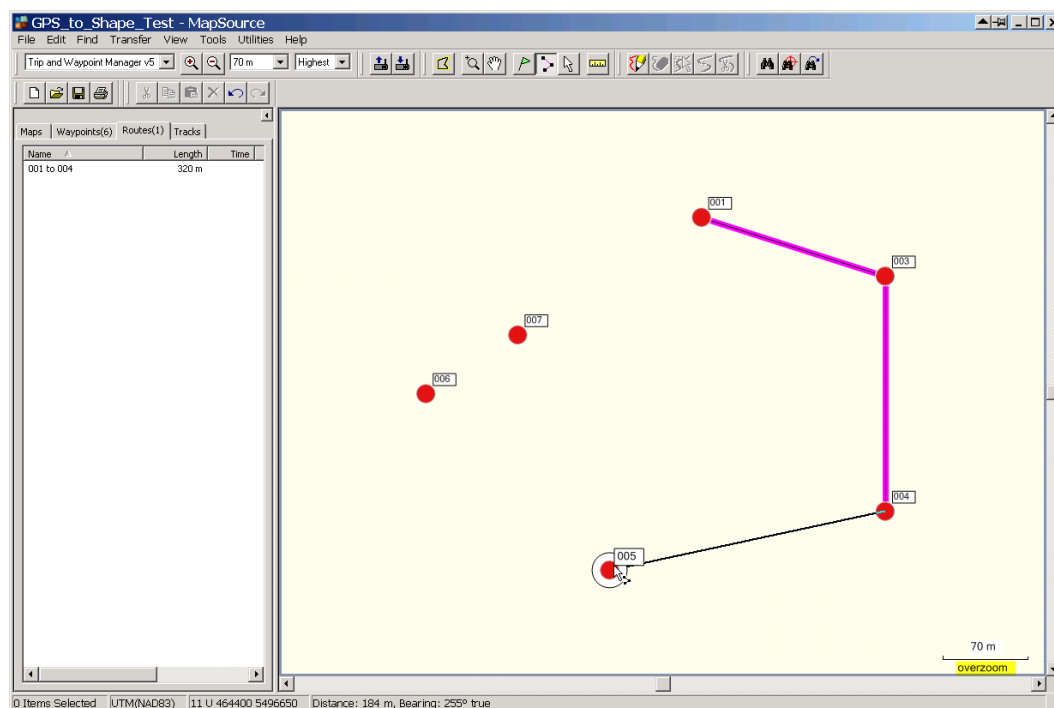


That white "target" icon means that it want to snap the start of the line to WP001. This is highly desirable! You want snap to work, so you make neat, closed features and lines that share a common endpoint.

5. Proceed to WP002, and snap to it.

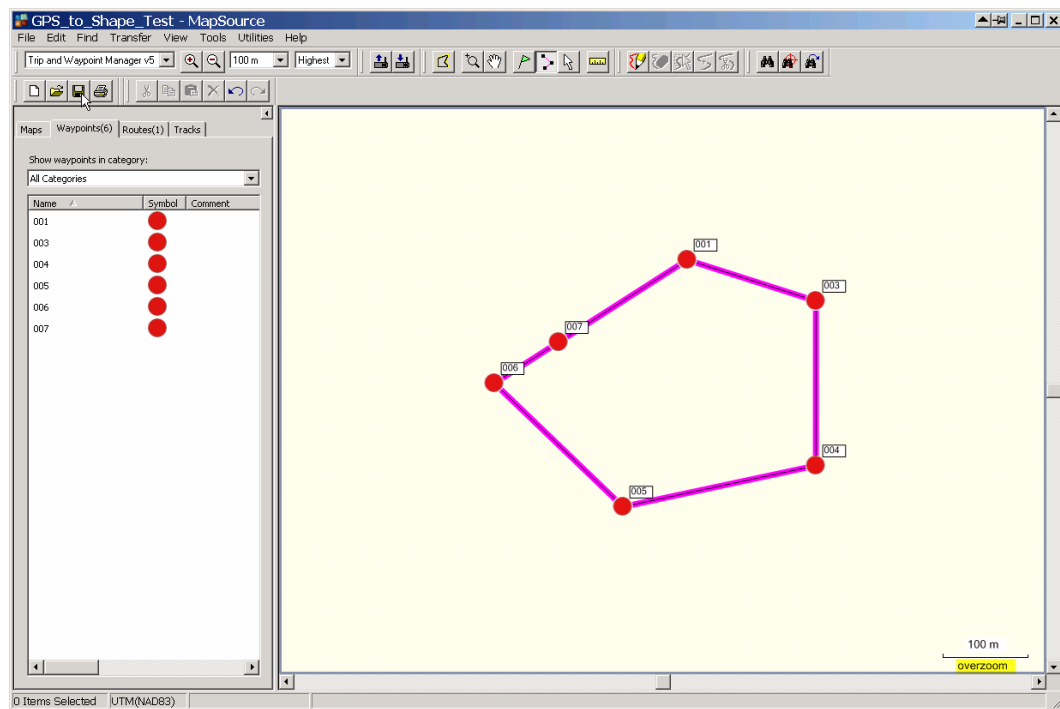
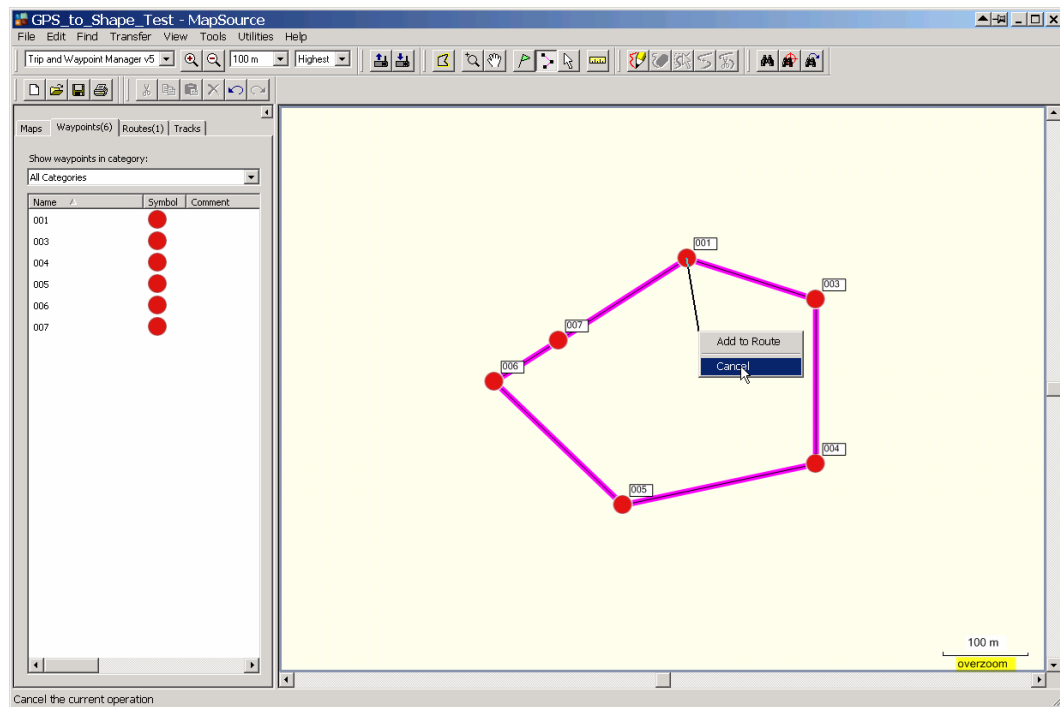


and onwards around the WP circuit:

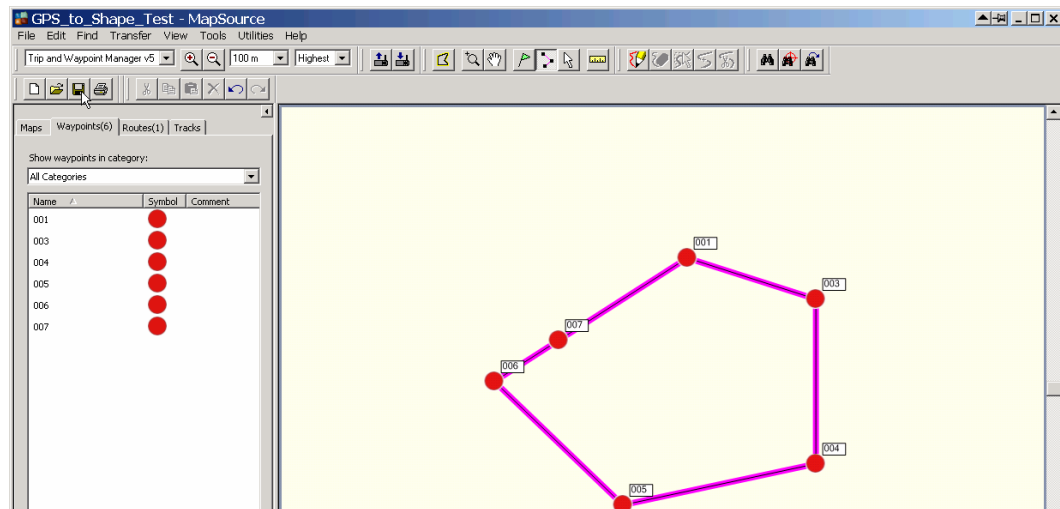


- When you get back to WP001 again, you need to finish the line.

Snap to WP001, then move off the WP and Alternate Click . A menu comes up. Rather unintuitively, you select Cancel. It sounds like it is about to erase your work, but it only gets rid of the last dangly line bit.

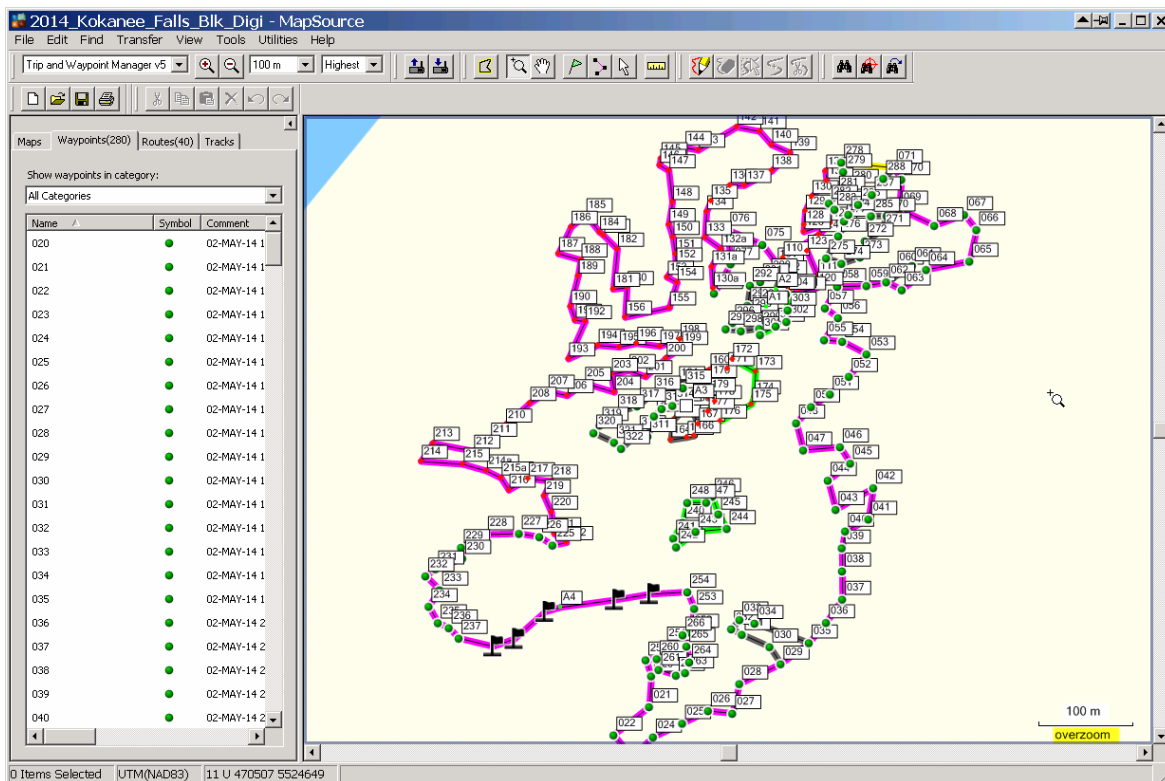


7. Save.



### Important Note

The example above is very simplified. In the real world, you may be looking:



Well, I hope not, but you could be.

Digitize it in small pieces. Digitize 12 points of so, snap to a WP to end your route/line, Cancel, snap to the same end WP to start a new route/line, and carry on with the new route/line. The Snap will make sure that your lines are topologically correct. When you inevitably make a mistake, you will only have to delete a minor length of digitized "route" and do it over.



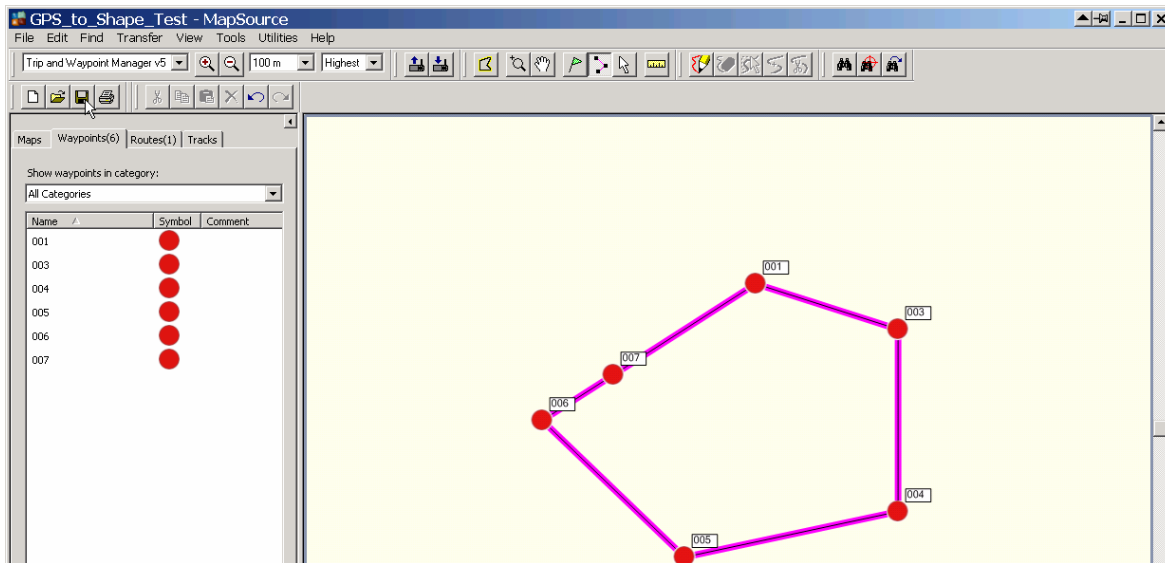
## 4 Garmin to Shape

You can easily convert a simple polygon digitized in MapSource to a shape file using free software. The resulting shape can be used for various things.

Unfortunately, at this time I can find no free solution to convert complex polygons from Garmin MapSource to shape. It takes only minutes to do so using ArcMap, but all the free approaches I have tried fail. If you know a free way, please tell me, so I can share the info!

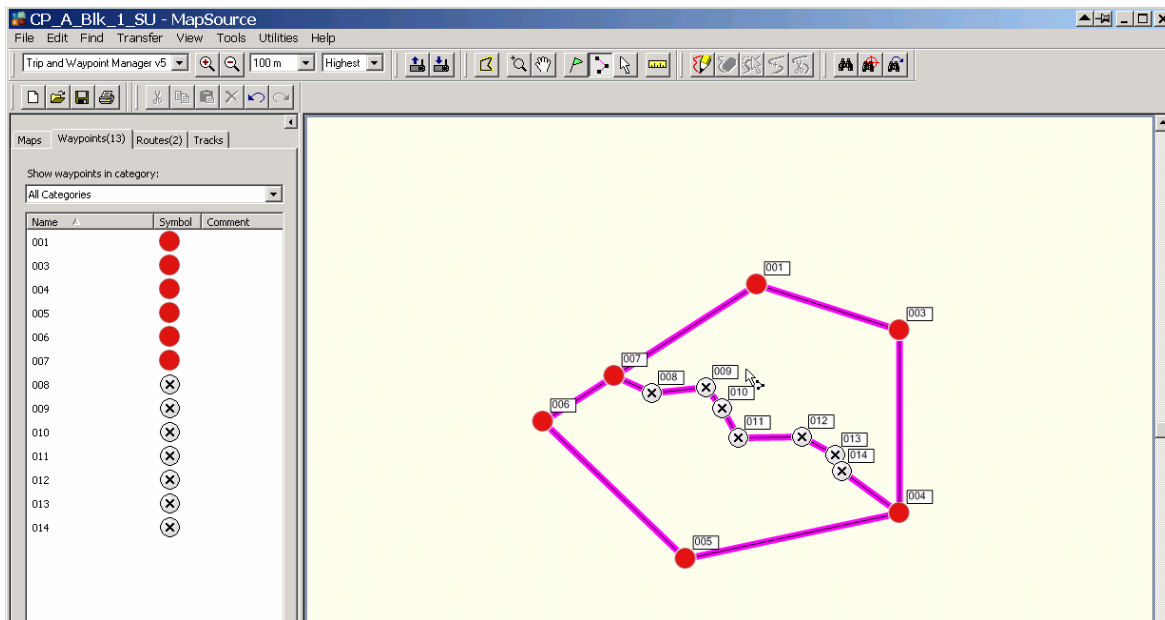
Translation:

You can convert the MapSource linework below to a shape for free:

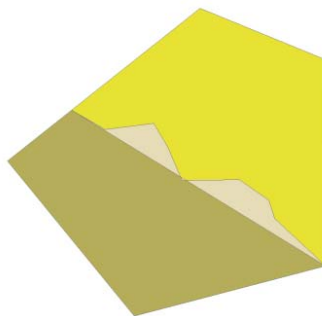


The boundary could be much more complex, but the limit is one polygon bounded by one or more lines.

To the best of my knowledge, you need to pay a mapping consultant to convert the MapSource linework below to a shape. It should take them about 15 minutes.



Every free methods I have tried converts the above to a shape with 3 polygons:



which is a complete fail.

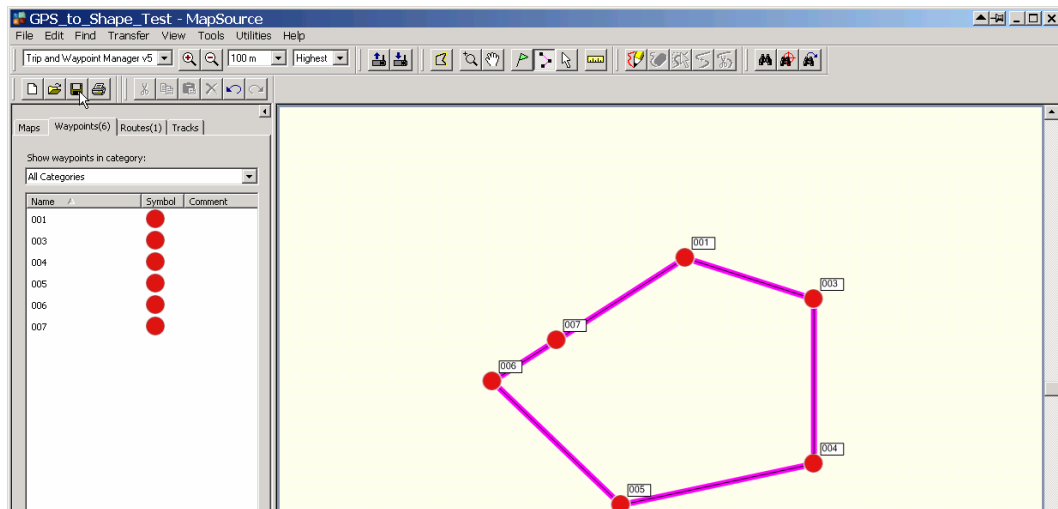
#### 4.1 How to Make a Simple Shape from Garmin MapSource for Free

This only works to make simple single polygons.

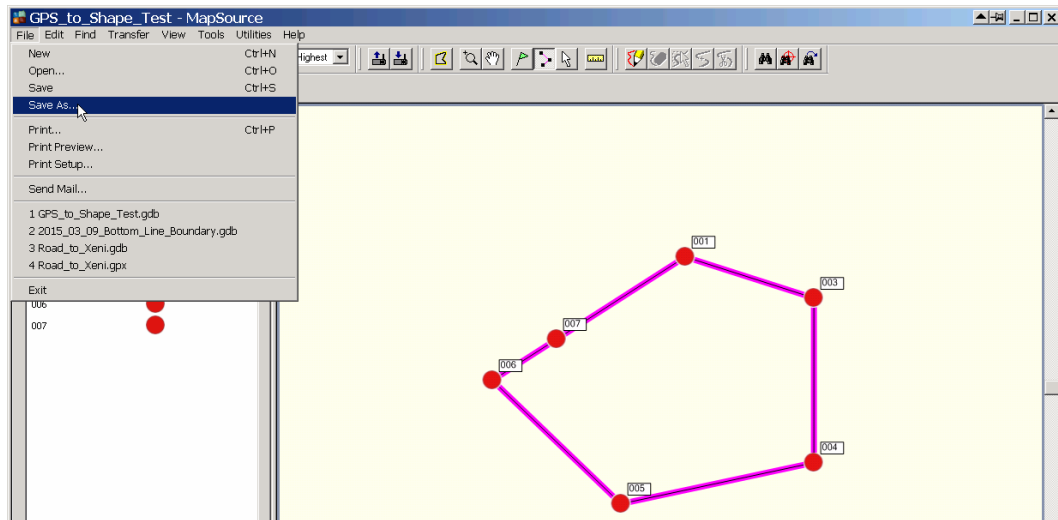
You will need a program called DNRGarmin, which is available from:

[http://www.woodfor.com/GPS/DNR\\_Garmin/dnrgarmin54setup.zip](http://www.woodfor.com/GPS/DNR_Garmin/dnrgarmin54setup.zip)

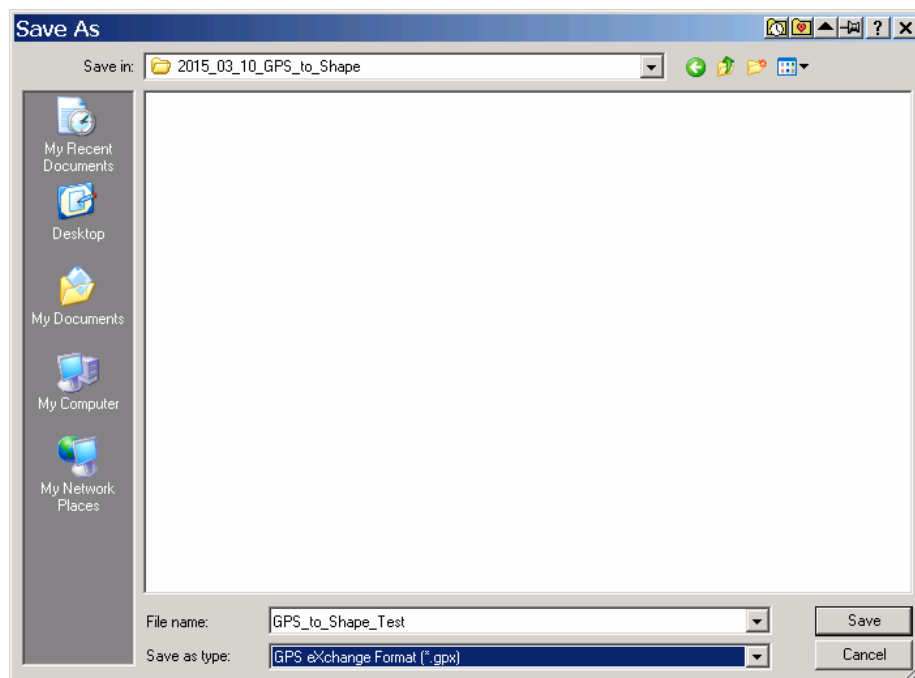
1. Digitize the boundary your polygon as a single route/line or a set routes/line.



## 2. Save your work, then Save As

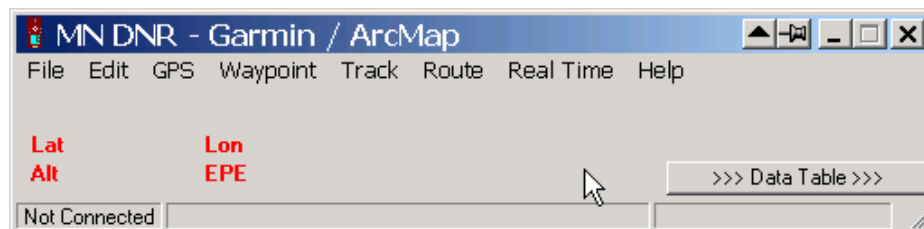


and save your work as a GPX file.

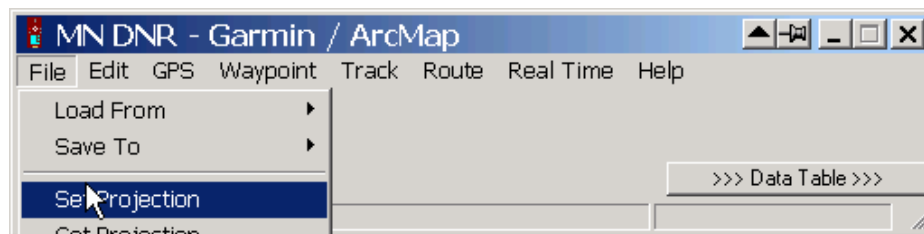


You need to put the GPX file somewhere that you can find it again, so I would suggest making a folder like C:\W1234 to store your data in, and not using C:\Documents and Settings\Tom XP\My Documents\My Garmin\ or some such...

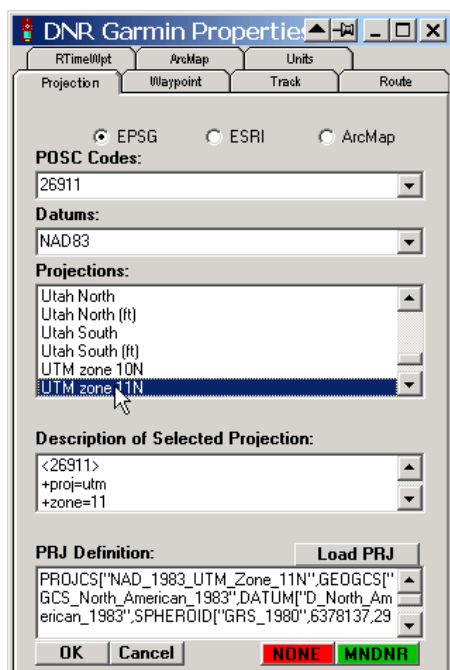
3. Open DNRGarmin. It will likely fuss at you about this not found or that not found - just keep clicking OK and it will eventually calm down.



4. <File> <Set Projection> DNR Garmin needs to be told what projection you want the spatial output to be in, or highly unexpected results can occur.

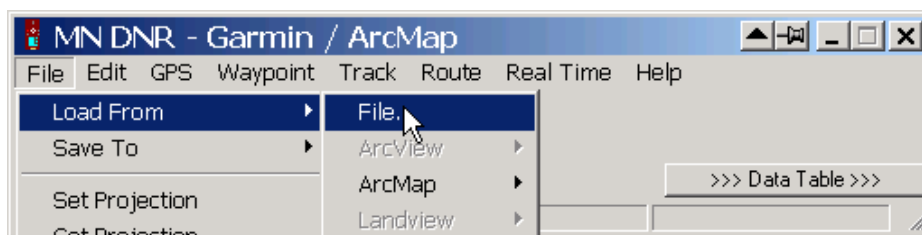


Here, I am selecting UTM 11 NAD 83 from the list, as I want my output in UTM 11 NAD 83.

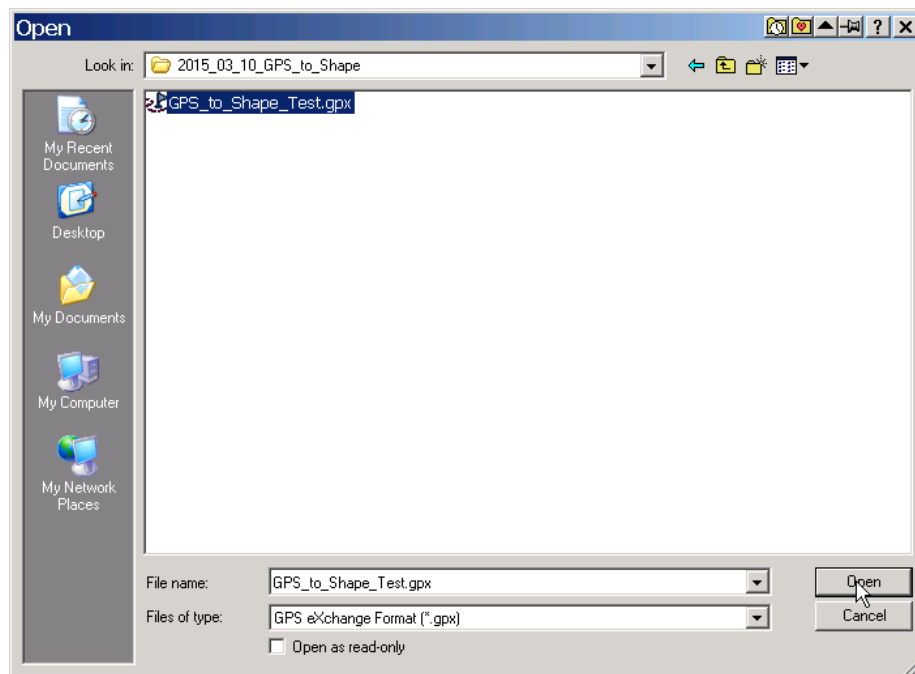


Click OK to set the appropriate map projection.

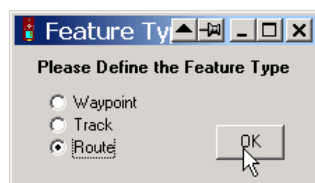
5. Back to the main DNRGarmin menu. <Load From> <File>



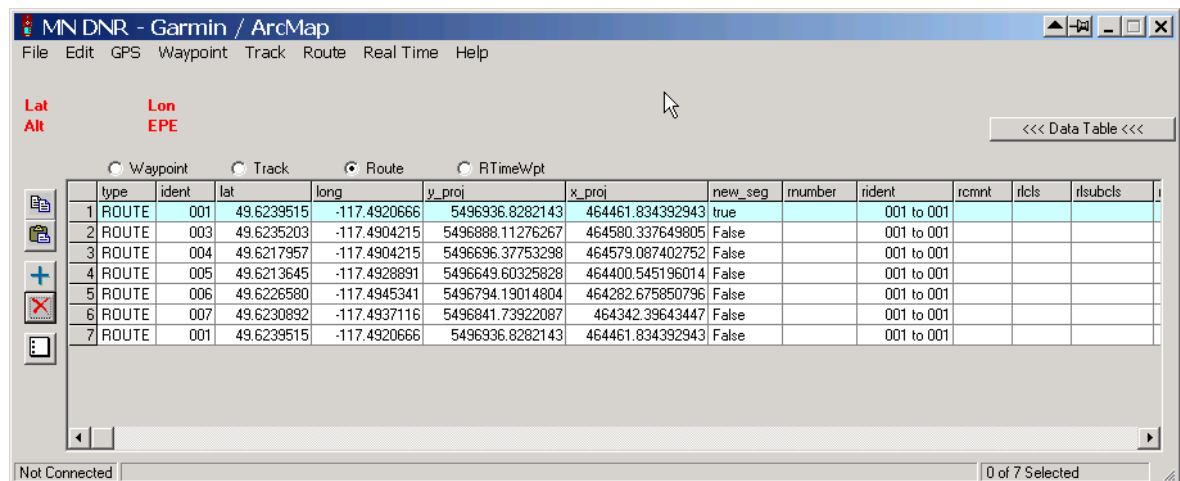
And hunt down that GPX file that you saved from MapSource a while ago:



It will ask what feature type you are trying to open, so tell it Route which is what the file contains:



## 6. The DXF file opens in DNRGarmin



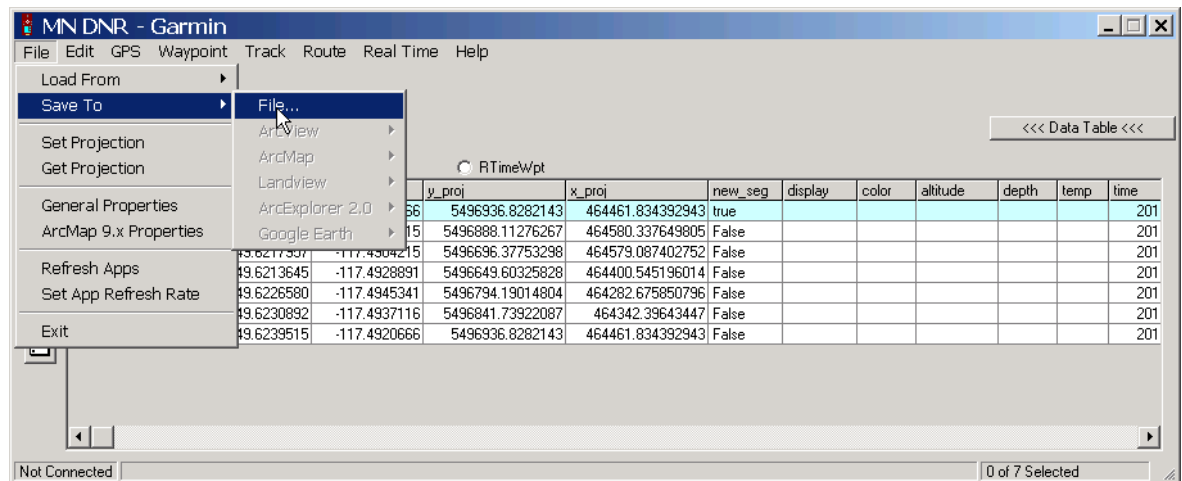
Pretty simple stuff. A bunch of X,Y coordinates, and the first co-ord is the same as the last co-ord. What a person would expect form a closed polygon.

## 7. Using that little row of click-buttons above the data, change from Route to Track

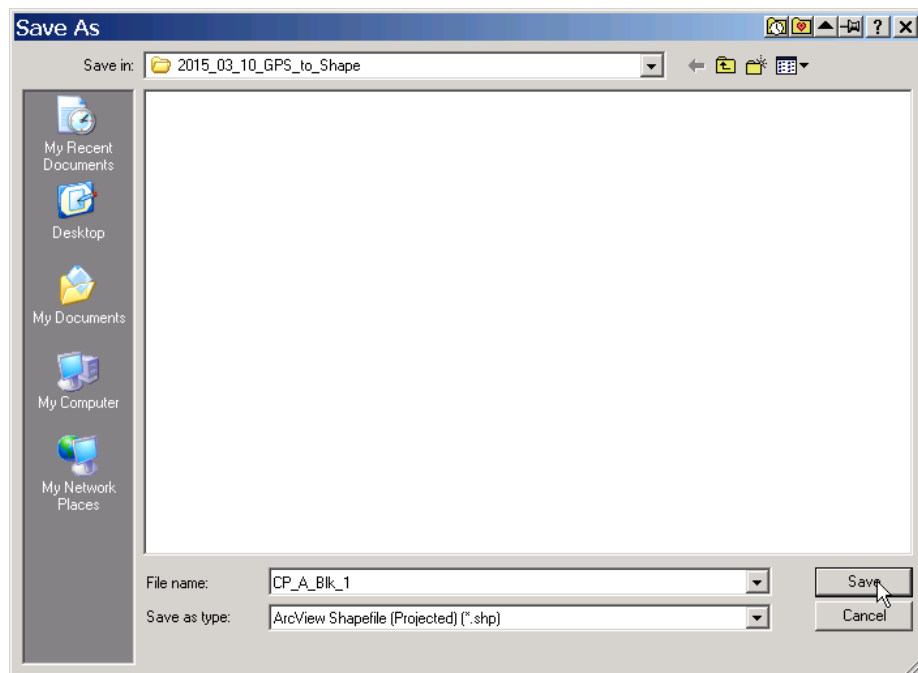
		<input type="radio"/> Waypoint	<input checked="" type="radio"/> Track	<input type="radio"/> Route	<input type="radio"/> RTime/Wpt					
		type	ident	lat	long	y_proj	x_proj	new_seg	display	color
1	TRACK	001	49.6239515	-117.4920666	5496936.8282143	464461.834392943	true			
2	TRACK	003	49.6235203	-117.4904215	5496888.11276267	464580.337649805	False			
3	TRACK	004	49.6217957	-117.4904215	5496696.37753298	464579.087402752	False			
4	TRACK	005	49.6213645	-117.4928891	5496649.60325828	464400.545196014	False			
5	TRACK	006	49.6226580	-117.4945341	5496794.19014804	464282.675850796	False			
6	TRACK	007	49.6230892	-117.4937116	5496841.73922087	464342.39643447	False			
7	TRACK	001	49.6239515	-117.4920666	5496936.8282143	464461.834392943	False			

I do not know why this is required, but it is.

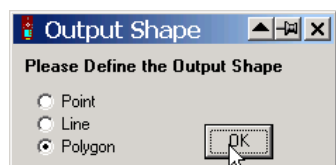
## 8. <Save To> <File>



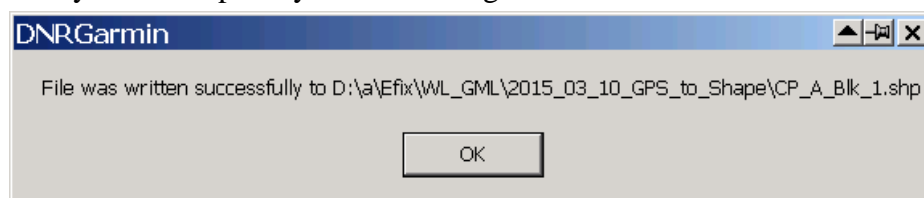
And send it out as a Projected Shape



After you click Save, it will ask for Output Shape type. Tell it Polygon.



And you will hopefully see something like

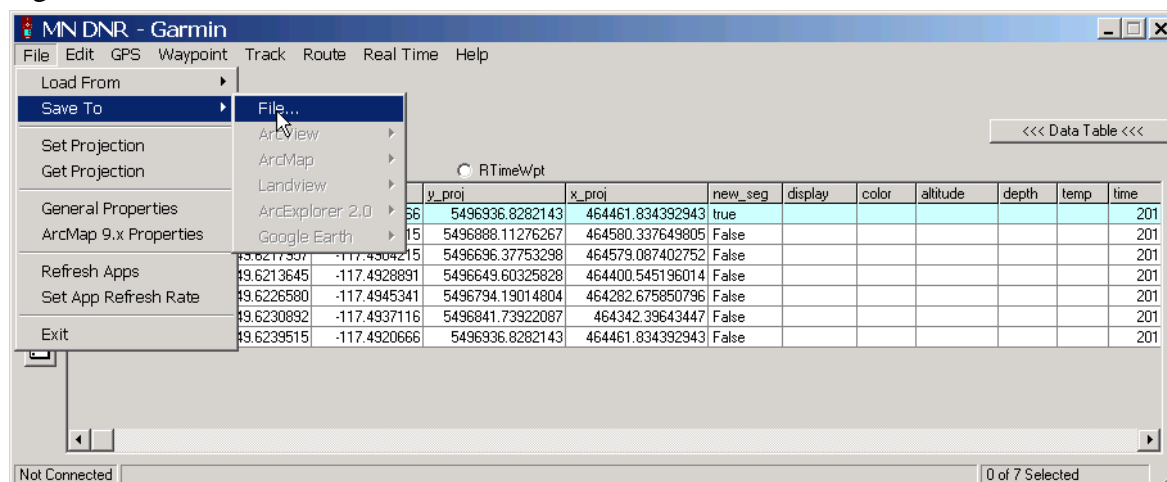


You now have a polygonal shape on your hard drive that you could use for any purpose that requires a polygonal shape file.

Because I have been doing digital mapping for decades, I am a highly suspicious guy. What if something went very wrong and my shape file is located in the Pacific Ocean, near the equator? I want to check.

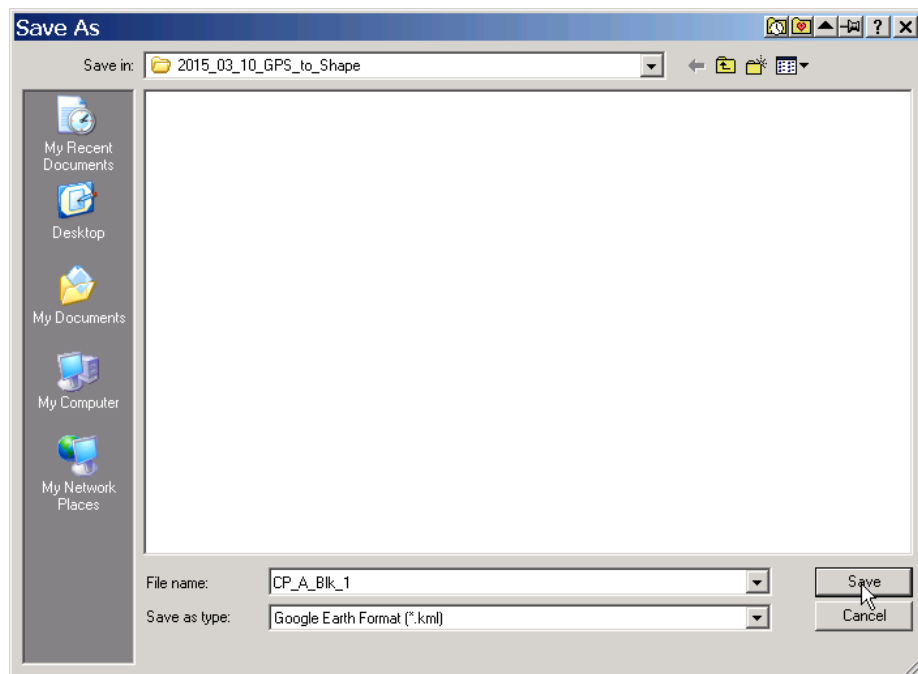
A quick free check is to use DNRGarmin to create a KML of your data, and look at it in Google Earth.

Again, <Save To> <File> :

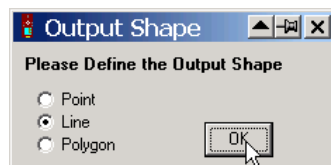


But this time, make it a KML.

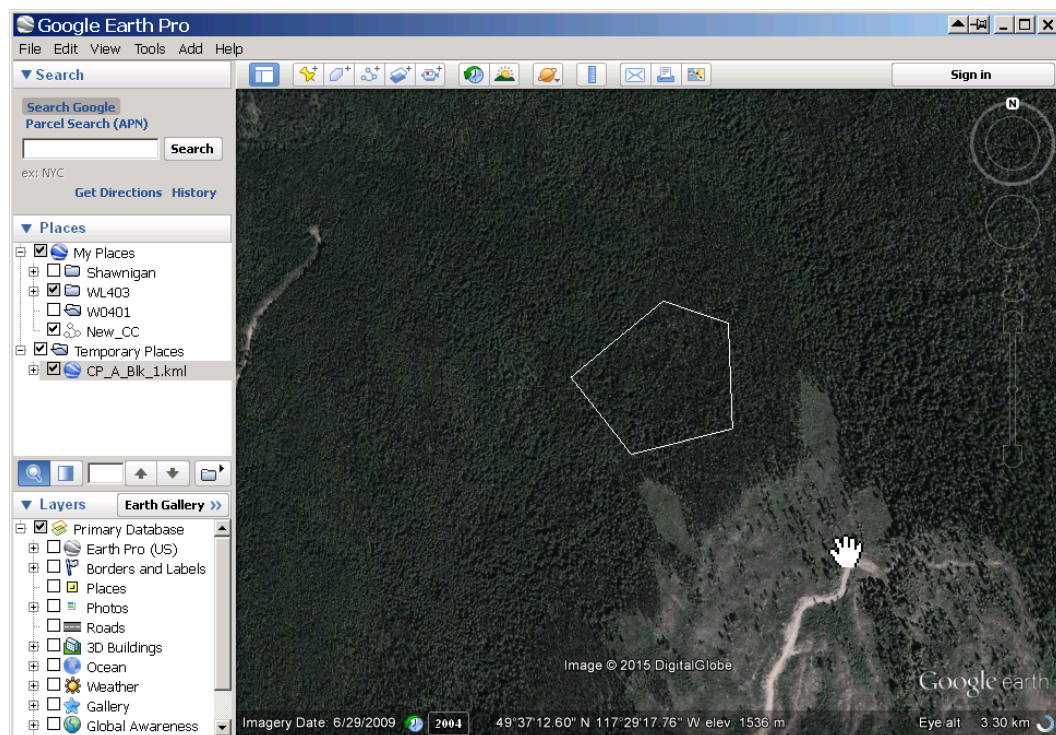




Line will do fine.



Then open the KML in Google Earth. It should auto zoom in to the location.

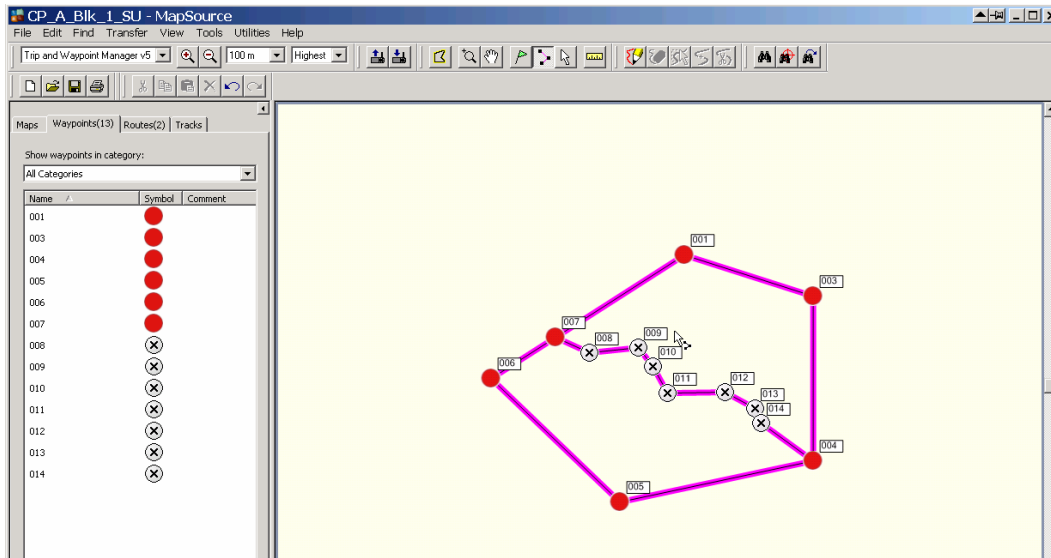


I am happy. I recognise the roads and blocks, and my converted data is in the right place.

## 4.2 Complex Polygons From Garmin

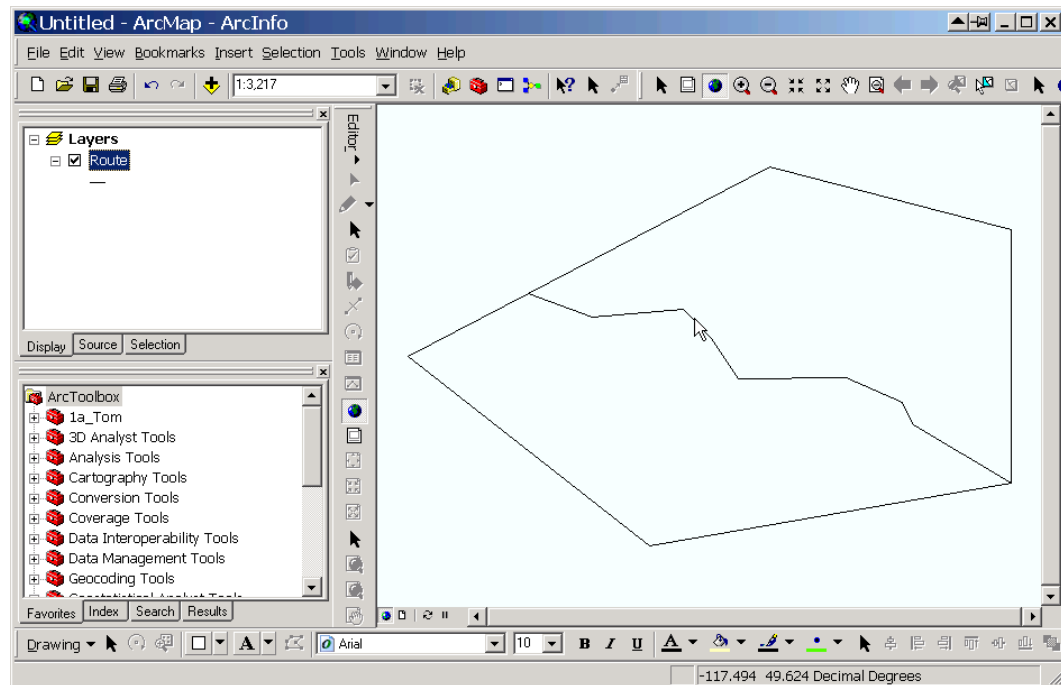
As previously discussed, any spatial arrangement of 2 or more polygons will require a GIS consultant to convert to a shape file.

For example:

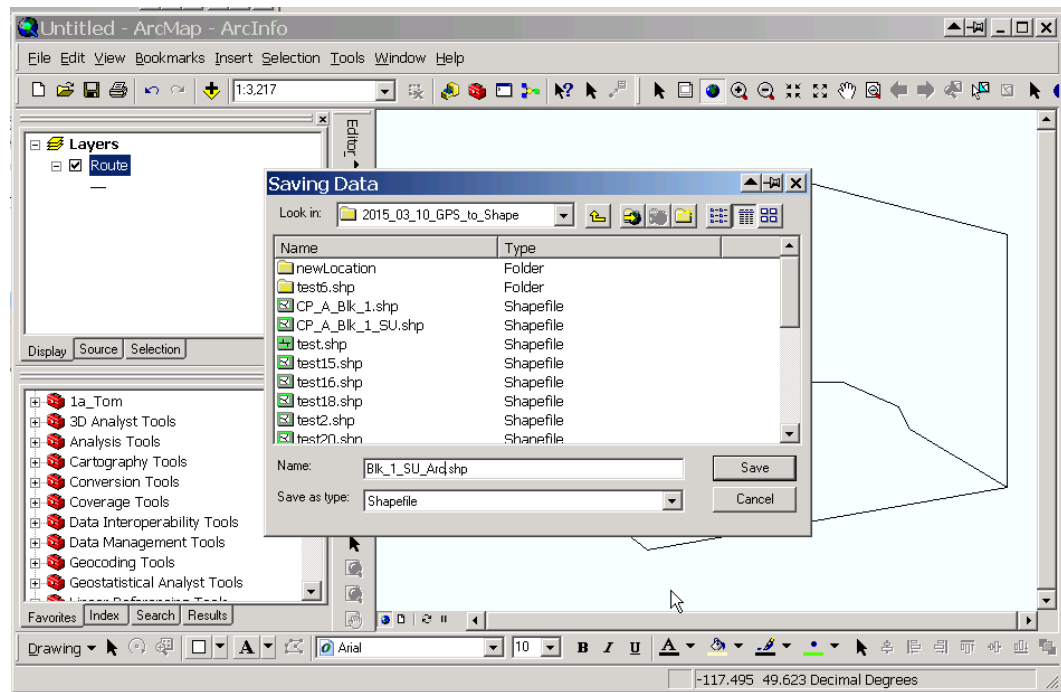


The conversion is pretty darn simple and should not result in a large bill. Here is what is required:

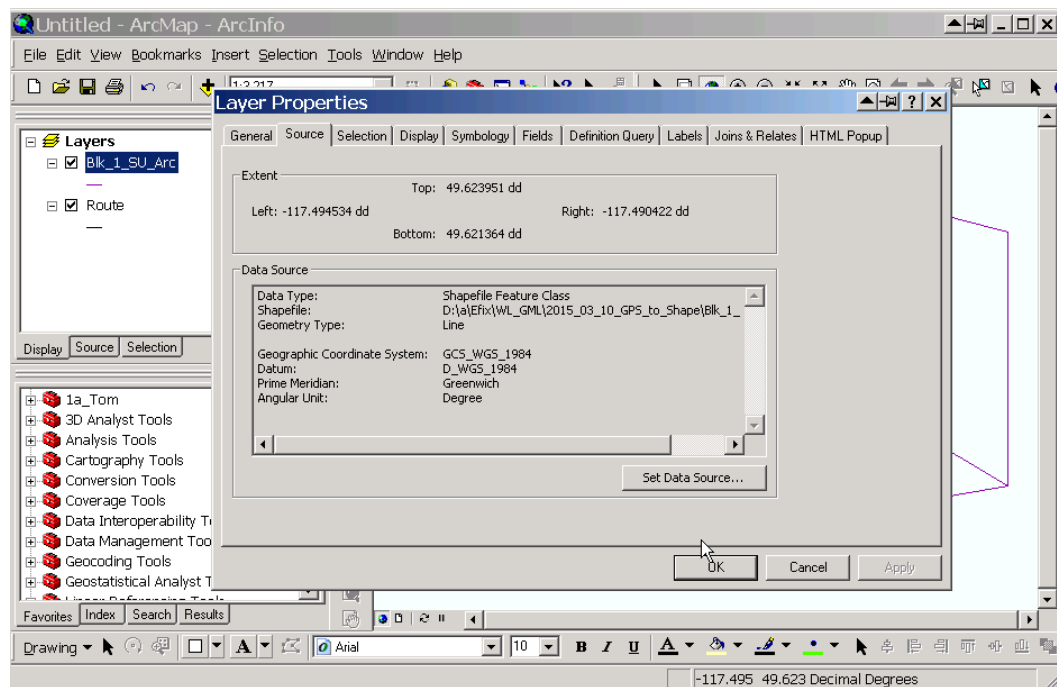
1. Open the Route component of the GPX in ArcMap



2. Export the lines to a Shape File.

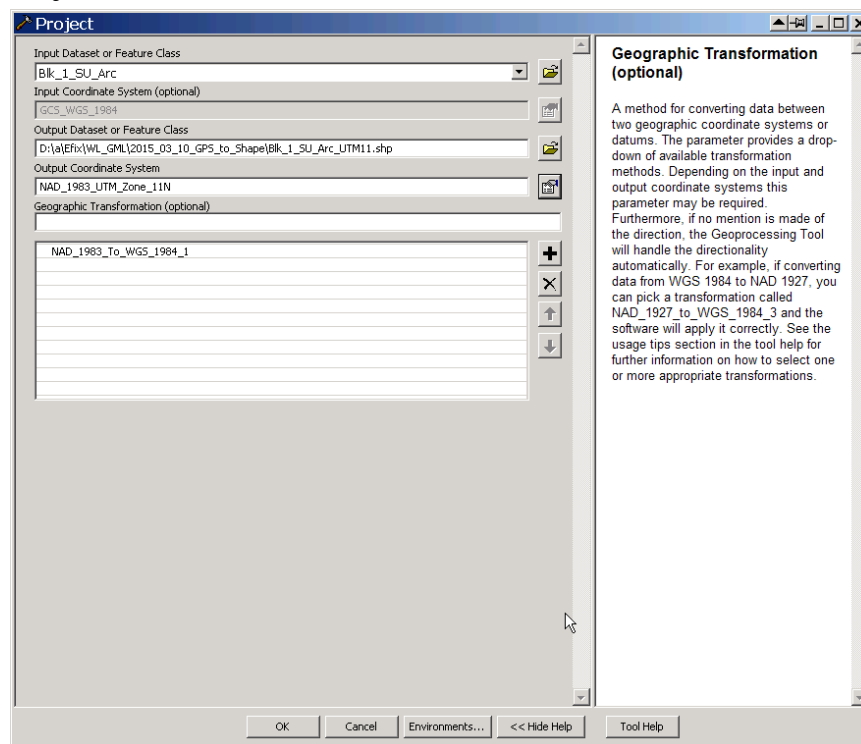


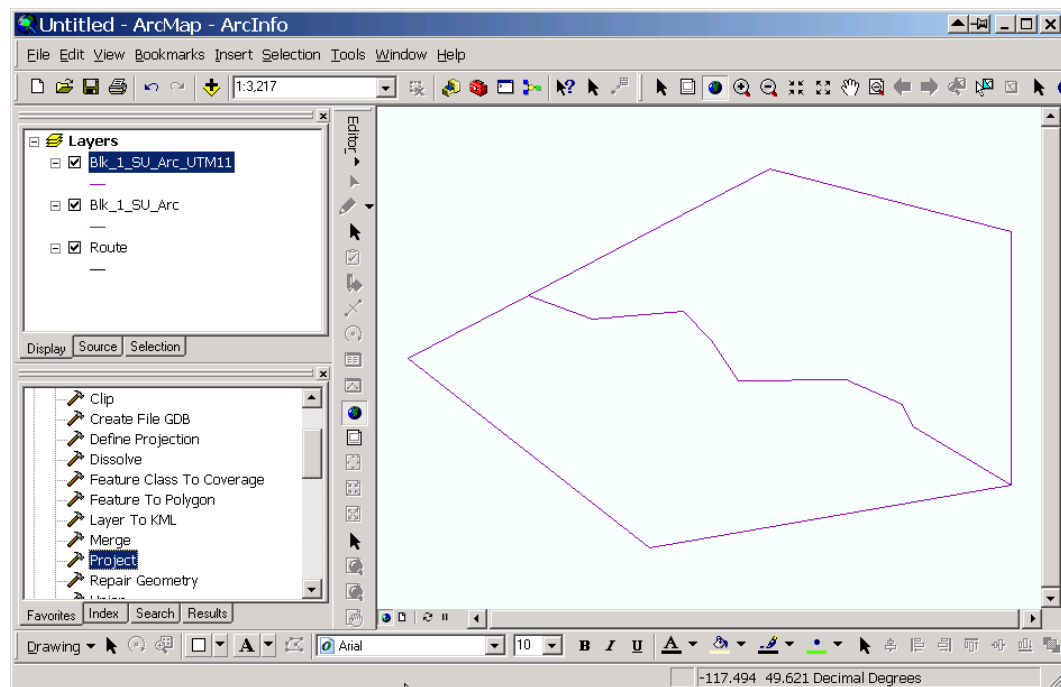
3. Check the projection.



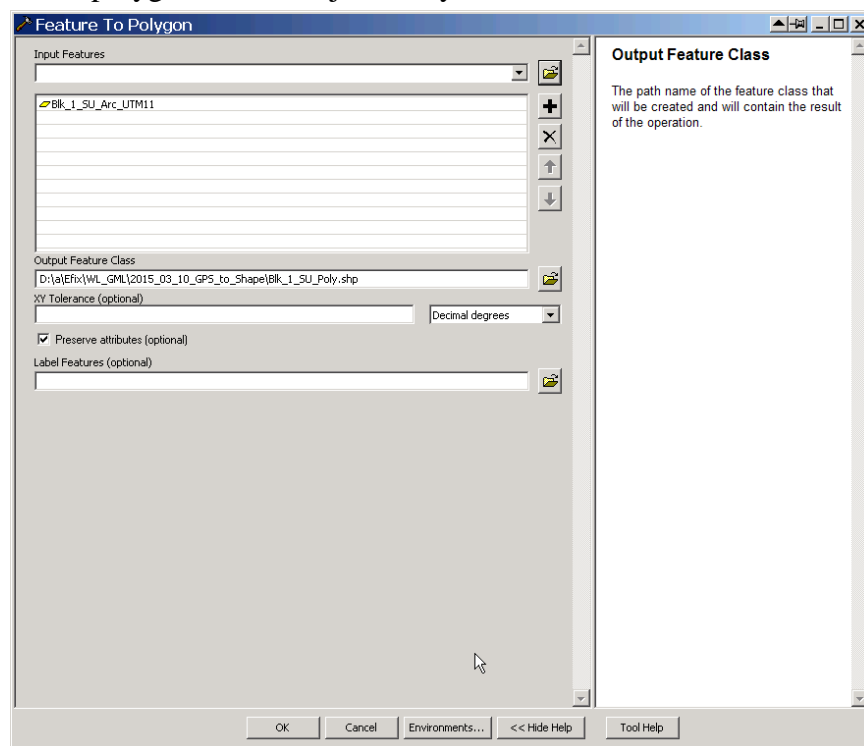
Hmm, WGS84. I want UTM11 NAD83, so I will project.

#### 4. Project.

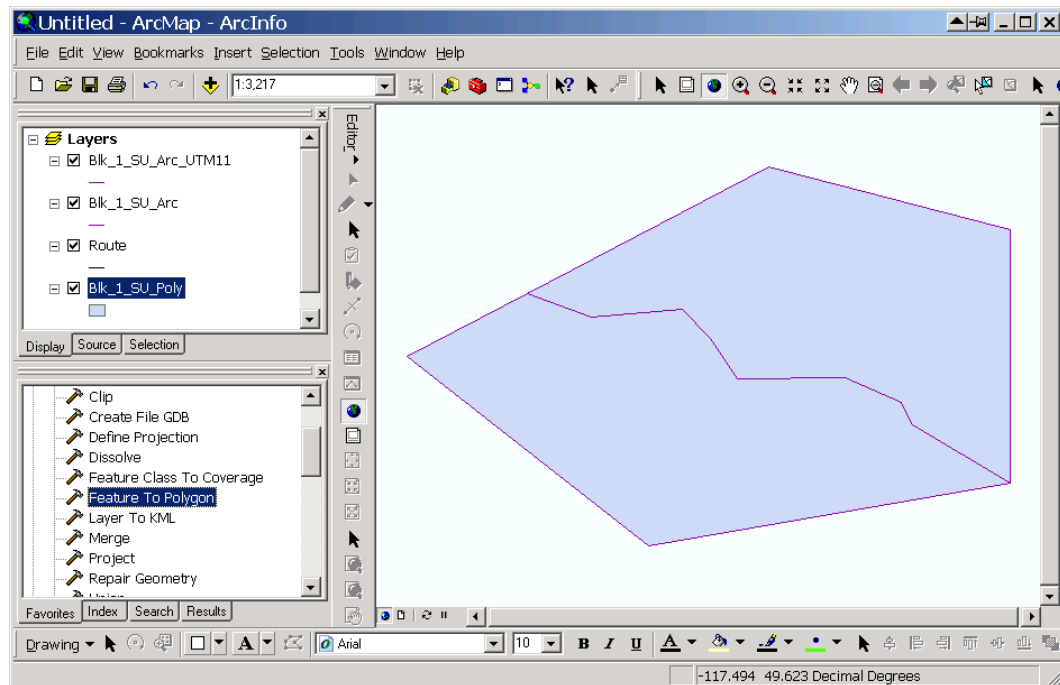




5. Make polygons from Projected layer.



6. Done. Send polygon shape back.



It actually takes longer to get the email and send the email with the zipped shape attached than it does to do the GIS work.

7. You digitized poorly and dangly lines in the GPX you sent need to be fixed to make polys? \$\$ You need some multipart shapes that join 2 or more discrete bits into one virtual polygon? \$ It all costs, but if you do the digitizing (well!) in MapSource, you can greatly reduce your final GIS Services bill.