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BSZLAK - Beauplan's 17th Century Szlak Routes
Across the Pontic Steppe

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BSZLAK-Description

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BSZLAK - Tracing 17th Century Szlak Paths Across the Pontic Steppe

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Introduction

Szlak, a Polish word meaning “trail”, was the name given to paths used to traverse the Pontic Steppe in the early modern period. Regular roads were virtually non-existent, and overland travel tended to follow general paths that conducted travelers between destinations as expeditiously as possible by avoiding rugged terrain such as mountains, ravines, and difficult river crossings. The BSZLAK project attempts to trace the paths of three of these trails, the Czarny szlak, the Kuzmianski szlak, and the Moraski szlak, which were of particular importance to the Black Sea slave trade that saw the abduction or death of some two million individuals from the region from 1500-1700. The primary sources used to trace these paths are fifteen maps by Guillaume Le Vasseur de Beauplan produced in the mid-1600's (Table 1). Beauplan's maps show populated places, rivers, river fords, river rapids, forests, mountains, and valleys that can be associated with places shown on modern maps, thereby providing landmarks for tracing szlak paths.

This description of the BSZLAK project begins with a list of Beauplan maps that show szlak paths, followed by a description of the modern sources used to locate the paths. The work flow used to trace the paths is then summarized, and example results of this work flow are shown. Next, project outputs are described and the means of accessing the outputs is presented. Finally, related project work and next steps are outlined.

Beauplan Maps and Modern Sources

Table 1 shows the Beauplan maps used for the BSZLAK project, the particular szlak shown on each map, a source where each map can be found.

Table 1: Beauplan maps showing szlak paths.

Beauplan Map Name	Czarny	Kuzmianski	Moraski	Source
Basse Podolie ou Palatinat de Braclaw	X	X		A
Basse Volhynie ou palatinat de Kiow	X			A
Carte d'Ukraine Contenant plusieurs Provinces comprises entre les Confins de Moscovie	X	X	X	A
Delineatio generalis Camporum Desertorum vulgo Ukraina	X	X	X	B
Delineatio specialis et accurata Ukrainæ - Panel 1			X	C
Delineatio specialis et accurata Ukrainæ - Panel 2	X			C
Delineatio specialis et accurata Ukrainæ - Panel 3	X	X		C
Delineatio specialis et accurata Ukrainæ - Panel 7	X			C
Delineatio specialis et accurata Ukrainæ - Panel 8	X			C
Haute Podolie ou Palatinat de Kamieniec	X	X		A
Haute Volhynie, ou Palatinat de Lusuc	X			A
Regni Poloniae magnique ducatus Lithuaniae nova et exacta tabula ad mentem Starovolcii descripta			X	A
Typus Generalis Ukrainæ sive Palatinatum Podoliæ, Kioviensis et Braczlaviensis			X	A
Ukrainæ pars quæ Barclavie palatinatus vulgo dicitur	X	X		A
Ukrainæ pars quæ Kiovia palatinatus vulgo dicitur	X		X	A

Source

A: Bibliothèque Nationale de France - <http://www.bnf.fr/>

B: Library of Congress - <https://www.loc.gov/>

C: Jagiellońska Biblioteka Cyfrowa - <https://jbc.bj.uj.edu.pl/>

As described in the next section, szlak paths were traced by correlating paths and landmarks shown on Beauplan maps with currently-existing landmarks. Three sources of current landmarks were used to make these correlations.

The authors' Base Maps of Ukraine (BMU) project¹ provides maps of rivers, terrain elevation², and terrain ruggedness³ for the area crossed by the szlak traced in this project. The authors' Gazetteer of Beauplan's Ukraine (GBU) project⁴ provides maps of populated places shown on Beauplan maps that have been associated with currently existing populated places. A Google Physical map⁵ and a Bing Aerial map⁶ of the area were used to provide additional currently existing landmarks such as roads and rail lines.

Work Flow and Example Results

The following work flow describes how a particular szlak path can be traced. Some familiarity with GIS and software such as QGIS and ArcGIS is beneficial to understanding the work flow. Figures 1-7 show intermediate work flow outputs and Figure 8 shows the final paths traced through this project.

- 1) Examine Beauplan maps.
 - a) Identify Beauplan maps that show the szlak path to be traced (Table 1).
 - b) On each map, identify populated places and rivers that can help to locate the path (Figure 1).
- 2) Create GIS base maps (Figure 2).
 - a) Create a QGIS project (or equivalent) for tracing the szlak path.
 - b) Create a line layer for tracing the path.
 - c) Add a populated places layer from the GBU project.
 - d) Add rivers, terrain elevation, and roughness index layers from the BMU project.
 - e) Add Google Physical and Bing Aerial map layers.
- 3) Trace path.
 - a) Using the Beauplan landmarks of Step 1.b, the populated places layer of 2.b, and the rivers layer of 2.c, locate the Beauplan landmarks on the rivers and populated places layers (Figure 2).
 - b) Using the landmarks of 3.a, trace an approximate path on the line layer of 2.b (Figure 3).
 - c) Using the terrain elevation layer of 2.b, adjust the approximate path of 3.b to avoid crossing deep valleys and high ridges (Figure 4).
 - d) Using the Google Physical and Bing Aerial map layers from 2.e, adjust the path to follow modern roads, rail lines, and river crossings (Figure 5).
 - e) Using the roughness index layer from 2.b, adjust the path to avoid areas of high roughness (Figure 6).
 - f) Repeat 3.c - 3.e until a likely path emerges (Figure 7).

In executing Step 3.d above, it was observed that many sections of the szlak paths ran very close to modern rail lines or roads. Where this occurred, the final szlak path was drawn directly over these rail lines and roads.

Project Outputs and Access

Szlak paths are stored as .shp files that can be opened in GIS applications such as QGIS and ArcGIS, and as .kml files that can be opened in applications such as Google Earth, QGIS and ArcGIS. These outputs are available for download as .zip folders through the BSZLAK repository⁷. The folder containing the .shp files also contains all associated files needed to open the files in QGIS. A web map of the BSZLAK szlak paths is available at https://qgiscloud.com/polczynski/BSZLAK_Web_Map.

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¹ https://epublications.marquette.edu/ottoman_ukraine/

² Shuttle Radar Topography Mission data (<http://Ita.cr.usgs.gov/SRTM1Arc>) was used to produce the BMU project terrain elevation map.

³ Riley, S. J., S. D. DeGloria and R. Elliot (1999). A terrain ruggedness index that quantifies topographic heterogeneity, *Intermountain Journal of Sciences*, vol. 5, No. 1-4, 1999. The terrain ruggedness index reflects the difference in elevation values from a center cell to the eight cells immediately surrounding it.

⁴ https://epublications.marquette.edu/ottoman_beauplan_gazetteer/

⁵ <https://www.google.com/maps/>

⁶ <https://bing.com/maps/>

⁷ http://epublications.marquette.edu/ottoman_bszlak/

⁸ <https://creativecommons.org/licenses/by/4.0/>

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Related Work and Next Steps

As noted, the authors' BMU and GBU projects provided critical information on the landmarks used to trace szlak paths. Databases for both of these projects continue to be updated as more information becomes available, thereby providing the opportunity to refine the szlak paths traced by this project. Beyond this, the authors plan to incorporate information from additional maps and sources to further refine these paths and to add paths contemporary with the three traced in this work.

In a related effort, the authors are using databases from the BMU, GBU, and BSZLAK projects to provide insight into the Sawran-Kodyma border dispute. In 1539 a proposal for a joint border demarcation commission to establish the border between the Ottoman Empire and the Polish-Lithuanian Commonwealth was sent by Ottoman sultan Süleymân to Polish king Zygmunt I. By 1542, the issue had boiled down to a dispute over whether the border should extend between the Dniester river and the Pivdenny Buh river along the Sawran river (Ottoman proposal) or along the Kodema river (Polish proposal). While detailed period accounts of the negotiations exist, the purpose of this work is to demonstrate how historical and modern maps can expand understanding of the situation by addressing questions such as: Where are the Dniester, Pivdenny Buh, Sawran, and Kodyma rivers? How much territory lies in the disputed area? Were there any settlements, travel paths, river fords, forests, or other resources of importance in the disputed area? Ultimately, was this a struggle for control of a strategic resource-rich territory, or fundamentally a war of wills over a worthless plot of land?

Figure 1: Section of Panel 3 of Beauplan's *Delineatio specialis et accurate Ukrainiæ* map showing intersecting sections of the Czarny szlak. North is at bottom on this Beauplan map.



Figure 2: QGIS project with GBU project populated places layer shown on BMU project rivers and terrain elevation layers. Codes in (parentheses) correspond to work flow steps. Note landmarks associated with Figure 1 map.

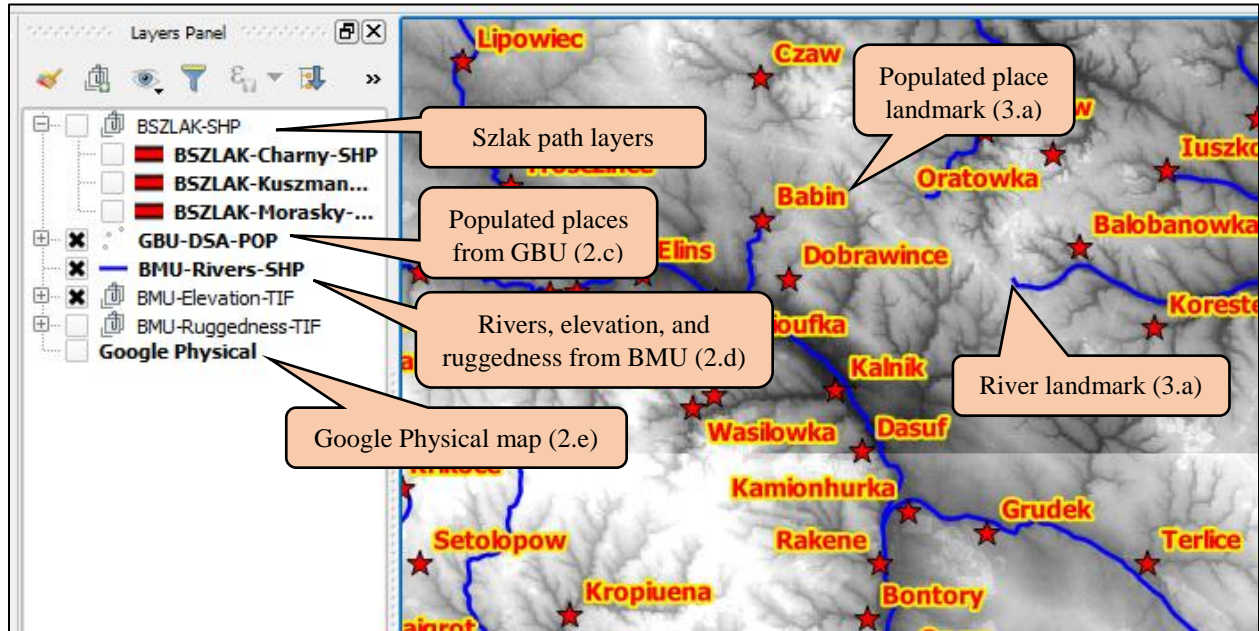


Figure 3. Approximate path traced using landmarks of Figures 1 and 2.

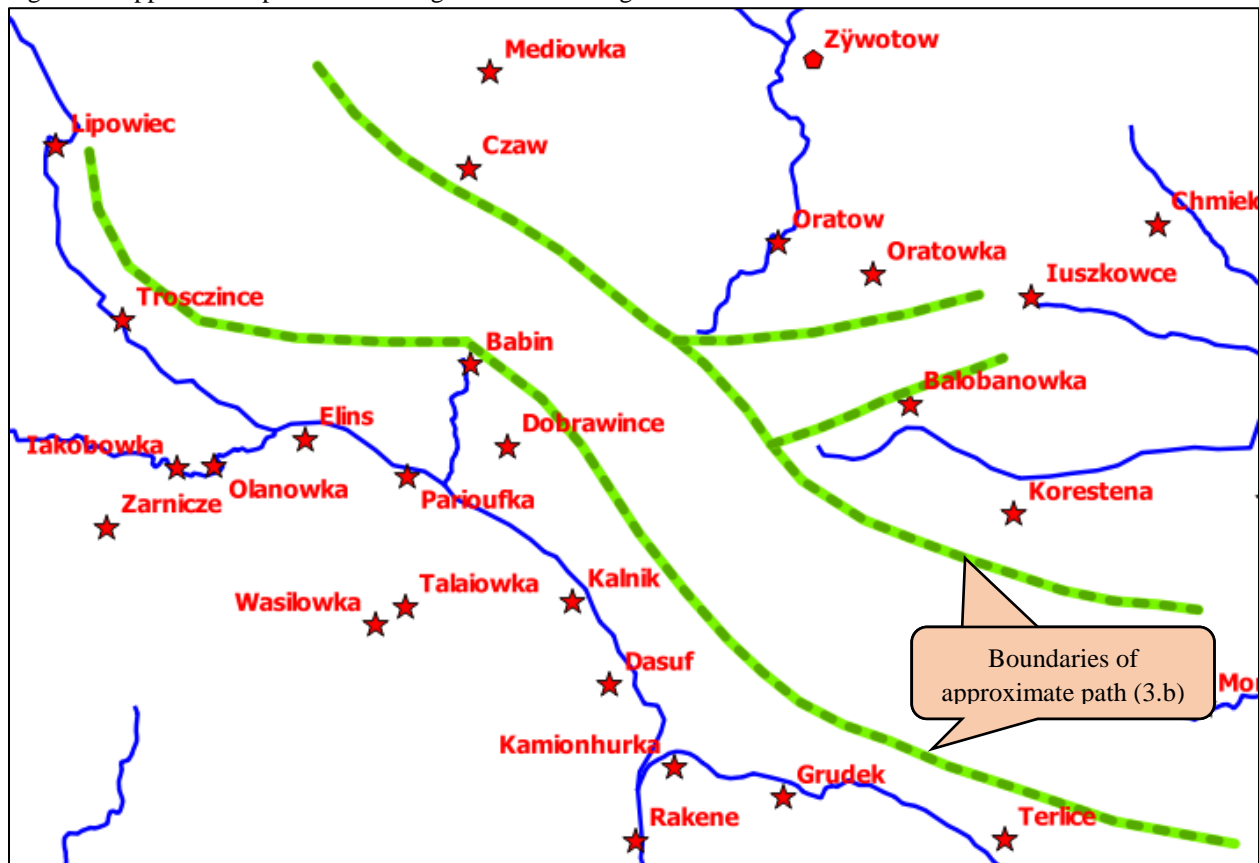


Figure 4: Path refined by examining terrain elevation to minimize crossing ridges and valleys.

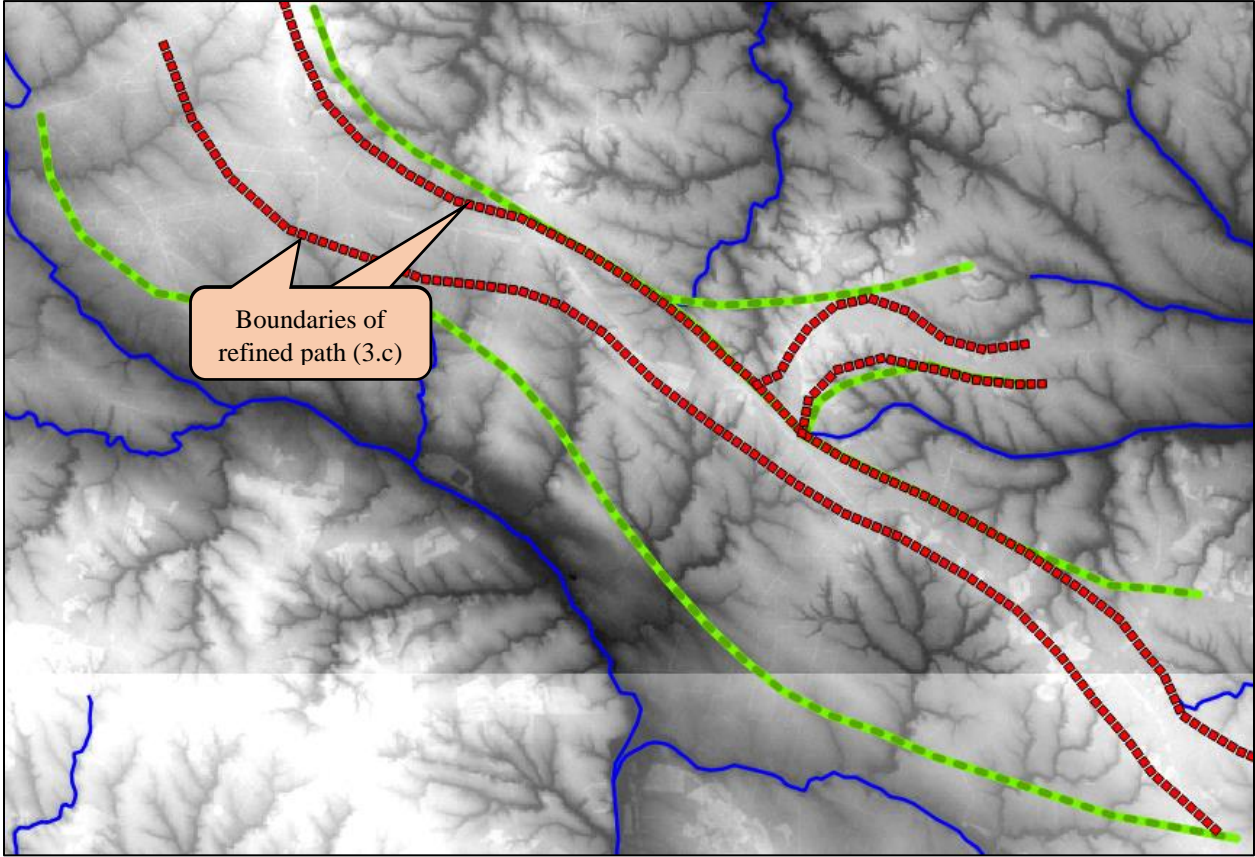


Figure 5: Section of refined path of Figure 4 superimposed on Bing Aerial map. Note that a modern railroad line runs down the center of the refined path.



Figure 6: Section of path drawn over railroad line of Figure 5 superimposed on the terrain roughness map and adjusted to avoid rough regions.

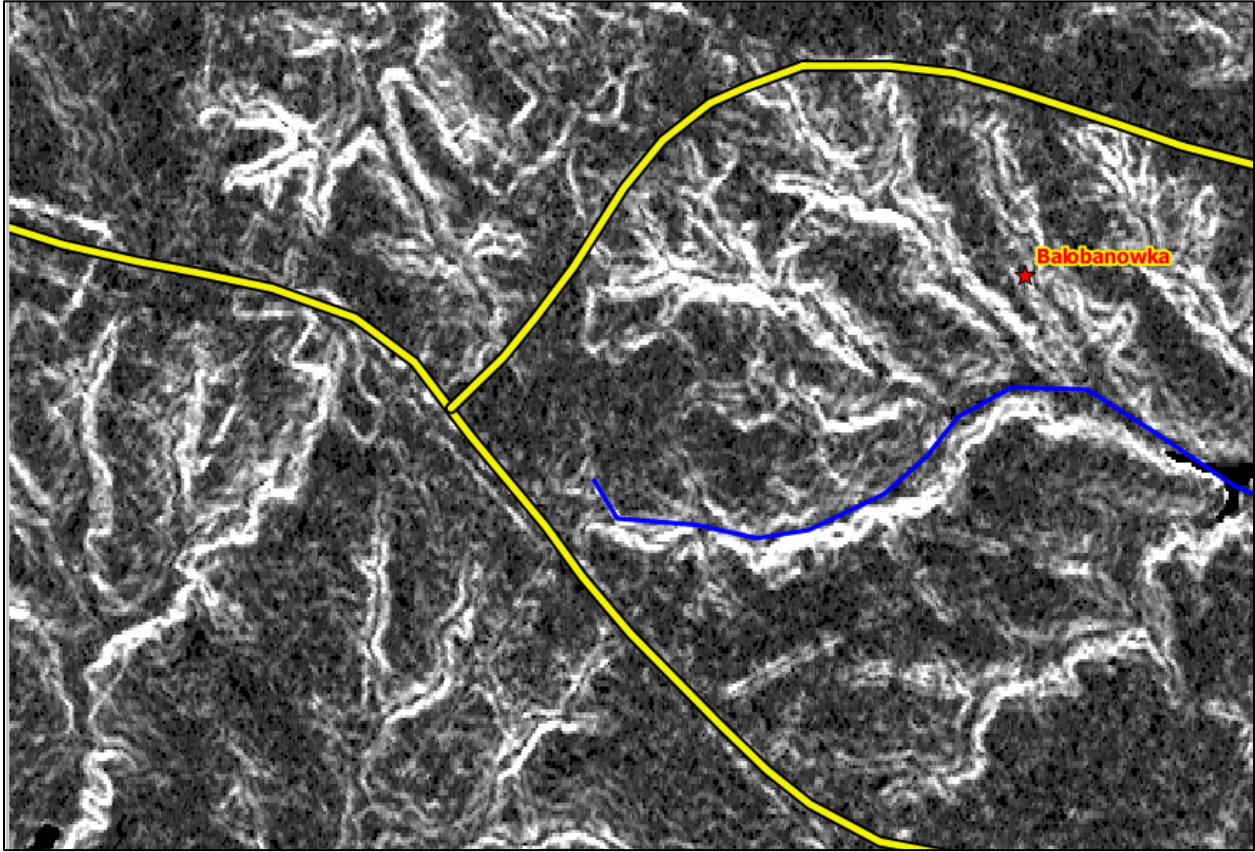


Figure 7: Czarny szlak path for Figure 1.

