South Fork Eel River Geomorphic Field Data Collection Final Report

HSU River Institute

September 2017

The HSU field crew successfully completed the target number of geomorphic surveys in ten weeks (June 6 – August 11, 2017) of field data collection (Figures 1 - 4). Survey goals originally included four survey reaches per bin type, including two of those four in each of the geology types and resulting in an overall goal of 52 surveys. However, there were limitations to achieving these goals in certain bins in the central geology type due to either no occurrence or because of limited access from cannabis operations. For example, bin type 4.1 (4-8% slope, 0-25 km^2 drainage area) only occurs in the central geology type where there is no public access and a high density of unsafe cannabis. Bin types 3.3 (2-4%, 200-1000 km^2), 2.3 (1-2%, 200-1000 km^2), and 1.3 (0-1%, 200-1000 km^2) only occur in the coastal geology type. In response, we revised our goals to achieve four surveys per bin type where feasible, whether that meant two surveys per geology type in each bin or one to four surveys per geology type per bin (Table 1 and Figure 5).

In the South Fork Eel River watershed study area, the stream network was segmented into 500-m long reaches in ArcMap 10.4.1 by ESRI. Initially, the 500-m reach lengths were created to buffer potential survey sites from adjacent reaches of different bin types. However, bin type 2.4 (1-2%, >1000 km^2) is only found in the lowest portion of the drainage where the channel bankfull widths are very large. Since survey site reach lengths were calculated by multiplying 15 times the bankfull width, the actual reach length exceeded the 500-m length in which the 2.4 bins occur. Bin type 1.4 (0-1%, >1000 km^2) occurs on both upstream and downstream ends of every 2.4 bin, therefore sampling these bin types would have resulted in surveying outside the desired bin type and into bin type 1.4. For this reason, bin type 2.4 was deleted from the list of targeted bins because it did not meet the guidelines of a useable bin type for the purpose of this study.

Bins 1.2 (0-1%, 25-200 km^2), 2.1 (1-2%, 0-25 km^2), and 3.1 (2-4%, 0-25 km^2) were surveyed more than four times as a result of errors locating sites while in remote locations. However, these oversampled bins appeared to be proportionally more abundant in the watershed than other bin types. Therefore, having more surveys of these common bin types could be useful to test the accuracy and

precision of the model generated. Bin 2.3 (1-2%, 200-1000 km^2) was only surveyed three times due to its limited occurrence and problematic access within the watershed.

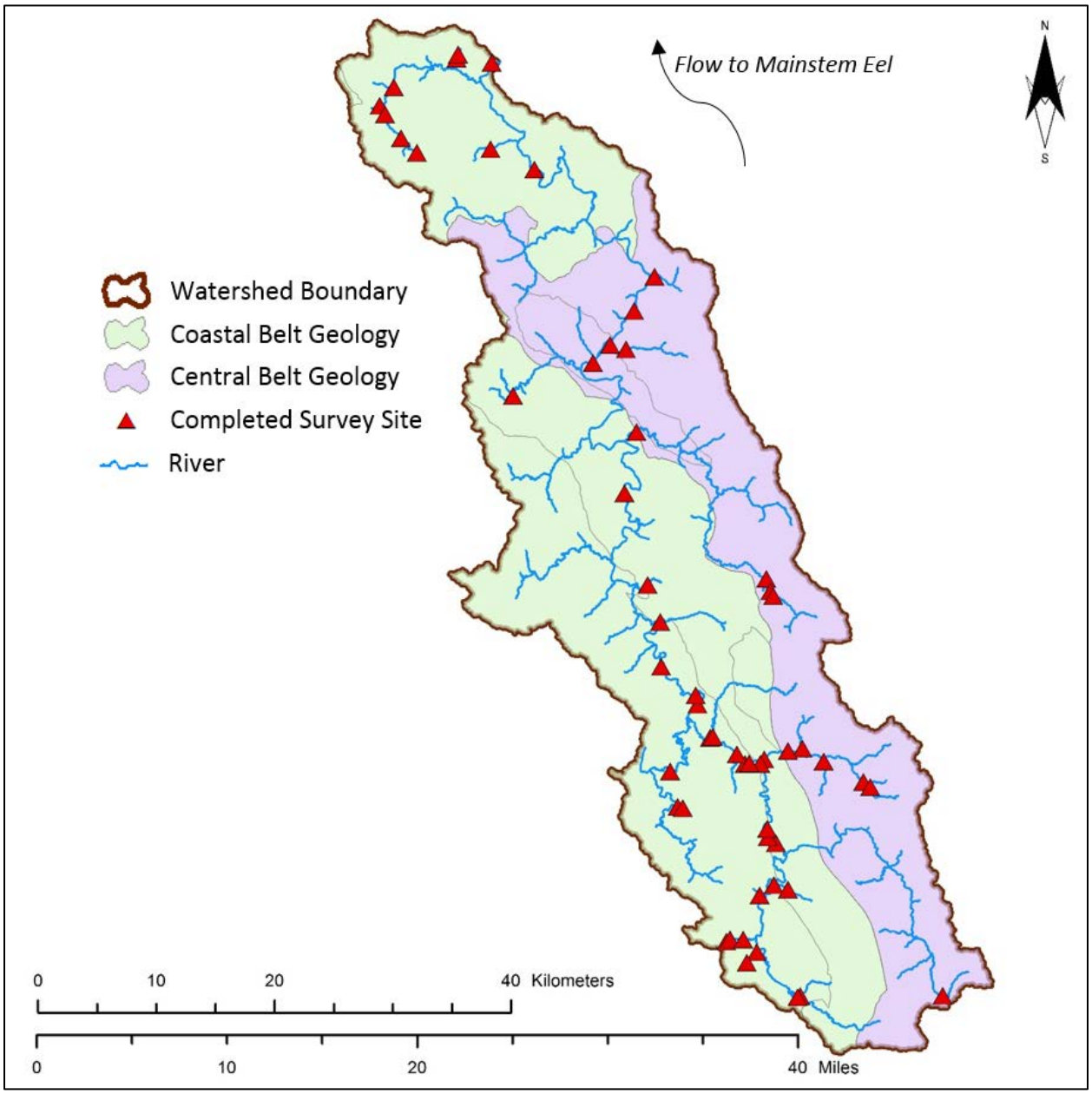

Figure 1. South Fork Eel River watershed study area showing spatial distribution of completed surveys (gray dots) from all field data collection during June – August 2017. Spatial Reference: WGS 1984, UTM Zone 10 North.

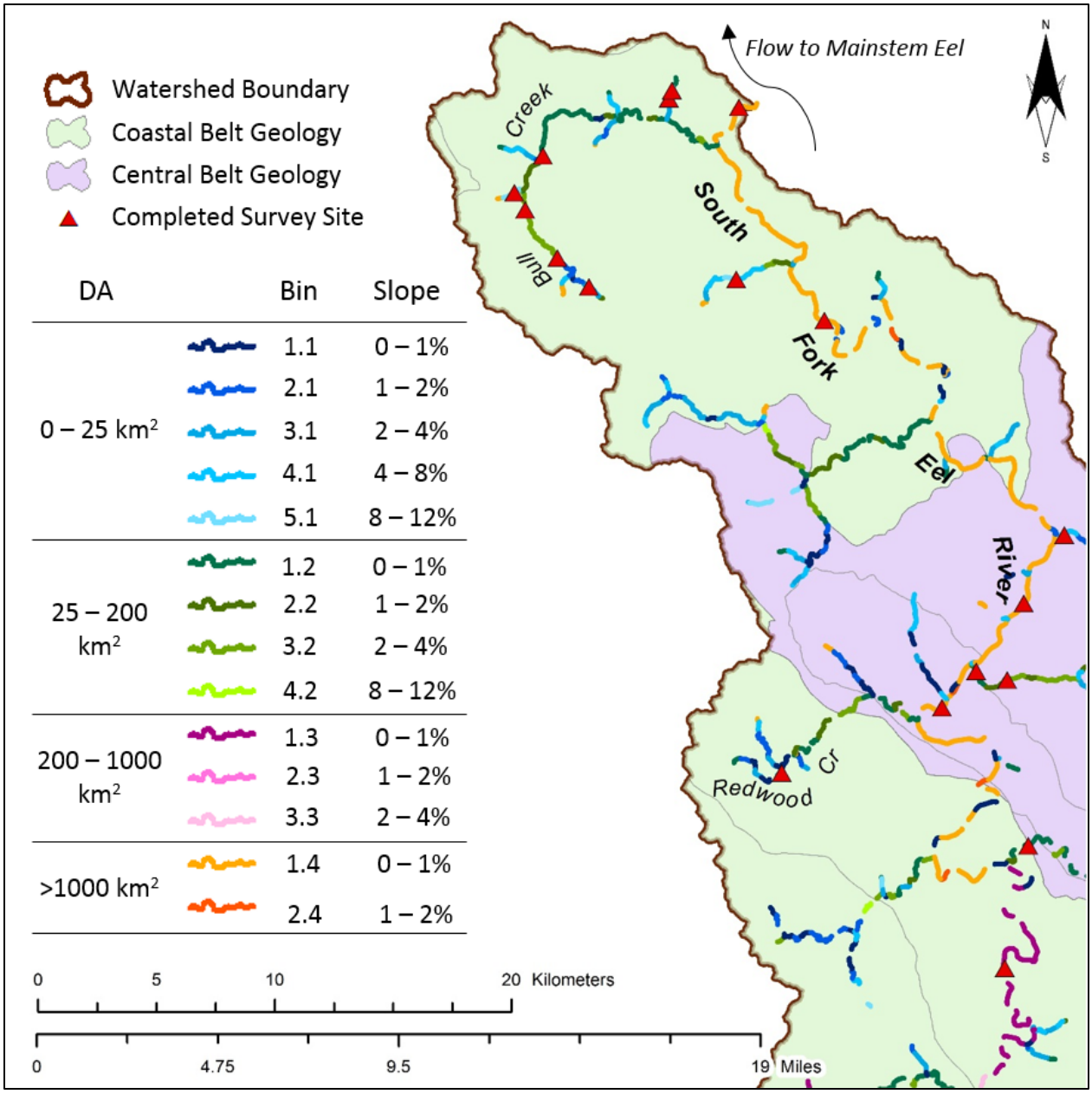

Figure 2. Northern portion of the South Fork Eel River watershed including completed survey sites (gray dots) among streams stratified by categories of drainage area and slope. Spatial Reference: WGS 1984, UTM Zone 10 North.

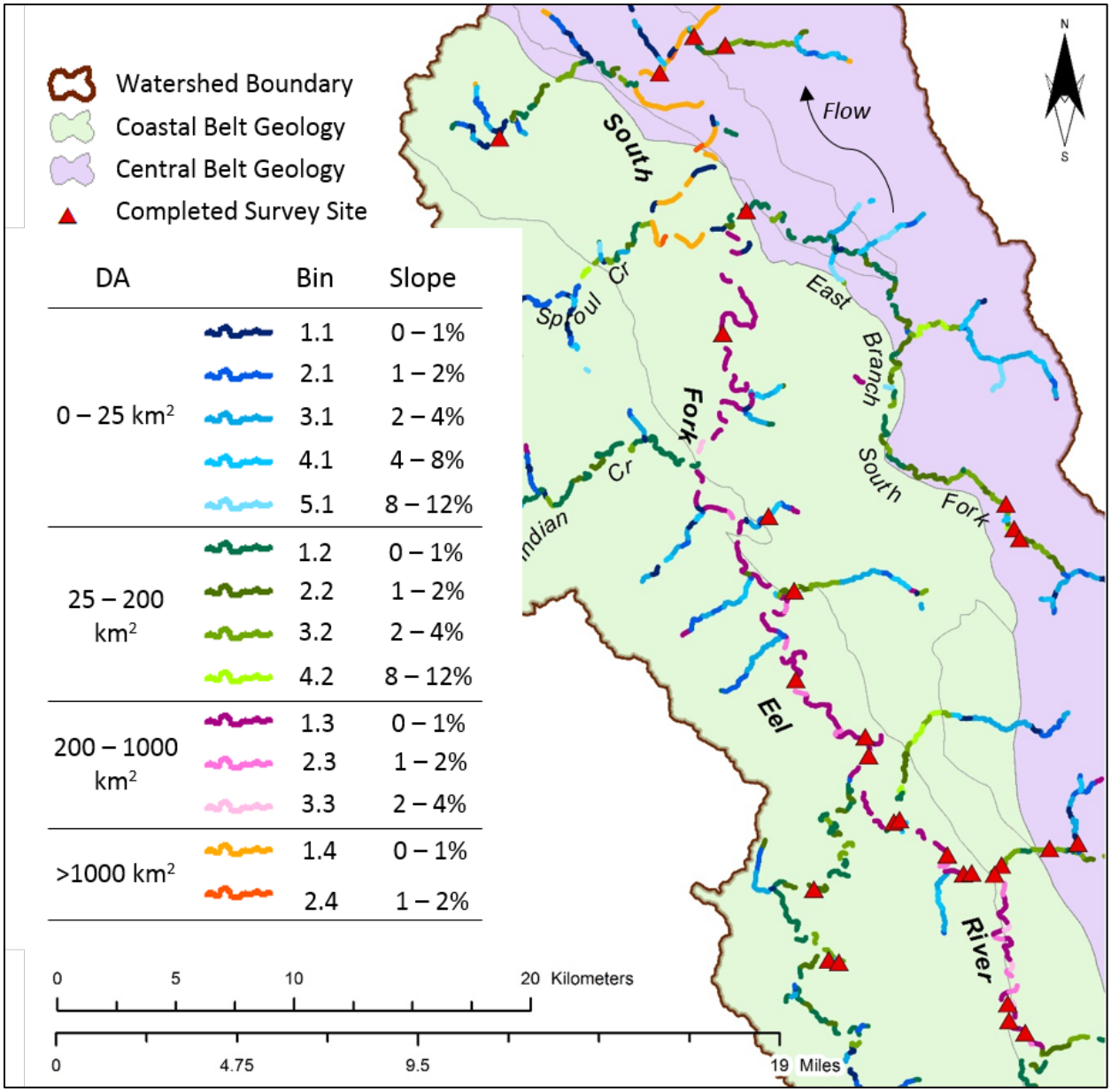

Figure 3. Central portion of the South Fork Eel River watershed including completed survey sites (gray dots) among streams stratified by categories of drainage area and slope. Spatial Reference: WGS 1984, UTM Zone 10 North.

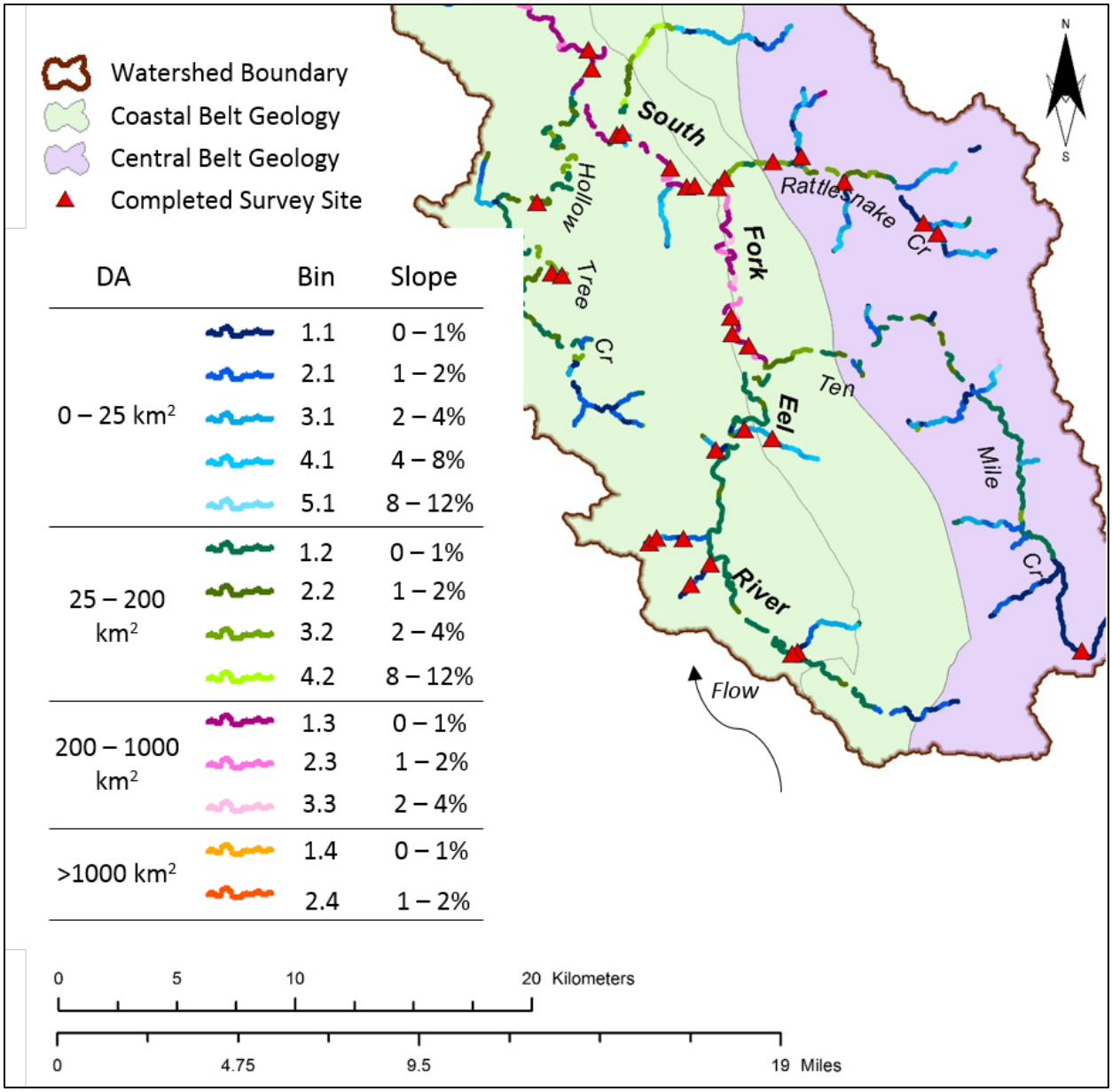

Figure 4. Southern portion of the South Fork Eel River watershed including completed survey sites (gray dots) among streams stratified by categories of drainage area and slope. Spatial Reference: WGS 1984, UTM Zone 10 North.

Table 1. Survey progress for each stream classification bin along with two geology types. Percent surveys completed is expressed in number of surveys completed out of 4 (4 surveys per bin with two in each geology type where applicable).

Bin	Bin Description	*N* Surveys	Central Geo	Coastal Geo	Overall % Complete
1.1	0-1%, 0-25 km^2	4	3	1	100
1.2	0-1%, 25-200 km^2	6	3	3	150*
1.3	0-1%, 200-1000 km^2	4	0	4	100
1.4	0-1%, >1000 km^2	4	2	2	100
2.1	1-2%, 0-25 km^2	5	2	3	125*
2.2	1-2%, 25-200 km^2	4	2	2	100
2.3	1-2%, 200-1000 km^2	3	0	3	75**
3.1	2-4%, 0-25 km^2	5	1	4	125*
3.2	2-4%, 25-200 km^2	4	1	3	100
3.3	2-4%, 200-1000 km^2	4	0	4	100
4.1	4-8%, 0-25 km^2	4	0	4	100
4.2	4-8%, 25-200 km^2	4	2	2	100
5.1	8-12%, 0-25 km^2	4	1	3	100
	Totals	55			100%

**Oversampled bin; resulted in a total of 4 oversampled surveys for season goal*
***Bin 2.3 (1-2%, 200-1000km2) had only 3 survey sites available for data collection*

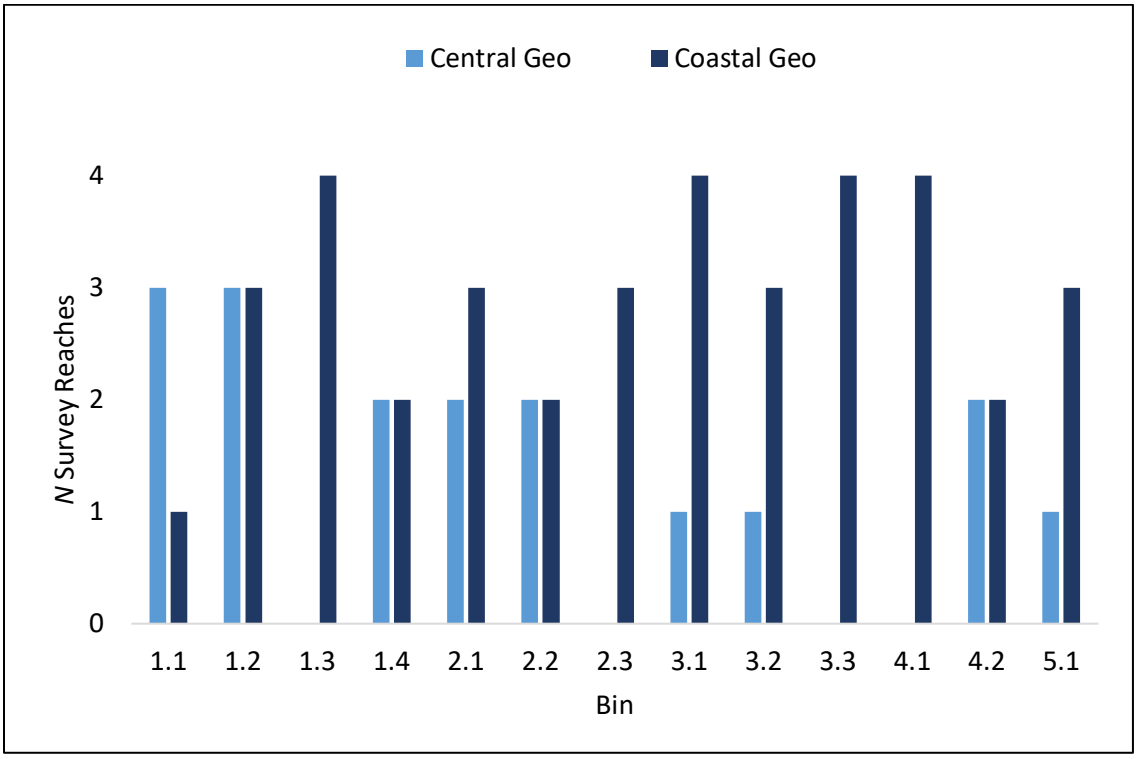

Figure 5. Geomorphic field data collection progress expressed in number of surveys completed among bin and geology types.