Memo

To: Whom it may Concern

From: SCRP Team

Date: 10/7/13

Subject: Watershed Delineation of Schultz Creek Project Site

Watershed delineations provide estimates for flow into a body of water or a channel. Watershed delineations can be performed manually or electronically using a USGS quadrangle topographic map. Performing a watershed delineation defines the area in which all precipitation and surface runoff is directed to the channel or body of interest. The watershed delineation for the Schultz Creek Restoration project site was performed using ArcGIS 10.2, which is an application used for collecting, managing, organizing, distributing, and analyzing geographic data from around the world. Figure 2 on the following page illustrates the complete watershed delineation of the Schultz Creek Project Site using ArcGIS 10.2. The completed watershed delineation helped determine the following site parameters:

- Watershed Area ≈ 7,084 Acres ≈ 308,580,000 ft^2
- Annual Flow = Annual Precipitation x Watershed Area = (22.8 in./yr). x (1 ft./12in.) x 308,580,000 ft^2 = 586,302,000 ft^3/yr
- Average Flow = 18.59 cfs

Using the information above and USGS stream flow regression equations shown below, flow for major flood events can be calculated, as shown below.

$$Q_2 = 0.124AREA^{0.845}PREC^{1.44}$$
$$Q_5 = 0.629AREA^{0.807}PREC^{1.12}$$
$$Q_{10} = 1.43AREA^{0.786}PREC^{0.958}$$
$$Q_{25} = 3.08AREA^{0.768}PREC^{0.811}$$
$$Q_{50} = 4.75AREA^{0.758}PREC^{0.732}$$
$$Q_{100} = 6.78AREA^{0.750}PREC^{0.668}$$

Figure 1: USGS Stream Flow Regression Equations

In the above equations, area is in units of square miles and precipitation is in inches per year. Using the regression equations, the 100-year flood event can be estimated to have a flow of about 63 cfs. The values above take evapotranspiration and groundwater recharge into consideration, based on climate and elevation. The Schultz Creek Project site is considered to be in a high elevation zone.

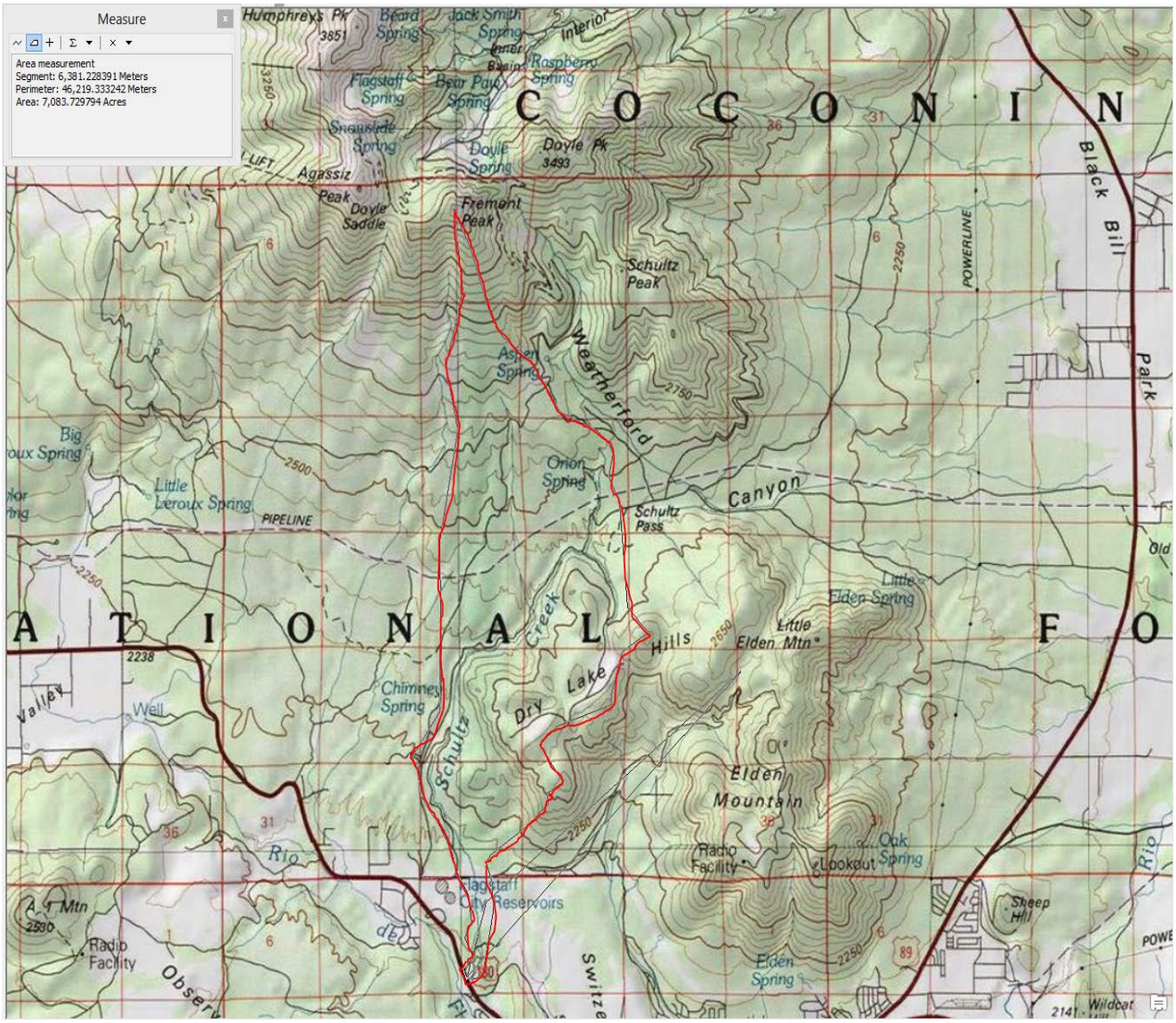

Figure 2: Watershed Delineation from ArcGIS-10.2