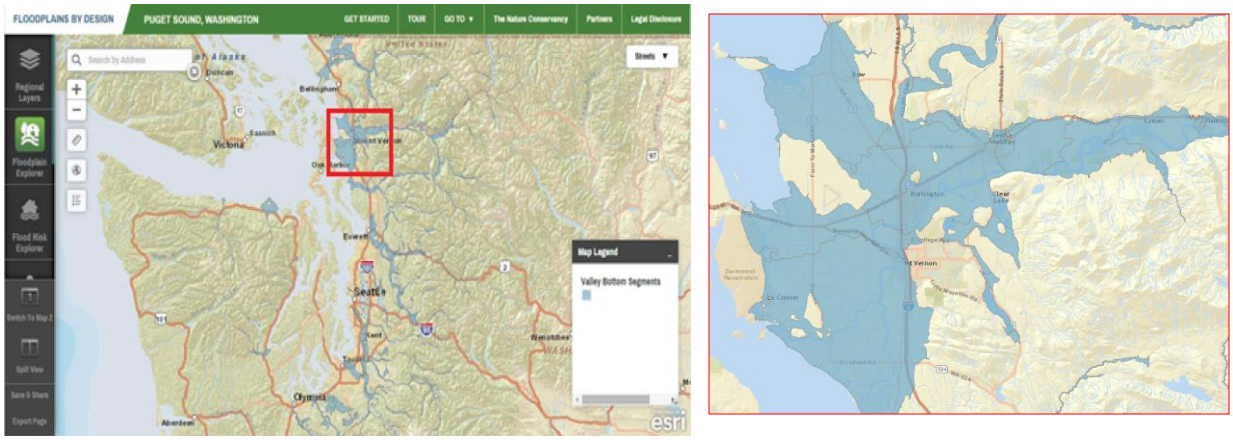
The Floodplains Explorer Guidance Document

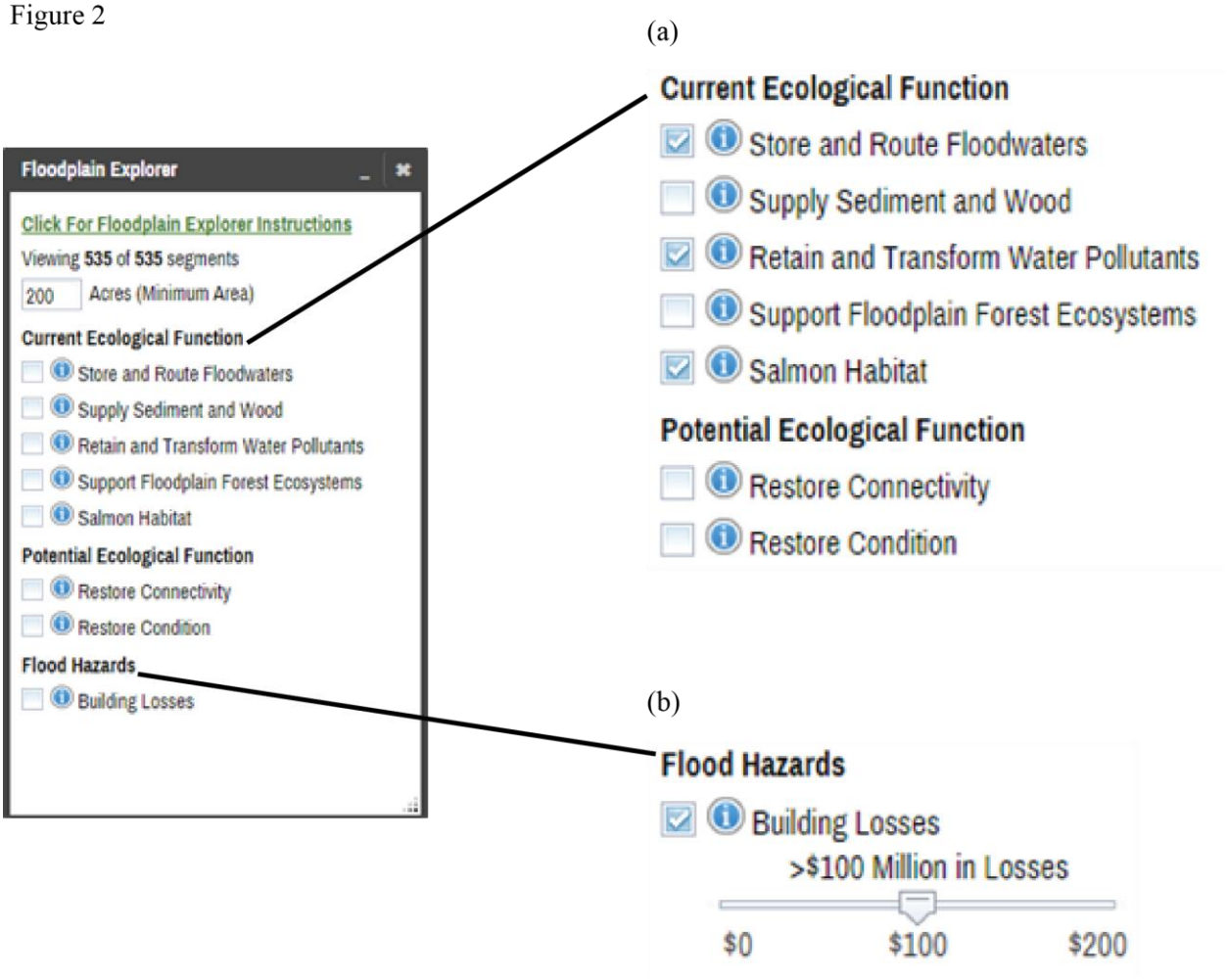
The Floodplain Explorer Tool combines the three key datasets that provide data visualizations to help align flood hazard reduction with ecosystem restoration and protection. The Floodplain Explorer visualizes ecological function and flood risk within the boundaries of the river's geomorphic floodplain in units that correspond to the Department of Ecology's Watershed Characterization Units (Figure 1). To avoid giving the impression of a greater degree of locational accuracy of the ecological function we aggregated the ecological data to these floodplain units because the source data were generated from remotely sensed data that may tend to over-generalize precise geographic locations of a specific function. This unit-based approach allows us to qualitatively assess the ecological condition and relative flood risk of an area in which a project exists or proposed project may be sited.

Figure 1



The user can first define a minimum area of ecological function within a FPU. The minimum acreage is the sum of all land area within a unit that supports current function and/or restoration potential. This is not intended to define a restoration project size but rather show the relative amount of land area that supports ecological function compared to the size of the FPU. Selecting a function will then display those units that contain ecological function in an amount equal to or greater than the defined minimum acreage (Figure 2). The user can select one or multiple functions producing an additive visualization of FPUs that contain those functions or the potential to restore ecological connectivity and function (Figure 2a).

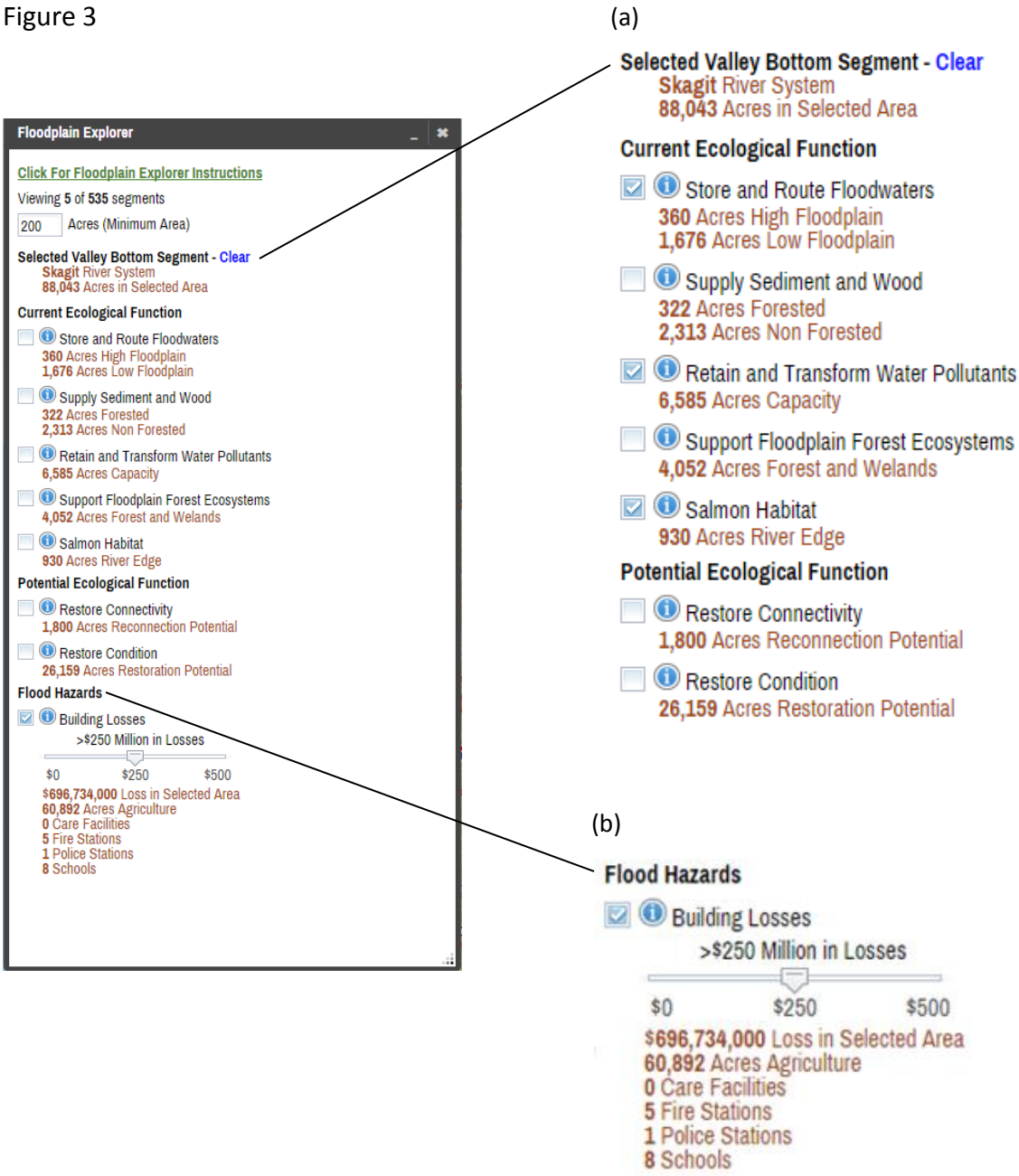
Figure 2



Flood hazard data from FEMA's HAZUS model, measured in dollars lost from affected structures, is summed for each floodplain unit as well. When "Building Losses" under the Flood Hazards section of the Floodplain Explorer is selected a slider bar appears that enables the user to select FPUs based on a minimum dollar amount of summed damage (Figure 2b).

The map display itself is also interactive. The user can select (click on) any floodplain unit on the map revealing additional information about that unit will appear in the Floodplain Explorer window (Figure 3). The name of the river system in which the selected FPU resides along with its total area is shown along with more detailed area measurements of that FPU's ecological condition (Figure a). Selecting an FPU also shows the total dollar losses from flooded structures and the number of critical facilities and area of agriculture land impacted (Figure 3b).

Figure 3

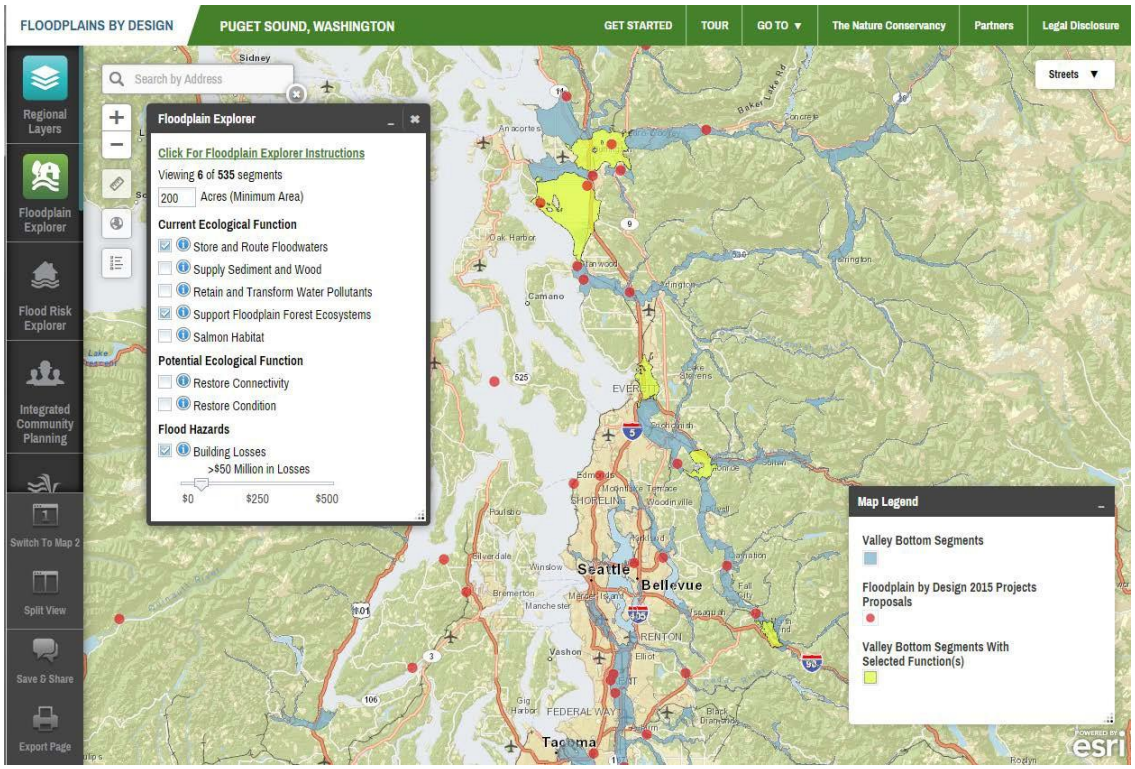


Example

There are many potential combinations of data layers that could generate opportunities to reduce flood hazards and restore ecological function and no single set of the "right" places to work. Opportunity areas can be identified using the data and visualization capabilities of the decision tool. For example with the information and functionality available in the Floodplain Explorer app a user could quickly identify floodplain units that contained the two ecological functions of storing and routing floodwaters and supporting floodplain forests

that are also susceptible to at least 50 million dollars in losses from flooding. With these floodplain units identified a user could use the Regional Layers app to overlay the location of the proposed Floodplain by Design Projects for 2015. Very quickly and easily the user could evaluate the ecological condition and flood hazard for any area in which a proposed restoration project resides and potentially assess the viability of the project to effectively meet the criteria of providing these multiple benefits (Figure 4).

Figure 4



An effective decision support tool will enhance the efficiency of the decision-making process and reveal new evidence-based approaches to problem solving. It is our hope that the Tier 1 *Floodplains by Design* Decision Support Tool will help facilitate coordinated use of regional data and enable multiple funding agencies to coordinate investment in projects that reduce flood risk while maintaining or enhancing ecosystem functions. The tool is not intended to provide prescriptive answers but rather to support collaborative discussion about how to simultaneously address flood risk, support agriculture and other activities and advance the critical goal of floodplain restoration in Puget Sound.