

and downstream of the alternative. Alternatives 6a and 6b cross the least amount of floodplain area, and Alternative H1 crosses the largest area. In general, the area of designated floodplain crossed by each alternative is in direct proportion to the overall length of the alternative, and is reflected in the number of HSAs crossed. Alternative H1 is expected to have the greatest potential to affect the hydrologic integrity and beneficial values of the designated floodplain in the project area. Alternatives 6a and 6b are expected to have the least potential to affect these parameters.

The total floodplain area that may be affected by a transportation alternative is determined primarily by the characteristics of the watersheds crossed and the siting of the alternative. Some of the longer alternatives cross a relatively smaller incremental area compared to the shorter alternatives - Alternative 1b does not cross substantially more floodplain area than the much shorter Alternative 6a. While Alternative 1b does cross a much greater number of USGS blue line streams, many of the streams in the HSAs crossed have very little or no designated floodplain area associated with them. The placement of alternatives crossing near the San Jacinto and Salt Creek floodplains results in a large area of floodplain crossed, as the floodplains for these streams along the route of these alternatives are much larger.

#### 4.10.2.9 Criterion FP-2 – Percent of Designated Floodplain Area Crossed

The extent of designated floodplains is associated with topography in the watershed, rainfall patterns in the upper areas of the watershed, and the size of the drainage basin.

**Regulatory Concerns.** The extent of encroachment on the designated floodplain area associated with USGS blue line streams to be crossed by transportation alternatives may result in the following effects:

- C Effects to the hydrologic integrity of the floodplain system in the area of the crossing, or downstream
- C Ability of the stream system to maintain beneficial floodplain values

**Evaluation Approach.** Tabulation and comparison of the potential percentage of the total floodplain area affected are directly related to the potential impact to beneficial floodplain values. The evaluation seeks to minimize the percentage of area potentially affected, so a lesser percentage of potential floodplain encroachment is considered better.

**Impacts of Alternatives.** Figure 4.10.4 presents the potential impacts of the HCLE alternatives on existing 100 year floodplain areas in each HSA crossed by these alternatives. The combined area of the HSAs crossed by the alternative is presented in Table 4.10.L. Table 4.2.M presents the aggregate area of existing 100 year floodplain within the affected HSAs that falls within the bandwidth, upstream of the alternative, and downstream of the alternative, as well as the percentage of the total floodplain area that falls within each of the three divisions, for the HCLE alternatives. The absolute area of floodplain crossed by each alternative is generally in direct proportion to the overall length of the alternative, and is reflected in the number of HSAs crossed. However, the percentage of floodplain area upstream and downstream of the

alternative is less directly related to overall alternative length (since it reflects a value in the fixed range of zero through 100 percent), and is an indicator of the relative position of the alternative within the HSAs crossed.

The percentage of the total floodplain area that may be affected by a transportation alternative is determined primarily by the characteristics of the watersheds crossed and the siting of the alternative. Some of the longer alternatives cross a relatively smaller incremental percentage of area compared to the shorter alternatives – Alternative 5b crosses a substantially smaller percentage of the floodplain area than the much shorter Alternative 6a. The results for this criterion are similar to those observed for Criterion FP-1. The trend of area affected and percent of total floodplain area affected are similar. This is likely due to the fact that no major floodplain areas are located away from the project area where the HCLE alternatives are routed – the proposed routes connect areas that have built up around existing floodplain areas.

#### 4.10.2.10 Criterion FP-3 – Length of Crossing of Floodplain

Crossings of streams by transportation alternatives may directly affect floodplain areas and uses, as well as other environmental factors and floodplain functions. The extent of designated floodplains is associated with topography in the watershed, rainfall patterns in the upper areas of the watershed, and the size of the drainage basin.

**Regulatory Concerns.** The extent of encroachment on the designated floodplain area of crossings by transportation alternatives may result in the following effects:

- C Effects to the hydrologic integrity of the stream system in the area of the crossing, or downstream
- C Effects to beneficial floodplain values
- C Effects to natural floodplain functions
- C Constriction or blockage of natural streamflow
- C Constriction or blockage of natural streambed migration in response to upstream precipitation and runoff events
- C Reduction in downstream shallow/bank groundwater storage due to reduced flow volumes, changes in flooding patterns, or channel constriction

**Evaluation Approach.** The extent of impact to beneficial floodplain values and constriction of streamflows by the proposed alternatives cannot be completely quantified at the program level of detail. However, tabulation and comparison of the total length of the potential crossings by each alternative provide a quantitative comparison of the potential for these types of impacts. The alternative crossings may affect the surface water hydrology and functions of floodplain areas; the evaluation seeks to identify the alternative with the minimum length of crossing that might potentially affect these parameters.

**Impacts of Alternatives.** The number and combined area of the HSAs crossed by each alternative are presented in Table 4.10.L. In general, the length of floodplain crossing