Steigerwald Reconnection Project
How Agencies Assess Level of Risk and Implications for Design

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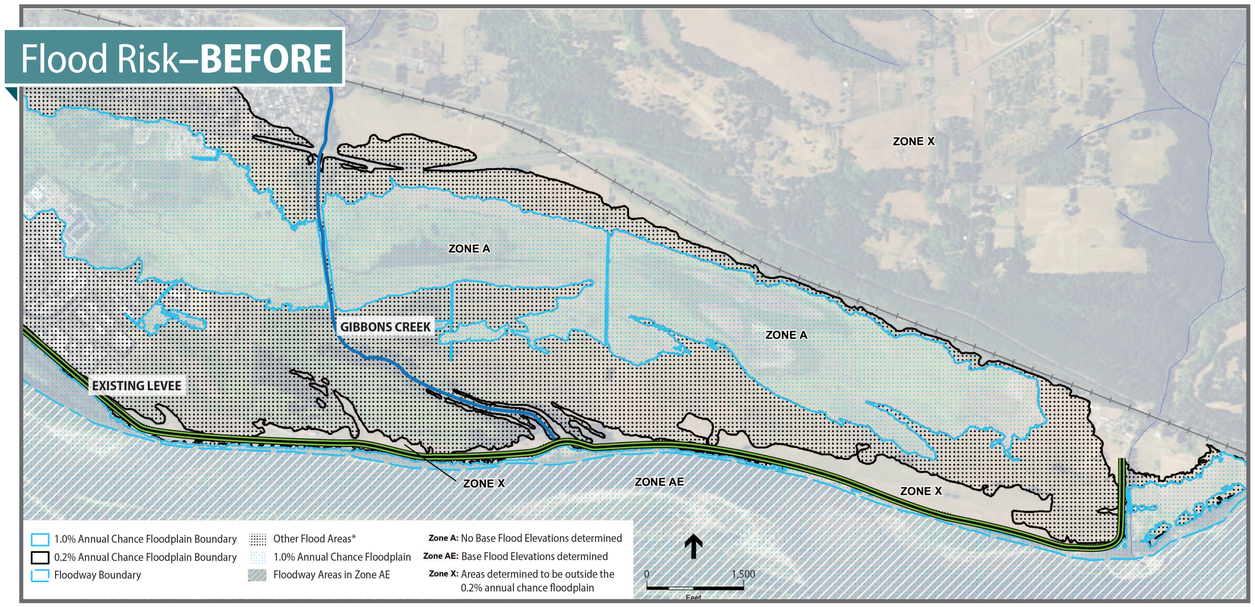
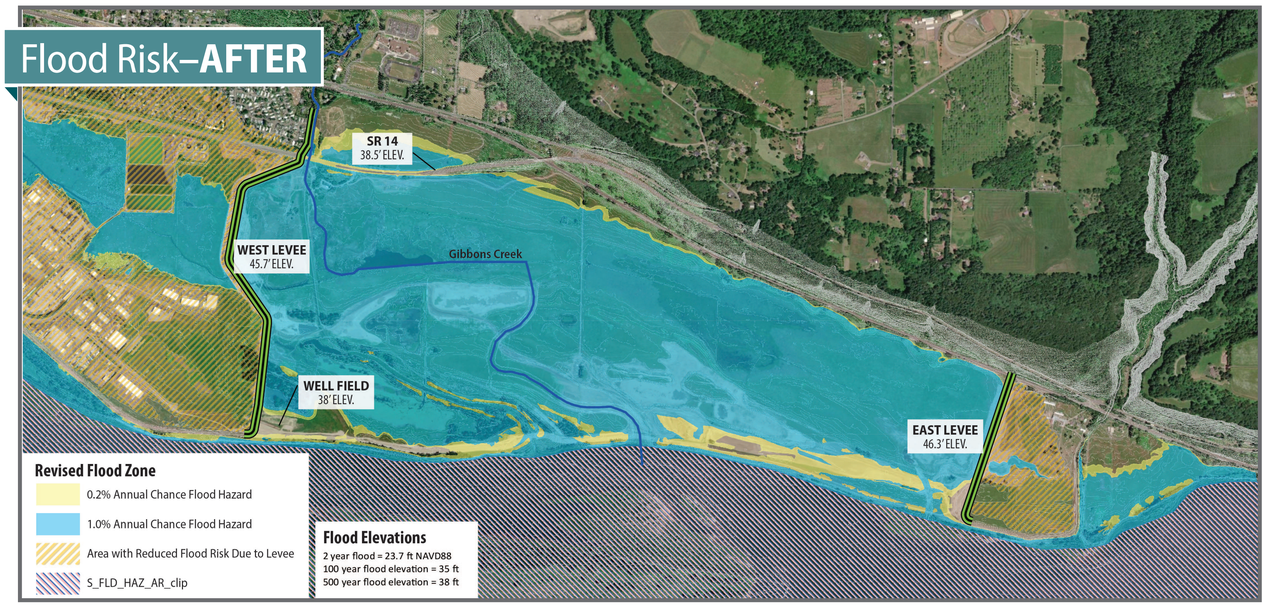




Introduction

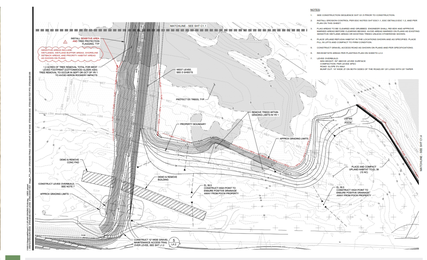
The Steigerwald Reconnection Project removed 2.2 miles of the Washougal Flood Damage Reduction levee to reconnect 965 acres of floodplain to the Columbia River and Gibbons Creek. Accomplishing this goal required the construction of a west and east setback levee. The design and configuration of the setback levees required agencies and project partners to evaluate their flood risk.

At issue was that the Levee Design Flood elevation (41.46 NAVD88) was developed based on the historical floods of record (June 1876, June 1894, May 1948), which occurred *before* the construction of the Columbia River dams and flow regulation. As a result, modern flood stages—and therefore flood risks—are currently much lower.

Elevation of Columbia River Water Levels and Impacted Infrastructure

Feature/Water Level	West Levee Elevation at RM 125.5 (feet NAVD88)	East Levee Elevation at RM 127.5 (feet NAVD88)
Original Levee Design Flood	41.46	41.46
Setback Levee Crest	45.7	46.3
0.2% ACE Event	38.5	38.8
SR 14 Low Point	35.2	N/A
SR 14 Raise Point	38.5	N/A
Regulatory Base Flood (1% ACE Event)	35.5	35.9
1% ACE Event	35.1	35.6
2% ACE Event	33.8	34.3
50% ACE Event	26.9	27.1
50% ACE Event (For Habitat Area Evaluation)	23.7	23.7
Levee Interior (1% ACE WSE)	22.4	22.4

ACE: Annual Chance Exceedance; WSE: Water Surface Elevation



Due to more intense/unpredictable weather events, the industry is generally increasing the capacity of infrasturcutre to further reduce flood risk. WSDOT and the City of Washougal went against this trend because:

1) The project brought multiple benefits, including managing Gibbons Creek.

2) The Columbia River is a highly regulated river system.

3) This system is operated to prevent flooding of Portland and Vancouver, which would happen at much lower levels than City of Washougal and WSDOT infrastructure would be affected.

Feature // Setback Levee
Agency // USACE

ISSUE. The US Army Corps of Engineers must review and approve the alteration of federally authorized levee projects through the Section 408 process. Otherwise, Congress must change the authorization, which would have delayed the project several years.

ACTION. The Section 408 process required the setback levees maintain the same level of flood risk reduction. Therefore, the setback levees needed to match existing levee heights (see table).

RESULTS. The design ultimately required the levees to have 10 feet of freeboard above the 100 year flood stage.

Feature // State Route (SR) 14
Agency // WSDOT

ISSUE. Removing the existing levee exposed a section of SR 14 to an increased level of flood risk. SR 14 runs along the northern border of the reconnected floodplain where a low point fell just below the Columbia River's 100 year flood stage.

ACTION. A series of meetings between WSDOT and the project team communicated the information WSDOT required to make a determination.

RESULTS. WSDOT agreed that raising the now unprotected section of SR 14 up to a minimum elevation of 38.5 NAVD88 (3 feet above the Columbia River's 100 year flood stage) would provide a sufficient level of flood risk reduction.

Feature // Future Well Field
Agency // City of Washougal

ISSUE. The cities of Camas and Washougal purchased property adjacent to the existing levee for the future build out of a municipal well field. The project would build the setback levee through this property and consequently leave many of the wells unprotected by the realigned levee system.

ACTION. The project would raise the unprotected portion of the well field to be above the 500 year flood stage, as that is the regulatory requirement for public well fields.

RESULTS. The City decided to accept this reduced level of flood protection. The project then graded the property to match this flood elevation and provide needed upland refuge habitat for wildlife as a co-benefit.