DRAFT

Skagit River, Washington
Flood Inundation Damage Assessment

1. **Floodplain Survey**

   1.1. Structures on project mapping were given unique geo-referenced identifier numbers (based upon uniquely numbered grids superimposed on floodplain maps) and entered into database
   1.2. Survey team drove through entire study area and conducted a 100% survey of commercial and public structures to record the following attributes:
      1.2.1. Business type (SIC-based) or Public Structure type (e.g., school, fire dept., etc…)
      1.2.2. Structure size
      1.2.3. Structure condition
      1.2.4. Construction type
   1.3. Attributes recorded for all commercial and public structures were entered into the database
   1.4. Residential sampling was required due to size of study area
   1.5. A random sample of approximately 350 residential structures was performed and compared with past study findings to calibrate assumptions regarding ranges of residential structure attributes:
      1.5.1. Size
      1.5.2. Condition
      1.5.3. First floor elevation increment above ground level
      1.5.4. Construction type
   1.6. Survey identified the *distribution*, *mean value*, and *standard error* for each residential attribute. This statistical data was used to populate residential attributes for each residential structure flooded.

2. **Floodplain Survey Findings (500-year floodplain)**

   2.1. Approximately 12,000 structures
   2.2. Approximately 10,600 single family structures
   2.3. Approximately ~~21,000~~ sq. ft. commercial property 21,000,000
   2.4. Over 41,000 acres agricultural land in production

3. **Damage Assessment**

   3.1. Risk and Uncertainty based analysis consistent with Corp of Engineers Guidance
      3.1.1. Explicitly incorporates uncertainty in data into the assessment
      3.1.2. Used the Corps HEC-FDA flood damage assessment computer model
   3.2. Hydraulic model provides water depths in each grid
   3.3. Economic model calculates damages to residential and commercial structures/contents for each grid
   3.4. Analysis used Corps-approved depth damage functions for structures and contents
   3.5. Damage Categories
      3.5.1. Damages to structures
      3.5.2. Damages to contents
      3.5.3. Public Assistance Costs
      3.5.4. Temporary Relocation Costs
      3.5.5. Cleanup Costs
      3.5.6. Agriculture
      3.5.7. Transportation

4.0 **Preliminary Findings ($66.7 million in expected annual damages)**

   4.1 Damages to structures: (48%)
   4.2 Damages to contents: (34%)
   4.3 Public Assistance Costs: (9%)
   4.4 Temporary Relocation Costs: (2%)
   4.5 Cleanup Costs: (4%)
   4.6 Agriculture: (3%)
   4.7 Transportation: analysis in final stages