Carson River Flood Hazard Mapping

Carson River Watershed Forum

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Outline

• Physical Map Revision
  – What is the process?
• Carson River Floodplain
  – Why are we re-mapping?
• Study Area
  – Where are we working?
• Hydrologic & Hydraulic Analyses
  – How are we creating new mapping & tools?
• New Flood Hazard Mapping
  – Who will be affected?
• Status
  – When will the project be complete?
FEMA Physical Map Revision

What is the Process?
Physical Map Revision (PMR)

- **Local** equivalent of FEMA Flood Insurance Study
  - Cooperating Technical Partner (CTP)
  - Work is done locally with community input
  - FEMA process

- More extensive than LOMR
Carson River Floodplain

Why are we re-mapping?
“The Carson River is unique in that we have no flood control structures and have extremely limited upstream storage capability. However, we have the best flood control mechanisms available - open floodplain lands.”

-Regional Floodplain Management Plan
Effective FEMA Flood Hazard Maps

- Lyon County, NV
  - Restudy 1992
  - DFRIM 2009
- Carson City, NV
  - Hydrology 1982
  - Hydraulics & Mapping 1993
  - DFIRM 2009
- Douglas County, NV
  - Hydrology 1989
  - 1994(work done in 1991)
  - East Fork 1997
Objectives

• Detailed, Up-to-date Carson River Flood Hazard Mapping (Lyon, Carson City, Douglas and Alpine Counties).

• Tool for Assessing Watershed Scale Floodplain Impacts

• Consistency in Modeling and Mapping.
Study Area

Where are we working?
Study Area

• 4 Year Plan
  – 1 Lyon County
  – 2 Carson City
  – 3 Douglas/Alpine County County Modeling
  – 4 Douglas/Alpine County Mapping
Hydrologic and Hydraulic Analyses

How are we creating new mapping & tools?
Hydrology

• Unsteady-state Flow Model
  – Hydrograph input (time vs. flow)
  – Non standard
  – Traditional flood studies use steady state
  – Assess timing and volume impacts to the floodplain
Hydrology

• Effective FEMA Flood Insurance Study
  – Hydrology based on 80’s an early 90’s estimates
  – Revised peak flow estimates
  – Include 1997 and 2006 events
## Hydrology

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Hydraulic Model

- US Army Corps of Engineers’ HEC-RAS
- One & Two Dimensional Model
- Model Elements
  - Stream Centerline
  - Flow Paths
  - Cross Sections
  - Bank Lines
  - Computational Mesh
MAS 3 Preliminary 2D Modeling

HEC-RAS Alpha/Beta Testers for 2D modeling
Model Validation

1997 Event Photos

• USGS Photo Series (Pat Glancy)
• Preliminary Floodplain Boundaries Compared to Photos
• Rating Curve Comparisons
  – Carson City Streamgage
  – Deer Run Streamgage
Similar proximity to homes

Similar proximity to road

Floodplain Boundary compares favorably
Tree and submerged road

Areas of favorable comparison between model and photograph
Houses and limits of flooding compare favorably.
New Flood Hazard Mapping

Who will be affected?
Floodplain Mapping

- Flood Hazard Mapping
  - 1-percent floodplain
  - 1-percent floodway
  - 0.2-percent floodplain
- Detailed Mapping with BFES
- Following FEMA Guidelines
- Physical Map Revision Process
Project Status

When will the project be complete?
Project Status

• MAS 1 (Lyon Co.)
  – Submitted to FEMA

• MAS 2 (Carson City)
  – Finalizing Mapping
    • Summer 2014

• MAS 3 (Douglas & Alpine)
  – Preliminary 2D modeling
    • Fall 2015