

FLOOD VULNERABILITY MAPS

Maps can increase awareness of the risks and vulnerabilities of flooding and surface water runoff. These detailed maps show flood-prone parcels and runoff flow paths using data from the April 15, 2018 flood event. Nearly every parcel within the project area is at risk of damage from water from river flooding and/or water carried in the flow path.

Wainiha Flood Vulnerability Panels - Key

Shows detail of twelve panels across the project area. Each numbered panel is shown on the air image of Wainiha Valley floodplain as a box with a white boundary. The key also shows the boundary of 506-acre project area where surveys and air imagery were collected for this project.

Wainiha Flood Water Depths, High Flow

Maps show parcels within the floodplain that are vulnerable to flood water inundation under both frequent and extreme flow events. The information used to create this panel was generated as output from a 3D hydraulic model that was used to simulate Wainiha River flows for the April 15, 2018 event.

Panel shows the extent of land area the flood waters cover and the maximum depth in color ranges. Depths are shown in 1-foot intervals. Parcel boundary lines are superimposed on the image along with Tax Map Key numbers.

Wainiha Flow Path Analysis

Flow paths show where rainfall runoff accumulates and drains during storm events. Flow paths is the name assigned to channels that make up the streams, gullies, gulches, auwa'i, and ditches. Many of the flow paths only carry water after rainfall events and run for a short period of time. Some of the larger flow paths draining the slopes along the west side of the valley are perennial, flowing year-round. Flow paths can become overgrown with vegetation obscuring their location on the ground. Flow paths can be filled with rainfall runoff and become torrents, carrying water at high rates and transporting debris (e.g. rocks and vegetation) encountered along the flow paths. Flows can undermine infrastructure and buildings, erode the landscape, and increase flood water levels on the floodplain.

Panel shows detail of the flow path analysis with risk levels. Risk levels are ranked by the size of drainage area draining into flow paths: Low [0.34 - 5.31 acres], Medium [5.52 - 23.77 acres], and High [23.78 – 673.53 acres]. The drainage areas were derived using a detailed digital terrain model that is comprised of 1 ft² grid cells, each with an elevation accurate to less than 0.4 feet.

Wainiha Flood Vulnerability

Panel shows a combination of the Flood Water Depths and Flow Path Analysis panels. Panel shows flood extents and depths as well as flow paths. Parcel boundary lines are superimposed on the image along with Tax Map Key numbers.

Flood Hazard Areas

Map shows the Federal Emergency Management Agency flood zones. The zones have an alpha code that defines the type of flood hazard that areas are located within.

How to Reduce Flood Vulnerability

- Maintain stream channels to be clear of debris and rubbish.
- Dispose of green waste in locations outside the floodplain.
- Maintain culvert inlets by keeping them free of debris that could block or clog the culverts.
- Install flood warning signs along the roadways at routinely-flooded locations.
- Locate structures back from the top of rivers and flow paths to prevent damage from flowing water.
- Ensure that dwellings and possessions are maintained above the base flood elevation.
- Ensure that structures within the base flood elevation are constructed to allow flow to pass underneath.
- Retrofit buildings with flood-proof materials.
- Bring structures and dwellings within the floodplain that do not conform to building code standards into compliance.
- Place loose items in secure locations above the expected flood water levels
- Inform tenants (residents and visitors) about flooding risks and provide them with evacuation plans and flood maps.
- Inform tenants (residents and visitors) on actions to take during flooding, such as sheltering in place if their dwelling is above the base flood elevation.
- Encourage tenants (residents and visitors) to maintain emergency kits containing water, food, first aid kit, and prescription medications for at least five days.
- Encourage homeowners and renters in the Special Flood Hazard Area to purchase flood insurance.
- Require approved plans and permits for any in-stream activities (e.g. bank stabilization).
- Establish an early warning and notification system to provide residents and visitors with advance warning of impending floods.

About

These panels were developed as part of the *Wainiha Hydrologic Vulnerability Assessment* to improve community preparedness and planning and aid in the development of strategies to cope with and minimize vulnerability to flood waters and surface runoff. Additional panels, and the accompanying report, are available on the Mālama Kuaʻāina website.

For more information contact:

Mālama Kuaʻāina

P.O. Box 536, Hanalei, HI, 96714

Caren Diamond, Executive Director

www.malamakuaaina.org

malamakuaaina@gmail.com