Effects of Flooding on Recreational Access and Navigation on the Llano River and Lake LBJ

Flat Rock Bridge - Junction, TX

On October 16, 2018, after a series of high-water events in the watershed over a three-week period, flood waves swept down the Llano River in central Texas. The U.S. Geological Survey (USGS) flow gage at the City of Llano recorded a peak flood elevation of 40.17 feet with an estimated discharge of 278,000 cubic feet per second, the second highest on record for the Llano River. These events resulted in the tragic deaths of five individuals and caused significant damage to property and infrastructure.

To determine the potential impacts of the flood on recreational access and navigation, staff from the Texas Parks and Wildlife Department (TPWD) and the Llano River Watershed Alliance assessed all public boat ramps on Lyndon B. Johnson Reservoir (where the Llano River meets the Colorado River near the City of Kingsland) and of river conditions along 150 miles of the Llano and South Llano rivers. Visual surveys of boating access facilities on the reservoir were conducted via watercraft using sonar to assess submerged hazards near the ramps. River surveys were conducted by vehicle to assess impairments at road crossings and public access points, including TPWD-sponsored river access areas supported through the River Access and Conservation Areas Program (RACA) and Texas Paddling Trails Program (TPT). Additionally, a helicopter-based survey of the river was performed to assess erosion, damage to streamside vegetation, and potential hazards to navigation posed by wood, sediment deposits, and artificial debris.

Lyndon B. Johnson Reservoir Survey Results

- Of 11 public boat ramps inspected, eight were in good condition, two suffered moderate impacts, and one was heavily affected (see map on opposite page). Substantial impacts were observed at the Kingsland Lions Club including shoreline erosion and loss of courtesy docks and bulkheads, which were being addressed at the time of inspection. Pre-existing submerged damage at the end of the ramp (large holes) may have worsened through erosion. Moderate impacts were observed at Sidney Rowe Memorial Park and Granite Shoals Park including sedimentation and deposition of debris on the ramp and in parking areas.
- Sonar inspections did not reveal underwater hazards at any of the inspected sites.

Recommendations

- Provide resources to parks and public access sites on the reservoir to restore or improve ramp access and parking facilities, rebuild courtesy docks, replace signage, install navigational safety buoys, and stabilize shorelines.

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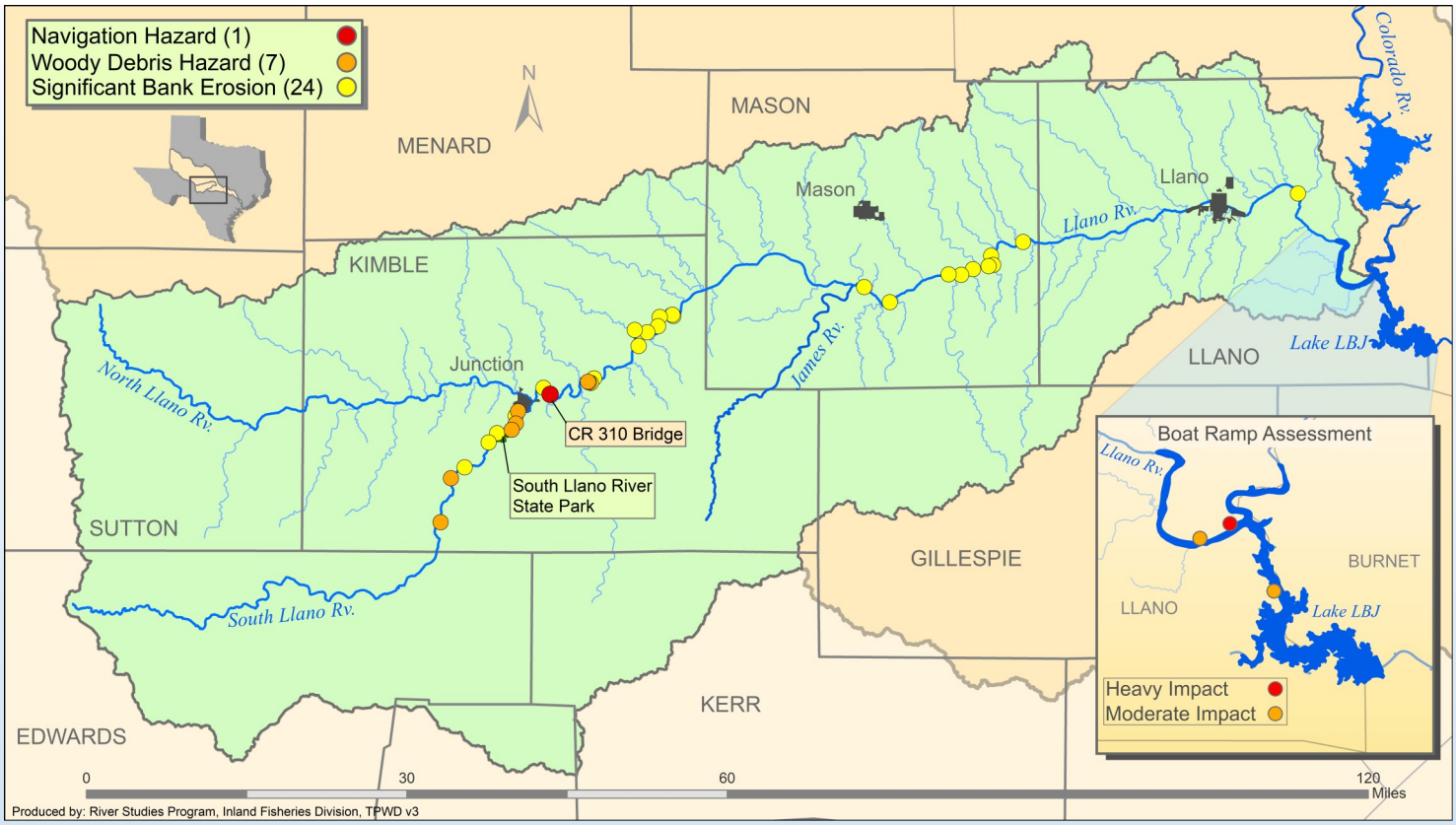

Llano River Survey Results

- Significant rearrangement of sediments occurred, which is typical of major flooding. The river can likely assimilate this material through natural processes and revegetation.
- Recreational access has been affected on the South Llano River in Junction at the County Road 150 RACA site and all three TPT access sites, which are located at the South Llano River State Park, Flat Rock Bridge, and Junction City Park. This includes gravel accumulation at bridges, damage to the parking area and boat ramp at Flat Rock Bridge (currently unusable), and loss of kiosks and signage at all sites. The County Park and part of the City Park in Junction remain closed.
- Areas of significant streambank erosion were observed. Most existed before the 2018 flood but may have been exacerbated. Notable exceptions include the Flat Rock Bridge in Junction (pictured on front page) and areas where stabilizing vegetation had been removed prior to the flood. The South Llano River State Park incurred significant erosion and damage to TPT signage, park trails, primitive campgrounds, and the river tubing takeout.
- Few instream hazards, such as wood or artificial debris, were noted. However, those may endanger paddlers. The previously failed County Road 310 crossing, located downstream of Junction, continues to pose a significant hazard to river users.
- Parks in the City of Llano suffered considerable infrastructure damage but have since reopened.

Recommendations

- Allow river to assimilate sand and gravel material through natural fluvial processes and revegetation.
- Provide resources to local parks, RACA sites, and TPT sites to improve access, rebuild signage and kiosks, and stabilize river banks.
- Consider the design and construction of river-friendly road crossings that require less maintenance, better withstand flood events, pass sediments downstream, and allow passage of paddlers and fish.
- Remove debris at the County Road 310 crossing, which continues to pose a safety hazard. As woody debris is important structural habitat for aquatic species, leave as much in-channel wood as possible. If necessary, trim limbs protruding into high velocity water or cut lanes wide enough to allow paddlers to pass through.
- Consistent with the successful response to Blanco River flooding, TPWD and partners should support revegetation efforts to jumpstart recovery and stabilize eroding banks; provide technical guidance visits to encourage private lands stewardship and streamside best management practices; host restoration workshops for land managers; establish conservation demonstration sites; and provide cost-share assistance to affected landowners to support natural resources recovery.
- Monitor colonization of flood-distributed invasive species, such as Arundo and elephant ear.
- Install additional river flow gages and warning systems to better prepare landowners and municipalities for unexpected flood events.