Lower South Fork McKenzie River Floodplain Enhancement Project
McKenzie River Ranger District
Willamette National Forest

Project Location
The project is located in the South Fork McKenzie River Watershed, approximately 50 miles east of the town of Eugene, Oregon. The project area is approximately 834 acres in size and is located along the South Fork McKenzie River from the base of Cougar Dam to the confluence with the McKenzie River (approximately 4.5 miles). This area includes the mainstem channel and all current and historic side channels and floodplain. Most of the project area is under Forest Service ownership, except for approximately 32 acres owned by the US Army Corps of Engineers.

The figures below provide further information about the project location. Figure 1 shows the location of the McKenzie River Ranger District. The location of the project (outlined in red) in relation to the McKenzie River sub-basin (outlined in blue) is shown in Figure 2. Figure 3 shows the entire project area.

Purpose and Need
The purpose of this project is to improve ecological function and biological productivity for ESA-Threatened spring Chinook salmon and bull trout, Pacific lamprey and other native fish, western pond turtle, amphibians, beaver, and waterfowl. Historically, the lower South Fork was a large alluvial fan with a complex network of side channels and frequently inundated floodplain (Figure 4). It was a depositional zone for much of the sediment, wood, and nutrients coming out of the South Fork drainage. As is typical of low gradient, alluvial fans, this area was very biologically productive. According to 1937 surveys, the South Fork was the most important tributary for spring Chinook salmon spawning and the confluence area was known as a “bull trout paradise” that was intensively fished.

Unfortunately, the South Fork has been significantly altered in the last century. Cougar Dam was built by 1963 for flood control and power generation. Associated with construction of the dam was straightening and channelization of the lower river with substantial amounts of levee and riprap material. In addition, large wood was removed from the river for timber and navigation purposes. These combined activities have limited the sediment and wood supply, altered the flow regime, reduced channel complexity, and restricted off-channel and floodplain connectivity. A recent habitat survey revealed very low pool habitat (12%) and wood abundance (<10 pieces/mile). The dominant substrate in both pools and riffles is cobble – too large for spawning. Fine sediment is no longer deposited onto floodplains, limiting nesting habitat for turtles.

Although Cougar Dam presents a major obstacle to floodplain restoration by altering flows and blocking wood, sediment, and nutrients, management actions can significantly improve conditions. By removing levees and riprap and adding large wood and sediment we will:

- Increase pools and pockets of slow water so fish can rest,
- Provide cover from predators,
• Retain gravels necessary for fish spawning and fine sediment needed for lamprey rearing and western pond turtle nesting, and

• Maintain a well-connected floodplain with abundant side channels, ponds, and wetlands for amphibians, beaver, waterfowl, and fry and juvenile fish rearing.

Recent studies indicate that stream biodiversity and productivity is greatest in streams that have a complex network of side channels (Cluer and Thorne 2013, Martens and Connolly 2014). Complex streams with a well-connected floodplain can be up to 250% more biologically productive than single thread channels (Bellmore et al. 2013). A review of projects designed to restore floodplain connectivity and side channel habitat increased salmon and trout production by 27-34% (Ogsten et al. 2014). By adding large wood to Deer Creek, we will be creating these habitat features (pools, cover, gravel, side channels) that are important for native fish and wildlife.

**Proposed Action**

This project proposes the following activities:

• Approximately 49 acres of levees (embankments built to prevent the overflow of a river) and riprap (material used to armor stream banks against scour and erosion) would be removed from stream banks and historic floodplains using heavy equipment. Material would be sorted on site and used for channel reconstruction and gravel augmentation within project area.

• Gravel and other sediment would be sourced from levee material removed within the project area and placed either at select locations suitable for spawning or in areas where the gravel will be transported into spawning reaches.

• Stream channel reconstruction, using heavy equipment, would occur throughout the project area to restore a more natural channel form, shape, and profile.

• Up to 4,000 pieces of large wood would be placed in stream channels and across adjacent floodplains.

• All temporary roads and areas of disturbance would be rehabilitated and replanted with native vegetation.

• The ground disturbance would mostly occur within the stream channels and from tipping trees on the edges of the current and historic channels.
Figure 1 and 2 - Lower South Fork McKenzie River Floodplain Enhancement Project
Figure 3 - Lower South Fork McKenzie River Floodplain Enhancement Project Area
Figure 4 - A LiDAR Bare Earth image (with vegetation removed) revealing the historic alluvial fan and complex channel network of the lower South Fork McKenzie River.

References

