

Alternative 8. Clear a 100-foot wide working area along the south bank of the River and use an excavator and other necessary equipment to remove the logjam from the channel and stockpile the debris along the working area for drying and later burning. The approach would also include dredging of the in-lake mudflat. (Suggested by the Flint Hills Wildlife Management Refuge.) The assessment of the approach would be similar to Alternative 4.

Preliminary Cost Estimates

The following cost estimates are limited in detail and are presented to facilitate a gross fiscal comparison of alternatives.

The dredging estimates were developed by calculating excavation quantities (whether woody debris, sediment, or excavation of wooded floodplain) times an average excavation and disposal cost of \$4 per cubic yard to form a construction cost. A total estimated cost was developed by including an estimate of formulation, NEPA documentation, engineering and design, and supervision and administration of contracts of 15% times the construction cost, plus contingencies of 25% times the construction cost.

The estimation of quantities is based on information presented herein and on limited field investigations. Quantities are simple rectangular channel estimates with no allowance for expansion, loss, or compaction of excavated materials. Overland haul distances are assumed to be less than 1 mile. Channel excavation is assumed to be accomplished by barge. Soil and sediment disposal for channel excavation is assumed to be placed adjacent to the channel for the purposes of a maintenance road and for the construction of Refuge features such as; wetlands or duck ponds. Woody debris disposal is assumed to be placed along the limits of the floodplain or beyond the floodplain, within the Refuge.

The boat ramp estimates were developed assuming minimal signage, access road, lighting, and parking – similar to existing facilities. A single lane concrete ramp and real estate are estimated based on John Redmond Reservoir ramp costs. No additional maintenance costs were estimated.

Timber clearing was estimated at \$10,000 per acre.

Annual channel maintenance costs are assumed to be \$25,000 per mile of maintained channel (rounded up to the nearest mile. All costs are rounded. Interest during construction was not estimated. The value of money over time for those plans with assumed 20 year implementation plans was not adjusted by the Federal discount rate.

The completion of annual maintenance is contingent on budget limitation and other Reservoir maintenance priorities that compete for available funds on a national level.

Maintenance Measure 1. Remove the logjam in the vicinity of the Jacobs Creek Landing boat ramp. (page 20)

Assumes 8 acres of woody debris and sediment about 5 feet deep.

Total estimated cost is \$370,000, plus \$25,000 annual maintenance

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
65,000	\$260,000	\$25,000

Maintenance Measure 2. Remove the logjam at the mouth of Eagle Creek and construct a permanent access road and boat ramp on Eagle Creek. (page 20)

Assumes a channel width of 150 feet and a logjam of 300 feet in length, about 6 feet deep, including woody debris and sediment.

Total estimated cost is \$180,000, plus \$25,000 annual maintenance.

Excavation (cu yd)	Ramp Cost	Construction Cost	Annual Maintenance Cost
10,000	(\$50,000)	\$90,000	\$25,000

Maintenance Measure 3. Construct a permanent boat ramp on the Neosho River at Neosho Rapids. (page 21)

Total estimated cost is \$70,000, plus \$25,000 annual maintenance.

Excavation (cu yd)	Ramp Cost/Construction Cost	Annual Maintenance Cost
Minimal	\$70,000	\$25,000

Maintenance Measure 4. Develop and implement a long-term (20 year) Neosho River debris and sediment removal plan. (page 21)

Assumes a logjam length of about 2 miles (about 5 feet deep over 70 acres), including sediment about 2 feet deep in the channel and lake entrance.

Total estimated cost is \$3.3 million, plus \$50,000 for annual maintenance (starting in year 21).

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
565,000	\$113,000 (Year 1) \$113,000 (Years 2-20)	\$50,000 (Years 21-50)

Alternative 1. Clear the Neosho River logjam in the vicinity of the Jacobs Creek boat ramp to a location downstream on the Neosho River (for example, 200 yards downstream). To provide a temporary storage area for future debris while minimizing the initial costs of removal, allow a new River channel to form. (page 21)

Assumes additional debris collection prior to implementation, resulting in 18 acres of woody debris and sediment about 5 feet deep.

Total estimated cost is \$1 million, plus \$50,000 for annual maintenance.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
145,000	\$580,000	\$25,000

Alternative 2. Excavate a pilot channel to the Reservoir avoiding the logjam. Extend the pilot channel through the in-lake mudflat by dredging. Leave the balance of the logjam in place and abandon the Jacobs Creek boat ramp. (page 23)

Assumes an 8-foot-wide pilot channel about 3 feet deep and about 3 miles long, including dredging through the mudflat. Live trees along the pilot channel would require removal for a width of about 300 feet and a length of 1.5 miles. Assume tree removal and disposal cost is \$454,000, included in construction cost below.

Total estimated cost is \$730,000, plus \$75,000 for annual maintenance.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
14,000 sediment	\$510,000	\$75,000

Alternative 3. Clear the Jacobs Creek Landing ramp and downstream reach and create a pilot channel into the lake, dredge through the in-lake mudflat, but leave the balance of the logjam in place. (page 25)

Assumes additional debris collection prior to implementation, resulting in 18 acres of woody debris and sediment about 6 feet deep.

Assumes an 8-foot-wide pilot channel about 3 feet deep and about 3 miles long, including dredging through the mudflat. Live trees along the pilot channel would require removal for a width of about 300 feet and a length of 1.5 miles. Assume tree removal and disposal cost is \$454,000, included in construction cost below.

Total estimated cost is \$1,570,000, plus \$75,000 for annual maintenance.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
159,000	\$1,090,000	\$75,000

Alternative 4. Clear the logjam from the existing Neosho River channel and dredge through the in-lake mudflat. (page 26)

Assumes a 220-foot-wide channel about 3.2 miles long (85 acres 5 feet deep), includes dredging through the mudflat (an additional 75 acres 3 feet deep).

Assumes management and contingencies of \$1 million.

Total estimated cost is \$5,200,000, plus \$100,000 for annual maintenance.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
1,050,000	\$4,200,000	\$100,000

Alternative 5. Clear roughly one half the width of the existing logjam by stacking the removed debris on top of the remaining debris in the channel, dredge through the in-lake mudflat, and initiate an annual dredging program to maintain the river channel. (page 27)

Not estimated due to risk of failure.

Alternative 6. Clear the logjam from within the existing Neosho River channel through the in-lake mudflat and initiate a long-term program of dredging to both maintain the river channel and revitalize the reservoir's water resources. (page 29)

Assumes the removal of 8,700 acre-feet of sediment, plus the debris and sediment in the Neosho River channel of about 550,000 cubic yards.

Assumes management and contingencies of \$6 million.

Total estimated cost is \$65 million, plus \$200,000 for annual maintenance after a 20-year rejuvenation plan.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
14.7 million	\$9 million	\$200,000

Alternative 7. Offer voluntary buyout and relocation assistance for Jacobs Creek Landing property owners. (page 30)

Not estimated due to the required detail of real estate appraisals.

Alternative 8. Clear a 100-foot wide working area along the south bank of the River and use an excavator and other necessary equipment to remove the logjam from the channel and stockpile the debris along the working area for drying and later burning. (page 31)

Assumes a 220-foot-wide channel about 3.2 miles long (85 acres 5 feet deep), includes dredging through the mudflat (an additional 75 acres 3 feet deep).

Assumes a 100-foot-wide working area along the south side of the existing channel would be cleared (about 1.5 miles long and 18 acres) at a cost of \$180,000.

Assumes management and contingencies of \$1 million.

Total estimated cost is \$5,400,000, plus \$100,000 for annual maintenance.

Excavation (cu yd)	Construction Cost	Annual Maintenance Cost
1,050,000	\$4,400,000	\$100,000