

Upper Tellico River OHV Area Trail Condition Assessment



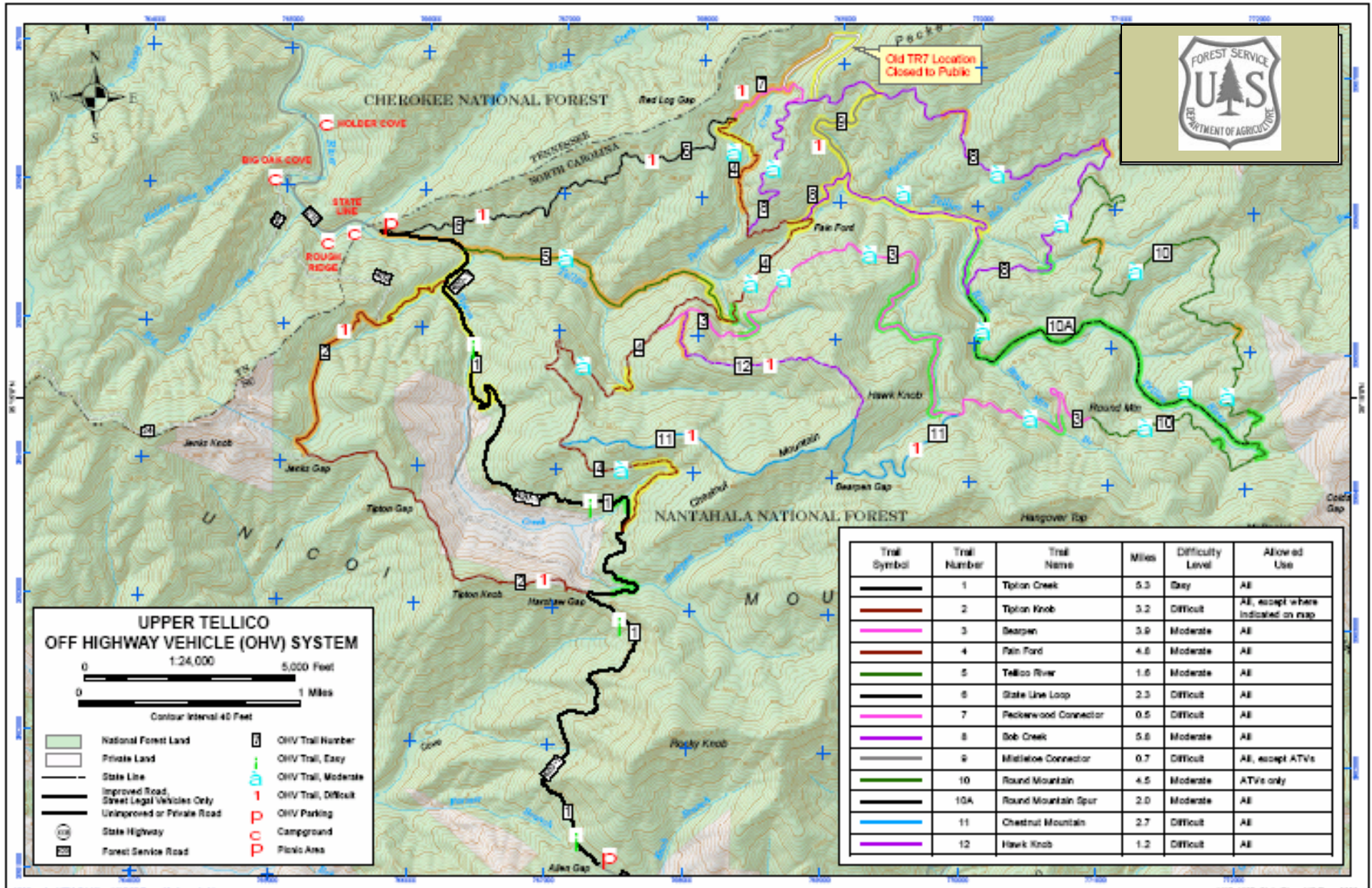
Objective:

Evaluate erosion and sedimentation from high priority trail segments in the Upper Tellico OHV Area

Methodology:

- Trail segments within 100 feet of mapped stream channels were identified using GIS & priority was given to trail segments based on known trail location and condition
- Trail condition and sediment transport assessment protocol were developed, field tested, and modified
- A team of US Forest Service personnel was assembled, representing engineering, fisheries, hydrology, GPS, and other experience
- Summarize data in tabular form & run the Water Erosion Prediction Project (WEPP) computer model

Assessment Priority Trail Locations



Assessment Protocol – Field Measurements

- Trail Condition Assessment

 - Data Collected:

 - Trail template & Surface type
 - Presence of rutting
 - Trail gradient, length, & width
 - Fill gradient & length
 - Buffer gradient
 - Trail drainage feature & functionality
 - Change in trail volume post construction

- Sediment Transport Assessment

 - Data Collected:

 - Distance from trail to stream channel (buffer length)
 - Distance sediment is traveling from trail
 - Stream flow type (perennial, intermittent, or ephemeral)
 - Note of any depositional feature in the stream
 - Potential for sediment entering the stream channel
 - Note of trail runoff contributing to slope or channel instability

Assessment Protocol – WEPP computer model

 metric U.S. customary' and a text input field for 'personality (a to z)'. At the bottom, there are two horizontal lines with links: '[FS WEPP hints and requirements | Send FS WEPP developers your comments on the Forest Service WEPP Interfaces]' and '[| FS WEPP privacy disclaimer]'. Below these lines, contact information is provided: 'Bill Elliot, Project Leader, USFS Soil & Water Engineering, Moscow, ID', the URL 'http://forest.moscowfsi.wsu.edu/fswepp/', the date and time '09/22/2006 20:18:11', and funding information: 'These interfaces funded in part by USDA FS San Dimas Technology and Development Center. WEPP is an interagency model lead by the Agricultural Research Service's National Soil Erosion Research Laboratory.'"/>

FS WEPP is a set of interfaces designed to allow users to quickly evaluate erosion and sediment delivery potential from forest roads. The erosion rates and sediment delivery are predicted by the Water Erosion Prediction Project (WEPP) model, using input values for forest conditions.

Results:

Trail Condition Assessment - Field Measurements:

Trail Number	Miles Surveyed	Road Template	Road Surface Type	Drainage Dips	% Non Functioning Drainage Dips
1	1.52	Out Sloped Road	Aggregate Surface	49	14
2	1.42	Out Slope w/ Entrenchment	Native Surface	54	31
3	1.02	Out Sloped Road	Native Surface	206	60
4	2.51	Out Sloped Road	Native Surface	215	33
5	1.51	Out Sloped Road	Agg. & Riprap Surface	67	36
6					
7	0.59	Entrenched	Native Surface	23	22
8	4.34	Out Sloped Road	Native Surface	76	36
9	0.73	Entrenched	Native Surface	36	33
10	0.07	Out Sloped Road	Native Surface	4	50
10a	2.74	Out Sloped Road	Native Surface	123	38
11					
12	0.08	Entrenched	Native Surface	0	0
Total	16.53				

Estimated Cumulative Sediment Loss from Trails since Construction

Trail #	Miles Surveyed	Max Trail Grade %	Sediment Loss Entrenched Sections (tons/mile)	Sediment Loss Entrenched Sections (tons)
1	1.52	22	0.00	0.00
2	1.42	32	1,904.78	2,704.79
3	1.02	8	2,424.18	2,472.66
4	2.51	15	751.11	1,885.28
5	1.51	23	1,534.75	2,317.48
6	-	-	-	-
7	0.59	35	4,112.69	2,426.49
8	4.34	19	768.91	3,337.07
9	0.73	30	8,455.71	6,172.67
10	0.07	24	7,383.57	516.85
10a	2.74	17	691.33	1,894.25
11	-	-	-	-
12	0.08	40	25,618.00	2,049.44
Total	16.53			25,776.98

Sediment Transport Assessment - WEPP:

WEPP Model Results – Predicted Annual Sediment Yield
from Trails & Delivery to Streams

Trail #	Leaving Trail (tons)	Leaving Trail (tons/mile)	Entering Stream (tons)	Entering Stream (tons/mile)	Leaving Trail & Entering Stream (%)
1	91	60	49	32	54
2	41	41	34	24	58
3	27	26	15	15	56
4	85	34	47	19	55
5	34	23	24	16	71
7	21	36	13	22	61
8	101	23	61	14	61
9	76	104	43	59	56
10a	101	37	55	20	54

WEPP will be used for comparing recommendations for trail maintenance & rehabilitation

Findings:

For trail segments surveyed:

- Soil loss from the trails since their construction is extensive (>2,000 tons) in trails 2, 3, 5, 7, 8, 9, and 12.
- Most trails have failing drainage structures.
- Sediment from trail erosion entering stream channels is a function of trail proximity to stream, trail gradient, & the frequency & functionality of trail runoff drainage structures.
- Maintenance of existing drainage structures is inadequate.
- Silt traps were effective at reducing sediment only when associated dips were functioning, they were properly sized, a sufficient buffer between trail and stream was available, and removed sediment was placed in a stable area.
- Three bridges were found deficient and needing repair/replacement.

Assessment Team Members

Brady Dodd - Forest Hydrologist, 15 years experience

Sheryl Bryan - Forest Fisheries Biologist, 20 years experience

Jason Farmer - Zone Fish Biologist, 8 years experience

Barry Jones - Civil Engineer, 8 years experience

Pete Russell – Civil Engineer, 6 years experience

Mike Cody – Civil Engineer Tech., 38 years experience

Max Riddle – Civil Engineer Tech., 20 years experience

Drew Selig – Forest GPS / Civil Engineer Tech., 22 years experience

David McFee – Operations Forester, 26 years experience

Todd Sharkey – OHV Ranger, 4 years experience

Kerri Lyda – District Biologist, 6 years experience

Lorie Stroup – Zone Fish Biologist, 10 years experience

Luke Decker – Forestry Tech., 3 years experience

Bill Champion – Safety Officer, 30 years experience