

**APPENDIX 3A**

**DATA DICTIONARY FOR THE KLAMATH HYDROELECTRIC PROJECT ROAD  
INVENTORY**



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The data elements for the Klamath Hydroelectric Project (Project) are formatted in Table 3A-1 using Trimble GPS Pathfinder format, which lists themes, features, attributes, and details. For further explanation of this format, see Trimble’s GPS Pathfinder Software Tutorial. A brief explanation of each column is provided below.

**Theme:** The theme is a major category of data to be collected. For this dictionary, there are four main themes:

1. **Roads.** This theme addresses the type and technical characteristics of Project roads.
2. **Stream Crossings.** This theme addresses the location, type, and characteristics of stream crossings.
3. **Soil Erosion/Potential Resource Damage.** This theme addresses the location of erosion and potential resource damage adjoining or on road features.
4. **Road Hydrological Features/Erosion Mitigation Measures.** This theme addresses the measures taken to control water flow, and the direction of water flows contrary to measures taken.

**Feature:** Each feature in the Feature column is left-justified and in bold print. Features identify physical objects or an event in the real world for which positions are collected and described for each of the four themes. Each feature is defined as a point, a line, or an area. Features of the four main themes listed above are summarized in the following chart.

<b>Roads</b>	<b>Stream Crossings</b>	<b>Soil Erosion/Potential Resource Damage</b>	<b>Hydrological Features/Mitigation</b>
Road	Bridge	Road Erosion Problem	Lead-Off Ditch
Closed Road	Culvert	Potential Resource Damage	Waterbar
Road Hazard	Ford	Ruts	Broad-Based Dip
End of Road		Ponding	Nonengineered Drainage
<b>Gated Road</b>		Slide	Sump
Road Sign			Diffuse Drainage

**Attribute:** Attributes are descriptive information about the listed features. Each attribute associated with a feature is indented and underlined. Attribute information includes type (numeric, menu, text [an “R” following the type designation indicates a required field]), value (minimum and maximum), and comments. Each attribute is given an attribute name. Attribute names are equivalent to items, columns, fields, or keys in a geographic information system (GIS) or computer-aided design (CAD) system. Attributes have been grouped into six categories, as follows:

- Numeric
- Text
- Date
- Time
- Menu
- File name

Definitions of data themes, features, and attributes may vary depending on the data logger and software used. However, these elements provide essential information that will need to be inventoried.

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
<b>1</b>	<b>Roads</b>			
<b>a</b>		<b>Road (line)</b>		
			<b>Segment # (numeric) R</b>	Assign number to road segment (Auto-increment)
			<b>Name (text)</b>	Road name if available (comment text 100)
			<b>Ownership (menu) R</b>	PacifiCorp, Private, Public
			<b>Purpose (menu) R</b>	Facility access*, ROW, property access, recreation access, scenic vista, river access, throughfare, other
			<b>Type (menu) R</b>	Road, OHV, trail, other
			<b>Width (menu) R</b>	Single lane, double lane, trail, variable
			<b>Surface (menu) R</b>	Paved, crushed rock*, cinder, native, herbaceous vegetation, brush, trees<4"
			<b>% Surface Cover (menu) R</b>	>75%*, >50%, >25%, >10%, 0%
			<b>Surface Condition (menu) R</b>	Good*, riled/eroded, washboard, rutted, rocky
			<b>Vegetation Constraints (menu) R</b>	In road (4" dba or less), encroaching, none*
			<b>Date (R)</b>	Auto generate (month, day, year)
			<b>Comment (text)</b>	(Comment text = 100)
<b>b</b>		<b>Intersection (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Type (menu) (R)</b>	Road to road, road to OHV trail, road to hiking trail
			<b>Comment (text)</b>	(Comment text = 100)
<b>c</b>		<b>Closed Road (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Closure Description (menu) (R)</b>	Log and berm*, downed trees, overgrown, planted, ripped or subsoiled, trenched, boulders, guard rail, cable, fencing
			<b>Closure Efficiency (menu) (R)</b>	Fully effective, driven around, damaged, missing
			<b>Comment (text)</b>	(Comment text = 100)
<b>d</b>		<b>Road Hazard (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Type (text) (R)</b>	Comment text = 30 (e.g., document braided roads, extreme slopes, excessive potholes, boulders)

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
<b>e</b>		<b>End of Road</b> (point)	<b>Description</b> (text) <b>(R)</b>	Comment text = 30
<b>f</b>		<b>Gated Road</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Type</b> (menu) <b>(R)</b>	Security, entrance, grazing, PP&L lock
			<b>Material</b> (text) <b>(R)</b>	(Comment text = 30)
			<b>Condition</b> (menu) <b>(R)</b>	Functional*, damaged
			<b>Limit Access</b> (menu) <b>(R)</b>	Yes, No: "Can you get around gate?"
			<b>Comment</b> (text)	(Comment text = 100)
<b>g</b>		<b>Road Signs</b>	<b>Number</b> (numeric)	Auto-increment number
			<b>Type</b> (text) <b>(R)</b>	Comment text = 30
			<b>Condition</b> (menu) <b>(R)</b>	Intact, sign damaged, post(s) damaged, sign and posts damaged
<b>2</b>	<b>Stream Crossings</b>			
<b>a</b>		<b>Bridge</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Stream Name</b> (text)	Stream name (comment text = 100)
			<b>Bridge Length</b> (numeric) <b>R</b>	Min: 1, Max: 3000, "In feet"
			<b>Bridge Width</b> (numeric) <b>R</b>	Min: 1, Max: 1000, "In feet"
			<b>Footing Type</b> (menu) <b>R</b>	Concrete*, wood, steel, other
			<b>Channel Type</b> (Menu) <b>R</b>	Natural stream*, irrigation ditch
			<b>Deck Surface</b> (menu) <b>R</b>	Wood, concrete, earth, rock, steel, aluminum, other
			<b>Water topped Bridge</b> (menu) <b>R</b>	Yes, no*
			<b>Trash Rack Present</b> (menu) <b>R</b>	Yes, no*
			<b>Road Separation</b> (menu) <b>R</b>	Yes, no*
			<b>Channel Width</b> (numeric) <b>R</b>	Min: 1, Max: 20, "In feet"
			<b>Angle to Channel</b> (Menu) <b>R</b>	<30 degrees*, 30-60 degrees, 60-90 degrees
			<b>Evidence of Blockage or Flooding</b> (menu) <b>R</b>	NA*, sediment plume, scoured road, washed out road, organic debris pile
			<b>Crossing Substrate</b> (menu) <b>R</b>	Culvert fill material*, sand, gravel, bedrock

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
			<b>Year Round Flow (Menu) R</b>	Yes, no*; "Is water present yearly?"
			<b>Comment (text)</b>	(Comment text = 100)
<b>b</b>		<b>Culvert (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Stream Name (text)</b>	Stream name (comment text = 100)
			<b>Num of pipes (Menu) R</b>	NA, 1*, 2, 3, >3
			<b>Design Type (Menu) R</b>	Round, arch, box, log, bottomless arch, other
			<b>Material Type (Menu) R</b>	Steel, ribbed steel, plastic, aluminum, concrete, wood, log, other
			<b>Condition (Menu) R</b>	0-20%*, 20-80%, 80-100%, partially crushed, totally crushed, rusted significantly, flows around pipe
			<b>Pipe Length (numeric) R</b>	20', 30', 40', 50', 60, 70' >70' (pipe length in feet)
			<b>Round Size (menu) R (diameter in inches)</b>	NA, <12", 12", 15", 18", 24"* , 36", 48", 60", >60"
			<b>Oval Size (menu) R (diameter in inches)</b>	NA*, 13"x17", 15"x21", 20"x28", 24"x35", 29"x42", 33"x49", 38"x57
			<b>Inlet Fill Height (menu) R</b>	<2', 2-4', 4-6', 6-8', 8-10', 10-12", >12'
			<b>Outlet Fill Height (menu) R</b>	<2', 2-4', 4-6', 6-8', 8-10', 10-12", >12'
			<b>Outlet Drop (menu) R</b>	<1', <2', <3', >3'
			<b>(Outlet) Pool Depth (numeric) R</b>	Pool depth in feet
			<b>(Outlet) Pool Length (numeric) R</b>	Pool length in feet
			<b>Discharge to (Menu) R</b>	Forest floor*, gully, ditch, landslide, wetland, stream
			<b>Slope Shape (Menu) R</b>	Concave, planar*, convex
			<b>Slope (degrees) (numeric) R</b>	Minimum = 0, Max = 90, "Degrees"
			<b>Fill Erosion (menu)</b>	No*, Yes
			<b>Percent Plugged (numeric) R</b>	Min: 0, max: 100
			<b>Water Topped Rd (menu) R</b>	Yes, no*: "Yes, if culvert cannot handle flow."
			<b>Year round Flow (Menu) R</b>	Yes, no*

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
			<b>Trash Rack Present (menu) R</b>	Yes, no*
			<b>Stream Connection (Menu) R</b>	No*, yes, unknown
			<b>Channel Type (Menu) R</b>	Natural stream*, irrigation ditch, canal, other
			<b>Channel Width (numeric) R</b>	Min: 1, Max: 20, "In feet"
			<b>Angle to Channel (Menu) R</b>	<25 degrees, <45 degrees, 45-75 degrees, > 75 degrees*
			<b>Evidence of Blockage or Flooding (menu) R</b>	NA*, no, sediment plume, scoured road, washed out road, organic debris pile
			<b>Crossing Substrate (menu) R</b>	Culvert fill material*, sand, gravel, bedrock
			<b>Comment (text)</b>	(Comment text = 100)
<b>c</b>		<b>Ford (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Foundation (menu) R</b>	Rock, wood, asphalt/concrete*, other
			<b>Functional (menu) R</b>	Yes*, No
			<b>Year Round Flow (menu) R</b>	Yes, No*, "Does water flow all year long?"
			<b>Channel Width (numeric) R</b>	Min: 1, Max: 1000, "In feet"
			<b>Comment (text)</b>	(Comment text = 100)
<b>3</b>	<b>Soil Erosion/ Potential Resource Damage</b>			
<b>a</b>		<b>Road Erosion Problem (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Type (menu) R</b>	Stream crossing erosion, stream lateral erosion, streamflow diverted (onto road), seepage area, nonengineered road drainage, other
			<b>Length (numeric) R</b>	Length of erosion feature in feet
			<b>Comment (text)</b>	(Comment text = 100)
<b>b</b>		<b>Potential Resource Damage (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Type (menu) R</b>	Mud hole*, braided roads, extremely rocky, other
			<b>Length (numeric) R</b>	Length of feature in feet



<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
			<b>Comment</b> (text)	(Comment text = 100)
<b>c</b>		<b>Rut</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Depth:</b> (menu)	< 2", 2" to 6", > 6"
			<b>Length</b> (numeric) <b>R</b>	Length of rut in feet
			<b>Comment</b> (text)	(Comment text = 100)
<b>d</b>		<b>Water Ponding</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Length</b> (numeric) <b>R</b>	Length of pond in feet
			<b>Comment</b> (text)	(Comment text = 100)
<b>e</b>		<b>Slide</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Description</b> (menu) <b>R</b>	Cut failure*, fill failure, (record only when within 400 yards of reservoir or perennial stream)
			<b>Length</b> (numeric) <b>R</b>	Length of slide in feet
			<b>Comment</b> (text)	(Comment text = 100)
<b>4</b>	<b>Road Hydrological Features/ Erosion Mitigation Measures</b>			
<b>a</b>		<b>Lead-Off Ditch</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Slope shape</b> (menu) <b>R</b>	Concave, planar*, convex
			<b>Discharge To</b> (menu) <b>R</b>	Forest floor*, gully, ditch, landslide, wetland
			<b>Stream Connection</b> (Menu) <b>R</b>	No*, yes, unknown
			<b>Condition</b> (menu) <b>R</b>	No problem*, gullied, not functional, excess deposition
			<b>Comment</b> (text)	(Comment text = 100)
<b>b</b>		<b>Waterbar</b> (point)	<b>Number</b> (numeric)	Auto-increment number
			<b>Slope shape</b> (menu) <b>R</b>	Concave, planar*, convex
			<b>Discharge To</b> (menu) <b>R</b>	Forest floor*, gully, ditch, landslide, wetland
			<b>Stream Connection</b> (Menu) <b>R</b>	No*, yes, unknown
			<b>Fill Erosion</b> (menu) <b>R</b>	No*, yes
			<b>Type</b> (menu) <b>R</b>	Road material*, fabricated material

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
			<b>Condition (menu) R</b>	No problem*, damaged, too small, drains inboard ditch
			<b>Comment (text)</b>	(Comment text = 100)
<b>c</b>		<b>Broad-Based Dip (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Slope shape (menu) R</b>	Concave, planar*, convex
			<b>Discharge To (menu) R</b>	Forest floor*, gully, ditch, landslide, wetland
			<b>Stream Connection (Menu) R</b>	No*, yes, unknown
			<b>Fill Erosion (menu) R</b>	No*, yes
			<b>Type (menu) R</b>	Grade reversal*, flat ditch, constructed
			<b>Condition (menu) R</b>	No problem*, puddles on road, wetland in ditch, saturated fill
			<b>Material (menu) R</b>	Crushed rock, native soil, vegetated, paved, cinder
			<b>Comment (text)</b>	(Comment text = 100)
<b>d</b>		<b>Nonengineered Drainage (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Slope shape (menu) R</b>	Concave, planar*, convex
			<b>Discharge To (menu) R</b>	Forest floor*, gully, ditch, landslide, wetland
			<b>Stream Connection (Menu) R</b>	No*, yes, unknown
			<b>Fill Erosion (menu) R</b>	No*, yes
			<b>Type (menu) R</b>	Grade reversal*, flat ditch, constructed
			<b>Condition (menu) R</b>	Blocked ditch*, diverted wheel track, broken berm, gully crosses road
			<b>Comment (text)</b>	(Comment text = 100)
<b>e</b>		<b>Sump (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Condition (menu) R</b>	No problem*, puddles on road, saturated fill
			<b>Comment (text)</b>	(Comment text = 100)
<b>f</b>		<b>Diffuse Drainage (point)</b>	<b>Number (numeric)</b>	Auto-increment number
			<b>Slope shape (menu) R</b>	Concave, planar*, convex
			<b>Discharge To (menu) R</b>	Forest floor*, gully, ditch, landslide, wetland

<b>Table 3A-1 Road Inventory Data Dictionary</b>				
No.	Theme	Feature	Attribute	Details
			<b>Stream Connection (Menu) R</b>	No*, yes, unknown
			<b>Fill Erosion (menu) R</b>	No*, yes
			<b>Comment (text)</b>	(Comment text = 100)

\* Default category