

Figure 1. Stream crossings with a high risk of washout on ODF lands in the Miami River Watershed Project Area.

Table 1. Count of Inventoried Cross Drains by Select Condition Code on ODF Land.

Subwatershed	Condition Code 0	Condition Code 1	Condition Code 2
Lower Miami	1	1	18
Upper Miami	3	2	3
Tillamook Bay		1	3
Total	4	4	24

Key to Cross Drain Condition Codes:

0. cross-drain needed
1. cross-drain has completely failed or blocked; direct sediment delivery into stream, fill washing out or sliding; not easily passable
2. cross-drain mostly blocked due to damage or debris; or gully developed at culvert outlet and extending beyond road

4.4.3.3 Hydrologic Connectivity

The RIMS inventory evaluated road segments and their connection to the stream network. Segment lengths that drain directly into a stream at a crossing, or that contribute to a cross drain that delivers outflow to a stream were measured. Roads that cross many streams have a high potential to be hydrologically connected to the stream network. Structural elements of the road prism can intercept and divert flow to streams, in effect lengthening the stream network. Where road systems have expanded the stream network substantially, hydrologic processes can become altered, particularly runoff and peak flow processes.

Cross drains emplaced at intervals on roads help truncate the expansion of the stream network, and reduce the hydrologic connection. It is estimated using the RIMS data that 20 percent of the inventoried road miles on ODF land are directly connected to the stream network. Figure 20 depicts the stream crossings and cross drains that are hydrologically connected to a water body.

Out of the 432,575 feet of road surveyed using the RIMS protocol, only 85,444 feet was connected to streams. This is 20 percent of the road system. Most of this connection occurred at stream crossings, with 149 out of 157 of stream crossings having hydrologic connection. Of the 335 cross drain culverts, only 50 had hydrologic connection to streams. The percentage of surveyed road segments with hydrologic connection is lower than all known surveys of forest roads. For example, a similar survey for the adjacent Kilchis watershed analysis in 1995 found between 25 and 39 percent of the road connected to streams, a percentage comparable to the statewide average determined by monitoring at that time (K. Mills pers. comm.).

Road segments with over 500 feet connection, with cross drains assigned a RIMS attention priority code for washout (high risk) of 0,1, or 2 are in need of immediate repair and should be candidate locations for a new culvert or waterbar.

Noteworthy segments of road on ODF land that are highly connected to the stream network include the Miami River Road between Prouty Creek and the North Fork crossing, the lower segments of the Minich Creek Road, the Miami North Road, the Stuart Creek Road, and segments of the Patterson Creek Road.

There remain opportunities to further reduce hydrologic connection to streams on certain roads. The Miami Forest Road, for example, has 43 percent of its road length with hydrologic connection to the Miami River. This is a winter haul turbidity concern for this road. In addition, the just improved Electric creek road appears to have had no additional disconnecting culverts installed during recent repairs.

4.4.3.4 Anecdotal Observations

During field reconnaissance, evidence of road related erosion on non inventoried roads on ODF land was observed. These were sites that were not identified during RIMS surveys, but were judged to be other sources of road-related sediment. The location of these sites was noted along with anecdotal observations. These observations are not intended to represent a comprehensive listing or survey of un-inventoried road conditions.

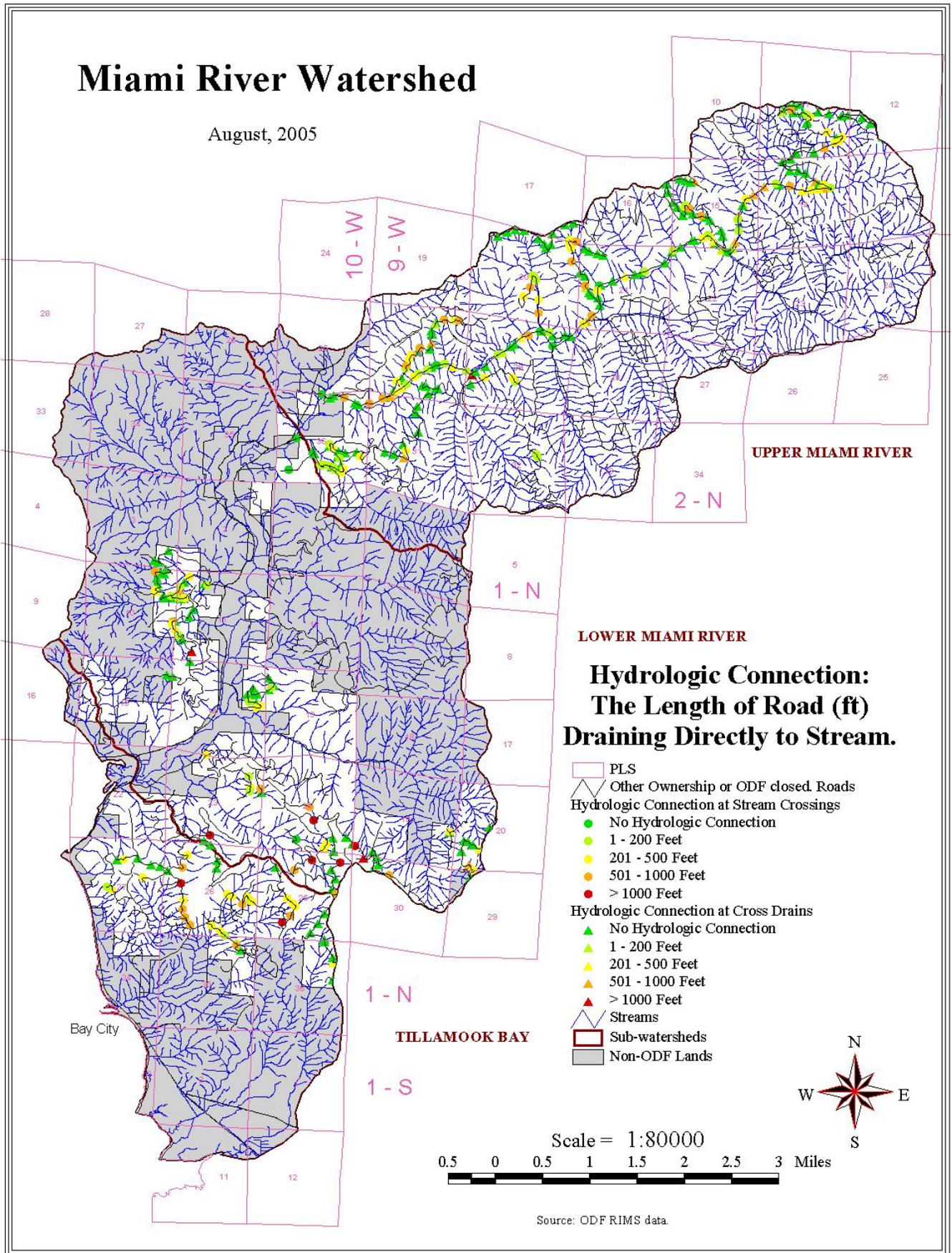


Figure 2. Road segments on ODF lands draining directly to streams in the Miami River Watershed Project Area.

The Main Miami River road between Diamond and Powderhouse Creeks is immediately adjacent to the river has undergone repair and armoring, as well as some relocation in the recent past to prevent damage from high flows. These improvements should minimize impacts and erosion, however, several segments impinge upon the channel and could still be impacted during high flows.

Noteworthy gully erosion associated with roads was observed on:

- the lower segment of the closed 2-9-22.2 road off of the South Miami road,
- a stream crossing on the decommissioned 2-9-11 road where the culvert has failed and the remaining fill has been deeply eroded

Sites where ravel erosion steadily contributes sediment to ditch lines, potentially contributing to the failure of drainage structures (i.e. ditch lines or cross drains) were observed where steep, relatively bare backslopes are located. These included:

- segments of Stuart Ck rd,
- recently reconstructed spurs off the Stuart Creek road,
- steep full bench sections of the upper segments of the Miami River road,
- lower segments of the Diamond Creek road,
- steep grades of the Miami West and Miami North roads,
- lower segments of the Foley road,
- lower and upper segments of Fire Break 3 road,
- lower segments of the Electric Creek road north of Bay City,
- upper segments of the Patterson Creek road

Heavy ground disturbance and bare soil conditions were observed in areas where high OHV use occurs, and where potentially illegal off-road recreation trails are located. These included:

- powerline access roads in the Electric, Larsen, and Patterson Creek drainages,
- unnamed spurs off the Electric Creek road just north of Bay City,
- the closed segments of the South Miami road,
- closed spur 2-9-22.2 off of the South Miami road

Recent road improvement, upgrade, and reconstruction projects have been completed, or are in progress on upper segments of:

- Miami River road between the North Fork and the top of the watershed divide
- Powderhouse Creek road system
- Electric Creek road between the ODF boundary north of Bay City and Electric Creek. Note: Recent repairs were made but without reducing the hydrologic connection (i.e., installation of cross drains).

Conditions on unsurveyed roads have not been evaluated. Road surveys conducted by ODF between 1997 and 1999 contain information stored in the Road Information System (RIS) database. Some of these are located on steep terrain where drainage and stability factors could be a concern; and where road related landslides and erosion may have an effect on aquatic and riparian habitat. These include:

- the closed segments of the Lower Moss Creek road,
- recently constructed and reconstructed spurs off of the Stuart Creek road,
- the entire Powderhouse Creek road network,
- the closed 2-9-21 road network east of Powderhouse Creek,
- abandoned sections of the South Miami road that extend into the upper reaches of the South Fork,
- the closed 2-9-22.2 road network off of the South Miami road
- an assortment of small, local closed and overgrown spurs off of the Doty Hill, Illingsworth, Minich, and Stuart road networks

Sites where rock sources for road construction have been recently worked are in close proximity to streams. Bare soil conditions are prevalent, and fine sediment is exposed.

- Junction of Foley and Miami River roads
- upper most segment of Miami River road just below the divide

4.5 Water Quality

A thorough and comprehensive analysis of water quality in the Miami watershed is presented in the existing E&S study, and for the sake of brevity is summarized here. Additional and equally comprehensive analyses of water quality are presented in the Kilchis Watershed Assessment and the Trask Watershed Analysis (ODF/BLM 2003). Those analyses are used to address select water quality issues associate with the streams in the Tillamook Bay subwatershed because they occupy the same coastal plain, are subject to similar land use, and have similar designated beneficial uses. These documents are incorporated here by reference, and supply an abundance of detailed data regarding water quality conditions that are applicable to conditions in the project area.

The beneficial uses designated by DEQ for all streams and tributaries in the North Coast Basin, including those in the project area are listed in Table 21. Beneficial uses considered sensitive include salmonid spawning and rearing and water contact recreation. Water quality evaluation criteria for designated beneficial uses are listed for each basin in the Oregon DEQ Water Quality Standards. A default list, which is applicable to most of the streams in the North Coast Basin is displayed in table 7.4 of E&S (2001) and Chapter 8 of the OWAM. Parameters that the evaluation criteria are applicable to include: temperature, dissolved oxygen, pH, nutrients, bacteria, turbidity, and organic and metal contaminants.

Table 2. Beneficial uses applicable to all stream reaches in the Miami River Watershed Project Area.

Public domestic water supply	Salmonid fish spawning
Private domestic water supply	Resident fish and aquatic life
Industrial water supply	Wildlife and hunting
Irrigation	Fishing
Livestock watering	Boating
Anadromous fish passage	Water contact recreation
Salmonid fish rearing	Aesthetic quality

Source: E&S 2001

For the project area, the Miami River from its mouth to Stuart Creek is the only stream segment in the project area listed on the 1998 303(d) list of limited water bodies (E&S 2001). From the mouth to Moss Creek it is limited due to exceeding the established temperature criteria for salmonid rearing and spawning. The reach from the mouth to Stuart Creek is listed due to exceeding established criteria for bacteria. These reaches are the only reaches of the Miami that are listed in the project area. Both reaches flow through private non-industrial lands and are downstream of ODF lands.

Water quality data indicate that since there was a somewhat frequent incidence of water monitoring samples that exceeded the evaluation criteria for temperature, nitrogen, and bacteria; that the Miami River may be impaired. Based on Oregon Water Quality Index values, the Miami River exhibits water quality ranges from fair during summer, to good during fall, winter, and spring.

The 303(d) temperature listing for the Miami River applies to the low gradient, wide reach below Moss Creek where conversion from forest to agriculture land use has occurred and riparian vegetation is sparse. Further upstream on ODF lands however, temperature monitoring has not revealed any exceedance of temperature parameters, even during summer low flows, suggesting that the potential for stream temperature to be a limiting factor in the critical reaches in the upper Miami is low for salmonid beneficial uses. Based on an evaluation of potential shade conducted as part of this analysis, there is an adequate range of shade levels on ODF lands (see Analysis Section; Limiting Factors Analysis).

Beneficial uses in the Tillamook Bay subwatershed are the same as those listed in Table 21. The most sensitive beneficial use in these streams is salmonid spawning and rearing. A cursory examination of water quality data for the frontal streams, specifically Patterson and Vaughn Creeks indicates that there has been a frequency of exceedance detected for temperature, bacteria, and nutrients. All the samples collected came from the lower reaches of the frontal streams, which flow through private non-industrial urban, rural residential, and agricultural lands.

4.6 Fisheries, Aquatic Habitat and Amphibians

A considerable amount of historical information and current data has been compiled and summarized for fish species and their habitats in Tillamook Bay and in the Miami River watershed, specifically (TNEP 1998, TBNEP 1996, E&S 2001, ODFW 2005). This assessment incorporates these documents by reference. This assessment will focus on summarizing key fisheries information in preparation for the subsequent “analysis” phase, which will provide the rationale for basing management recommendations, and identifying restoration opportunities on ODF administered lands in the Miami River Watershed and adjacent frontal subwatershed. Information to be discussed here will focus on:

- presence and distribution of fish species,
- potential passage barriers and associated blocked stream miles,
- current habitat conditions,
- location of critical habitats on ODF lands,
- and, potential presence of selected amphibians.