Chapter 2.11 Colorado River West Watershed Management Unit Water Quality Assessment

2.11.1 Introduction

The West Colorado Watershed Management Unit includes all streams located in the U.S.G.S. Hydrological Units (HUCs) listed in Table 2.11-1 Some of the major streams are the Price River, Huntington Creek, Cottonwood Creek, Ferron Creek, San Rafael River, Escalante River, Muddy Creek, Dirty Devil River, the Fremont River, and portions of the Green River.

Table 2.11-1 U.S.G.S. Hydrological Units in the Colorado River West Watershed Management Unit

Hydrological Unit Code	Hydrological Unit Name
14060007	Price
14060008	Lower Green
14060009	San Rafael
14070001	Upper Lake Powell
14070002	Muddy
14070003	Fremont
14070004	Dirty Devil
14070005	Escalante
14070006	Lower Lake Powell

2.11.2 Water Quality Assessment Results

Water quality and field data collected between January 1, 2002 and December 31, 2006 were assessed for beneficial use support. Assessments made for the 2006 intensive survey were reassessed to determine if the assessment was changed. Field and water chemistry data were compared against the water quality standards for the designated beneficial use classifications assigned to the rivers and streams to determine beneficial use support (Figure 2.11-1). Benthic macroinvertebrate data were used to assess some streams under DWQ's narrative standard (Chapter 2.15).

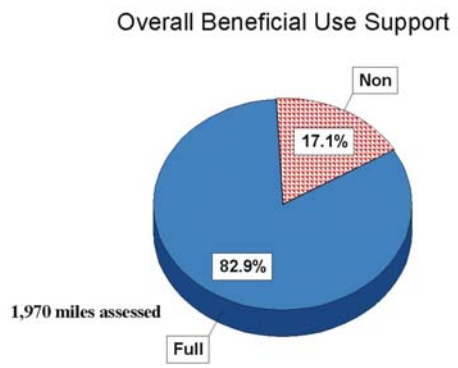

Figure 2.11-1 Overall Beneficial Use Support

2.11.2.1 Overall Beneficial Use Support

There are an estimated 2,551 perennial stream miles within the West Colorado River Watershed Management Unit. An assessment of at least one beneficial use was made on 1,970.1 miles of streams. Of these 1,633.0 (82.9%) miles were assessed as fully supporting at least one beneficial use and 337.1 miles (17.1%) were assessed as not supporting at least one designated beneficial use (Figure 2.11-2).

2.11.2.2 Beneficial Use Assessment By Categories

Table 2.11-2 lists the streams miles that were assigned to each of the assessment categories. An AU can be placed in multiple categories when it is assessed. Therefore the number of stream miles listed in the table may exceed the number assessed.

Table 2.11-2 Stream Miles by Assessment Category – Colorado River West Watershed Management Unit

Category	Category Definitions	Stream Miles
1	All beneficial uses fully supported.	
2	Beneficial uses assessed are fully supported.	1680.4
3A	No data or insufficient data to make an assessment.	424.8
3B	Lakes that are not supported for one cycle only.	
3C	Insufficient data to assess but an assessment plan is in place.	
4A	Approved TMDL	88.2
4B	Pollution control requirements are expected to result in full beneficial use support in near future.	
4C	Impaired by pollution, no TMDL required.	
5	Impaired by pollutant, TMDL required.	201.5

2.11.2.3. Individual Use Support

Table 2.11-3 lists the beneficial use support by individual beneficial use classes. Of the Class 1C (source of drinking water) stream miles, 840.7 miles are fully supporting this beneficial use. The aquatic life beneficial is supported in 1,691.9 stream miles (85.9%) and 278.2 stream miles (14.1%) are not supporting aquatic life. Of the, 1,636.7 miles assessed for agricultural use, 1,551.8 miles (94.8 %) were are supported and 84.9 (5.2%) are not supported.

2.11.2.4 Total Waters Impaired by Various Causes

Table 2.11-4 is a list of streams miles affected by the various causes identified as generally affecting water quality. The causes of water quality impairment were unknown causes, temperature, metals, total dissolved solids, dissolved oxygen and nutrients (total phosphorus) (Figure 2.11-4). The relative percent impact by causes is illustrated in Figure 2.11-5

2.11.2.5. Total Waters Impaired by Various Sources

The sources of impairment were unknown sources, agricultural activities, natural sources, habitat modification and drought (Figure 2.11-6). The relative percent impacts by sources are illustrated in Figure 2.11-7.

Table 2.11-3 Individual Beneficial Use Support – Colorado River West Watershed Management Unit (Stream Miles)

Use	Size Assessed	Size Fully Supporting	Size Not Supporting	Totals
Aquatic Life	1,970.1	1,775.3	194.8	1,970.1
Fish Consumption	0.0	0.0	0.0	0.0
Swimming	118.0	96.9	21.1	118.0
Secondary Contact	118.0	96.9	21.1	118.0
Drinking Water	840.4	840.4		840.4
Agricultural	1,636.7	1,551.8	84.9	1,636.7
Use				
Aquatic Life		88.3%	11.7%	100.0%
Fish Consumption		0.0%	0.0%	100.0%
Swimming		82.1%	17.9%	100.0%
Secondary Contact		82.1%	17.9%	100.0%
Drinking Water		100.0%	0.0%	100.0%
Agricultural		94.8%	5.2%	100.0%

2.11.2.6 Impaired Assessment Units

Table 2.11-6 is a list of the impaired waters in the Colorado River West Watershed Management Unit.

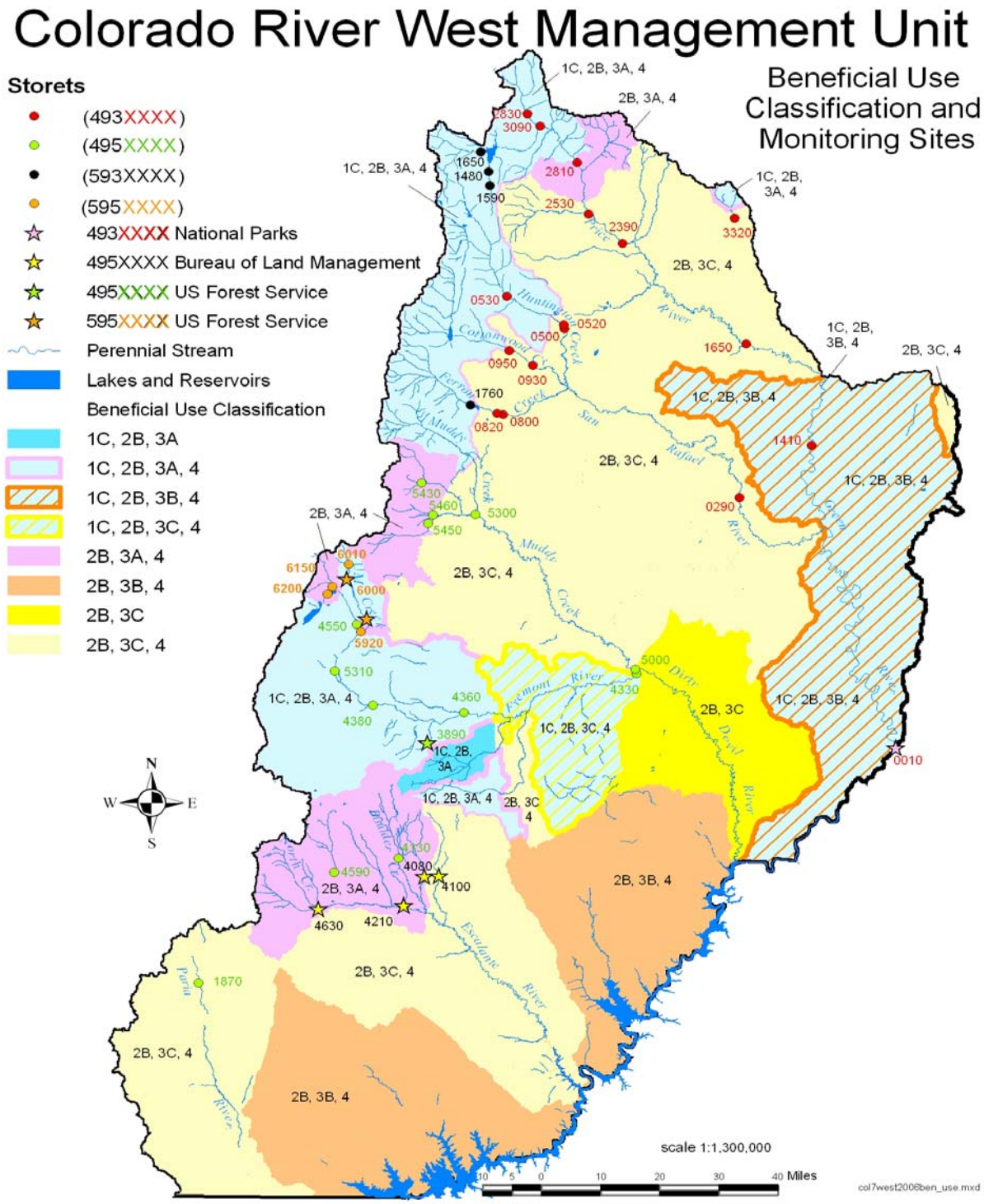

Figure 2.11-2 Beneficial use classifications – Colorado River West Watershed Management Unit

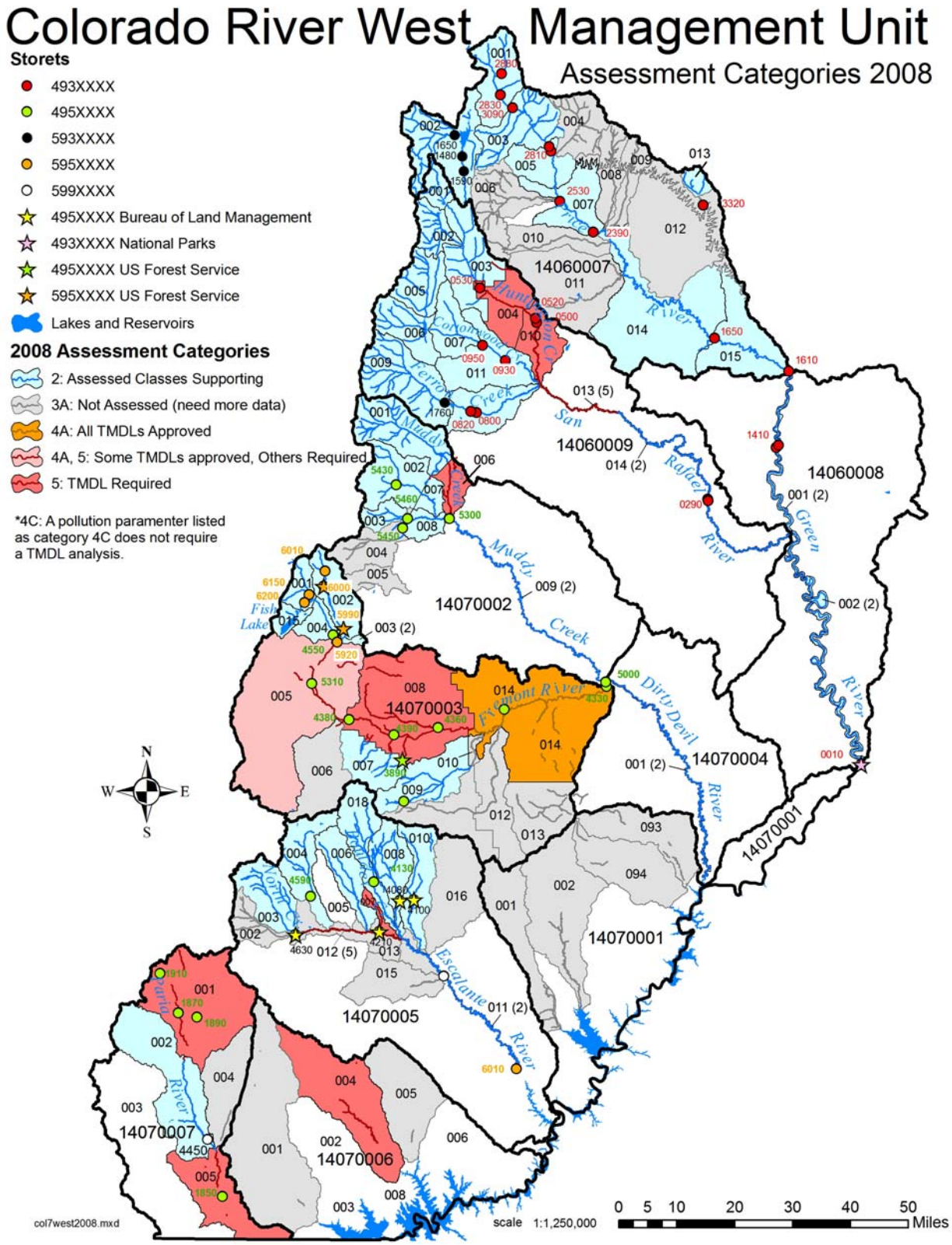

Figure 2.11-3 Beneficial use assessment by category – Colorado River West Watershed Management Unit

Table 2.11-4 Total Waters Impaired by Various Cause Categories (Stream Miles) - Colorado River West Watershed Management Unit

Cause Category	Stream Miles
Benthic macroinvertebrate assessment impairment	132.13
E. coli	
Flow Alteration	
Netals	25.79
Organic Enrichment/Low DO	29.34
Other Habitat Alterations	
pH	
Radiation	
Salinity/TDS/Chlorides	84.89
Siltation	
Temperature	16.77
Total Phosphorus	29.34
Unionized Ammonia	

Table 2.11-5 Total Waters Impaired by Various Source Categories (Stream Miles) – Colorado River West Watershed Management Unit

Source Category	Stream Miles
Agriculture	140.02
Aquaculture	
Construction	
Drought	16.77
Habitat Modification (other than Hydromodification)	
Hydromodification	
Industrial Point Sources	
Municipal Point Sources	
Natural Sources	110.68
Resource Extraction	
Septic	
Source Unknown	161.47
Sources outside State Jurisdiction or Borders	
Urban Runoff/Storm Sewers	

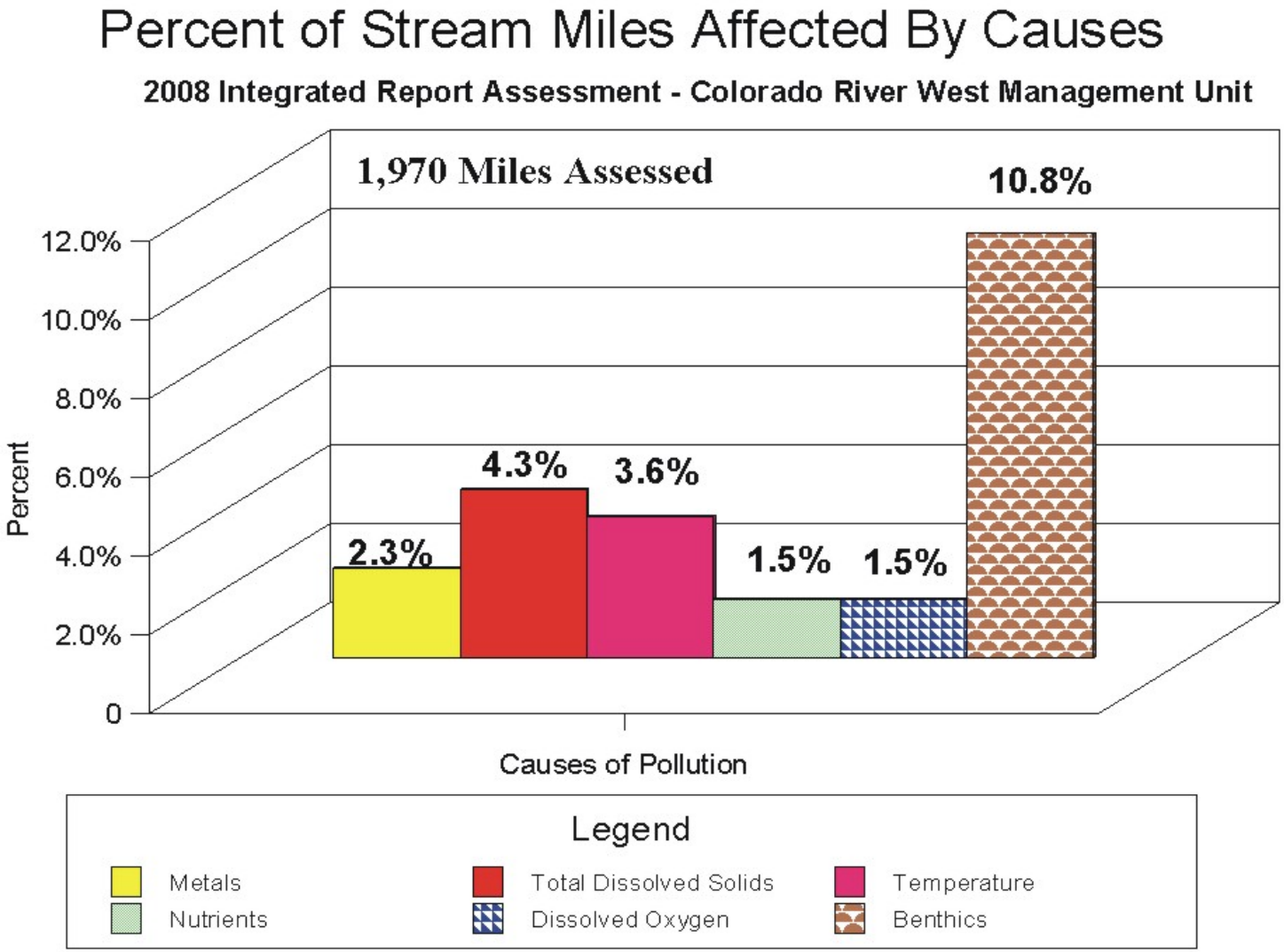

Figure 2.11-4 Percent impact by causes on stream water quality – Colorado River West Watershed Management Unit

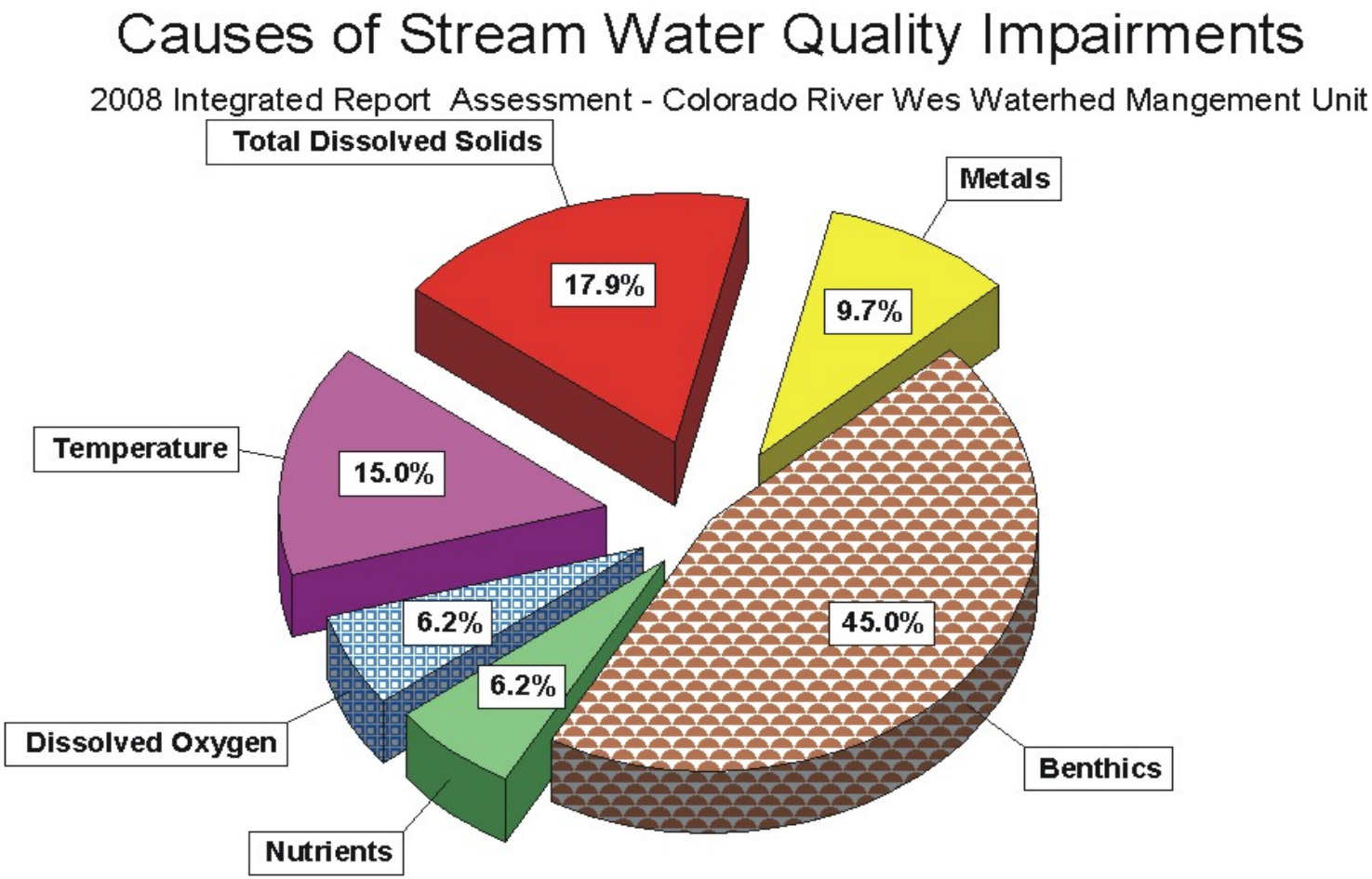

Figure 2.11-5 Relative percent contribution of causes on stream water quality – Colorado River West Watershed Management Unit

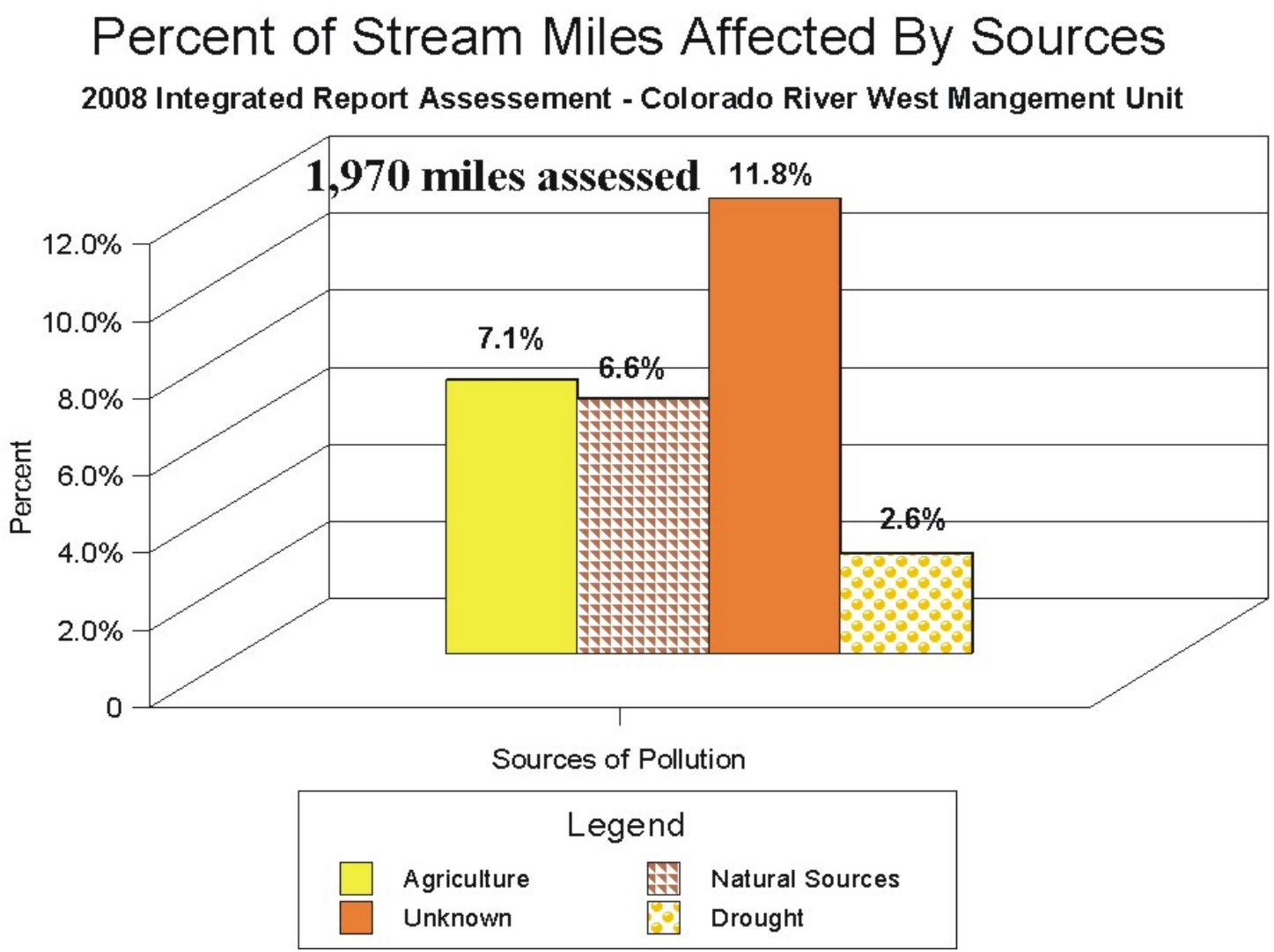

Figure 2.11-6 Percent impact by sources on stream water quality – Colorado River West Watershed Management Unit

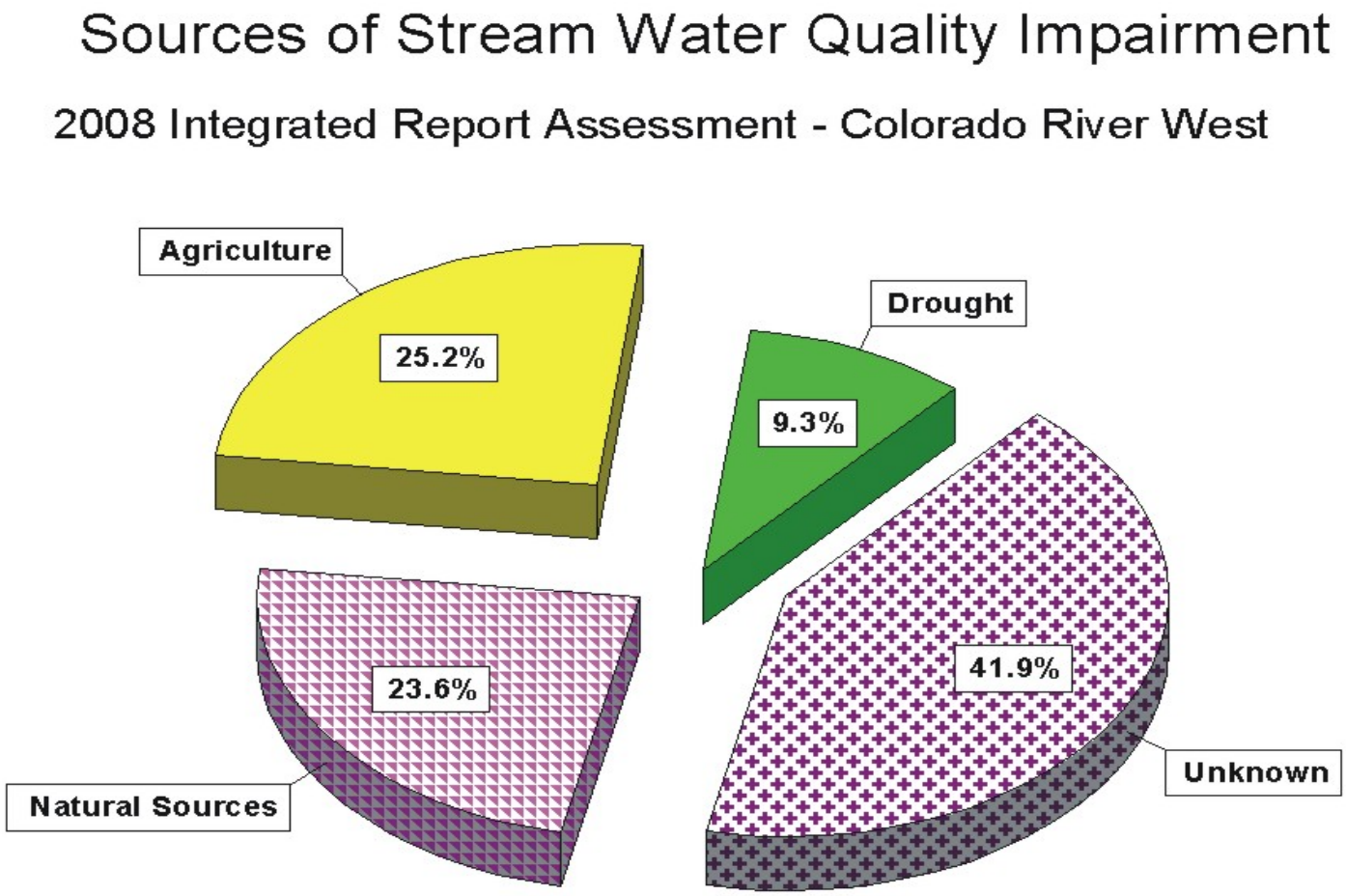

Figure 2.11-7 Relative percent contribution of sources on stream water quality – Colorado River West Watershed Management Unit

Table 2.11-6 Impaired Waters Located in the Colorado River West Watershed Management Unit

Watershed Management Unit	Assessment Unit ID	Assessment Unit Name	Assessment Unit Description	Beneficial Use Class Impaired	Beneficial Use Support	Support Category	Pollutant Or Pollution	Stream Miles
Colorado River West	UT14060009-010	Huntington Creek-1	Huntington Creek and tributaries from confluence with Cottonwood Creek to Highway 10	3C	NS	5	Selenium	25.79
Colorado River West	UT14060009-013	Upper San Rafael	San Rafael River from Buckhorn Crossing to confluence of Huntington and Cottonwood Creeks	3C	NS	5	Benthic macroinvertebrate assessment impairment	23.3
Colorado River West	UT14070003-008	Fremont River-3	Fremont River and tributaries from east boundary of Capitol Reef National Park to Bicknell	3A	NS	5	Benthic macroinvertebrate assessment impairment	82.88
Colorado River West	UT14070006-004	Chance Creek	Chance Creek and tributaries from Lake Powell to headwaters	3A	NS	5	Benthic macroinvertebrate assessment impairment	16.72
Colorado River West	UT14070007-001	Paria River-1	Paria River from start of Paria River Gorge to headwaters	3C	NS	5	Temperature	16.77
Colorado River West	UT14070007-001	Paria River-1	Paria River from start of Paria River Gorge to headwaters	4	NS	5	TDS	16.77
Colorado River West	UT14070007-005	Paria River-3	Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence	3C	NS	5	Benthic macroinvertebrate assessment impairment	9.23
Colorado River West	UT14070007-005	Paria River-3	Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence	4	NS	5	TDS	9.23