

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

Overall Beneficial Use Support

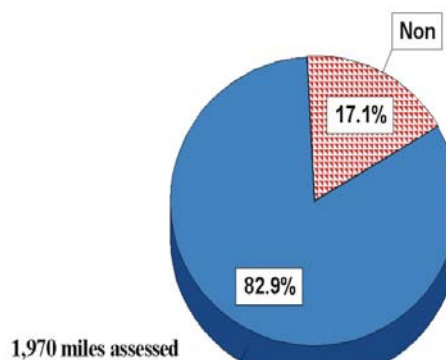


Figure 2.11.1. Overall Beneficial Use Support

Figure 2.11.1. Over all beneficial use support. 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).

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. | 0.0 |
| 2 | Beneficial uses assessed are fully supported. | 1,633.0 |
| 3A | No data or insufficient data to make an assessment. | 470.4 |
| 3B | Lakes that are not supported for one cycle only. | |
| 3C | Insufficient data to assess but an assessment plan is in place. | 0.0 |
| 4A | Approved TMDL | 88.2 |
| 4B | Pollution control requirements are expected to result in full beneficial use support in near future. | 0.0 |
| 4C | Impaired by pollution, no TMDL required. | 0.0 |
| 5 | Impaired by pollutant, TMDL required. | 278.2 |

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, 859.6 miles. All 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, 1,617.5 miles assessed for agricultural use, 1,532.6 miles (94.8 %) were are supported and 84.9 (5.2%) are not supported.

2.11.2.4 Total l 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) (Table 2.11.4) (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) | | | | |
|--|-----------------|-------------------|-------------------|---------------|
| | Size | Size Fully | Size Not | |
| Use | Assessed | Supporting | Supporting | Totals |
| Aquatic Life | 1,970.1 | ,1691.9 | 248.9 | 1,970.1 |
| Fish Consumption | 0.0 | 0.0 | 0.0 | 0.0 |
| Swimming | 0.0 | 0.0 | 0.0 | 0.0 |
| Secondary Contact | 0.0 | 0.0 | 0.0 | 0.0 |
| Drinking Water | 859.6 | 859.6 | 0.0 | 859.6 |
| Agricultural | 1,970.1 | 1,532.6 | 84.9 | 1617.5 |
| | | | | |
| Use | | | | |
| Aquatic Life | | 85.9% | 14.1% | 100.0% |
| Fish Consumption | | 0.0% | 0.0% | 100.0% |
| Swimming | | 0.0% | 0.0% | 100.0% |
| Secondary Contact | | 0.0% | 0.0% | 100.0% |
| Drinking Water | | 100.0% | 0.0% | 100.0% |
| Agricultural | | 94.8% | 5.2% | 100.0% |

Colorado River West Management Unit

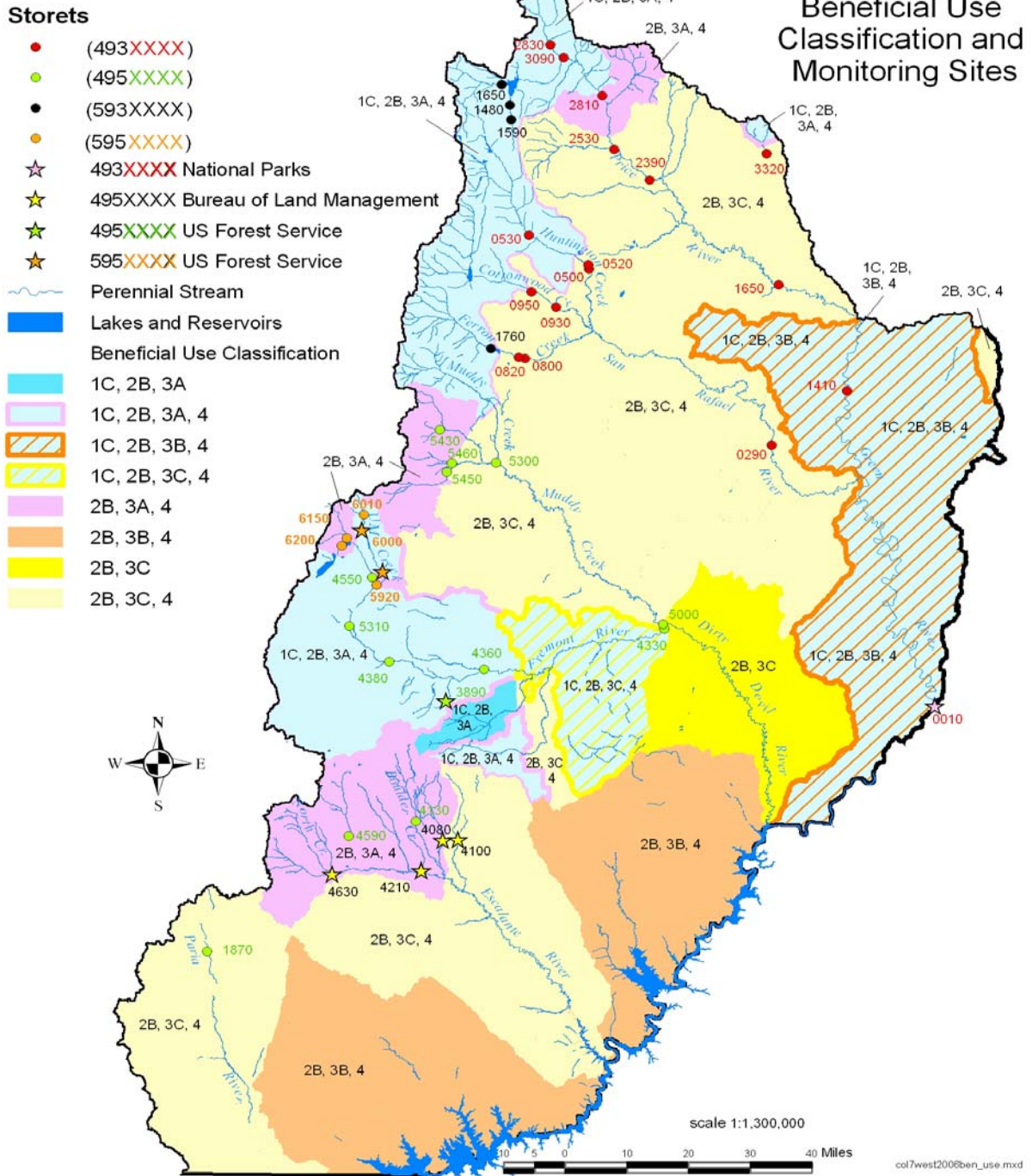


Figure 2.6.2. Beneficial use classifications – Colorado River West Watershed Management Unit.

Colorado River West Management Unit

Assessment Categories 2008

Storets

- 493XXXX
- 495XXXX
- 593XXXX
- 595XXXX
- 599XXXX
- ★ 495XXXX Bureau of Land Management
- ★ 493XXXX National Parks
- ★ 495XXXX US Forest Service
- ★ 595XXXX US Forest Service

● Lakes and Reservoirs

2008 Assessment Categories

- 2: Assessed Classes Supporting
- 3A: Not Assessed (need more data)
- 4A: All TMDLs Approved
- 4A, 5: Some TMDLs approved, Others Required
- 5: TMDL Required

*4C: A pollution parameter listed as category 4C does not require a TMDL analysis.

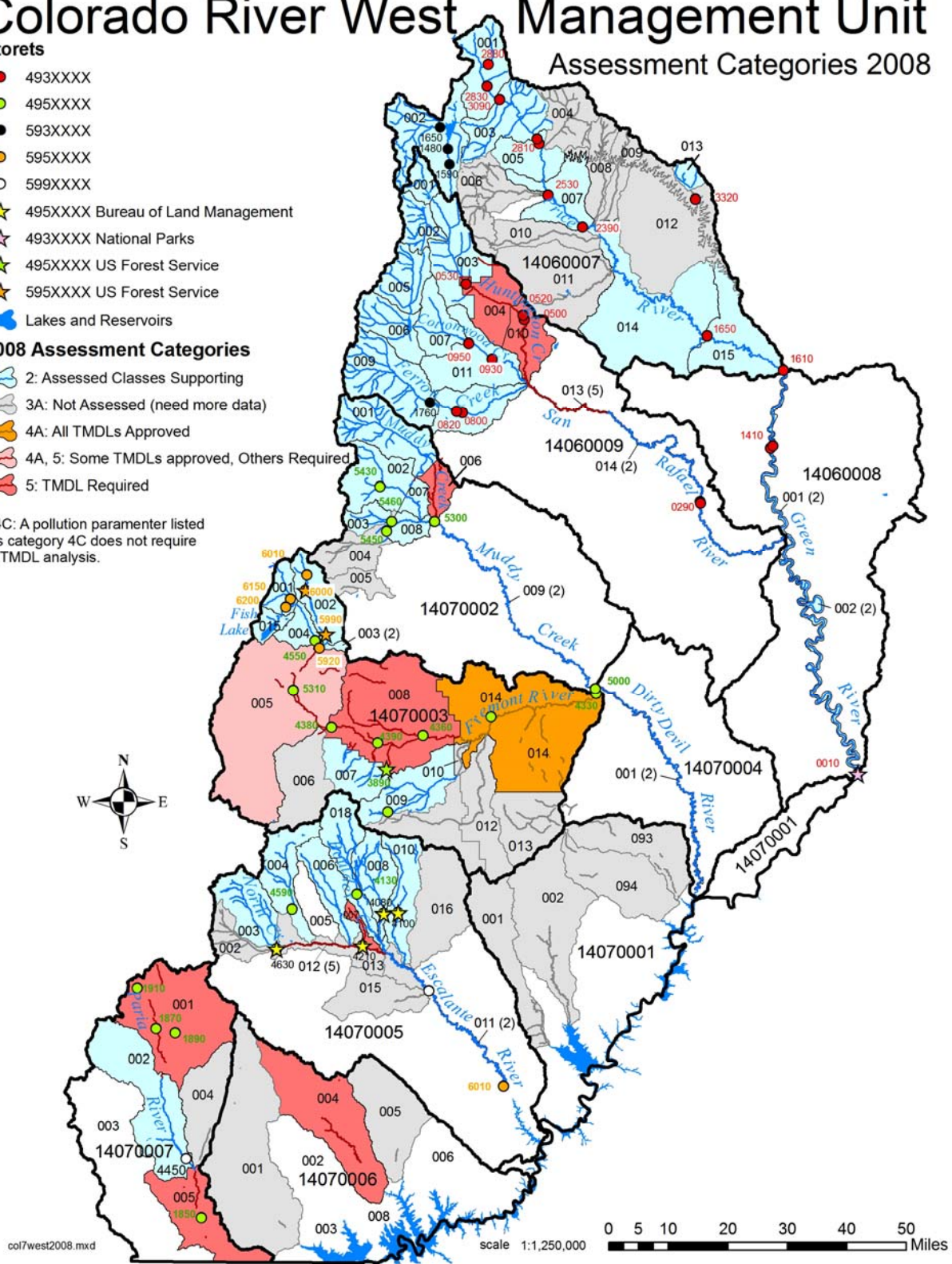


Figure 2.3.3. Beneficial use assessment by category – Colorado River West Watershed Management Unit.

| Table 2.11.4 Total Waters Impaired by Various Cause Categories (Stream Miles) – Colorado River West Watershed Management Unit | |
|--|---------------------|
| Cause Category | Stream Miles |
| Cause unknown | 0.0 |
| Unknown toxicity | 0.0 |
| Pesticides | 0.0 |
| Priority organics | 0.0 |
| Nonpriority organics | 0.0 |
| Metals | 45.9 |
| Ammonia | 0.0 |
| Chlorine | 0.0 |
| Other inorganics | 0.0 |
| Nutrients | 29.3 |
| pH | 0.0 |
| Siltation/Sediments | 0.0 |
| Organic enrichment/low DO | 29.3 |
| Salinity/TDS/Chlorides | 84.9 |
| Thermal modifications | 70.9 |
| Flow alterations | 0.0 |
| Other habitat alterations | 0.0 |
| Pathogen Indicators | 0.0 |
| Radiation | 0.0 |
| Oil and grease | 0.0 |
| Taste and odor | 0.0 |
| Noxious aquatic plants | 0.0 |
| Total toxics | 0.0 |
| Turbidity | 0.0 |
| Benthic Macroinvertebrates | 213.2 |
| Other (specify) | 0.0 |

| Table 2.11.5. Total Waters Impaired by Various Source Categories (Stream Miles) – Colorado River West Watershed Management Unit. | |
|---|---------------------|
| Source Category | Stream Miles |
| Industrial Point Sources | 0.0 |
| Municipal Point Sources | 0.0 |
| Combined Sewer Overflow | 0.0 |
| Agriculture | 140.0 |
| Silviculture | 0.0 |
| Construction | 0.0 |
| Urban Runoff/Storm Sewers | 0.0 |
| Resource Extraction | 0.0 |
| Land Disposal | 0.0 |
| Hydromodification | 0.0 |
| Habitat Modification | 0.0 |
| Marinas | 0.0 |
| Atmospheric Deposition | 0.0 |
| Contaminated Sediments | 0.0 |
| Unknown Source | 232.4 |
| Natural Sources | 130.7 |
| Reservoir Releases | 0.0 |
| Recreation | 0.0 |
| Aquaculture | 0.0 |
| Extreme Drought | 51.9 |
| Out of State | 0.0 |

Percent of Stream Miles Affected By Causes

2008 Integrated Report Assessment - Colorado River West Management Unit

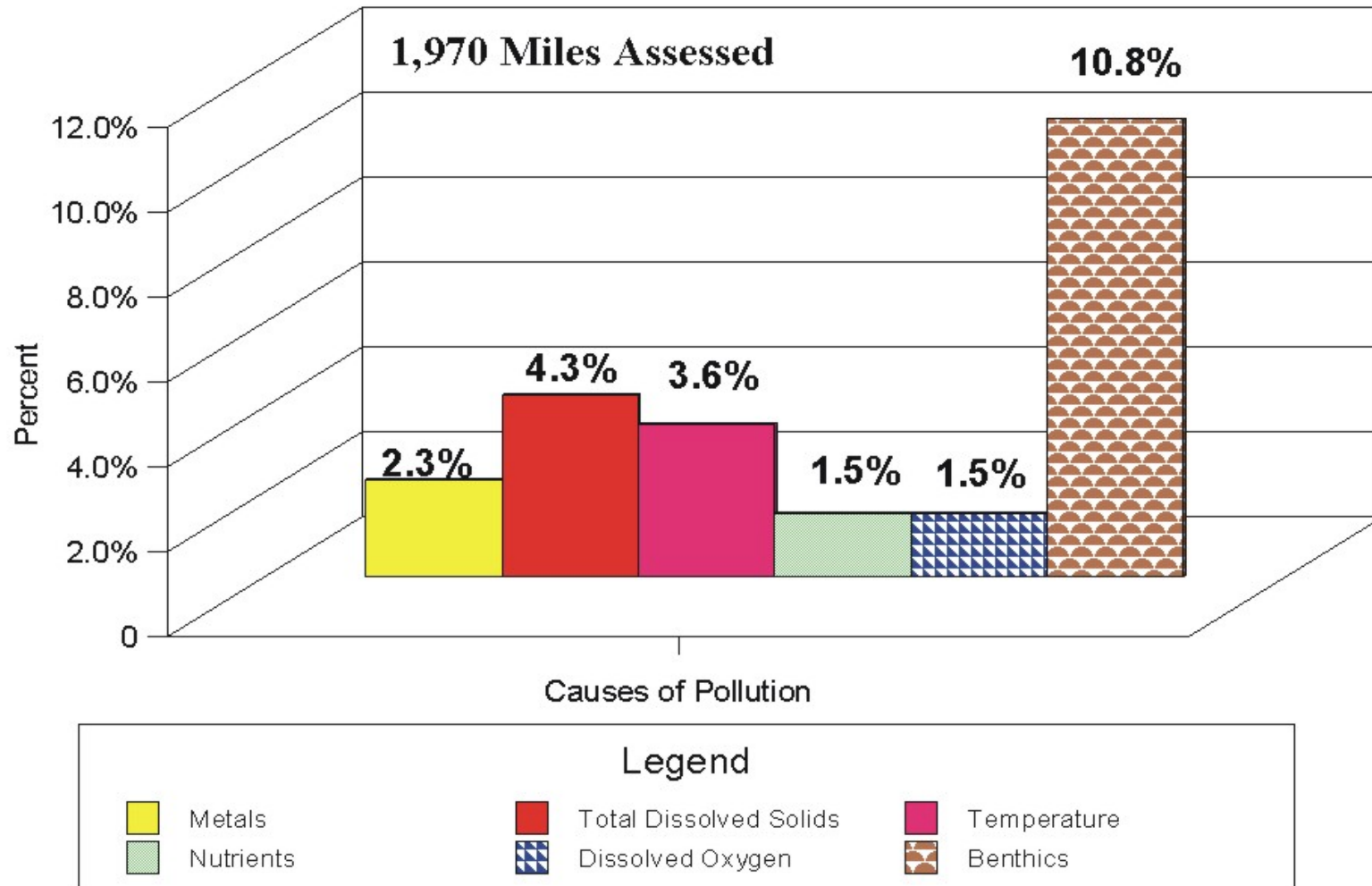


Figure 2.11.4. Percent impact by causes on stream water quality – Colorado River West Watershed Management Unit.

Causes of Stream Water Quality Impairments

2008 Integrated Report Assessment - Colorado River West Watershed Management Unit

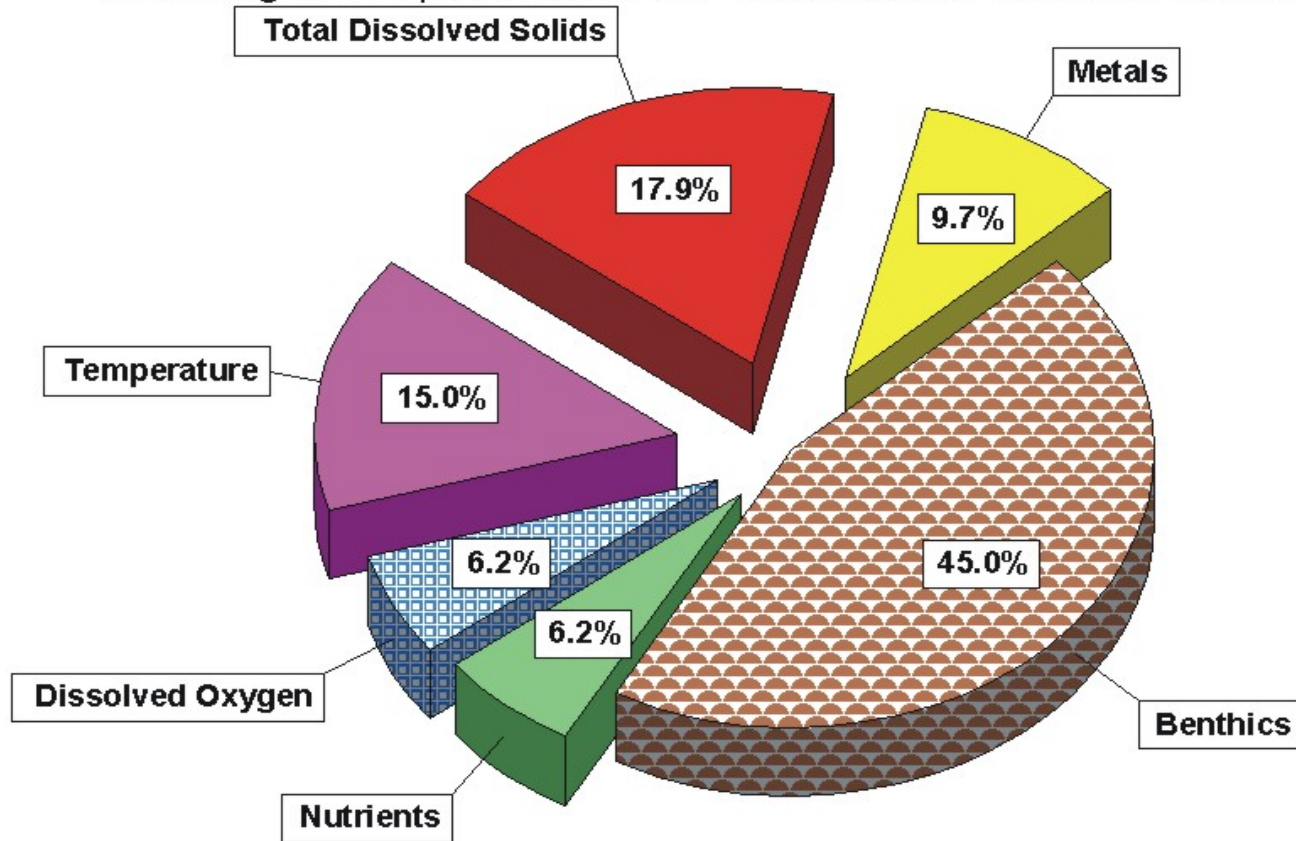


Figure 2.11.7. Relative percent contribution of causes on stream water quality – Colorado River West Watershed Management Unit.

Percent of Stream Miles Affected By Sources

2008 Integrated Report Assessment - Colorado River West Mangement Unit

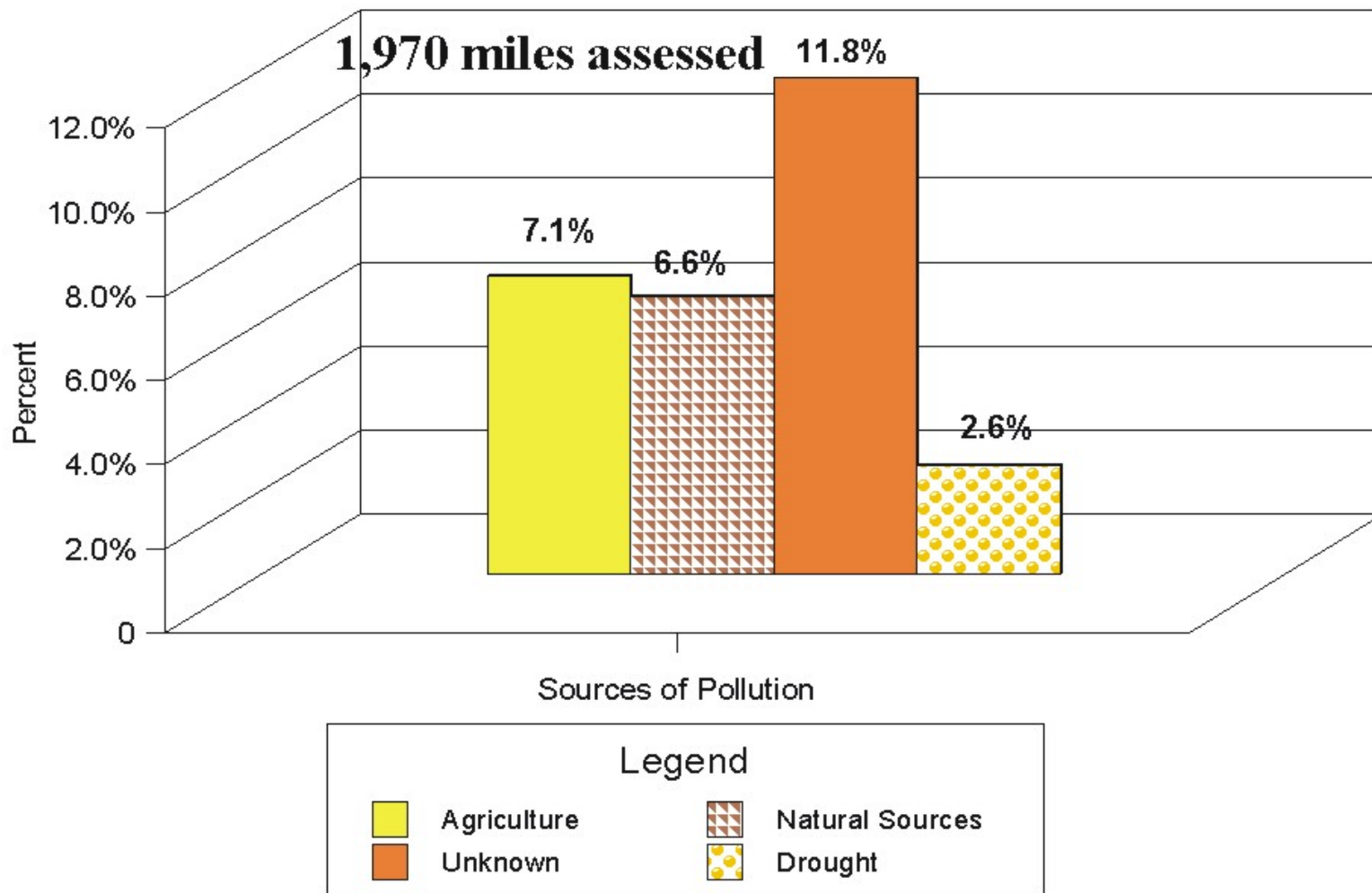


Figure 2.11.6. Percent impact by sources on stream water quality – Colorado River West Watershed Management Unit.

Sources of Stream Water Quality Impairment

2008 Integrated Report Assessment - Colorado River West

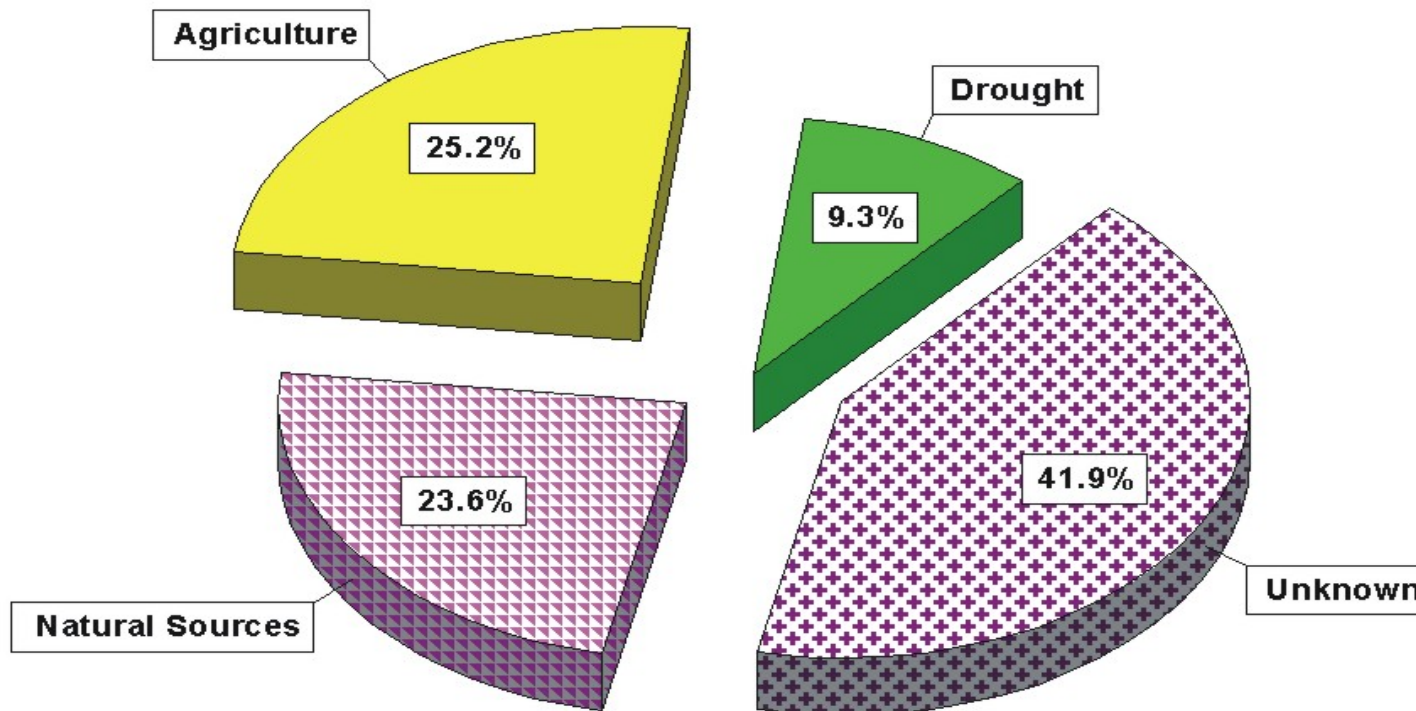


Figure 2.11.7. Relative percent contribution of sources on stream water quality – Colorado River West Watershed Management Unit.

Table 2.11.6. Impaired Waters Located in the Colorado River West Watershed Management Unit.

| Assessment | Assessment | Assessment | Beneficial Use | Beneficial | | Pollutant | |
|----------------|--------------------|---|----------------|------------|----------|---|--------|
| Unit | Unit | Unit | Class | Use | Support | Or | Stream |
| ID | Name | Description | Impaired | Support | Category | Pollution | Miles |
| UT14070003-005 | Fremont River-2 | Fremont River and tributaries from Bicknell to Mill Meadow Reservoir near USFS boundary | 3A | NS | 4A | Organic Enrichment/Low DO | 29.34 |
| UT14070003-005 | Fremont River-2 | Fremont River and tributaries from Bicknell to Mill Meadow Reservoir near USFS boundary | 3A | NS | 4A | Total Phosphorus | 29.34 |
| UT14070003-014 | Fremont River-4 | Fremont River and tributaries from confluence with Dirty Devil to east boundary of Capitol Reef National Park, except Pleasant and Sandy Creeks | 4 | NS | 4A | Salinity/TDS/Chlorides | 58.89 |
| UT14060009-004 | Huntington Creek-2 | Huntington Creek and tributaries from Highway 10 crossing to USFS boundary | 3A | NS | 5 | Temperature | 19.24 |
| UT14060009-010 | Huntington Creek-1 | Huntington Creek and tributaries from confluence with Cottonwood Creek to Highway 10 | 3C | NS | 5 | Selenium | 25.79 |
| 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 |
| UT14070002-006 | Middle Muddy | Muddy Creek and tributaries from Ivie Creek confluence to U-10 crossing | 3C | NS | 5 | Selenium | 20.06 |
| UT14070003-005 | Fremont River-2 | Fremont River and tributaries from Bicknell to Mill Meadow Reservoir near USFS boundary | 3A | NS | 5 | Benthic Macroinvertebrate Assessment Impairment | 29.34 |
| 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 |
| UT14070005-007 | Calf Creek | Calf Creek and tributaries from confluence with Escalante River to headwaters | 3A | NS | 5 | Benthic Macroinvertebrate Assessment Impairment | 8.13 |
| UT14070005-007 | Calf Creek | Calf Creek and tributaries from confluence with Escalante River to headwaters | 3A | NS | 5 | Temperature | 8.13 |
| UT14070005-012 | Upper Escalante | Escalante River from Boulder Creek confluence to Birch Creek confluence | 3A | NS | 5 | Benthic Macroinvertebrate Assessment Impairment | 26.78 |

Table 2.11.6. Impaired Waters Located in the Colorado River West Watershed Management Unit.

| Assessment | Assessment | Assessment | Beneficial Use | Beneficial | | Pollutant | |
|-------------------|-------------------|---|-----------------------|-------------------|-----------------|---|---------------|
| Unit | Unit | Unit | Class | Use | Support | Or | Stream |
| ID | Name | Description | Impaired | Support | Category | Pollution | Miles |
| UT14070005-012 | Upper Escalante | Escalante River from Boulder Creek confluence to Birch Creek confluence | 3A | NS | 5 | Temperature | 26.78 |
| UT14070006-004 | Chance Creek | Chance Creek and tributaries from Lake Powell to headwaters | 3A | NS | 5 | Benthic Macroinvertebrate Assessment Impairment | 16.72 |
| UT14070007-001 | Paria River-1 | Paria River from start of Paria River Gorge to headwaters | 3C | NS | 5 | Benthic Macroinvertebrate Assessment Impairment | 16.77 |
| UT14070007-001 | Paria River-1 | Paria River from start of Paria River Gorge to headwaters | 3C | NS | 5 | Temperature | 16.77 |
| UT14070007-001 | Paria River-1 | Paria River from start of Paria River Gorge to headwaters | 4 | NS | 5 | Salinity/TDS/Chlorides | 16.77 |
| 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 |
| UT14070007-005 | Paria River-3 | Paria River and tributaries from Arizona-Utah state line to Cottonwood Creek confluence | 4 | NS | 5 | Salinity/TDS/Chlorides | 9.23 |