

Appendix D-3

Gunnison Basin Mapping Results

Gunnison Basin Environmental and Recreational Nonconsumptive Focus Mapping

Background:

In 2005, Colorado's legislature established the Water for the 21st Century Act. This act established an Interbasin Compact Process that provides a permanent forum for broad-based water discussions in the state. It creates two new structures: 1) the Interbasin Compact Committee (IBCC), and 2) the Basin Roundtables. There are nine Basin Roundtables based on Colorado's eight major river basins and the Denver metro area (Figure 1-1).

As part of the IBCC, the Basin Roundtables are required to complete basinwide needs assessments. The needs assessments are to include:

- An assessment of consumptive water needs (municipal, industrial, and agricultural);
- An assessment of non-consumptive water needs (environmental and recreational);
- An assessment of available water supplies (surface and groundwater) and an analysis of any unappropriated waters; and
- Proposed projects or methods to meet any identified water needs and achieve water supply sustainability over time.



Figure 1-1 Colorado's Nine Basin Roundtables

The focus area mapping presented here within is part of the Gunnison Basin Roundtable's assessment of nonconsumptive water needs. The development of the focus mapping for environmental and recreational features in the Gunnison Basin was heavily dependent on Basin Roundtable NCNA subcommittee member participation. The following are members of the Gunnison Basin NCNA subcommittee:

- Tyler Martineau (chair)
- Marc Catlin
- Ken Spann
- David Kanzer
- Jim Hokit

- Dixie Luke
- Steve Glazer

Environmental and recreational focus mapping was completed for the following purposes:

- The maps are intended to serve as a useful guide for water supply planning so that future conflicts over environmental and recreational needs can be avoided;
- The maps can assist in identifying environmental and recreational water needs status, such as where needs are being met, where additional future study may need to take place, or where implementation projects in the basin are needed;
- The maps can help basins plan for the water needs of species of special concern so that they do not become federally listed in the future; and
- The maps can provide opportunity for collaborative efforts for future multi-objective projects.

The mapping developed as part of this effort can serve as a tool as the Gunnison Basin Roundtable completes their consumptive needs assessments and NCNAs and begins to identify multi-purpose projects to meet their needs. The NCNA process is not intended to create a water right for the environment and it is not the intent of the process to diminish, impair, or cause injury to existing absolute or conditional water rights.

Phase II of the NCNA process will include the following tasks:

- An examination of next steps for priority focus areas as directed by the Basin Roundtables;
- Flow evaluations as determined by the Basin Roundtables for focus areas as needed; and
- Basin Roundtable identification of projects and methods (both structural and nonstructural) to meet their identified nonconsumptive needs.

Methodology:

The Gunnison Basin developed an Excel spreadsheet matrix that identified reaches within the basin that contained environmental data layers and recreational data layers identified as important, and reaches that had both recreational and environmental data layers present. The Gunnison also identified reaches that had scientific and educational significance. The Basin Roundtable NCNA subcommittee members used maps of the aquatic-dependent data layers in their basin, previously provided to them, to aid in the development of their matrix. The matrix was further refined with BRT input.

Results:

The Gunnison Basin chose to include waters within the Rocky Mountain Biological Laboratory property as scientific and educational waters. These are highlighted on the map in cyan.

Waterbodies shown in purple are those that are known as boating and fishing reaches. Segments highlighted in orange have environmental nonconsumptive water needs. Many of these streams are located within wilderness areas including the Roubideau Special Area and the Dominguez Wilderness. Segments highlighted in red have both environmental and recreational nonconsumptive water needs. This overlap occurs on a large portion of the Gunnison River.

The following mapping information for the Gunnison Basin is contained in the remainder of this Appendix:

- Data sources for GIS data layers used in Gunnison map development
- Data Matrix for Gunnison Basin Environmental/Recreational/Scientific/Education Reaches
- Gunnison Basin Major Stream Segment Map

Gunnison Basin GIS Data and Sources**SWSI 2 Shapefile****Data Source**

SWSI 2 Shapefile	Data Source
Humpback Chub Streams	CDOW
Colorado Pikeminnow Streams	CDOW
Razorback Sucker Streams	CDOW
Federal Critical Habitat	USFWS http://criticalhabitat.fws.gov/
Boreal Toad Known Breeding Sites	CDOW
Colorado River Cutthroat Trout Streams	CDOW
Colorado River Cutthroat Trout Lakes	CDOW
Roundtail Chub Streams	CDOW
Bluehead Sucker Streams	CDOW
Bluehead Sucker Lakes	CDOW
Flannelmouth Sucker Streams	CDOW
Flannelmouth Sucker Lakes	CDOW
Rare Riparian/Wetland-Dependent Plants	CNHP
Significant Riparian/Wetland Plant Communities	CNHP
Instream Flow Streams	CWCB
Natural Lake Level Lakes	CWCB
Gold Medal Streams	CDOW
Recreational In-Channel Diversion Structures	CWCB
Audubon Important Bird Areas	National Audubon Society

Additional Data Layers**Data Source**

Additional Data Layers	Data Source
River Otter (Confirmed Sightings)	CDOW (River Otter database)
Bald Eagle Active Nestsites	CDOW (NDIS)
Bald Eagle Communal Roost	CDOW (NDIS)
Northern Leopard Frog	CDOW (herp database)
Flatwater Motorized and Non-motorized Boating	CO State Parks Boatable Waters List http://parks.state.co.us/Boating/BoatableWaters/
Kayaking Reaches	digitized from list provided by NCNA Committee Sources are listed as: Whitewater of the Southern Rockies, Southwest Paddler
Rafting Reaches	digitized from list provided by NCNA Committee
Colorado Outstanding Waters (Wilderness Area Waters)	digitized from WQCD list http://www.blm.gov/nstc/WaterLaws/pdf/Colorado2.pdf
Eligible/Suitable Wild and Scenic	National Wild and Scenic Rivers Act http://thomas.loc.gov/cgi-bin/query/z?c101:H.R.5476.IH:
GMUG Wilderness Roubideau Special Area	polygon shapefile provided by GMUG/NCNA Committee Members
GMUG Wilderness Waters (Dominguez Wilderness)	polygon shapefile provided by GMUG/NCNA Committee Members
High Recreation Areas	digitized from list of stream/river reaches and lakes/reservoirs sighted as "high recreation areas" by NCNA Committee Members
Riparian/Wetland Wildlife Viewing	Digitized from list provided by David Graf (CDOW)
Waterfowl Hunting	CDOW SWA parcels with waterfowl hunting
Rocky Mountain Biological Laboratory (scientific and educational reaches)	waters within RMBL property boundary
Significant cold and warm-water fishing	digitized from list provided by NCNA Committee Colorado Fishing Network

GUNNISON BASIN NON-CONSUMPTIVE NEEDS ASSESSMENT - IDENTIFICATION OF MAJOR STREAM AND LAKE SEGMENTS

	STREAM OR LAKE SEGMENT (Based upon segment maps)	ATTRIBUTE CATEGORY	1. Federally Listed Fish Species (critical habitat and distribution)	2. Aquatic-Dependent State Endangered, Threatened, and Species of Concern (including conservation agreement species)	3. Rare Aquatic-Dependent Plants and Significant Riparian/Wetland Plant Communities	4. Special Value Waters (CWCB instream flow waters, WQCD Outstanding Waters, Wilderness Area Waters, Eligible/Suitable Wild and Scenic)	5. Whitewater and Flat-water Boating	6. Riparian/Wetland Wildlife Viewing and Waterfowl Hunting	7. Significant Cold and Warm- Water Fishing	8. High Recreation Areas	Total Number of Attributes	No. of Environmental Attributes	No. of Recreation Attributes	RATIONALE FOR CONSIDERATION AS A MAJOR SEGMENT
No.	Major Environmental & Recreational Segments													
1	Blue Mesa, Morrow Point, Crystal Reservoirs and Gunnison River in Cureanti National Recreation Area			c,d	b		d	a	b,c	b	8	3	5	Highest Flat-water Recreation Use, High Water Quality, Environmental, Scientific, and Educational Values
2	Gunnison River in Black Canyon of the Gunnison National Park			c,d,f,g	b	b,c	a	a	a	a	11	7	4	National Park - Multiple Environmental, Recreational, Scientific and Educational Values
3	Gunnison River in Gunnison Gorge National Conservation Area down to Confluence with North Fork of the Gunnison River			c,d,f,g		b,c	b		a	a	9	6	3	Gold Medal Stream, Multiple Recreational and Environmental Values
	Major Environmental Segments													
4	Gunnison River - Hartland Diversion to Confluence Colorado River ¹		a,b	b,c,d,g	b		b	a			9	7	2	Critical Habitat for Federal Endangered Species, Multiple State Aquatic Species of Concern plus Recreation
5	Gunnison River - Confluence with North Fork Gunnison River to Hartland Diversion ¹			b,c,d,g			b		a,b		6	4	2	Multiple State Aquatic Species of Concern, Opportunities for Recreation Use
6	North Fork of the Gunnison River - Paonia Dam to Confluence with Gunnison River ¹			b,c,d,f,g	a,b	b	b	a	b		11	8	3	Multiple State Aquatic Species of Concern, Opportunities for Recreation Use
7	Stream Segments on Headwaters Wilderness			a,e	a,b	a,b,d,e			b		9	8	1	Multiple Environmental Values plus Recreation

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	STREAM OR LAKE SEGMENT (Based upon segment maps)	ATTRIBUTE CATEGORY	1. Federally Listed Fish Species (critical habitat and distribution)	2. Aquatic-Dependent State Endangered, Threatened, and Species of Concern (including conservation agreement species)	3. Rare Aquatic-Dependent Plants and Significant Riparian/Wetland Plant Communities	4. Special Value Waters (CWCB instream flow waters, WQCD Outstanding Waters, Wilderness Area Waters, Eligible/Suitable Wild and Scenic)	5. Whitewater and Flat-water Boating	6. Riparian/Wetland Wildlife Viewing and Waterfowl Hunting	7. Significant Cold and Warm- Water Fishing	8. High Recreation Areas	Total Number of Attributes	No. of Environmental Attributes	No. of Recreation Attributes	RATIONALE FOR CONSIDERATION AS A MAJOR SEGMENT
8	Coal Creek, Slate River and Tributaries ¹				a,b	b	a		b	5	3	2	Opportunities for Environmental Remediation	
9	East River - Gothic to Almont			g,h	b	b	b	a	b,d	8	4	4	Multiple Environmental Values	
10	Henson Creek and Tributaries ¹			c	b	a,b	a			5	4	1	Opportunities for Environmental Remediation	
11	Uncompahgre River and Tributaries - Headwaters to Ouray ¹				b	b		a	b	4	2	2	Opportunities for Environmental Remediation	
12	Uncompahgre River - Ouray to South Canal Outfall and West Canal Flume ¹			d,h	a,b	b	b	a,b	b	11	5	4	Opportunities for Environmental Remediation, Recreation Opportunities	

	Major Recreational Segments													
13	Grand Mesa Lakes on National Forest				a	a	d		c	b	5	2	3	Highest Recreation and Fishery Use
14	Tributaries to Taylor Park Reservoir			a	b,a	a,b			b	a	7	5	2	Highest Recreation and Fishery Use, Significant Environmental Values
15	Taylor Park Reservoir						d	a	c	b	4	0	4	Highest Recreation and Fishery Use
16	Taylor River - Taylor Park Reservoir to Almont			h		b	b		b	a	5	2	3	Highest Recreation and Fishery Use
17	Gunnison River - Almont to Blue Mesa Reservoir			c,d			b,c		b	a	6	2	4	Highest Recreation and Fishery Use
18	Lake San Cristobal				b	a	d		c	b	5	2	3	Highest Recreation and Fishery Use
19	Lake Fork of the Gunnison River - Lake San Cristobal to Blue Mesa Reservoir			c,d	b	b	b	a	b		7	4	3	Fishery Needs (Augmentation of Stream Flows Needed)
20	Ridgway Reservoir			d,f			d	a	c	b	6	2	4	Highest Recreation and Fishery Use
	Major Scientific and Educational Segments													

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21	Upper East River and Tributaries - Headwaters to Gothic			a,e	b	a,b		a			6	5	1	Scientific and Educational Use, Environmental Values
	<u>Other Segments with Four or More Attributes (Not to Be Included on Major Segments Map)</u>													
	Kannah Creek ¹			a,c,d	a						4	4	0	
	Crawford Reservoir and watershed			c,d		b	d	a	c		6	3	3	
	Muddy Creek Headwaters above North Fork of Gunnison River			a,f	b	b					4	4	0	
	Coal & Anthracite Creeks			a,d,f	b	b	a		b		7	5	2	
	Brush Creek Headwaters			a,e	b	b					4	4	0	
	Cement Creek				a,b	b	a				4	3	1	
	Tributaries to Taylor River below Taylor Park Reservoir			a	a,b	a,b					5	5	0	
	Upper Cochetopa Basin			a	b	b		a	b		5	3	2	
	Cebolla Creek				a,b	b	a		b		5	3	2	
	Tributaries to Lake San Cristobal			a	a,b	a,b	a				6	5	1	
	Soap and Curecanti Creeks			a	b	b	a		b		5	3	2	
	Cimarron River Basin			a	b	a,b	a		b,c		6	3	3	
	Uncompahgre River - Montrose to Confluence Gunnison River ¹			b,c,d,f,g	b		b	a			8	6	2	
	Cow Creek (E of Ridgway)			a	a,b	b		b			4	4	0	
	Dry Creek (S of Delta)			a,c,h	b	b					5	5	0	
	Roubideau Creek				b	b,f		a			4	3	1	

GUNNISON BASIN NON-CONSUMPTIVE NEEDS ASSESSMENT - IDENTIFICATION OF MAJOR STREAM AND LAKE SEGMENTS

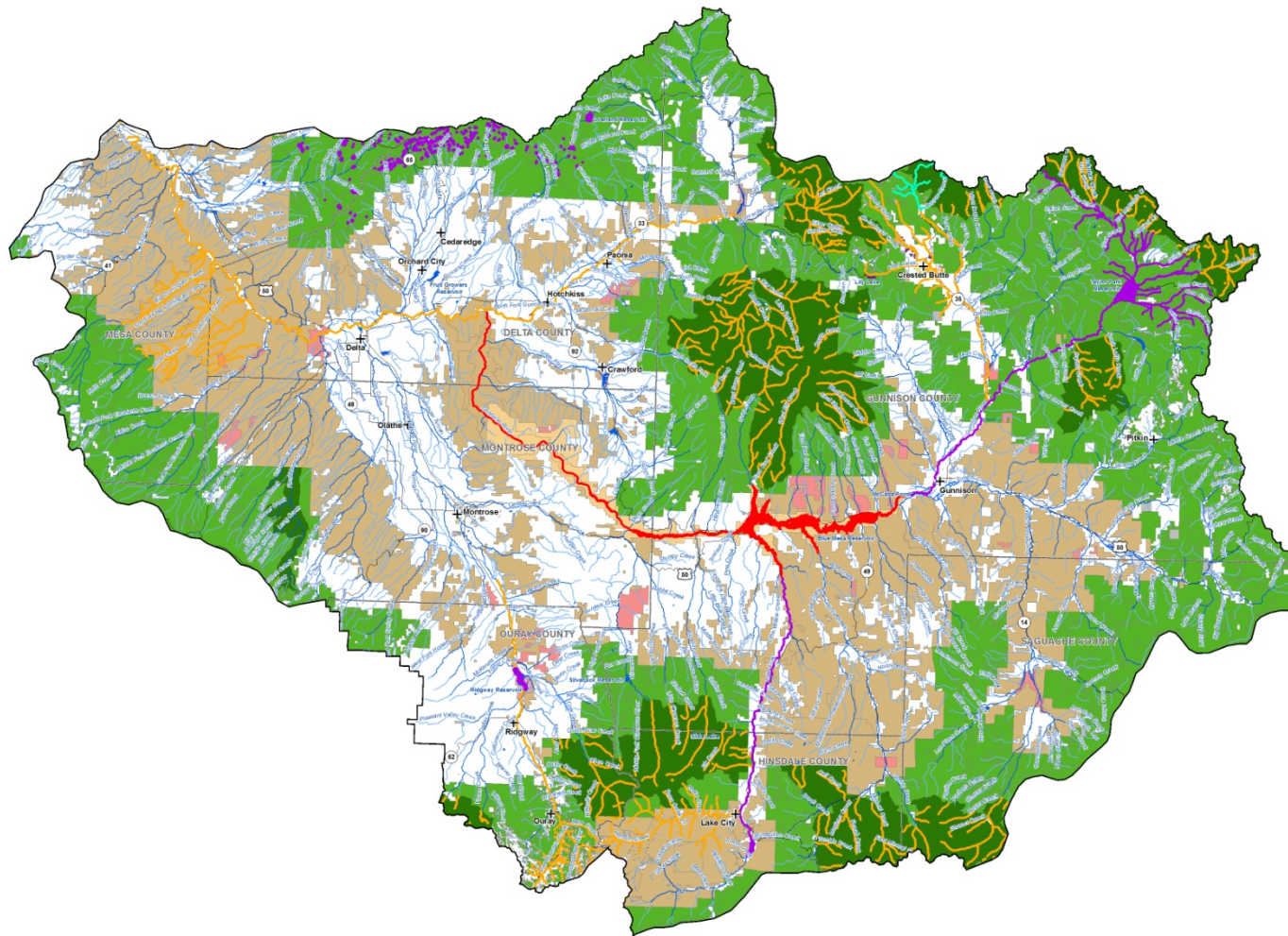
STREAM OR LAKE SEGMENT (Based upon segment maps)	ATTRIBUTE CATEGORY	1. Federally Listed Fish Species (critical habitat and distribution)	2. Aquatic-Dependent State Endangered, Threatened, and Species of Concern (including conservation agreement species)	3. Rare Aquatic-Dependent Plants and Significant Riparian/Wetland Plant Communities	4. Special Value Waters (CWCB instream flow waters, WQCD Outstanding Waters, Wilderness Area Waters, Eligible/Suitable Wild and Scenic)	5. Whitewater and Flat-water Boating	6. Riparian/Wetland Wildlife Viewing and Waterfowl Hunting	7. Significant Cold and Warm- Water Fishing	8. High Recreation Areas	Total Number of Attributes	No. of Environmental Attributes	No. of Recreation Attributes	RATIONALE FOR CONSIDERATION AS A MAJOR SEGMENT
Escalante Creek	a	C,d,f,g	a,b	b	a	a			7	5	2		
Dominguez Creek	a	C,d,f	a,b	b					4	4	0		
<u>Other Segments (Not to Be Included on Major Segments Map)</u>													
Surface and Leroux Creeks		f,g		b					3	3	0		
Fruitgrowers Reservoir ¹						a			1	0	1		
Terror Creek Headwaters		a	b	b					3	3	0		
Bell Creek (SW of Paonia)		f							1	1	0		
Smith Fork				b					1	1	0		
Paonia Reservoir						d	c		2	0	2		
Tomichi Creek Tributaries			b	a,b					3	3	0		
West Antelope Creek		a	b	b					3	3	0		
South Beaver Creek Headwaters		a		b					2	2	0		
Beaver Cr. (W of Gunnison)		a	b	b					3	3	0		
Red, East Elk, Willow, and Steuben Creeks			b	b					2	2	0		
Mill Creek (Curecanti Cr)		a							1	1	0		
Road Beaver Creek		a		b					2	2	0		
Big Blue Creek			b	b			b		3	2	1		
Spring Creek (W of Montrose)		a,c		b					3	3	0		
Switzer Lake ¹						d	a	c	3	0	3		
Buttermilk Creek (SW of Delta)		c,f							2	2	0		
Cottonwood Creek (SW of Delta)		a	b				a		3	2	1		
East Creek (S of Grand Jct)		f		b					2	2	0		
<u>KEY TO ATTRIBUTE CODES</u>													

GUNNISON BASIN NON-CONSUMPTIVE NEEDS ASSESSMENT - IDENTIFICATION OF MAJOR STREAM AND LAKE SEGMENTS

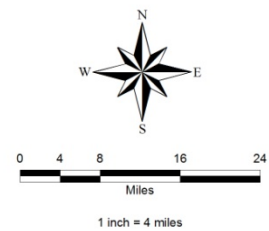
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Attribute 1 - Federally Listed Fish Species (critical habitat and distribution)													
a. Razorback Sucker, Humpback Chub, Colorado Pikeminnow													
b. Federal Critical Habitat													
Attribute 2 - Aquatic-Dependent State Endangered, Threatened, and Species of Concern (including conservation agreement species)													
a. Colorado River Cutthroat Trout													
b. Roundtail Chub													
c. Flannelmouth Sucker													
d. Bluehead Sucker													
e. Boreal Toad													
f. Northern Leopard Frog													
g. River Otter Sightings													
h. Bald Eagle Sites													
Attribute 3 - Rare Aquatic-Dependent Plants and Significant Riparian/Wetland Plant Communities													
a. Rare Aquatic-Dependent Plants													
b. Significant Riparian/Wetland Plant Communities													
Attribute 4 - Special Value Waters (CWCB instream flow waters, WQCD Outstanding Waters, Wilderness Area Waters, Eligible/Suitable Wild and Scenic)													
a. CWCB Natural Lake Levels													
b. CWCB Instream Flows													
c. Eligible Wild and Scenic													
d. WQCD Outstanding Waters													
e. GMUG Wilderness Area Waters													
f. Camelback/Roubideau Wilderness Study Area Waters													
Attribute 5 - Whitewater and Flat-water Boating													
a. Kayaking													
b. Rafting (and Kayaking)													
c. Recreational In-Channel Diversions													
d. Flat-water Boating													
Attribute 6 - Riparian/Wetland Wildlife Viewing and Waterfowl Hunting													
a. Wildlife Viewing and Waterfowl Hunting													
b. Audubon Important Bird Areas													
Attribute 7 - Significant Cold and Warm-Water Fishing													
a. Gold Medal Streams													

GUNNISON BASIN NON-CONSUMPTIVE NEEDS ASSESSMENT - IDENTIFICATION OF MAJOR STREAM AND LAKE SEGMENTS

STREAM OR LAKE SEGMENT (Based upon segment maps)	ATTRIBUTE CATEGORY	1. Federally Listed Fish Species (critical habitat and distribution)	2. Aquatic-Dependent State Endangered, Threatened, and Species of Concern (including conservation agreement species)	3. Rare Aquatic-Dependent Plants and Significant Riparian/Wetland Plant Communities	4. Special Value Waters (CWCB instream flow waters, WQCD Outstanding Waters, Wilderness Area Waters, Eligible/Suitable Wild and Scenic)	5. Whitewater and Flat-water Boating	6. Riparian/Wetland Wildlife Viewing and Waterfowl Hunting	7. Significant Cold and Warm- Water Fishing	8. High Recreation Areas	Total Number of Attributes	No. of Environmental Attributes	No. of Recreation Attributes	RATIONALE FOR CONSIDERATION AS A MAJOR SEGMENT
b. River and Stream Fishing													
c. Reservoir and Lake Fishing													
d. Fish Hatchery													
Attribute 8 - High Recreation Areas													
a. High Recreation Rivers													
b. High Recreation Lakes and Reservoirs													
Notes:													
1. All or portion of segment is listed on State 303(d) list of water quality impaired segments													
2. Non-consumptive environmental and/or recreational attributes exist on virtually all stream and lake segments, whether such attributes are identified herein or not.													
Exclusion of a segment from this chart does not indicate absence of non-consumptive attributes.													
3. Attributes associated with the major segments are commonly dependent on conditions in upstream tributary segments.													
Therefore, the achievement or maintenance of non-consumptive attributes depends upon achieving or maintaining													
necessary values in upstream segments as well as within the major segment itself.													



- Legend**
- Major Environmental, Recreational and Scientific/Educational Segments**
- Environmental and Recreational Segments
 - Recreational Segments
 - Scientific and Educational Segments
 - Environmental Segments
- Other Features**
- Roads
 - Rivers and Streams
 - Lakes and Reservoirs
 - + Cities and Towns
 - County Boundary
 - Wilderness Areas
- Land Management**
- BLM
 - BOR
 - CDOW
 - CITY
 - COUNTY
 - FWS
 - LAND TRUST
 - NPS
 - PRIVATE
 - SCHOOL DISTRICT
 - SLB
 - STATE
 - STPARKS
 - USFS



**Figure 3-7
Gunnison Basin
Nonconsumptive Needs Assessment
Major Stream and Lake Segments**

DRAFT

Refer to Appendix B of the NCNA Mapping Report for a complete list of data sources and Appendix D of the Mapping Report for other basin-specific mapping information.

