CHAPTER 13: GREAT SALT LAKE AND WEST DESERT WATERSHED MANAGEMENT UNIT ASSESSMENT

13.1 INTRODUCTION

The Great Salt Lake and West Desert Watershed Management Unit (WMU) includes all streams located in the USGS Hydrological Units (HUCs) listed in Table 13-1. This management unit stretches from the north western portion of the state south to almost Cedar/Beaver Management Unit. There are many small streams within this WMU, which include: Deep Creek, Trout Creek, Grouse Creek, Pine Creek, Pole Creek, and South Junction Creek. These streams flow from the various mountain ranges into the West Desert and disappear. Some of them are diverted at the canyon mouths to be used for irrigation. Those streams in the Hydrologic Unit 17040210 flow north into the Snake River. Figure 13-1 shows the beneficial use classes for this WMU.

13.2 STREAM ASSESSMENT RESULTS

The west desert portion of this unit is remote, with rugged mountain ranges, and desert. As a result, assessments for these watersheds are limited to biological assessments until water quality problems are observed. To date, biological data has been collected for three streams in this unit: Trout Creek, Thomas Creek and Pole Creek. The biological data for Trout and Thomas Creeks is fully supporting. The biological data for Pole Creek was inconclusive, so the stream was listed as Category 3A (insufficient data and information). The remaining streams in this unit are not assessed. Beneficial use classifications for waters in this management unit are shown in Figure 13-1.

13.3 LAKE ASSESSMENT RESULTS

Water quality assessment for lakes includes determination of Carlson's trophic state index (TSI), water chemistry, phytoplankton species dominance, reported fish kills, and water quality trends.

Table 13-3 shows TSIs based on each sample collected from May through September by sample date. Table 13-4 contains a summary of lake trophic status by study periods. Note that some of the change in TSIs between assessment periods is due to the variability in the lakes and some is due to switching methodologies between 2008 and 2010. The reported TSI for 2010 is based on Chl-a, whereas prior reporting cycles averaged the TSI based on secchi disk depth (TSI-SD), Chl-a (TSI-Chla), and total phosphorus (TSI-TP). Table 13-4 includes the TSIs using both the 2008 and 2010 method using the 2010 data.

TSI values for some lakes and reservoirs differed between the 2008 and 2010 methods. Small differences are defined as a difference in TSIs of 6-10, medium differences 11-20, and large differences as greater than 20. Small differences were observed for Grantsville Reservoir. These small differences suggest little difference in trophic state between the new and older methods for Grantsville Reservoir.

For the purpose of assessing trends, the TSI's from the most recent five assessment periods were considered. Consistent trends that resulted in a net TSI change of five or changes greater than 10 between 2008 and 2010, which are not attributable to the change in TSI methodology alone, are identified. No trends were observed.

Development of assessment methods for Great Salt Lake is currently incomplete. More information on progress with developing assessment methods for the Great Salt Lake ecosystem can be found in Chapter 14.

TABLES

Table 13-1 USGS Hydrological Units in the West Desert Watershed Management Unit

USGS Hydrological Units in the West Desert Watershed Management Unit	
Hydrological Unit Code	**Hydrological Unit Name**
17040210	Raft
17040211	Goose
16020301	Hamlin-Snake Valleys
16020302	Pine Valley
16020303	Tule Valley
16020304	Rush-Tooele Valleys
16020305	Skull Valley
16020306	Southern Great Salt Lake Desert
16020307	Pilot - Thousand Springs
16020308	Northern Great Salt Lake Desert
16020309	Curlew Valley
16020310	Great Salt Lake

Table 13-2 Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes

Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes																	
					Parameters Not Supporting 2010							Assessment Cycle				
Assessment Unit ID	Name	Assessment Category 2008	Assessment Category 2010	Parameters Not Supporting 2008	DO	pH	T	Other	Total P > 0.025 mg/L or TSI>50	Winter DO/Fish Kills	Cyano Bacteria Present	2002	2004	2006	2008	2010
UT-L-16020304-005	Grantsville Reservoir	2	2		FS	FS	FS		No		Y	FS	FS	FS	FS	FS
UT-L-16020304-002	Rush Lake	2	2	FS							N	FS	FS	FS	FS	
UT-L-16020304-004	Settlement Canyon Res	2	2	FS							N	FS	FS	FS	FS	
UT-L-16020304-003	Stansbury Lake	3B	3B	DO							N	FS	FS	FS		

Summary of Assessment Results for Great Salt Lake and West Desert Watershed Management Unit Lakes																	
					Parameters Not Supporting 2010							Assessment Cycle				
Assessment Unit ID	Name	Assessment Category 2008	Assessment Category 2010	Parameters Not Supporting 2008	DO	pH	T	Other	Total P > 0.025 mg/L or TSI>50	Winter DO/Fish Kills	Cyano Bacteria Present	2002	2004	2006	2008	2010

Notes:

FS Fully Supporting

NS Not Supporting

Y Yes

N No

DO Dissolved Oxygen

FK Fish Kill

T Temperature

Total P Total Phosphorus

NA Not Analyzed

TDS Total Dissolved Solids

Table 13-3 Individual Lake and Reservoir 2010 Trophic State Index (TSI)

Individual Lake and Reservoir 2010 Trophic State Index (TSI)						
Watershed Management Unit	**Assessment Unit**	**Name**	**Date**	**TSI-SD**	**TSI-Chla**	**TSI-TP**
GSL and West Desert	UT-L-16020304-005	Grantsville Reservoir	9/4/2007	62	41	37

Notes:

TSI-SD = Trophic State Index from secchi disk

TSI-Chla = Trophic State Index from chlorophyll-a

TSI-TP = Trophic State Index from total phosphorus

Table 13-4 Summary of Individual Lake and Reservoir Trophic State Index (TSI)

Summary of Individual Lake and Reservoir Trophic State Index (TSI)														
Watershed Management Unit	Assessment Unit	Lake / Reservoir	Assessment Cycle Trophic State Index										Trophic State	
			1992	1994	1996	1998	2000	2002	2004	2008	2010 Old Method	2010 Current Method	2010 Old Method	2010 Current Method
GSL Desert / Columbia	UT-L-16020304-005	Grantsville Reservoir	44	49	46	41	50	45	41	43	47	41	M	M

Notes:

2010 Old Method TSI calculated using the 2008 Integrated Report Methodology

2010 Current Method TSI calculated using the 2010 Integrated Report Methodology of only chlorophyll-a

O = Oligotrophic

M = Mesotrophic

E = Eutrophic

H = Hypereutrophic

Figures

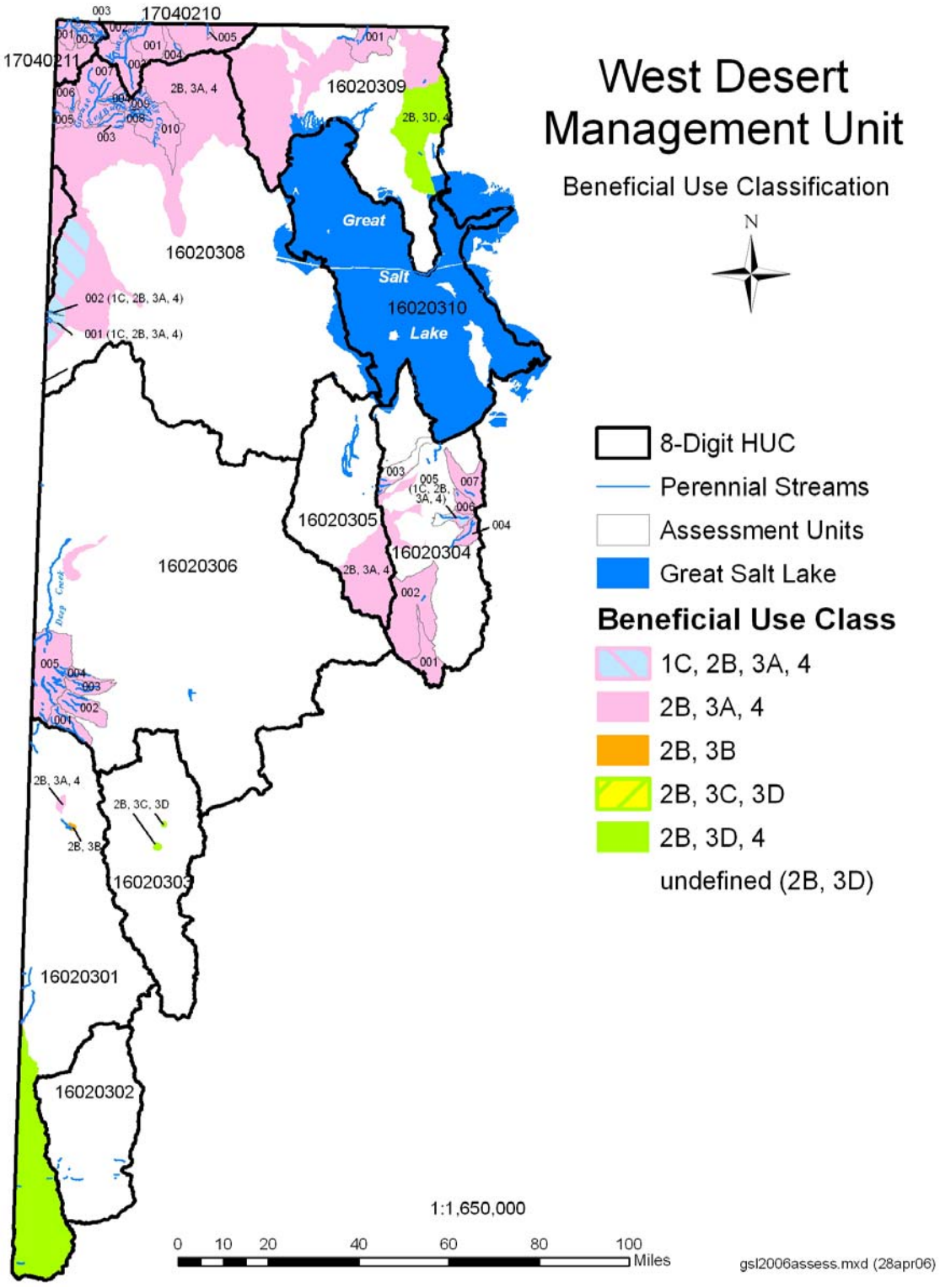

Figure 13-1 Beneficial Use Classes for Great Salt Lake/West Desert Watershed Management Unit