

(DRAFT) Lower Boise Watershed Phosphorus TMDL Addendum Strategy Paper

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Introduction

The Lower Boise River (LBR) is known as the stretch of river that flows from Lucky Peak Dam to the Snake River. This 64 mile stretch of river flows through Ada and Canyon Counties and through the Cities of Boise, Eagle, Star, Middleton, Caldwell, Notus, and Parma. The watershed drains 1290 square miles of range and forest lands, agricultural land, and urbanized land areas. Tributaries include Fifteenmile Creek, Willow Creek, Mason Creek/Drain, Hartley Gulch, Indian Creek, Conway Gulch, and Dixie Slough.

Section 303(d) of the Federal Clean Water Act requires states to develop a Total Maximum Daily Load (TMDL) allocation plan for water bodies determined to be water quality limited. A TMDL allocation plan documents the amount of a pollutant water body can assimilate without exceeding a state's water quality standards, and allocates that amount as loads to point and nonpoint sources. TMDLs are defined in 40 CFR Part 130 as the sum of the individual Waste Load Allocations (WLA) for point sources and Load Allocations (LA) for nonpoint sources, including a margin of safety and natural background conditions.

The LBR from just below the Middleton Road Bridge in Middleton to its confluence with the Snake, Mason Creek/Drain a tributary to the LBR, and two segments of Sand Hollow Creek are listed as impaired for Total Phosphorus (TP) in Category 5 of the 2010 Integrated Report (IR) (Table 1). Water bodies that are in Category 5 of the IR do not meet applicable water quality standards for one or more beneficial uses due to one or more pollutants. In the case of the LBR, Mason Creek/Drain and Sand Hollow Creek the beneficial uses are aquatic life and primary/secondary contact recreation and the pollutant is Total Phosphorus; therefore, the Boise Regional Office (BRO) of the Idaho Department of Environmental Quality in cooperation with the Lower Boise Watershed Advisory Council (LBWC) need to develop an Environmental Protection Agency (EPA)-approved TMDL.

Total Phosphorus Target Development

A TP TMDL will be developed using a synoptic flow and phosphorus mass balance spreadsheet model that will be developed for the LBR from Veterans Bridge in Boise to the Snake by BRO in coordination with the United States Geologic Survey (USGS), LBWC, and EPA (Figure 1). Model inputs for total and dissolved phosphorus, periphyton, nitrogen, and flows will consist of both existing data and data gathered by a new USGS study that will be completed over the next two years. New monitoring data to be gathered by USGS will be from a synoptic study of the LBR completed during three seasons: during irrigation season, post irrigation season (October/November), and winter. The study will provide insight into nutrient cycling with comparison of total dissolved phosphorus (TDP) to orthophosphorus (OP) results. Similarly, comparison of total phosphorus (TP) with TDP and suspended sediment concentrations will allow USGS to identify sources of particulate phosphorus. Total dissolved phosphorus has not been extensively analyzed in samples from the Boise River basin and may be a differentiating factor between sources of organic phosphorus and orthophosphorus from groundwater or wastewater treatment plants. The study will also determine seasonal total-phosphorus to dissolved-phosphorus ratios in relation to suspended sediment concentrations

within the sampling reach. The USGS study will also potentially provide a glimpse at the impact of Best Management Practices (BMP) implementation, point source allocations in NPDES permits (per SR-HC .07 mg/L target), and other phosphorus reducing measures as a result of the LBWC implementation efforts (for example 319 projects). The USGS study will provide new data that will be used to update the current Lower Boise River Nutrient Subbasin Assessment.

Nutrient pollutant targets will be established watershed wide at a level that will prevent nuisance algae growth within the Lower Boise River Assessment Units (AUs) that are listed in Category 5 of the 2010 Integrated Report (Figure 2); as well as meeting the source reductions and targets at Parma identified in the SR-HC TMDL. Targets in the TMDL will be used to establish wasteload allocations for point sources in the watershed and load allocations for non-point sources. Natural background conditions will also be considered along with a margin of safety. Once the TMDL is approved by EPA the 2008 Lower Boise River Implementation Plan for TP will be updated to reflect the TP TMDL allocations. Pollutant trading will be authorized in the TMDL and updated Implementation Plan. The existing Lower Boise Pollutant Trading Framework will subsequently be updated to reflect new information and establish updated trading ratios so that EPA can include trading in future NPDES permits in the watershed.

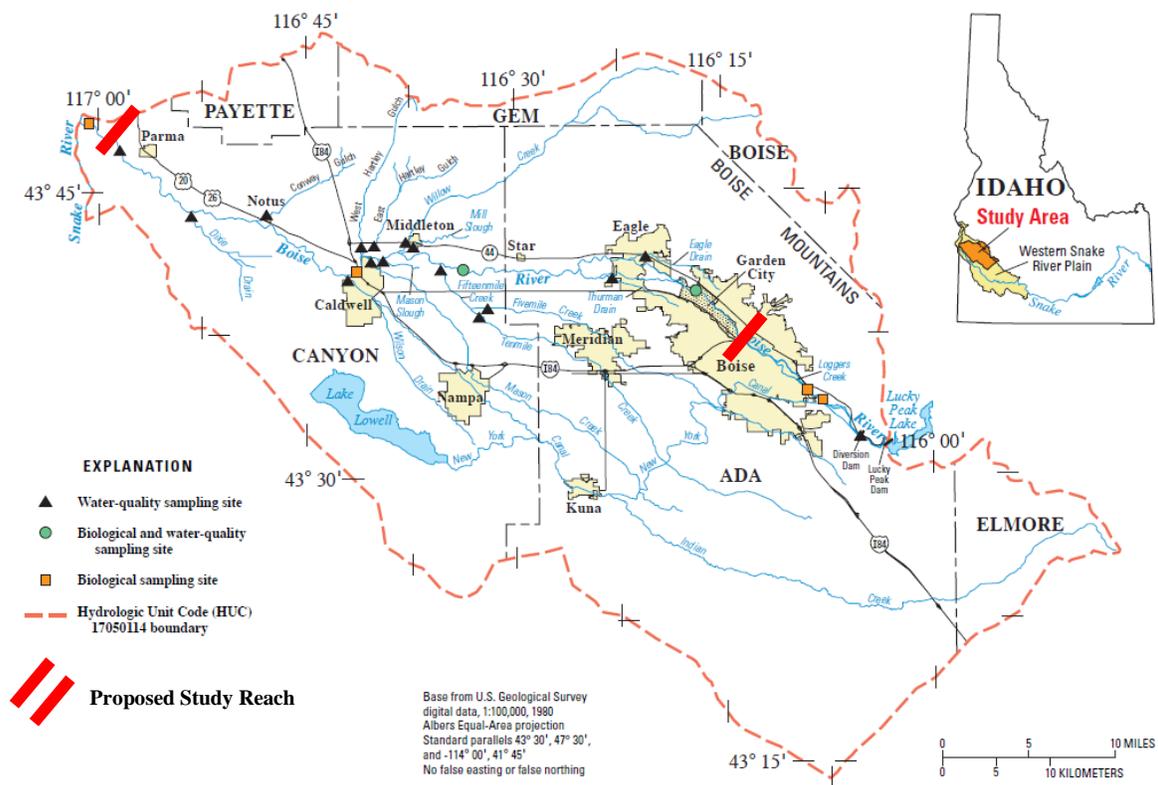


Figure 1: USGS study reach of the Lower Boise River

Table 1. Phosphorus TMDL Assessment Units in Category 5 of 2010 Integrated Report.

Assessment Unit	Beneficial Use	Impairment
Boise River- Middleton to Indian Creek ID17050114SW005_06b	CWAL	Total Phosphorus
Boise River- Indian Creek to Mouth ID17050114SW001_06	CWAL	Total Phosphorus
Mason Creek-Entire Watershed ID17050114SW006_02	CWAL	Nutrients suspected impairment
Sand Hollow Creek-C-Line Canal to I-84 and Sharp Road -Snake River ID17050114SW016_03 ID17050114SW017_06	CWAL CWAL	Nutrients suspected impairment Nutrients suspected impairment(Assessment Data Base)

Flow Balance

The LBR from the Diversion Dam to the mouth is listed in Category 4c (Waters Impaired by Pollution) of the 2010 Integrated Report (IR) for low flow alterations. The following is a passage from the comment section in 4c of the IR that best explains why a TMDL is not developed for flow alteration: "... habitat modification and flow alteration, which may adversely affect beneficial uses, are not pollutants under Section 303(d) of the Clean Water Act. There are no water quality standards for habitat or flow, nor are they suitable for estimation of load capacity or load allocations". The flow mass balance for the LBR will be developed by comparing historic flow data with new measurements from the USGS study and by working closely with the Boise Project and all of the irrigation districts in the LBR watershed.

During the summer months the impaired reach of the LBR from Middleton to mouth is severely impacted due to an unnatural flows as a result of irrigation water that is diverted upstream that returns to the impaired reach of the LBR after being used and reused on farms and in pressurized subdivisions where it picks up nutrients, sediment, bacteria, and heat. The flow of the LBR from the bottom of Lucky Peak Reservoir to its confluence with the Snake is incredibly dynamic during irrigation season (April-October) and otherwise highly regulated year round for the purpose of meeting irrigation needs, flood control, and other uses. There are more than 32 diversions and 15 returns to the LBR. Additionally, there is a transfer of irrigation water from the Payette River at Black Canyon Dam into the Black Canyon Irrigation District C-Line Canal that irrigates over 25,000 acres of farmland that drains into the LBR below Middleton. This transfer of water provides for a significant portion of the base flow of LBR in the two listed AUs and in Sand Hollow Creek. The Payette River water is traded out with irrigation water diverted into the New York Canal and Lake Lowell that doesn't make its way back into the LBR and instead drains directly to the Snake River. The Payette water transfer will be monitored and factored into the TMDL model.

LBWC Facilitation

BRO attends the monthly LBWC meetings to coordinate activities associated with the Lower Boise River TMDL. The LBWC has established a Technical Advisory Committee (TAC) for the development of the TP TMDL that will meet on a regular basis to provide technical review and advisement to BRO.

EPA Coordination

BRO will actively coordinate with the EPA throughout the TMDL development process. Because of the differences in EPA and DEQ interpretation of Idaho WQS it is imperative to have EPAs buy-in into the Phosphorus TMDL development strategy very early on in the process. EPA has agreed to provide modeling support through the Region 10 and additional assistance from the Region 10 Boise Office.

Monitoring/Assessment

Monitoring will be conducted by the USGS over the next two years. The USGS will complete three synoptic sampling events on the LBR. They will collect samples with measured discharge and water elevation at up to 40 sites in August 2012, October 2012, and March 2013. Samples will be analyzed for TP, total dissolved phosphorus, dissolved orthophosphorus, periphyton, total nitrogen, and suspended sediment concentration. The timing of each synoptic sampling event will be coordinated with sampling efforts at municipal wastewater treatment plants to the extent possible. USGS will ship a duplicate sample from each participating wastewater treatment facility to the NWQL to obtain comparable analytical results. USGS will also work with BRO and other stakeholders to coordinate additional sampling from other known point sources throughout the study reach during each synoptic sampling event.

Phosphorus TMDL Timeline

May 2012: Draft of Strategy Paper for the TP TMDL
June 2012: Lower Boise LBWC/TAC review of Draft Strategy Paper and share with EPA
June-August 2012: USGS begins data mining and identification of sampling sites
August 2012- USGS begins first of three synoptic sampling events
October 2012: USGS conducts second sampling event
March 2013: USGS conducts third sampling event
September 2013: Establish Draft TMDL Target and Allocations share with LBWC and EPA
November 2013: Draft TMDL review by LBWC/TAC and EPA
November 2013: Finalize Draft TMDL with LBWC and EPA
December 2013: Public Comment
January 2014: Respond to Public Comment and TMDL Revision
February 2014: Submit Final TMDL to EPA

Figure 2. Map of Impaired segment of the Boise River for which a TMDL will be developed.

