

## **USGS Monitoring Results for Big Payette Lake, 2007**

*Molly Wood and Doug Ott, USGS Idaho Water Science Center*

The U.S. Geological Survey (USGS) conducted limnological sampling in Big Payette Lake at three stations (Stations 1, 3, and 4 on Figure 1) on four sampling trips between mid-May and late September 2007. Sampling included full-depth water-column profiles of temperature, specific conductance, and dissolved oxygen. Photosynthetically-active radiation (PAR) was measured to determine the depth of the euphotic zone. Water samples were taken in the euphotic zone (depth-weighted composite) and at 1-meter above the lakebed. Each sample was analyzed for total concentrations of nitrogen and phosphorus, and dissolved concentrations of nitrite + nitrate, ammonia, and orthophosphorus. The euphotic-zone sample were analyzed for chlorophyll-*a*. All samples were analyzed at the USGS National Water-Quality Laboratory.

Monitoring results in relation to the four water-quality objectives outlined in the Big Payette Lake Management Plan and Implementation Plan (December 1997) are as follows:

**Objective #1:** Dissolved oxygen concentrations during June through September measured in the southwest basin shall be equal to or greater than a value of 6.0 mg/L between the lake's surface and 200 foot depth.

***Observations in 2007:*** Dissolved oxygen concentrations at this depth range in the southwest basin were below the criterion during the September sampling visit (5.6-5.8 mg/L at 197-200 feet on 9/20/07). Dissolved oxygen concentrations were above the criterion during other sampling visits. Objective not met.

***Previous years:*** Objective has not been met for the past three years (2005-2007).

**Objective #2:** Dissolved oxygen concentrations during June through September measured in the southwest basin shall be equal to or greater than a mean value of 3.0 mg/L below 200 foot depth and above 3.0 feet of the lakebed

***Observations in 2007:*** The mean dissolved oxygen concentration at this depth range in the southwest basin was above the criterion. Objective met.

***Previous years:*** The objective has been met for the past eleven years (1997-2007).

**Objective #3:** Lakewide euphotic zone total phosphorus concentrations from May through September shall not exceed a median value of 6.0 mg/m<sup>3</sup>.

***Observations in 2007:*** The median lakewide total phosphorus concentration in the euphotic zone was at, but did not exceed, the criterion. Objective met. The maximum total phosphorus concentration measured in the euphotic zone (22 mg/m<sup>3</sup>) was at Station 3 (north basin) during the September sampling visit.

*Previous years:* The objective has been met for the past three years (2005-2007).

**Objective #4:** Lakewide euphotic zone chlorophyll-*a* concentrations from May through September shall not exceed a median value of 3.0 mg/m<sup>3</sup>.

*Observations in 2007:* The median lakewide chlorophyll-*a* concentration in the euphotic zone did not exceed the criterion. Objective met. The maximum chlorophyll-*a* concentration measured in the euphotic zone (5 mg/m<sup>3</sup>) was at Station 1 (southwest basin) during the May sampling visit.

*Previous years:* The objective has been met for the past eleven years (1997-2007).

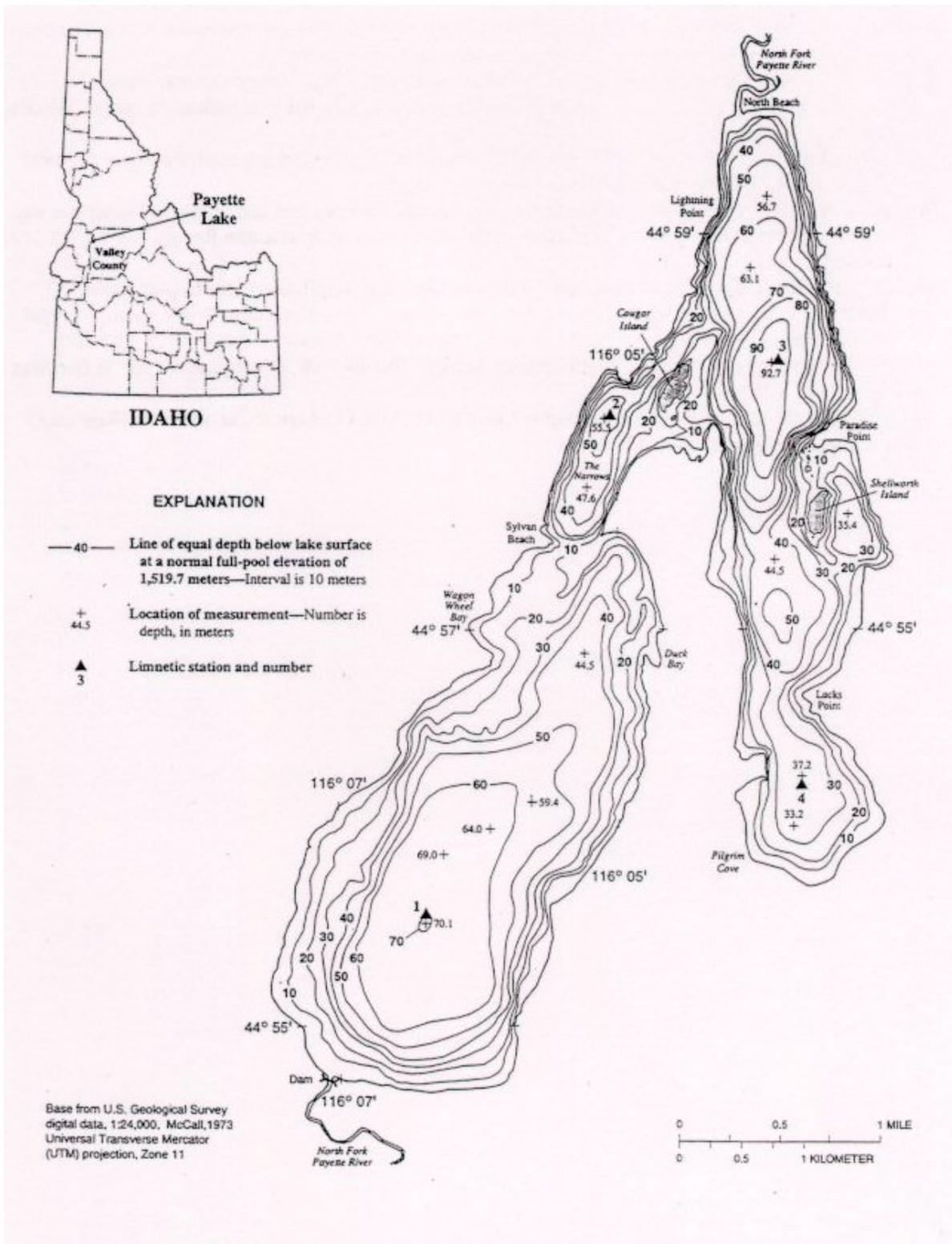


Figure 1. Big Payette Lake study area and sampling locations.