

Water Quality Status Report No. 15

WATER QUALITY SURVEY

Summary Report

CASCADE RESERVOIR

1971 – 1973

WATER QUALITY SURVEY
Summary Report
CASCADE RESERVOIR
1971-1973

Comprehensive limnological studies on Cascade Reservoir were initiated by the Department of Health (now the Department of Environmental and Community Services) in August of 1971. Prior to that time a sanitary survey of the reservoir was made in July of 1961. There were few summer vacation homes around the reservoir in 1961, however, in the past five years most of the land around the reservoir has been subdivided and a large number of homes have been built.

At the present time there are no central facilities to provide domestic water or sewage treatment for the majority of the homes around the reservoir.

Cascade Reservoir is classified as A₁ water except for the 100 feet of water surface adjacent to the shoreline which is class A₂ water. Class A waters are "primary contact recreational waters", which "are further divided into sub-classes A₁ and A₂. Class A₁ is restricted to lakes and impoundments in which exceptionally high water quality exists." "Class A₂ includes the remainder of the primary contact recreational waters." The fecal coliform bacteria density (indicators of fecal contamination) in Class A₁ water shall not exceed "a geometric mean of 10/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 20/100 ml; or greater than 50/100 ml for any single sample." according to DECS Water Quality Standards. In Class A₂ waters fecal coliform concentration shall not exceed "a geometric mean of 50/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 200/100 ml; or greater than 500/100 ml for any single sample."

In August 1971, 22 stations were established near public beaches and docks, private dwellings, in the middle of the reservoir and in the

major tributary arms. On August 3, 1971, July 26, 1972, July 12 and August 7, 1973, water samples for bacteriological analysis were collected at all stations and samples for routine chemical analysis were collected at 10 of these stations. Plankton hauls and limnological observations were also made.

Bacteriological analysis of water samples collected on August 3, 1971 showed a low total coliform bacteria density for all but one station located near the Nampa-McCall branch railroad bridge. A total coliform density of 194/100 ml was found at that station. Fecal coliform densities were not determined at that time.

Fecal coliform density at all stations sampled on July 26, 1972 was less than 2/100 ml, and on July 12 and August 7, 1973, less than 10 fecal coliform bacteria per 100 ml were present at all stations sampled.

Nutrient analysis of Cascade Reservoir water collected from 1971 to 1973 indicate presence of more than sufficient concentrations of all essential nutrients to support excessive algal blooms. Blue-green dominated algal blooms were in progress each time the reservoir was sampled. Secchi disk transparency was greatly reduced on July 9, 1973 by an extensive bloom of the blue-green alga, Aphanizomenon flos-aquae. The bloom diminished somewhat by August 7.

In mid-summer 1971-1973 the thermocline was at the 15-20 foot depth level. Dissolved oxygen exceeded 100% saturation in the epilimnion (above the thermocline) but rapidly diminished below the thermocline. Dissolved oxygen was virtually depleted near the bottom in the deeper areas of the lake.

Hydrogen ion concentration (pH) was quite high (7.7 - 10.2) when the reservoir was sampled on July 9, 1973. The high algal photosynthesis apparently depleted the free carbon dioxide during the day.

These studies indicate that Cascade Reservoir is a mesotrophic (moderate nutrient supply) lake. Every effort should be made to reduce the nutrient flow to the reservoir in order to slow down the eutrophication process. Good sewage treatment practices should be closely followed to prevent excessive bacterial contamination of the reservoir.