

LAKE BRYANT

REPORT DESCRIPTION

This report is an annual update to the 2003 [State of the Lakes Report](#) and includes water quality data collected from 2003 through 2010. For additional background on the information provided here or to find out more about Lake Bryant visit www.lakes.surfacewater.info or call Snohomish County Surface Water Management (SWM) at 425-388-3464.

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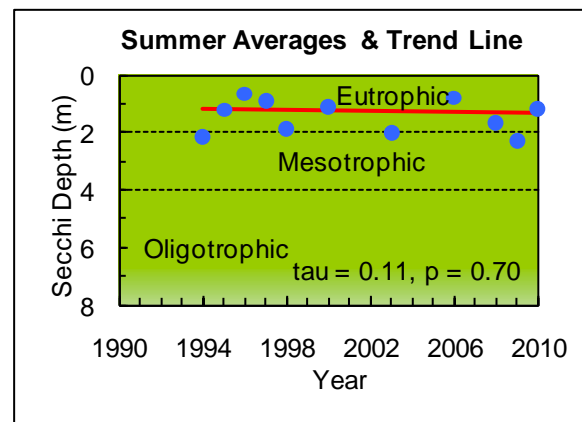
Lake Bryant is a 21-acre lake about three miles northwest of Arlington. Lake Bryant has a maximum depth of 7 meters. The lake is a kettle, an almost circular depression, formed by a large ice block left behind during the last Ice Age. Anecdotal evidence indicates that the lake was mostly drained in the first half of the 20th century to expand the surrounding agricultural lands. The water level has returned to historic depths in recent decades. The lake shoreline is largely undeveloped, but the watershed or area draining to the lake has both agricultural and residential areas. The watershed is large, covering 463 acres, which is about 22 times the size of the lake. This means that there is a greater potential for impacts from the watershed than at a lake with a small watershed.

LAKE CONDITIONS

The following graphs illustrate the summer averages and trend lines (in red) for water clarity, total phosphorus, and chlorophyll *a* for Lake Bryant. Please refer to the table at the end of the report for long-term averages and for averages and ranges for individual years.

Water Clarity

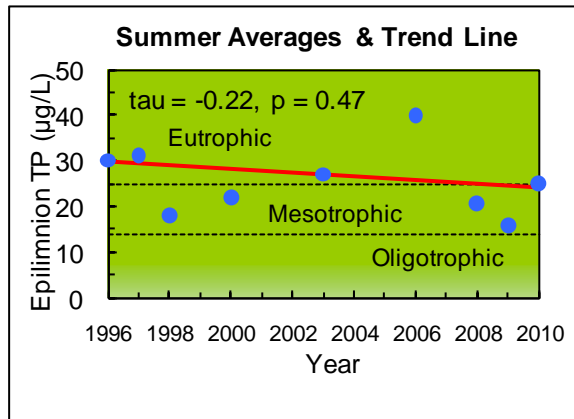
The water clarity in Lake Bryant is low and variable, with a long-term summer average of 1.5 meters. There have been no significant trends in water clarity between 1994 and 2010. The low water clarity is caused, in part, by the lake's dark water color. The dark brown hue is naturally occurring and is caused by dissolved organic or humic material from the surrounding wetlands.



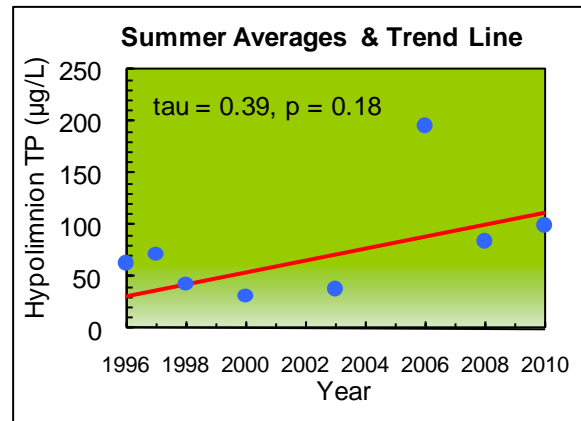
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Total Phosphorus (key nutrient for algae)

Total phosphorus concentrations in the epilimnion (upper waters) are moderately high, with a long-term 1996 – 2010 summer average of 26 µg/l. There has been no statistically significant trend in phosphorus levels between 1996 and 2010. However, there is a high level of annual variability. In part, this may be due to the limited number of samples taken in most individual years. Typically, a summer average consists of four samples, but there have been several years at Lake Bryant with only one or two samples.

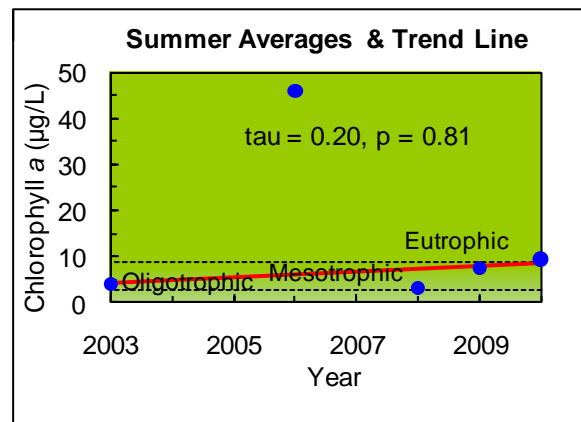


Phosphorus values in the hypolimnion (bottom waters) are also high, with a long-term summer average of 99 µg/l. In 2006 and 2009, the averages were significantly higher at 196 and 262 µg/l, respectively. High levels of phosphorus in the bottom waters are the result of a buildup of phosphorus in the sediments. The phosphorus is then released during periods of low dissolved oxygen and may become available for algal growth. Increasing phosphorus levels could be an indication of accelerating lake eutrophication. However, in spite of the two years of higher concentrations, there is no statistically significant trend toward increasing phosphorus levels at Lake Bryant. More years of monitoring data will help to determine if phosphorus levels are changing.



Chlorophyll a (Algae)

Lake Bryant has a limited chlorophyll a dataset, with only five years of recent sampling. The five-year summer average is 14 µg/l. This long-term average is greatly influenced by one sample taken in 2006 that was 46 µg/l—three times higher than any other individual reading. Likely this sample was taken during a severe algal bloom. Given the lack of long-term monitoring data, it is impossible to determine if there are any trends in chlorophyll a in Lake Bryant. However, moderate to high levels of algae have been measured regularly at Lake Bryant, and occasional algal blooms have been observed.



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SHORELINE CONDITION

The condition of the Lake Bryant shoreline was surveyed in 2009 (see map on page 4). The lake shoreline condition is important in understanding the overall lake health. Frequently, lake shorelines are modified either through removal of natural vegetation and/or the installation of bulkheads or other hardening structures. This type of alteration can be harmful to the lake ecosystem because natural shorelines protect the lake from harmful pollution, prevent bank erosion, and provide important habitat for fish and wildlife.

Lake Bryant has the least developed shoreline in the county. There are no homes directly on the lake, there are no docks, and the shoreline vegetation is 100% intact, although some of the plant community is dominated by non-native species. Intact vegetation means the shoreline is primarily bordered by tall grasses, trees and shrubs. There is also a moderate amount (about 43 pieces) of large wood still remaining in the lake. These old logs and branches are valuable for fish and wildlife habitat.

SUMMARY

Trophic State

Lake Bryant may be classified as a eutrophic lake, with low water clarity, high phosphorus, levels, and high levels of algae. This appears to be the natural condition for this shallow, kettle lake.

Condition and Trends

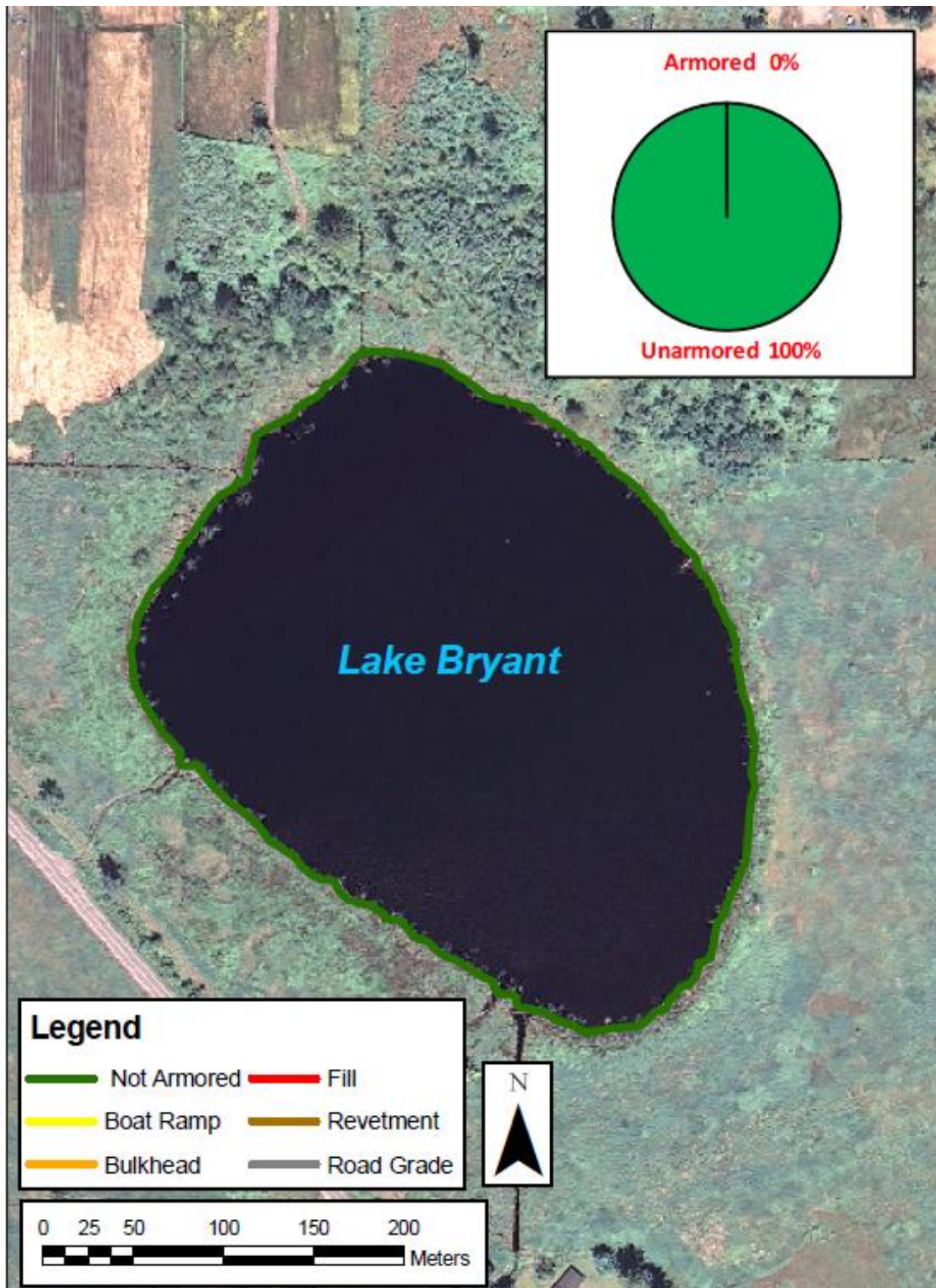
Overall, Lake Bryant is in healthy condition for a eutrophic lake. In the 2003 State of the Lakes

Report, the targets of maintaining water clarity and phosphorus levels were identified. With five additional years of data, there have been no significant changes in water clarity or phosphorus concentrations. There have been higher phosphorus measurements in the bottom waters in some recent years, but at this time there is no statistically significant trend. Therefore, the water quality targets are being achieved through 2010.

Regular monitoring of the lake should continue in order to better determine if changes are occurring in the phosphorus and chlorophyll a levels.

The primary threat to Lake Bryant's water quality is the possibility of an increase in nutrients from new development or other human activities in the watershed, such as agriculture. Lake Bryant is more susceptible to nutrient pollution given its large watershed size. However, the wetlands surrounding the lake should help filter inputs if additional development occurs. In order to protect the healthy condition of the lake, measures should be taken to control nutrients in the watershed. Nutrients enter the lake through stormwater runoff or streams flowing into the lake. Sources of nutrients include fertilizers, pet wastes, and erosion from land clearing and construction. Nutrients may also enter the lake through poorly maintained septic systems in the watershed. To find out more about the causes and problems of elevated lake nutrient levels and to obtain tips to improve lake water quality please visit www.lakes.surfacewater.info.

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DATA SUMMARY FOR LAKE BRYANT					
Source	Date	Water Clarity (Secchi depth in meters)	Total Phosphorus (ug/l)		Chlorophyll a (ug/l)
			Surface	Bottom	Epilimnion
Bortleson, et al, 1976	8/6/1974	0.6	29	33	-
Sumioka and Dion, 1985	7/7/81	0.9	10	10	11
SWM Staff or Volunteer	1994	1.6 - 2.6 (2.2) n = 4	-	-	5.5 - 6.4 (6.0) n = 2
SWM Staff or Volunteer	1995	1.2 - 1.3 (1.2) n = 3	-	-	13
SWM Staff	1996	0.6 - 0.7 (0.7) n = 2	29 - 31 (30) n = 2	53 - 73 (63) n = 2	-
SWM Staff	1997	0.8 - 1.1 (0.9) n = 2	26 - 36 (31) n = 2	47 - 97 (72) n = 2	-
SWM Staff	8/11/98	1.9	18	43	-
SWM Staff	6/14/00	1.1	22	32	-
SWM Staff	7/24/03	2.0	27	38	4.0
SWM Staff	7/24/06	0.8	40	196	46
Volunteer	2008	1.3 - 2.0 (1.7) n=4	15 - 32 (21) n=4	43 - 152 (85) n=4	2.1 - 4.3 (3.1) n=4
SWM Staff or Volunteer	2009	2.2 - 2.4 (2.3) n = 3	15 - 17 (16) n = 3	233 - 296 (262) n = 3	4.0 - 9.8 (7.4) n = 3
SWM Staff or Volunteer	2010	1.0 - 1.5 (1.2) n = 4	14 - 43 (25) n = 4	54 - 153 (100) n = 4	6.4 - 13 (9.3) n = 4
Long Term Avg		1.5 (1994-2010)	26 (1996-2010)	99 (1996-2010)	14 (7/24/03-2010)
TRENDS		None	None	None	None

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NOTES

- Table includes summer (May-Oct) data only.
- Each box shows the range on top, followed by summer average in () and number of samples (*n*).
- Total phosphorus data are from samples taken at discrete depths only.
- "Surface" samples are from 1 meter depth and "bottom" samples are from 1-2 meters above the bottom.