

Spring Lake

Spring Lake has moderate water clarity, low phosphorus levels, and abundant aquatic plants. The plants help to maintain the clear water. The lake may be at risk of future declines in water quality if the aquatic plants are removed or if nutrient runoff from the watershed increases.

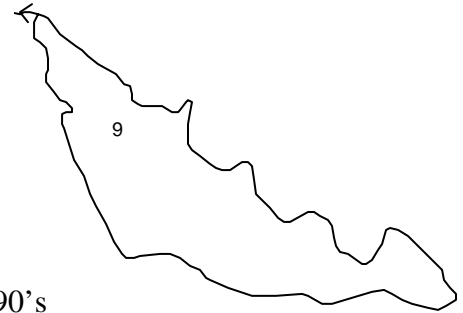


State of the Lakes Report
March 2003

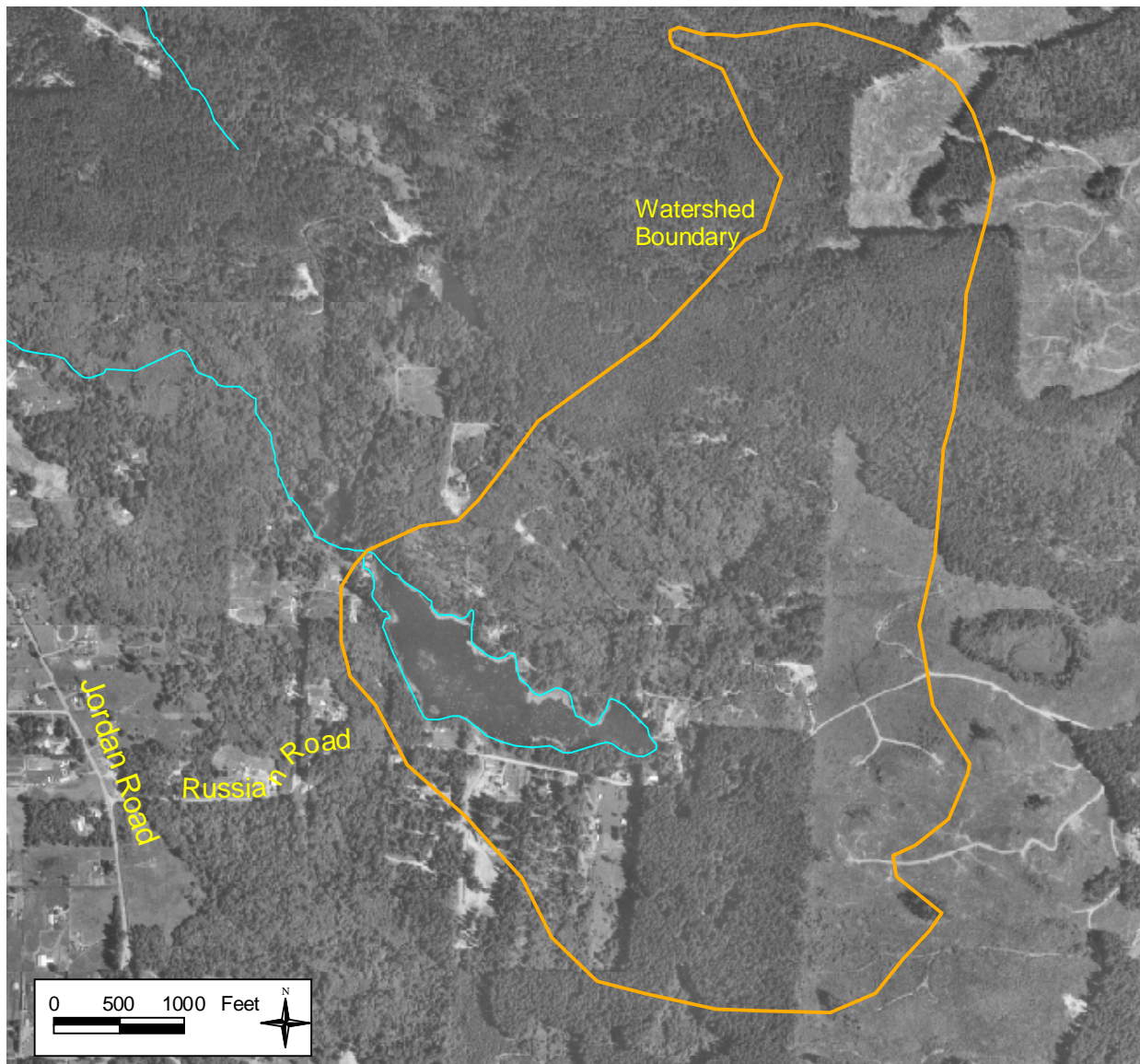
Snohomish County Public Works
Surface Water Management

LAKE AND WATERSHED DATA

Lake Area: 26 acres
 Watershed Area: 620 acres
 Watershed to Lake Area Ratio: 23.8
 Maximum Depth: 10 feet (3.0 meters)
 Average Depth: NA
 Lake Volume: NA
 Length of Shore: 1.3 miles



	<u>1974</u>	<u>Mid-90's</u>
# of nearshore homes	2	12
# of homes/1000' of shoreline	0.3	1.8
% of homes with bulkhead or fill		8%
% of homes with some native vegetation near shore		100%
% of watershed developed (residential or commercial)	2%	5% (est.)



LAKE ASSESSMENT

DESCRIPTION

■ Location/Access – Spring Lake lies east of Jordan Road approximately three miles northwest of Granite Falls. There are no perennial streams entering the lake, so ground water is likely the main water source. The lake drains to an unnamed tributary of the South Fork Stillaguamish River. Spring Lake has no public access.

■ Size/Shape – It appears the lake was originally a beaver pond. Later, an earthen dam was built to replace the beaver dam and make the lake more permanent. The surface area of Spring Lake covers 26 acres. The lake has a maximum depth of 3.0 meters, which makes it one of the shallowest lakes in the county. No bathymetric maps of the lake exist, so the average depth and volume are unknown.

■ Watershed – In contrast to its small surface area, Spring Lake has a large watershed—the watershed totals 620 acres, including the lake. The ratio of the watershed to lake area is 23.8. Having a large watershed means that there is greater potential for receiving pollution and sediment from the surrounding lands than at a lake with a small watershed. However, the watershed is relatively undeveloped. In 1973, only 2% of the watershed was developed with residential or commercial uses. By the mid-90s, development covered only about 5% of the watershed.

■ Shoreline – The shoreline of Spring Lake is 1.3 miles long. Around the shore, there were only 2 homes in 1973. By the mid-90s, there were 12 homes on the lake, making this one of the least developed lakes in the county. All of the homes have retained some native vegetation along the shore, and only 8% of the homes have modified the shoreline with bulkheads or fill. A zone of vegetation is important for filtering pollution before it reaches the water.



LAKE CONDITIONS

■ Water Clarity – The water clarity of Spring Lake is low to moderate. Summer averages ranged from 1.8 to 2.4 meters from 1996 to 2001. However, because of the shallow lake depth, the Secchi disk often hit the bottom of the lake during water clarity measurements. This means that the true water clarity was somewhat greater than the actual measurement. The water level of the lake also varies as much as 12 inches. The changes in water level, the shallow depth near the monitoring station, and periodic algal blooms all contribute to fluctuations in water clarity measurements.

■ Color – There have been no measurements of color in the lake. However, the volunteer monitor usually describes the water color as green or brown.

■ Nutrients – Only two total phosphorus measurements are available for Spring Lake. A 1998 sample measured 12 $\mu\text{g/l}$ at 1 meter depth, while a 2000 sample was 8 $\mu\text{g/l}$. These show relatively low phosphorus levels. Although nitrogen data are not available, the low phosphorus levels suggest that phosphorus is likely the nutrient that limits algal growth.

■ Oxygen/Temperature – Vertical profiles of dissolved oxygen and temperature, taken in July 1998 and September 2000, showed that the lake was not stratified. Because of the shallow depth

and the long shape of the lake, it is likely that Spring Lake remains mixed and does not stratify for any length of time during the summer. Temperature and dissolved oxygen (as well as other physical and chemical parameters) are close to uniform from top to bottom when a lake is mixed.

■ *Algae and Aquatic Plants* – Algal blooms are rarely reported at Spring Lake. However, the pH level at 1.5 meters depth in September 2000 was almost 10. This high value suggests that vigorous algal growth was occurring at that depth. In contrast to the apparently low levels of algae, the lake supports dense growths of aquatic plants. Because of the shallow depth and moderate water clarity, the entire lake provides suitable habitat for aquatic plants. Shallow lakes often exist in one of two conditions—either abundant aquatic plants with limited algae (like Spring Lake), or few aquatic plants with dense growths of algae. These conditions are fairly stable. The presence of abundant plants in Spring Lake stabilizes the bottom sediments and is probably a major factor in limiting algae and maintaining clear water. As long as the lake remains in this condition, it is not likely to experience major problems from excess algae. However, if the plants are removed or nutrient levels increase, it is possible for the lake to switch to the low plants/high algae condition. This would be a much less desirable situation and would be difficult to reverse. The dominant plants in the lake are large-leaf pondweed, thin-leaf pondweed, watershield, yellow water-lily, potentilla, and smartweed. Non-native plants have not been identified in the lake.

SUMMARY

■ *Trophic State* – Based on low to moderate water clarity, low total phosphorus concentrations, limited algae, but high aquatic plant productivity, Spring Lake may be classified as mesotrophic.

■ *Current Conditions/Trends* – Spring Lake is currently in satisfactory condition. However, monitoring data are not sufficient to analyze trends in water clarity or total phosphorus. The lake could be at risk of water quality declines if the nutrient levels increase and algal blooms become more common.

■ *Future Concerns/Targets* – The target for Spring Lake is maintaining a clear water/low phosphorus/abundant aquatic plants condition. If the plants are reduced or nutrients from the watershed increase, the lake could shift to an algae-dominated, low water clarity condition.

■ *Recommendations* – Monitoring of the lake should continue, with focus on water clarity, algae, and aquatic plants. No large-scale efforts should be made to control aquatic plants.

CITIZEN VOLUNTEERS

Thanks to Jack Halbert for volunteer monitoring at Spring Lake.

DATA SUMMARY TABLE

Source	Date	Secchi Depth (meters)	Total Phosphorus (ug/l)		Color (Pt-Co scale)	Chlorophyll a (ug/l)
			Surface	Bottom	Epilimnion	Epilimnion
Volunteer	Summer 1996	2.1 - 2.7 (2.4) <i>n</i> = 10	-	-	-	-
Volunteer	Summer 1997	2.0 - 2.6 (2.3) <i>n</i> = 4	-	-	-	-
SWM Staff or Volunteer	Summer 1998	1.2 - 2.6 (1.8) <i>n</i> = 6	12	-	-	-
Volunteer	Summer 1999	1.8 - 2.4 (2.1) <i>n</i> = 9	-	-	-	-
SWM Staff or Volunteer	Summer 2000	2.0 - 2.3 (2.2) <i>n</i> = 6	8	-	-	-
SWM Staff or Volunteer	Summer 2001	2.0 - 2.3 (2.1) <i>n</i> = 3	-	-	-	-

NOTES

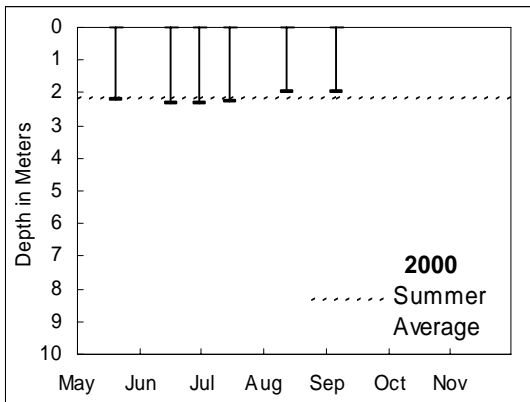
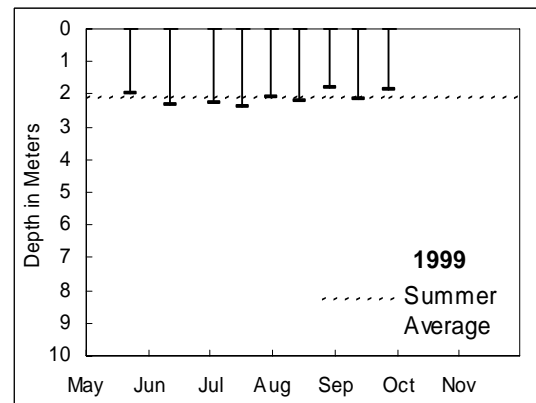
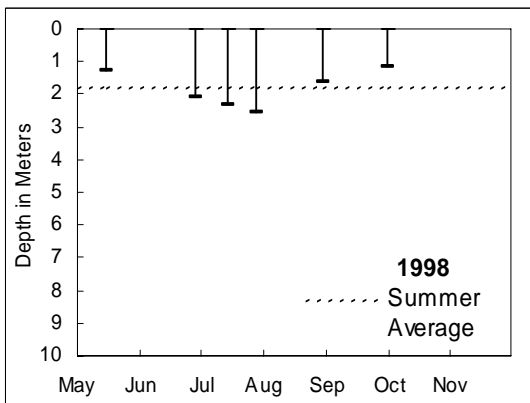
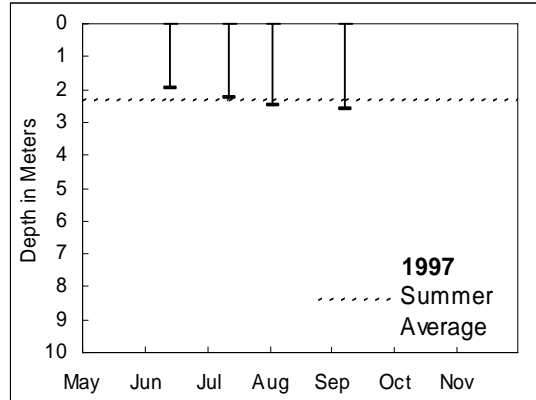
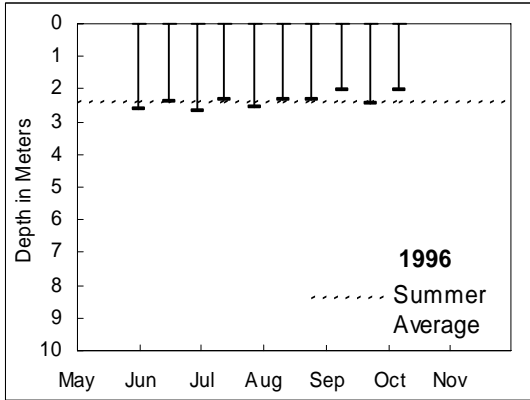
- Table includes summer (May-Oct) data only.
- Each box shows the range on top, followed by summer average in () and number of samples (*n*).
- Total phosphorus data are from samples taken at discrete depths only.

SUMMARY OF OTHER DATA

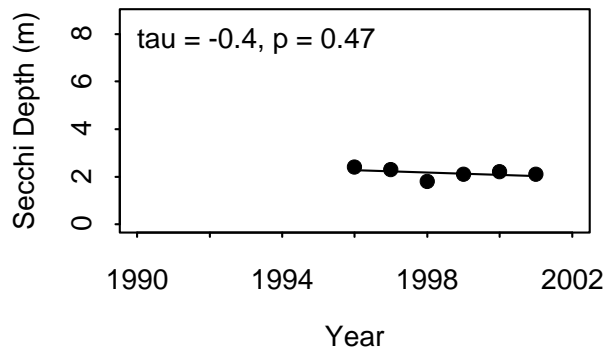
■ *pH*– from single observations in 1998 and 2000, pH averaged 6.9 throughout the lake, which is near neutral.

■ *Conductivity*– 1998 and 2000 data averaged 72 μ mhos throughout the lake, indicating moderate levels of dissolved materials in the water.

WATER CLARITY



TREND ANALYSIS



BASIC MONITORING DATA

1996									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/3/1996	2.6	22.5	19.5	0	50	none	light	clear	Heavy algae, moderate algae scum, slight aquatic plants, no odor.
6/18/1996	2.4	12	17	0	100	heavy	light	clear	Secchi reading doesn't work in this shallow lake, water is very clear. No scum, odor, slight algae, moderate plants. 12 ducks and/or geese.
7/2/1996	2.9	18	20.5	1	0	none	calm	clear	No odor, slight scum, moderate algae, plants. 2 ducks.
7/15/1996	2.5	21	24.5	3	0	none	light	lt brown	Moderate algae, plants, slight scum, no odor. 5 ducks and/or geese.
7/29/1996	2.7	21	25.5	6.5	0	none	calm	lt brown	Kingfisher diving for fish. Hundreds of polliwogs. No odor, moderate algae, scum, plants. 1 duck.
8/12/1996	2.4	17	22	9	0	none	light	lt green	
8/26/1996	2.6	19.5	22	12	10	none	calm	lt green	
9/9/1996	2.1	14	17	13.5	25	heavy	calm	lt green	
9/23/1996	2.5	7.5	14	12.5	10	heavy	calm	lt green	
10/7/1996	2.1	13	15	13.5	90	light	calm	dk brown	

1997									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
6/16/1997	2.0	16	20	1.75	100	moderate	calm	lt brown	Moderate plants, algae, no odor, slight scum. 1 adult, 5 juvenile ducks/geese.
7/14/1997	2.3	15	20	0.75	25	light	calm	grn brown	Slight algae, scum, moderate plants. 1 duck/goose. clean.
8/4/1997	2.6	19.5	23	4	0	none	light	dk brown	Slight algae, moderate scum, plants. 6 ducks, 4 geese, 1 heron.
9/8/1997	2.8	13.5	19.5	7	0	none	calm	dk brown	Slight algae, moderate scum, plants, no odor. 30-40 ducks. Extensive logging in the area - could be affecting water supply.

1998									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
5/19/1998	1.3	11.5	14.5	4.5	0	trace	light	lt green	No odor, slight algae, scum, plants. 2 geese, 10 ducks.
7/1/1998	2.8	15	15	5.75	100	none	calm	lt brown	Secchi disk hit bottom and entered weeds; Moderate algae & plants; heavy scum and odor; 6 ducks/geese; extensive logging may be affecting lake level.
7/16/1998	2.3	18.5	21	6.5	0	moderate	calm	grnbrown	Slight algae; no scum or odor; moderate plants; Secchi disk hit bottom; moderate amount of floating sediment in lake.
*7/30/98	2.6				100	none	calm	grnbrown	5 geese/15 ducks, slight algae, scum; heavy plants.
8/31/1998	1.7	18.5	22	14	0	none	calm	grnbrown	Slight algae & scum; heavy plants; no odor; no ducks/geese.

*Indicates data collected by Snohomish County staff.

1999									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
5/26/1999	2.2	10.5	18	1	0	trace	calm	clear	1 family of geese, 1 eagle.
6/14/1999	2.4	18	21	3.75	10	trace	calm	grnbrown	
7/5/1999	2.3	13.5	14.5	2.75	0	heavy	calm	clear	
7/19/1999	2.6	15	19.5	3	0	light	calm	clear	
8/2/1999	2.2	16	21.5	5.75	0	none	calm	grnbrown	
8/16/1999	2.3	16	19	8	100	moderate	calm	black	
8/30/1999	1.9	12	19	11	100	light	calm	black	
9/13/1999	2.2	13	19	13.5	0	none	calm	lt brown	
9/28/1999	1.9	6	14.5	15	25	trace	calm	dk brown	

2000									
DATE	Secchi Depth (meters)	Air Temp (C)	Water Temp (C)	Lake Level (in)	Clouds (%)	Rain	Wind	Color	COMMENT
5/23/2000	2.4	13	17	0	25	trace	light	gr-brown	Looks good. No ducks, algae, or algae scum, and slight aquatic plants.
6/19/2000	2.4	12	18	3	100	moderate	light	black	1 duck, slight algae and aquatic plants, and moderate algae scum.
7/3/2000	2.3	10.5	19	3	100	moderate	calm	black	No ducks or algae, slight algae scum, and moderate aquatic plants.
7/17/2000	2.3	17	22	4	0	none	calm	dark brown	3 ducks, moderate algae and aquatic plants, and heavy algae scum.
7/31/2000		21	24	5	0	light	light	dark brown	1 duck, heavy algae and algae scum, and moderate aquatic plants.
8/14/2000	2.1	13	20	7.5	90	none	calm	dark green	12 ducks, heavy algae and algae scum, and moderate aquatic plants.
*09/07/00	2	15	17.87	10	100	moderate	calm	lt brown	Many Bryozoans. 6 ducks, no algae or algae scum, and heavy aquatic plants.

[Click here to view more recent data.](#)

HOW YOU CAN HELP SPRING LAKE

- Educate yourself about lake ecology and the lake's health.
- Use lawn and garden fertilizers sparingly; test your soil first; choose low or no phosphorus fertilizers.
- Retain or plant native vegetation adjacent to the water to protect the shoreline and filter pollution.
- Infiltrate or filter the runoff from rooftops, patios, and driveways rather than piping it to the lake.



- Cover or mulch bare soil areas.
- Use pesticides, herbicides, and household chemicals sparingly and never near the water.
- Maintain your septic system—have it inspected every two years and pumped when needed.
- Conserve water both inside and outside.
- Clean up pet wastes and keep livestock away from the lake shore.

- Learn to identify non-native invasive aquatic plants and animals; check your boat and trailer for invaders; never empty an aquarium into the lake.
- Do not feed geese or ducks.
- Join with neighbors or the local property owners' association to work together to protect the lake.



Contact Snohomish County Surface Water Management at 425-388-3464 for information about these topics or if you have questions about Spring Lake.

(TTY users call 425-388-3700)