

OFFUTT

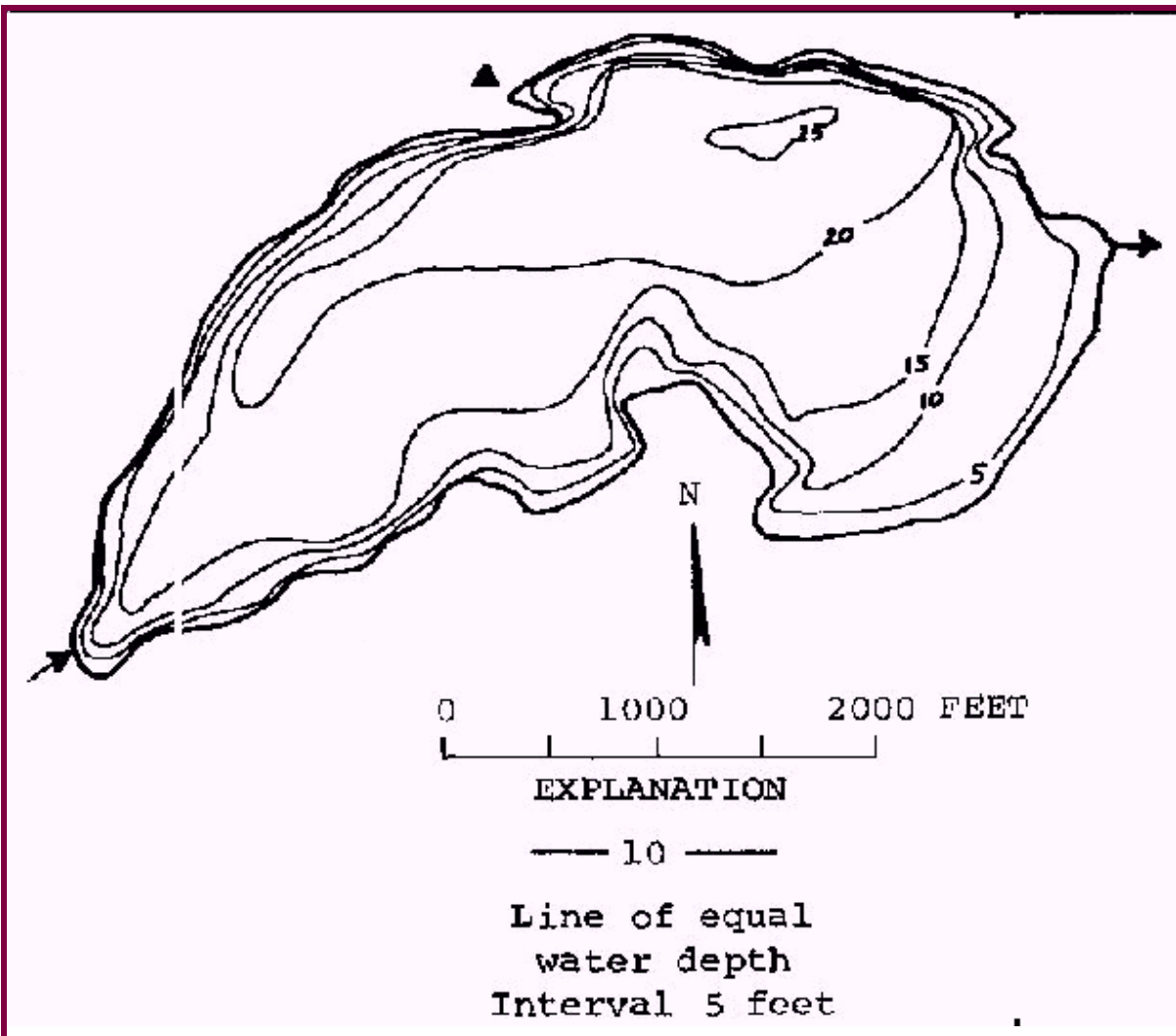
THURSTON County

Lake ID: OFFTH1

Ecoregion: 2

Offutt Lake is in rural Thurston County, about 10 miles south of Olympia. It is fed by an unnamed surface inlet and drains to the Deschutes River. There is a small resort on the lake; however the lake receives little recreational use. Livestock has access to the western shores of the lake.

<i>Area (acres)</i>	<i>Maximum Depth (ft)</i>	<i>Mean Depth (ft)</i>	<i>Drainage (sq mi)</i>	
200	25	15	3	
<i>Volume (ac-ft)</i>	<i>Shoreline (miles)</i>	<i>Altitude (ft abv msl)</i>	<i>Latitude</i>	<i>Longitude</i>
2900	2.86	230	46 55 06.	122 49 04.



Station Information

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Primary Station	Station # 1	latitude: 46 55 05.9	longitude: 122 49 37.4
Description: Deep part of lake approximately 250 feet north of the middle of a line extending from boat launch to outlet			

Trophic State Assessment for 1998

OFFUTT

Analyst: KIRK SMITH

TSI_Secchi:	44
TSI_Phos:	47
TSI_Chlor:	49
Narrative TSI: ^a	M

Offut Lake is a relatively shallow lake that shows signs of natural eutrophication. The lake has retained most of its natural aesthetic appeal despite the established residential community surrounding the lake. There are large areas where natural vegetation has been allowed to flourish. Aquatic plants were generally sparse. Nutrients in the epilimnion were quite low except in September when concentrations may have been raised after mixing (mean total phosphorus 19.2). Water clarity somewhat indicates a mesotrophic lake despite the tannin colored water which may bias Secchi readings low. Hypolimnetic phosphorus concentrations were very high indicating internal loading. Our 1998 data indicate that Offut Lake may be phosphorus limited in mid-summer and nitrogen limited in early and late summer. With only four samples in one season, however, this is a very tenuous conclusion; a more thorough examination into biologically active forms of both phosphorus and nitrogen may reveal the true dynamic of nutrient limitation. The habitat survey revealed a shoreline influenced by human structures and modifications. These modifications may not affect water quality much, but they may attract an undesirable population of Canada geese. There were no user surveys returned for Offut Lake. There is a resort on the lake with a fishing dock so fishing is most likely a valued recreational use. Water quality measurements suggest a "put and take" fishery could be supported; zooplankton tended to be on the small side and dominated by copepods. There is an area where livestock water on the lake. Although there were colonies of blue-green algae observed in the water samples, dense algal blooms were not observed; lake water should be safe for drinking by livestock. There is the potential for livestock to contaminate water supplies with fecal material and nutrients; however, the water samples analyzed in 1998 for fecal coliform bacteria did not indicate a fecal contamination problem.

We recommend that the remaining natural shoreline be protected so that available habitat for Canada geese will not be artificially increased. We recommend the total phosphorus nutrient criterion for Offut Lake be set at 20 ug/L, the action value in the water quality regulations for Puget Lowlands lower mesotrophic lakes. Due to the limitations of the sampling conducted during this study, it is difficult to determine whether nitrogen is also limiting to the system. Future studies may propose a nitrogen criterion. Some septic infiltration into the lake from some of the older homes

^a E=eutrophic, ME=mesoeutrophic, M=mesotrophic, OM=oligomesotrophic, O=oligotrophic

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Strata: L=lake surface, E=epilimnion, H=hypolimnion; Qualifier: J=Estimate, U=Less than

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Impervious surfaces (Roads and parking area): No Curbs

Observations (check mark denotes presence)

BMP's ☐

Odors ☐

Cattle ☒ Ducks ☐ Geese ☐

Cattle have been observed entering the lake along the north-west shore of the lake. There is no fencing to keep the cattle out.

Fertilizers and weed killers appear to be used in residential or agriculture area ☐

Buffer zones around streams and wetlands ☒

Most of the shoreline has natural vegetation along the shore. The wooded area along the northwest shore is where the cattle enter the lake.

Irrigation ☐

Survey Id: 30

Habitat Survey Summary Report

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Data are averages of 10 Stations Surveyed

Date of Visit: 7/7/1998

Vegetation Type (Avg. only of sites w/ vegetation present; 1=coniferous, 3=deciduous)

Canopy Layer Avg:	2.2	Number of stations with canopy:	10
Understory Avg:	2.9	Number of stations with understory:	10

Percent Areal Coverage (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)

Canopy Layer:	trees > 0.3 m DBH	1.9
	trees < 0.3 m DBH	1.5
Understory:	woody shrubs saplings	2.1
	tall herbs, forbs grasses	1.2
Ground Cover:	woody shrubs seedlings	1.0
	herbs, forbs, grasses	1.1
	standing water or inundated veg	0.6
	barren or buildings	1.3
Substrate Type (within shoreline plot):	bedrock	0.0
	boulders	0.2
	cobble/gravel	1.2
	loose sand	0.3
	other fine soil/sediment	0.7
	vegetated	3.2
	other	0.2

Bank Features:	angle (0:<30; 1: 30-75; 2:nr vertical)	0.2
	vertical dist (M from wtrln to high wt):	0.1
	horiz. dist. (M from wtrln to high wt):	0.1
Human Influence (0 = absent, 1 = adjacent to or behind plot, 2 = present within plot)		
	buildings	1.0
	commercial	0.2
	park facilities	0.4
	docks/boats	0.9
	walls, dikes, or revetments	0.6
	litter, trash dump, or landfill	0.2
	roads or railroad	0.2
	row crops	0.0
	pasture or hayfield	0.0
	orchard	0.0
	lawn	0.8
	other	0.2
Physical Habitat Characteristics		
	station depth (at 10 m from shore)	2.6
Bottom Substrate (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)		
	bedrock	0.0
	boulders	0.0
	cobble	1.0
	gravel	1.4
	sand	0.5
	silt	1.3
	woody debris	0.8
Macrophyte Areal Coverage (0 = absent, 1 = <10%, 2 = 10-40%, 3 = 40-75%, 4 = >75%)		
	submergent	0.9
	emergent	1.1
	floating	0.9
	total weed cover	1.8
	Do macrophytes extend lakeward (-1 = yes, 0 = no)	-0.3
Fish Cover (0 = absent, 1 = Present but sparse, 2 = moderate to heavy)		
	aquatic weeds	0.9
	snags	0.3
	brush or woody debris	1.3
	inundated live trees	0.0
	overhanging vegetation	1.4
	rock ledges or sharp dropoffs	0.0

boulders	0.0
human structures	0.8

Zooplankton Report

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Date 6/1/1998 Station: 1
 Sample ID 17

Number of organisms measured: 193

Group	Percent	Group	Percent
Cladoceran	9.3%	Small < 1mm	91.2%
Copepod	90.7%	Large >= 1mm	8.8%
Other		Ratio of large to Small:	0.10
		Average size (mm):	0.40

Aquatic Plant Data

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Sampler: Parsons, O'Neal

Survey Date: 7/7/1998

Max depth of growth (M): 3 +

Comments cloudy, calm. Did habitat survey for Kirk Smith - LWQA program. Macrophytes sparse except at inflow and outflow wetland areas. Many patches of Nymphaea.

SPECIES LIST

Scientific Name	Common Name	Dist ^a	Comments
<i>Brasenia schreberi</i>	watershield	2	
<i>Carex sp.</i>	sedge	1	
<i>Chara sp.</i>	muskwort	2	
<i>Eleocharis sp.</i>	spike-rush	2	
<i>Elodea canadensis</i>	common elodea	2	
<i>Iris pseudacorus</i>	yellow flag	2	
<i>Juncus sp.</i>	rush	2	
<i>Ludwigia palustris</i>	water-purslane	1	
<i>Nuphar polysepala</i>	spatter-dock, yellow water-lily	2	
<i>Nymphaea odorata</i>	fragrant waterlily	3	
<i>Polygonum sp.</i>	smartweed	2	
<i>Potamogeton amplifolius</i>	large-leaf pondweed	3	
<i>Potentilla palustris</i>	purple (marsh) cinquefoil	1	
<i>Potamogeton sp (thin leaved)</i>	thin leaved pondweed	2	
<i>Salix sp.</i>	willow		on shore
<i>Scirpus sp.</i>	bulrush	2	bulrush
<i>Tolypella intricata</i>	macro algae	1	
<i>Typha sp.</i>	cat-tail	2	

a 0 - value not recorded (plant may not be submersed)

2 - few plants, but with a wide patchy distribution

4 - plants in nearly monospecific patches, dominant

1 - few plants in only 1 or a few locations

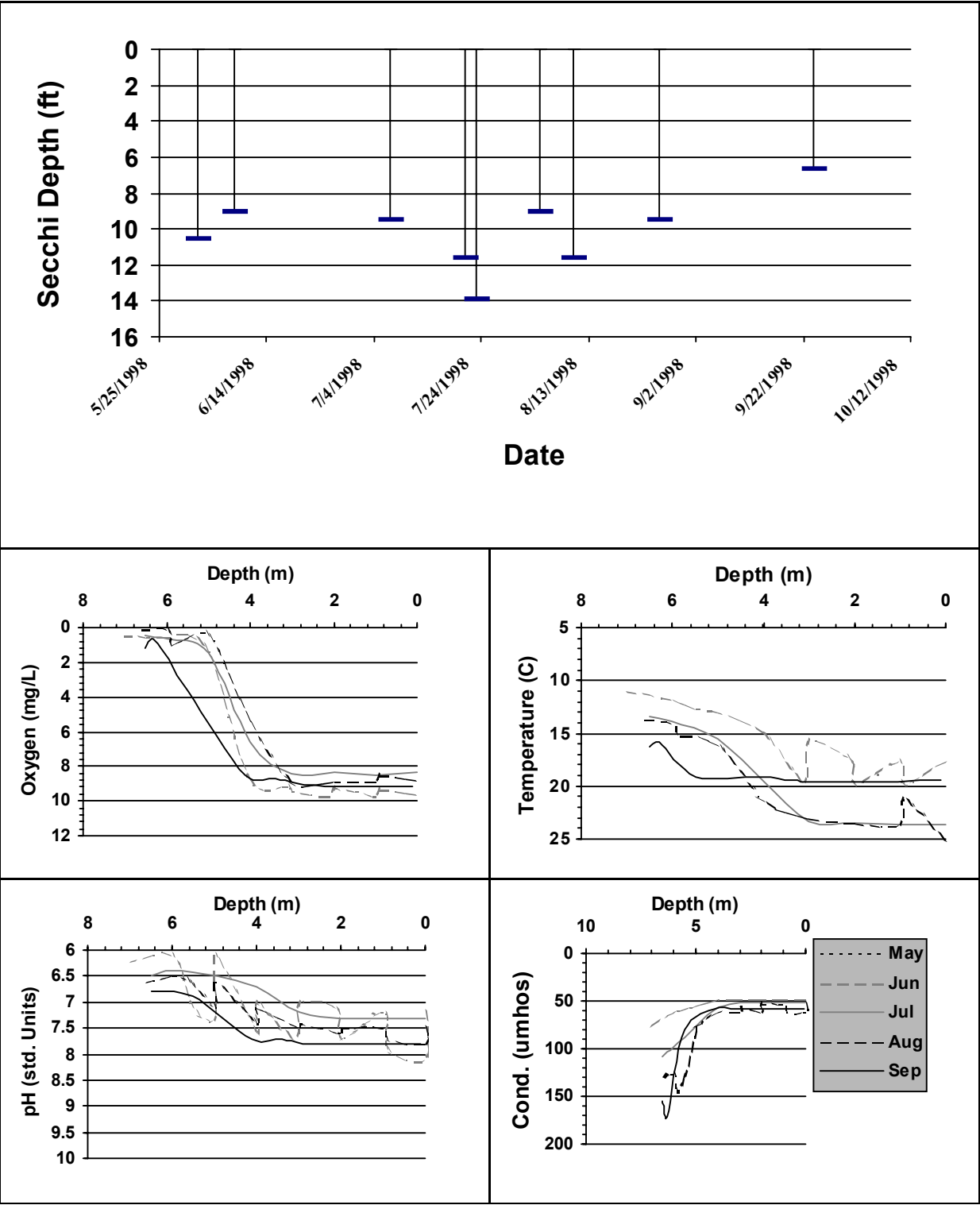
3 - plants in large patches, codominant with other plants

5 - thick growth covering substrate to exclusion of other species

Secchi Depth and Profile Graphics

Station: 1

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Secchi Data and Field Observations

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Date	Time	Temp- erature (F)	Secchi (ft)	Color (1-greens, 11-browns)	Bright- ness (pct)	Wind (1-none, 5-gusty)	Rainfall (0-none, 5-heavy)	Aesthetics (1-bad, 5- good)	Swimming (1-poor, 5- good)	Geese (#)	Waterfowl (besides geese #)	Boats- Fishing (#)	Boats- Skiing (#)
Station 1													
6/1/1998			10.5	7	100	2	1	4	4	0	7	6	0
	Sampler: SMITH			Remarks: ZOO NET PULLED THROUGH 6 METERS. FEC#1 AT RESORT, #2 AT BOAT LAUNCH									
6/8/1998		20	9	6	75	2	1	5	4	0		6	0
	Sampler: KELLY			Remarks:									
6/8/1998			9		0					0	0	0	0
	Sampler: BELL-MCKINNON			Remarks:									
7/7/1998		20	9.5	6	25	2	2	4	4	0	6	4	0
	Sampler: KELLY			Remarks:									
7/21/1998		23	11.58	6	0	2	1	4	4	0	10	1	0
	Sampler: KELLY			Remarks:									
7/23/1998			13.86	2	20			5	5	0	6	0	0
	Sampler: SMITH			Remarks: SLIGHT BLUE-GREEN BLOOM. LOTS OF FRAGRANT LILLIES									
8/4/1998		23	9	6	100	1	1	4	4	0	0	2	0
	Sampler: KELLY			Remarks:									
8/10/1998			11.55	3	0			4	3	0	0	3	0
	Sampler: SMITH			Remarks: NOTICEABLE BLUE-GREEN BLOOM. LARGE MASSES OF BRYOZOANS NEAR BOAT LAUNCH. STRONG MANUE IN THE BREEZE. FEC SAMPLES TAKEN SAME PLACE AS JULY									
8/26/1998		23	9.5	6	100	1	1	4	4	0	0	1	0
	Sampler: KELLY			Remarks: LAKE HEIGHT STICK BROKEN.									
8/26/1998			9.5		0					0	0	0	0
	Sampler: BELL-MCKINNON			Remarks:									
9/24/1998			6.6		100	3		4	2	0	134	0	0
	Sampler: SMITH			Remarks:									

Date	Time	Temp- erature (F)	Secchi (ft)	Color (1-greens, 11-browns)	Bright- ness (pct)	Wind (1-none, 5-gusty)	Rainfall (0-none, 5-heavy)	Aesthetics (1-bad, 5- good)	Swimming (1-poor, 5- good)	Geese (#)	Waterfowl (besides geese #)	Boats- Fishing (#)	Boats- Skiing (#)
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