

## **Silver Lake**

Cheboygan County, T33N, R3W, Sec. 11, 12  
Cheboygan River Watershed

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### **Environment**

Silver Lake is a 74.5-acre natural lake located two miles west of the village of Wolverine (Figure 1). The lake has a single basin with no inlets or outlets and reaches a maximum depth of 90 feet (Figure 2). Silver Lake is in the West Branch Sturgeon River watershed, which is primarily forested and contains a mixture of public and private land. The geology of the watershed is composed primarily of coarse material, such as end moraines of coarse-textured till, and glacial outwash sand and gravel. The West Branch Sturgeon River flows into the Sturgeon River, which flows into Burt Lake. These waterbodies are all within the Cheboygan River watershed which empties into Lake Huron at Cheboygan.

Silver Lake generally has good water clarity, with a Secchi disk visible down to 24 feet in depth in August 2010. The temperature profile measured at that time shows that the thermocline was established between 24 and 40 feet in depth (Table 1). Shoreline sampling found 74 dwellings around the lake, and over 59% of those had a dock (Table 2). A fairly low percentage (7%) of the shoreline was armored, but very few submerged trees were available for fish cover.

Public access to Silver Lake is available at a DNR boat access site on the northwest shore. The site has a gravel launch surface and accommodates up to 10 parking spaces.

### **History**

Silver Lake has a long history of fisheries management. Fisheries management in the 1930s and 1940s focused on stocking a variety of species including bluegill, rock bass, largemouth and smallmouth bass, yellow perch, walleye, and lake trout. A 1942 survey found the forage base to consist of bluntnose minnows, blacknose shiners, Iowa darters, and killifish (sp.). In the mid-1940s, warmwater fish stocking was discontinued and fisheries management shifted to establishing a rainbow trout fishery via stocking.

Silver Lake continued to be managed as a rainbow trout lake through the 1970s, 1980s, and 1990s. A number of surveys during that time period documented slow- to average growth for most species, except for yellow perch, which had better growth rates, and a few reports of walleye growing well. Good growth of several fish species was documented in the 1980s and early 1990s. Bluegill, yellow perch, and pumpkinseed all were growing above state average based on surveys in 1982-84. Similar growth was found in a 1989 survey, and a survey in 1990 again documented good growth for yellow perch, pumpkinseed, and bluegill. The 1990 survey also documented good survival of the rainbow trout plants, and reported a good fishery for rainbows during the summer months.

A general netting survey of Silver Lake was done in 1995. Angler reports indicated rainbow trout fishing improved in 1995. Trout growth was acceptable, but many other species were not growing

well. Bluegills, pumpkinseed, rock bass, and smallmouth bass were growing below state average and were not large enough to be of much interest to anglers. The 1995 survey analysis indicates that the lake gets a moderate amount of fishing pressure for panfish in the summer, but that most of the anglers in the summer target trout. There is also a modest fishery in the winter for perch. Green sunfish were reported in Silver Lake for the first time in 1995. Because the rainbows were doing well in Silver Lake and were providing a good summer fishery, it was recommended that the stocking program should continue.

Recently, the annual stocking level for Silver Lake has been 5,000 yearling Eagle Lake strain rainbow trout, or about 67 per acre (Table 3). Silver Lake has Type B trout lake regulations. The fishing season for this lake is open for the entire year, all types of tackle may be used, and the minimum size limit for rainbow trout is 12 inches. The daily possession limit is five fish, with no more than three trout 15 inches or greater in size.

### **Current Status**

A survey of Silver Lake was conducted May 24-27, 2010. Silver Lake was selected for sampling as part of Fisheries Division's Status and Trends Program, where gear is standardized and survey effort is a function of lake size (Wehrly et al. in press). The purpose of the Status and Trends program is to sample randomly selected water bodies, using similar protocols, to document fish community and habitat conditions and trends on a regional and statewide basis. Effort for the Silver Lake survey consisted of 8 large-mesh fyke net lifts, 2 large-mesh trap net lifts, 4 gill net lifts, 9 small-mesh (3/16") fyke nets, and 3 seine hauls. Nighttime electrofishing was conducted on June 23, 2010. An additional electrofishing survey sampling the entire shoreline was conducted October 2011.

A total of 2,735 fish representing 12 species were collected in the May survey (Table 4). Rock bass, pumpkinseed sunfish, and bluegill dominated the catch. These three species comprised 46.6% of the catch by number, and 56.4% of the catch by weight (Table 4). Rock bass were the most abundant species collected comprising 28% of the total catch. Emerald and common shiners together comprised almost 44% of the catch. Bluegill and pumpkinseed sunfish were also a substantial component (18.5%) of the catch, although few were found greater than 7 inches in length (Table 5). Although white suckers weren't abundant numerically, they were of a large enough size to comprise 18.2% of the catch by weight. Smallmouth bass comprised 2.4% of the catch numerically, but made up 12.5% of the catch by weight. Smallmouth bass ranged from 2-18 inches in total length.

Other sportfish collected in the May 2010 survey were found in low abundance. Two rainbow trout averaging 13 inches were collected. It should be noted, however, that air and water temperatures were very warm during the survey, making it unlikely that trout would be captured in the nearshore impoundment nets. Two large walleye (>20 inches) were captured during the survey. These fish were likely stocked illegally in the lake. Four northern pike, 18-32 inches in total length, were also captured.

A fall electrofishing evaluation of the Silver Lake trout population was conducted on October 12, 2011. The lake was surveyed along the entire shoreline. Two rainbow trout averaging 13 inches were collected in the October 2011 electrofishing survey. Up to 12 additional trout were observed but avoided capture. Many of these fish were larger in size, and did not appear to be from the current year's stocking event. Overwinter survival of trout appears to be good.

### **Analysis and Discussion**

Rainbow trout stocking in Silver Lake has met with mixed results. Surveys in 1995 and 2010 found them in low abundance but may reflect the seasonal biases with catch and gear type. The observation of 14 rainbow trout in the October 2011 survey indicates acceptable survival and warrants continued stocking.

Growth rates of all species for which a growth index could be calculated were below state average (Table 4), with the exception of rainbow trout. This is consistent with growth rates observed in 1995, although many species have shown a slight improvement in growth and size structure. Bluegill up to 9 inches were captured in 2010 (mean length = 5.4 inches), compared to a maximum size of 6 inches in 1995 (mean length = 4.7 inches). Overall, bluegill and pumpkinseed sunfish experienced slight improvements in growth rates since 1995. Rock bass, however, saw a decline in growth rates, with a growth index of -1.0 in 1995, which decreased to -1.5 in 2010. Larger rock bass (up to 12 inches) were captured in 2010, compared to a maximum size of 9 inches in 1995. Rock bass up to age-12 were captured in 2010, compared to a maximum age of age-9 in 1995. The overall populations of the warmwater fish community in Silver Lake have remained fairly stable, with perhaps an increase in the abundance of fish in the acceptable size range for anglers.

Although the sample size for rainbow trout wasn't large enough to calculate a growth index for the 2010 survey, a comparison of the mean lengths to the state average length at age shows that rainbow trout are growing well above state average (approximately 1.6 inches larger than the state average length at age).

Coolwater predators were also found in Silver Lake. Smallmouth bass were present in a good distribution of size ranges, while northern pike were present in a low abundance, but at fairly large sizes. Large northern pike are not uncommon in trout lakes, as trout provide a ready food source. Two walleye were also captured.

Based on discussions with anglers and conservation officers, most anglers fishing Silver Lake appear to be targeting yellow perch, bluegill, and bass. There is a limited amount of fishing pressure targeted for rainbow trout. Fishing pressure for rainbow trout in Silver Lake historically was high, but has declined recently based on anecdotal reports. Whether the current fishery fully justifies the cost of stocking is uncertain. An inland creel is needed to document the angling pressure our trout lakes receive.

Presently, Silver Lake supports good opportunities for rock bass and smallmouth bass. Bluegill, pumpkinseed, and yellow perch are satisfactory but fish greater than 7 inches do not occur in high abundance which may be the result of angler harvest. Additional opportunities exist for the harvest of northern pike and walleye. Although targeted rainbow trout fishing appears to be limited in Silver Lake, there are few rainbow trout fishing opportunities that are similar in the area. Silver Lake has historically provided a popular trout fishery.

### **Management Direction**

1. Continue to advocate for a creel survey of inland trout lakes.

2. Continue to stock rainbow trout in Silver Lake. Rainbow trout in Silver Lake provide a unique fishing opportunity in the Wolverine area.
3. If hatchery production allows, switch to stocking Michigan strain steelhead, as recommended by a study comparing the performance of Eagle Lake strain rainbow trout and Michigan strain steelhead in inland lakes (A. Nuhfer, retired DNR, personal communication).
4. In the absence of a rigorous creel survey, try to gather additional information on fishing pressure by talking with the lake association and anglers. Try to gather voluntary creel census data.

### **References**

Wehrly, K.E., G.S. Carter, and J.E. Breck. In Press. Standardized sampling methods for the inland lakes status and trends program. Chapter XX in Schneider, J. C., editor. 2000. Manual of fisheries survey methods II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

Figure 1. Location of Silver Lake, Cheboygan County.

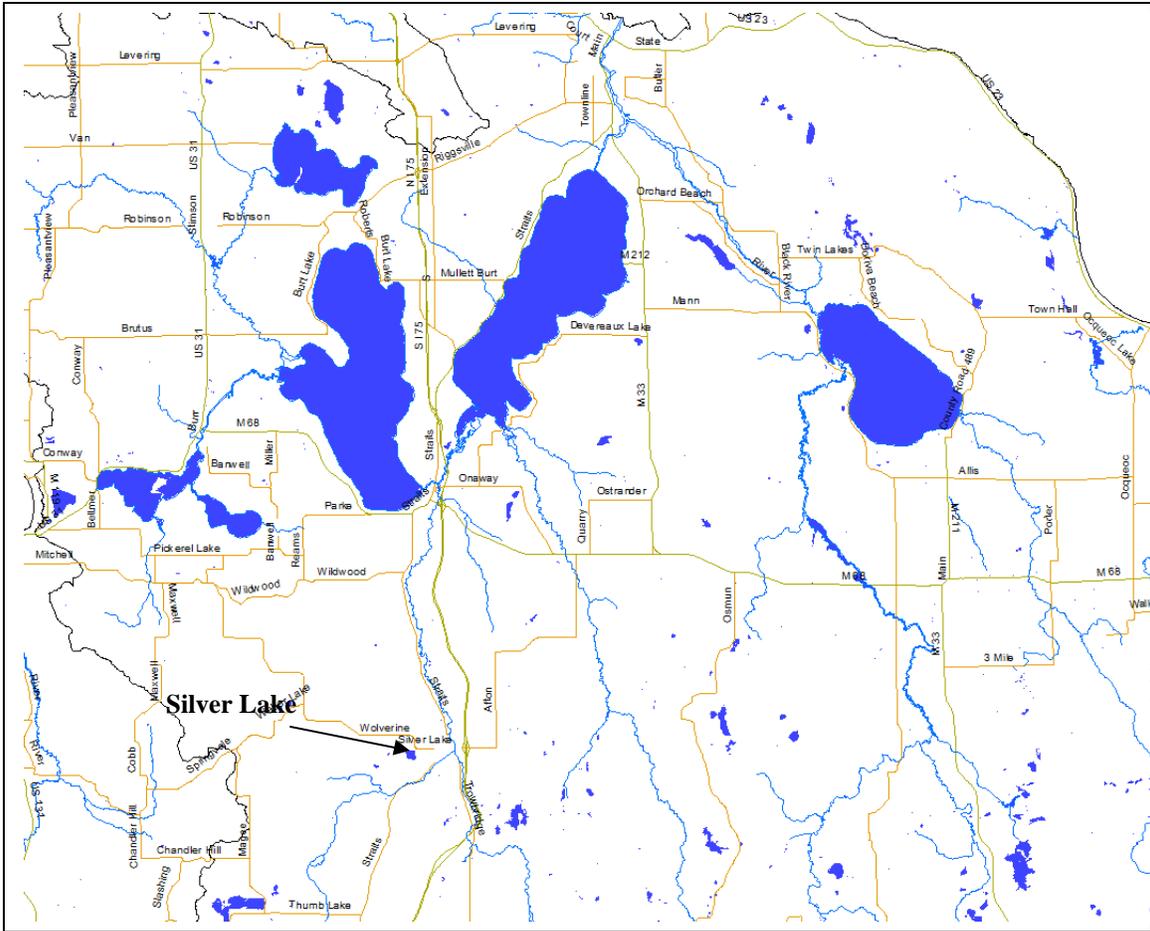
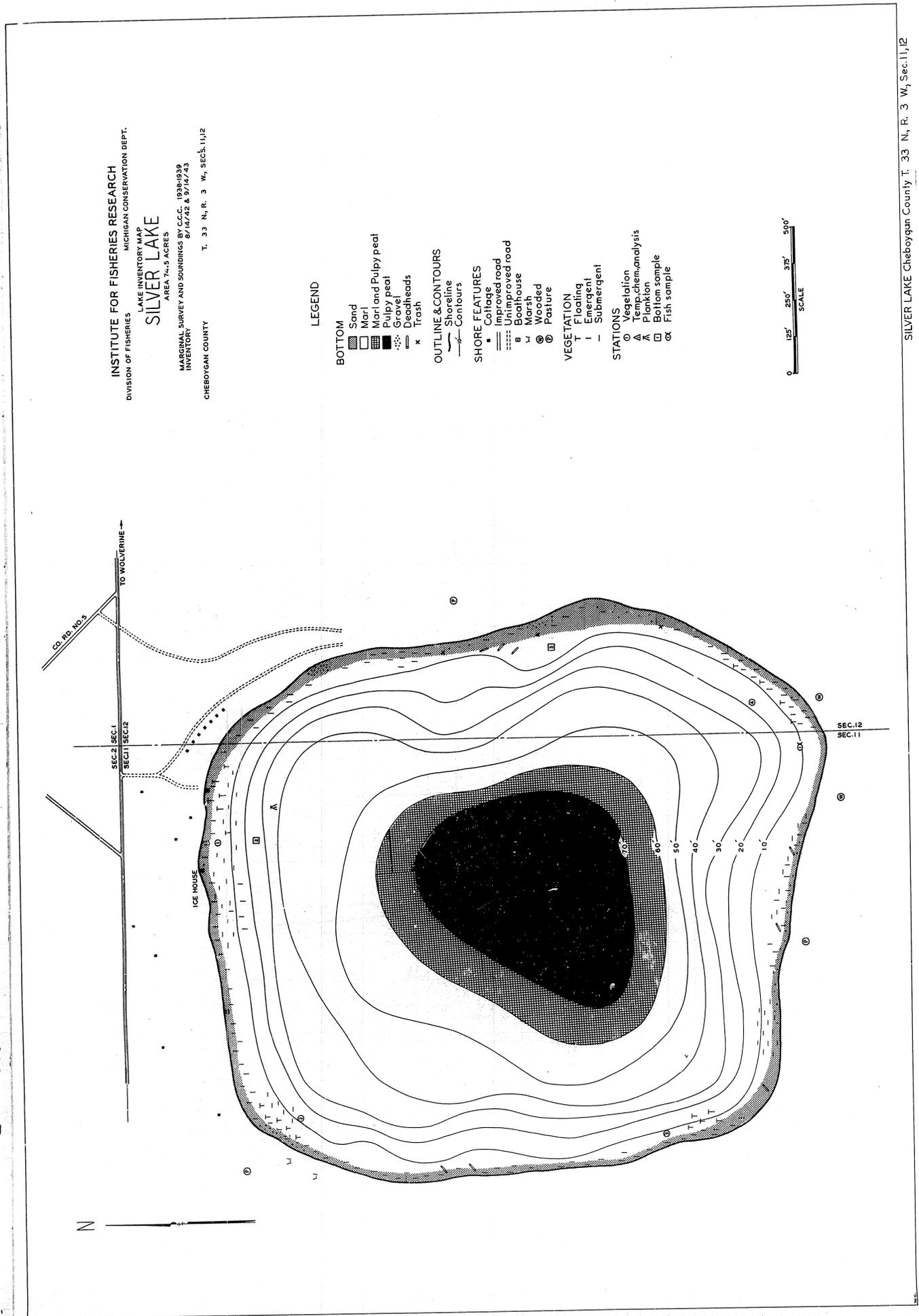


Figure 2. Hydrographic map of Silver Lake, Cheboygan County.



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Table 1. Temperature and dissolved oxygen profile of Silver Lake, measured on August 18, 2010.

<b>Depth</b>	<b>Temperature (°F)</b>	<b>Dissolved Oxygen Concentration (ppm)</b>
Surface	75.6	11.40
2.6	75.6	11.37
5.6	75.6	11.15
8.5	75.5	10.90
11.7	75.5	10.59
14.8	75.4	10.33
17.8	75.3	10.06
20.9	75.3	9.86
24.1	75.0	9.61
27.3	70.0	13.27
29.9	66.5	12.73
33.6	63.0	12.04
36.9	59.1	10.72
40.1	56.4	10.57
43.0	54.8	9.91
46.7	52.2	9.48
47.9	51.5	8.26
51.5	49.6	6.34
55.5	48.3	5.38
58.9	47.6	4.35
62.2	46.9	2.73
65.5	46.4	1.49
66.2	46.3	0.78
71.3	46.2	0.36
70.7	46.1	0.16

Table 2. Shoreline sampling of Silver Lake conducted August 18, 2010.

<b>Transect</b>	<b>No. small docks</b>	<b>No. large docks</b>	<b>No. of dwellings</b>	<b>% Shoreline armored</b>	<b>No. submerged trees</b>
1	0	10	25	0	5
2	1	8	11	2	0
3	0	6	5	0	0
4	0	3	6	4	0
5	1	7	14	1	0
6	0	8	13	0	0
<b>Total</b>	<b>2</b>	<b>42</b>	<b>74</b>	<b>7</b>	<b>5</b>

Table 3. Rainbow trout (Eagle Lake strain) stocking in Silver Lake, Cheboygan County, 2000 – present.

<b>Year</b>	<b>Number</b>	<b>Avg. Length (in.)</b>
2000	1,400	6.56
2000	3,400	7.24
2001	5,000	6.04
2002	5,260	6.88
2003	5,760	6.6
2004	6,000	6.08
2005	6,000	6.24
2006	5,000	6.56
2007	5,900	6.08
2007	10,000	3.28
2008	5,700	7.12
2009	5,900	7.24
2010	5,700	5.96
2011	5,700	6.24

Table 4. Number, percent, length range, and growth of fish species found in Silver Lake, Cheboygan County, Michigan, May 24-27, 2010. Growth is not reported for non-game fish and for species having a small sample size in our collection.

<b>Common Name</b>	<b>Number</b>	<b>Percent by Number</b>	<b>Percent by Weight</b>	<b>Length Range (in.)</b>	<b>Growth</b>
Bluegill	200	7.3	8.6	1-9	-0.2
Common shiner	426	15.6	0.1	1-2	--
White sucker	19	0.7	18.2	10-22	--
Emerald shiner	768	28.1	0.1	0-3	--
Green sunfish	75	2.7	0.9	1-5	--
Northern pike	4	0.1	6.2	18-32	--
Pumpkinseed	307	11.2	17.5	2-8	-0.3
Rainbow trout	2	0.1	0.2	9-10	--
Rock bass	769	28.1	30.3	1-12	-1.5
Smallmouth bass	67	2.4	12.5	2-18	-2.4
Walleye	2	0.1	1.7	20-20	--
Yellow perch	93	3.4	3.6	4-11	-1.2

Table 5. Length-frequency distribution of sportfish collected at Silver Lake during the 2010 status and trends survey.

<b>Length Group (in.)</b>	<b>Blue-gill</b>	<b>North-ern pike</b>	<b>Pumpkin-seed</b>	<b>Rainbow trout</b>	<b>Rock bass</b>	<b>Small-mouth bass</b>	<b>Walleye</b>	<b>Yellow perch</b>
1	1				2			
2	11		1			3		
3	39		18		27	2		
4	36		54		132	4		1
5	43		81		173	5		6
6	30		101		141	6		72
7	27		49		59	7		10
8	11		3		20	9		2
9	2			1	9	4		
10				1	4	5		1
11					1	6		1
12					1	6		
13						1		
14						2		
15						5		
16						1		
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32		1						