

# Summary of Activities

**Date:** November, 2016

**To:** Ian Kitch  
Conservation & Water Stewardship  
Cc: Lloyd Rowe, Jonathan Stephens  
Blue Lake Cottage Owners  
Blue Lakes Resort - Arch & Dawn Dowsett

**From:** Holly Urban, Brock Koutecky &  
Megan Paterson - Swan Valley Sport  
Fishing Enhancement Technical Staff  
**Contact:** svsfe@mymts.net

**Subject:** East Blue Lake Trout Maintenance 2016

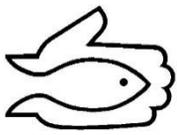
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**Location:** East Blue Lake, Duck Mountain Provincial Forest, 14U 367303 5717799

**Background Information:** With a rising concern regarding the degrading fishing quality (specifically rainbow trout) in East Blue Lake, SVSFE technicians further investigated the concern in the field season of 2015. Following the fish inventory study, along with extensive literature review, SVSFE provided suggestions for further monitoring/management in the fall of 2015 (See Prj 15-004 SVSFE's IFIA for more details). The 2015 recommendations are as follows:

1) Monitoring: It appears that current monitoring methods of East Blue Lake are not representative. Brook Trout Index Netting (BTIN) has proven to not accurately represent stocked rainbow trout composition, and therefore should be discontinued as the appropriate method for evaluating rainbow trout stocks. In terms of electrofishing, it was also an ineffective capture method. The lake's lack of accessible littoral area (area of depth <3m) has proven to be problematic in regards to capturing all cohorts of stocked trout. Perhaps electrofishing during cooler temperatures (either early spring or late fall) could be a considered method in the future. Trap-netting has also been a insignificant method due to lack of ideal depths for sampling. At current, it is suggested that monitoring be conducted through closely monitoring angling success through either voluntary creel, barrel counts, monitoring the master angler awards, and "keeping in touch" with Blue Lakes Resort - Arch and Dawn Dowsett, who are a great asset in terms of monitoring angling quality in the lake.





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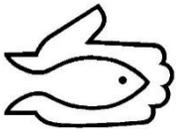
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## **Background Information cont'd:**

2) Stocking: Fisheries Branch staff suggests a "switch" from the current spring & fall stocking program to a spring only stocking program. According to Kerr (2000) there are endless peer-reviewed case studies that suggest survival is greater with spring stocking rainbow trout as opposed to fall-stocking. This phenomena has been documented time and time again through various scientific methods and creel surveys. With regards to stocking methods, the approach of scatter stocking is preferred. This method is currently conducted by fisheries branch when assistance is available but not implemented as a mandatory practice. Mueller and Rockett (1961) reported that predation on rainbow trout was significantly less when fish were released over deep (e.g. 12-18m) water sites.

In terms of rate and size, is suggested to lower the rate of stocking. Many believe stocking more will return high angling results, but this is not the case. Overstocking can also result in slow growth and reduced condition (Bailey, 1958). Overall, it is better to understock than to overstock (Brown and Thoreson, 1958). There are several rates recommended by various departments in Canada and the United States which all include different influencing factors to weigh out. Few to mention; Michigan, recommends 2-25 yearlings/acre (5-62 fish/hectare) in large, oligotrophic lakes with multi-species (1977, MDNR), while Ontario stated 350 yearlings/hectare of water <6m (for water possessing TDS>100mg/L) (1982, OMNR). Note both rates equate to far less than 10,000 fish annually. It was also suggested to stock fish at a greater size; with an ideal size being 18cm or greater. There have been various studies conducted regarding stocking size and classifying fisheries, which in most cases relate specifically to the fish community and presence of predators and/or competitors. In this case walleye and fish eating birds are a prevalent predators, and white sucker are a prevalent competitor. Further discussions are required to develop the best suited stocking rate for rainbow trout in East Blue Lake, but through literature, it appears the rate for rainbow trout stocking should not exceed 10,000 yearlings(18+cm) per year or 100 yearlings per hectare.





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## **Background Information cont'd:**

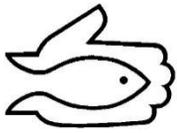
### 3) Lake Maintenance:

In the case of East Blue, it has been recently identified that white suckers may be negatively effecting the survival of rainbow trout in the current system. Looking back on historic data, there is no evidence of white suckers in the fish community. Conversations with long-term lake users the common theme is "there were never suckers in this lake", or "as far back as I can remember, I've never seen so many suckers". It is not fully known if white-suckers are completely new to the ecosystem, however it is believed that sucker recruitment has increased significantly with the creation on new habitats directly associated with recent high water periods. Regardless, following 2015 assessments, 3/4 of the species composition consist of white-suckers which is a growing concern.

Several studies have demonstrated a negative relationship between white suckers and rainbow trout (Kerr, 2000). The diet of rainbow trout, white-sucker and longnose sucker was found to overlap considerably in Paine Lake, Alberta (Barton and Bidgood, 1979). Bidgood and Barton (1982) noted that the presence of suckers resulted in decreased growth rate of stocked rainbow trout. Alexander (1975) found survival of stocked rainbow trout was reduced after the introduction of white sucker in both East Fish Lake and Fuller Pond in Michigan. The was attributed to a reduction of benthos populations (Kerr, 2000). Upon literature review, it becomes apparent that there is significant information pertaining to the negative relationship between rainbow trout and white suckers. For more information a great literature review can be found on the OMNR website titled Rainbow Trout Stocking in Inland Lakes and Streams: An Annotated Bibliography and Literature Review by S.J. Kerr and T.A Lasenby, 2000.

Following further investigations regarding white sucker removal as a management objective in rainbow trout fisheries: Reesor Lake Alberta is managed as a rainbow trout fishery and corresponding decreased angling quality in 1978 test-netting indicated a 85% composition of white sucker (Bradford, 2004). It was determined that white suckers invaded the lake via an outflowing tributary. Managers suggested a full lake reclamation as suckers compete with trout for food and are considered detrimental to trout production (Bradford, 2004). A chemical reclamation removed white suckers in 1979. Success was monitored through creel census. In 1984 the catch rate was significantly higher (0.22 trout per hour), than in 1979 (0.05 trout per hour) which was conducted before the suckers were removed from the lake (Bradford, 2004).

Another "successful" white sucker removal program on a rainbow trout fishery was conducted on Twin Lake, Alberta in 1991 (Government of Alberta, 2014). A similar program was conducted on Lake Tanycomo, Utah in the 1980's. And again, yet another successful "biomanipulation" program of white suckers was conducted in a brook trout fishery in Maine (Obrey, 2014). Please refer to literature cited for further information if required.

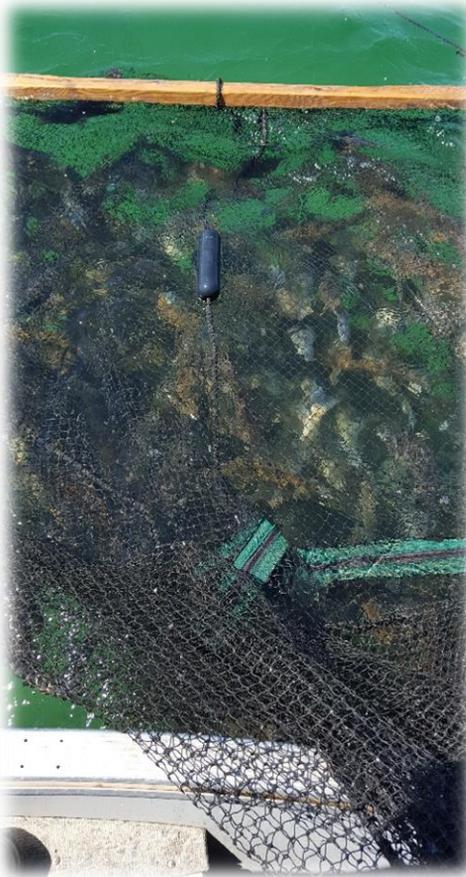


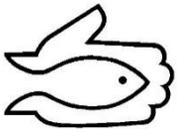
# Summary of Activities

**Subject:** East Blue Lake Trout Maintenance 2016

**2016 Trout Maintenance Program:** It is evident, white sucker removal programs can be a benefit to trout fisheries. The province of Manitoba invests dearly into the current trout program which attracts anglers from far and wide. It has been recently identified, some of these waterbodies require specific maintenance programs in order to continue to grow big fish. More specifically, the problems are directly associated with invasions of competitive/predatory species as a result of either high water or human fowl-play. For example, this has been noted in multiple FLIPPR lakes including Tokaryk and Pybus, as well as local lakes including Two-Mile and Gull where yellow perch have basically over-run these popular trout fisheries and in-turn decreased fishing quality significantly.

In terms of maintenance, removal programs of these predators/competitors have recently been suggested and in a few cases, implemented. In 2016, SVSFE and provincial fisheries staff conducted non-salmonid removal programs on East Goose, West Goose, Patterson, Tokaryk, Pybus, Two Mile, Gull, Glad, and now East Blue Lakes to help facilitate stocked trout growth and survival. The idea here is to identify negative relationships detrimental to stocked trout and implement maintenance programs to help aid and eliminate these negative relationships. The East Blue removal program was conducted by SVSFE, Intermountain Sport Fishing Enhancement Inc and Manitoba Sustainable Development - Fisheries Branch.





# Summary of Activities

**Subject:** East Blue Lake Trout Maintenance 2016

**Results:** In the spring of 2016, the program initiated a "sucker removal program" on East Blue Lake with the intention of (1) to further quantify white-sucker invasion, and (2) removing as many white-suckers as possible from the lake based on literature review and suggestions from 2015 and (3) develop an effective yet long term management program for East Blue Lake. Beginning on May 30<sup>th</sup> and concluding on June 7<sup>th</sup> 2016, team members used large ESTN trap nets, electrofishing and short set gill netting as the primary methods for white sucker removal.

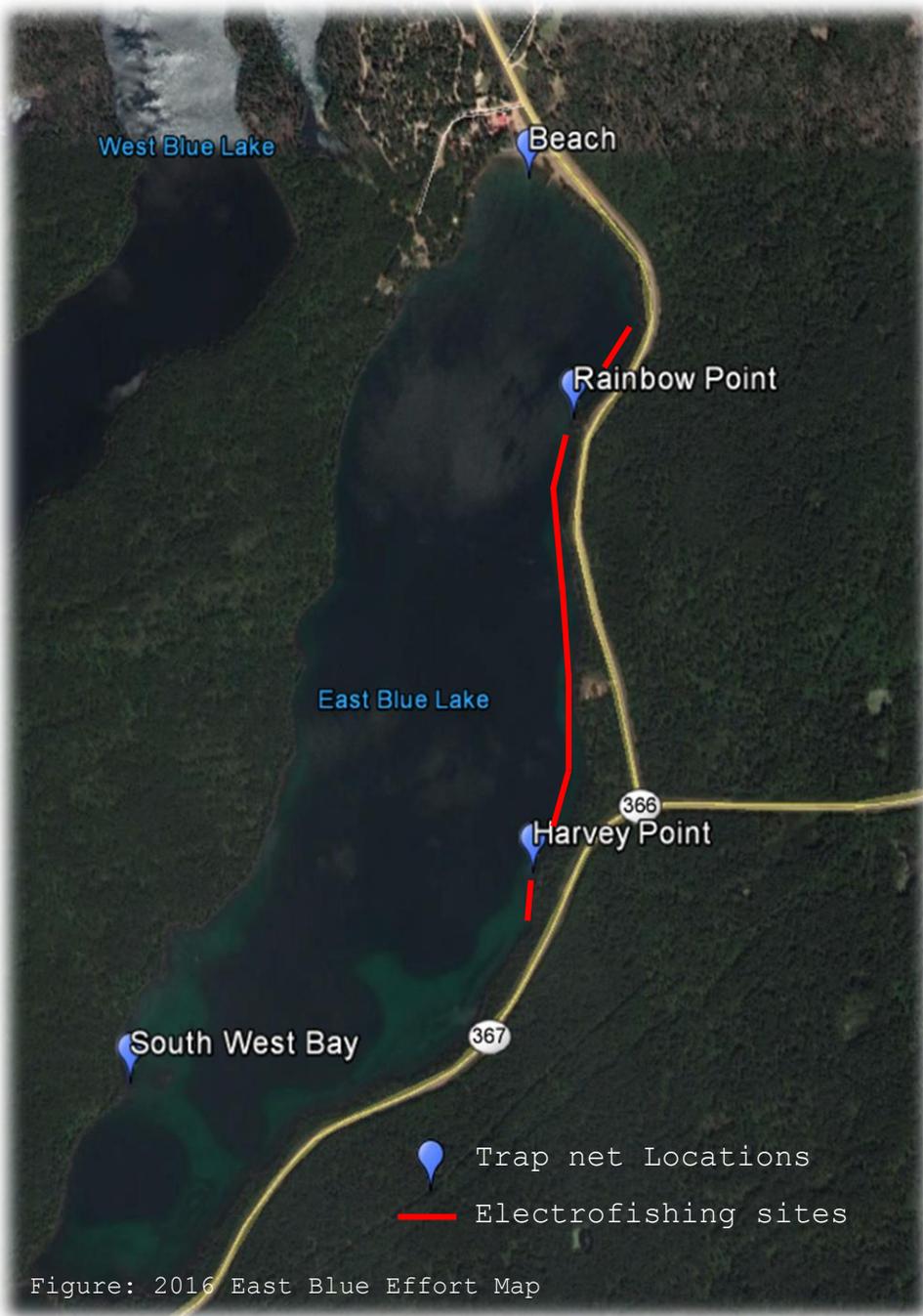
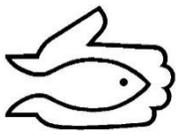


Figure: 2016 East Blue Effort Map



# Summary of Activities

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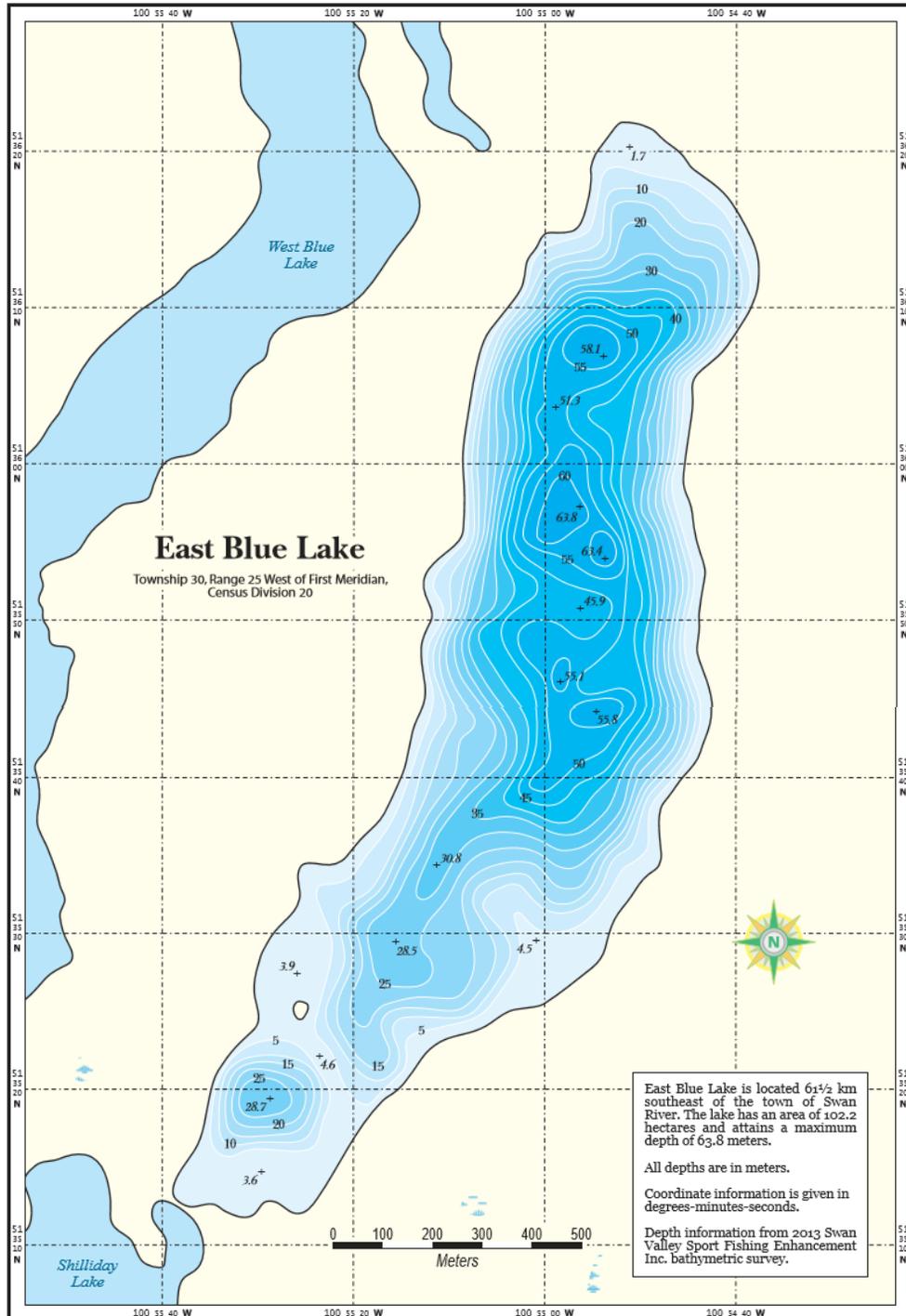
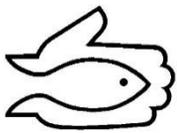


Figure: 2016 Depth Map depicting very little littoral areas suitable for trap netting



# Summary of Activities

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**White Sucker Removal:** White suckers captured were (1) transferred to Sinclair Lake or (2) donated to locals. Catches far exceed expectations with a total of 3,576 suckers caught through various methods and transferred; 2,992 (84%) transferred to Sinclair Lake, and 584 (16%) were donated to locals. From the total catch, 37 were randomly sampled and found a mean weight of 813 grams per fish. This would equate to approximately 2.9 tonnes of fish removed.

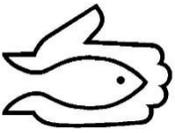
In terms of methods, trap netting was the most productive with regards to number of fish caught. Four net locations were attempted (figure on page 5). These sites included the main beach, Harvey Point (Kabooki Point), Southwest Bay and Rainbow Point (see table below). In summary, the beach and Harvey point were the most successful trap netting locations. In total, trap-netting effort equated to 355.6 hours and 3354 white-suckers removed (9.43 fish/hour).

Trap Netting			
Site	# of Fish	Effort (hours)	CPUE (fish/hour)
BOAT LAUNCH	1900	180.8	10.5
HARVEY POINT	1280	125.3	10.2
SOUTHWEST BAY	80	26.7	3.0
RAINBOW POINT	94	22.8	4.1
<b>Total</b>	<b>3354.0</b>	<b>355.6</b>	<b>27.8</b>

In terms of electrofishing, the most successful area was the east shore on the exposed rocky points where the white-suckers were spawning between and including Rainbow point and Harvey point. Electrofishing effort equated to 1.489 hours and 500 white-suckers caught (335.79 fish/hour). Unfortunately 300 suckers escaped from covered holding pens overnight and only 200 fish were removed.



In terms of gill netting, a total of seven gills were set with a total effort of 3.08 hours. Through these efforts a total of 22 white-suckers were captured equating to 7.14 fish/hour. It is important to note, gill netting was conducted prior to May 30<sup>th</sup> and white suckers were not as congregated. But while gill netting, it was observed many fish would escape while lifting the net and deemed an insufficient method and therefore discontinued.

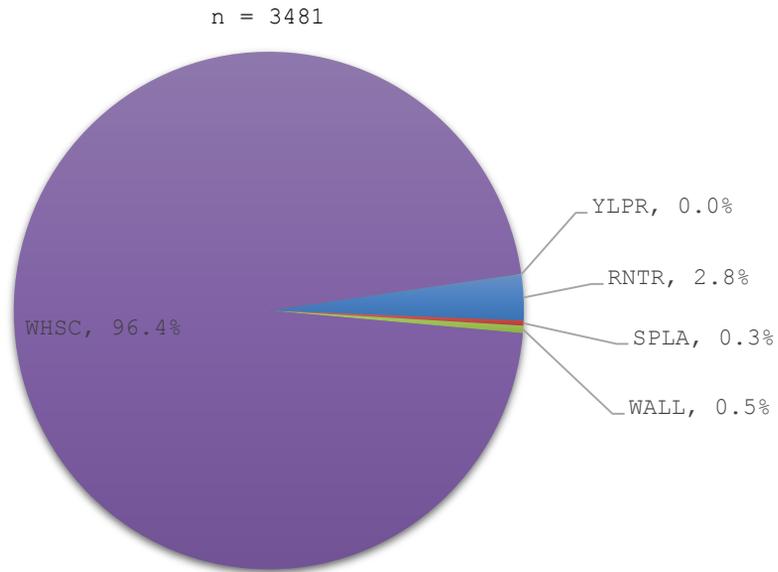


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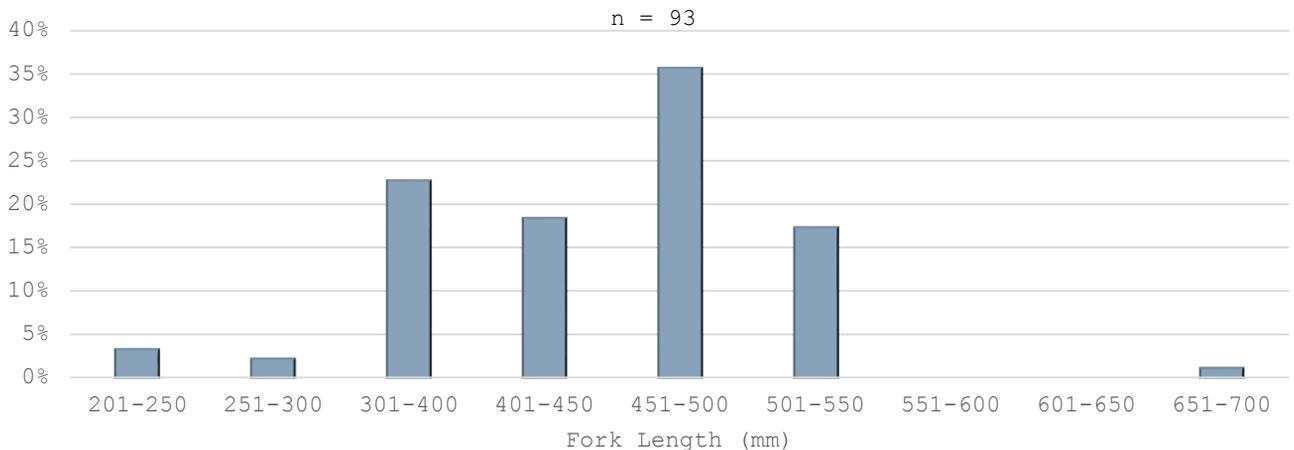
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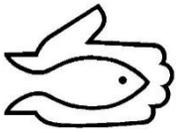
**Other Game Species:** Trout and walleye captured during the removal were measured, tagged, and released. Not too many conclusions in regards to population dynamics can be drawn from these catches mostly due to the fact that efforts were focused primarily on white sucker capture. Results do however provide a better understanding on growth and habitat preference. Interestingly, recaps indicated rainbow trout favored the north and east shorelines within littoral areas during this time year, with high frequencies of recaptures at the beach area. Additional info on game species caught during the removal program are as follows:

## 2016 EAST BLUE LAKE Trap Netting - Species Composition



## 2016 EAST BLUE LAKE Rainbow Trout Length Frequencies

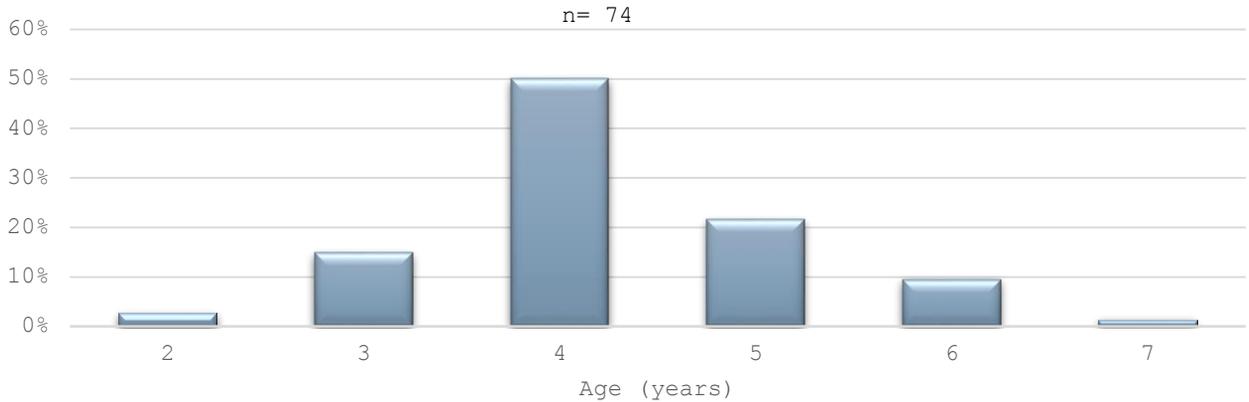




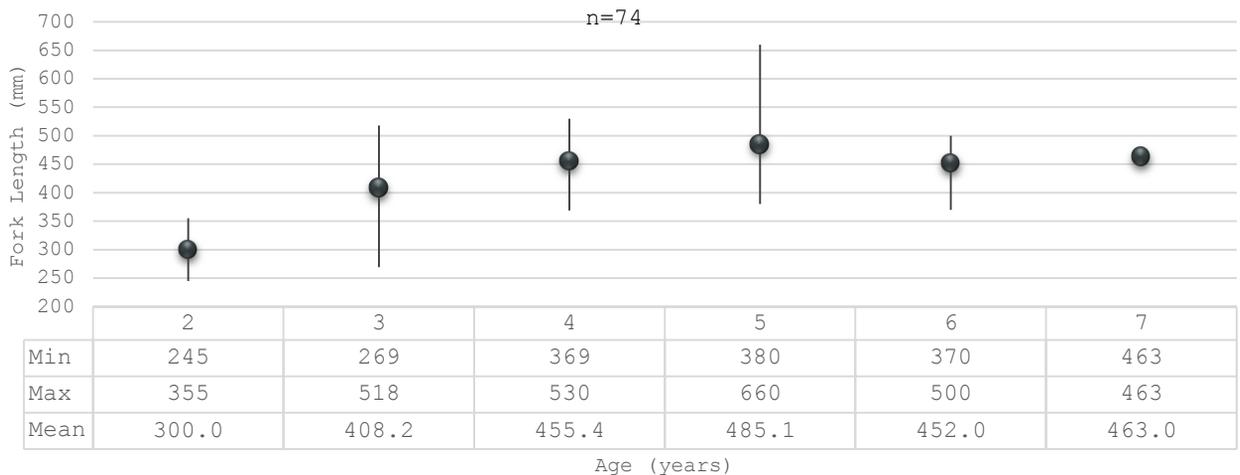
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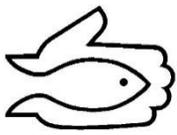
## 2016 EAST BLUE LAKE Rainbow Trout Age Frequencies



## 2016 EAST BLUE LAKE Min, Max, Mean Fork Length of Rainbow Trout



In terms of rainbow trout, a total of 93 different individuals were captured and multiple recaps (n=57) with some individuals caught multiple times. Average length of rainbows was 441.6mm. Aging analysis indicated a strong year class at age four. On average, four year old rainbows were 455 mm in length. Interestingly, some rainbows reached master angler size as early as three years old. It is speculated rainbows are more likely to reach this size at age five or six. On average all age classes remained below the master angler size.



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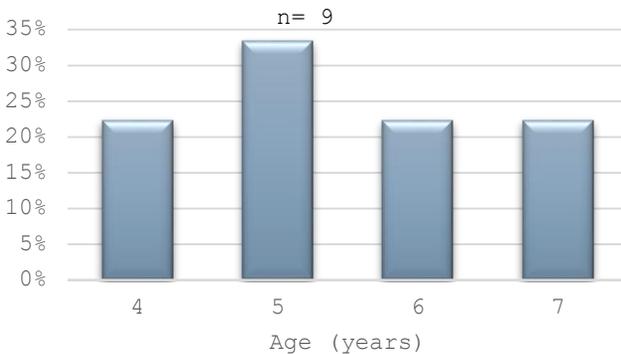
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The strong four year age class could be a result of either 12-15cm fall stocking in 2012 or 18+ cm stocking in 2013. 2013 stocking records indicate a remarkable number of 18+ cm rainbow being stocked both in the spring and fall, totaling 30,000 fish. Interestingly, in the fall of 2011 - 40,000 and in the fall of 2014 - 31,000, 12-15cm rainbows were stocked in addition to spring stocking. There is little evidence of success to these high stocking rates of smaller trout. In regards to the 2013 stocking, the stocking of 18+ in the **fall** was not a typical practice, therefore more investigations are required to understand whether these fish are the true contributors to the higher age cohort. Future surveys will reveal more light on the success of stocking 18+ in the spring as this is the current stocking practice but it will take time for these fish to become susceptible to catchment.

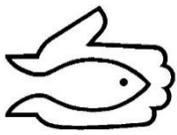
Year	Season	Size (cm)	# of Fish
2009	Spring	18+	5,000
	Fall	12-15cm	25,000
2010	Spring	18+	5,000
	Fall	12-15cm	15,000
2011	Spring	18+	8,300
	Fall	flg	40,000
2012	Fall	12-15cm	19,500
2013	Spring	18+	5,000
	Fall	18+	25,000
2014	Spring	18+	6,000
	Fall	12-15 cm	25,000
2015	Spring	18+	15,400
2016	Spring	18+	14,920
Total			209,120



**2016 EAST BLUE LAKE  
Splake Age Frequencies**



In terms of splake, a total of 15 were captured (average length 572mm). Interestingly, the last stocking of splake was in 2010. None of the ages received correlate with stocking records and may indicate the variance in the growth/development of scales. Additionally, confidence levels were generally low for splake (< 7) and it can be assumed that all the splake caught in 2016 are a result of the 2010 stocking, which would be 8 years old.

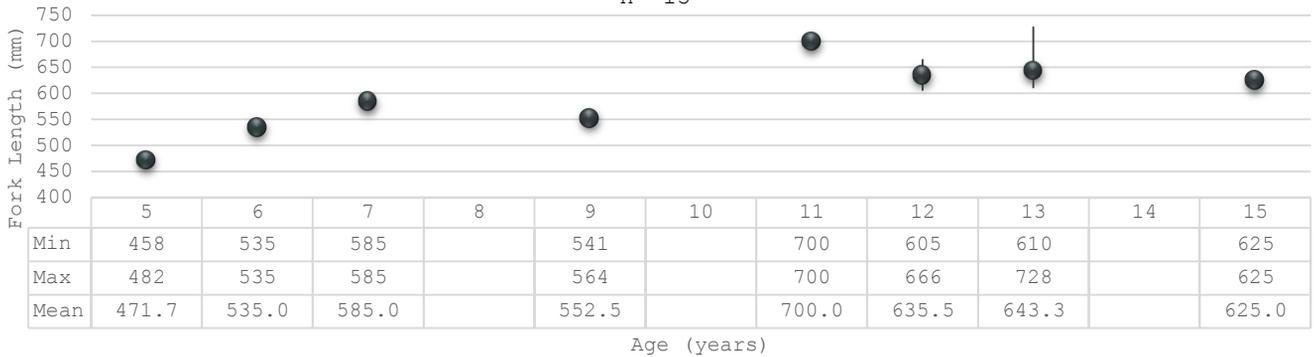


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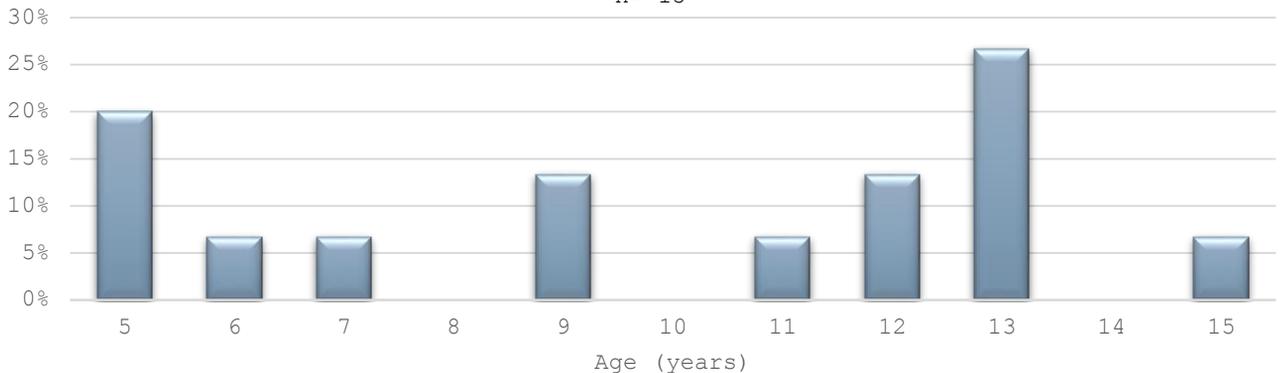
## 2016 EAST BLUE LAKE Min, Max, Mean Fork Length of Walleye

n= 15



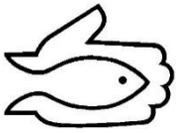
## 2016 EAST BLUE LAKE Walleye Age Frequencies

n= 15



Regarding walleye, a total of 16 were caught with an average length of 588mm. Ages varied from 5 to 15 years and all fish appeared to be quite healthy living in this trout fishery. Although these fish are top predators, anglers appear to be enjoying the presence of this species and keep the population at a maintainable level.

In terms of other percoid species, only one yellow perch at 210mm was captured throughout the removal program.



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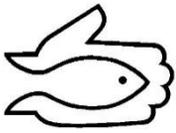
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**Discussion:** In summary it appears the white-sucker numbers may be greater than previously understood. As the program went on, CPUE dropped, however not significantly suggesting a high population of white-suckers still exists in East Blue Lake. Interestingly, from general observation there was very little evidence of younger white-suckers and a vast majority of the total sample was considered mature. As the summer went on we had continued reports of some anglers catching suckers using suspended gang trolls over deep water. For these reasons, it is suggested that trout maintenance continue in the spring of 2017.

**Suggestions:**

- 1) Short set gill netting is not recommended for capturing white suckers, as many fish escape while lifting short-set gills.
- 2) The true success of this program was entirely do to the fact that timing was ideal, as white-suckers were congregated in the shallows and spawning. It is imperative that in future years the removal program directly correlate with the congregation and spawning of white-suckers (12°C in 2016) and timed around the first week in June.
- 3) Trap netting efforts and locations should replicate areas of 2016, and as CPUE drops nets may be capable of fishing multiple days as long as water remains cool.
- 4) An after dark shoreline cruise with a spotlight be conducted to identify any other currently unknown spawning areas to target.
- 5) Use of the electrofishing boat be scheduled for this program as it was very effective in capturing white-suckers where netting wasn't possible. To keep costs down it is suggested that small crews (3 people) go out in shifts and shock spawning areas.
- 6) Holding-pens be upgraded and/or modified to limit unattended escapement.
- 7) Markets for white-suckers be determined and scheduled prior to removal program. The fewer fish transferred to other waterbodies (i.e. Sinclair) the more efficient the program will be.
- 8) This program should continue until species composition of suckers reaches manageable levels (ie. below or near 25%) or until trout angling quality has dramatically improved.
- 9) Removals occur prior to spring stocking, and communication with hatchery staff regarding intended stocking dates be imperative!!!!





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