

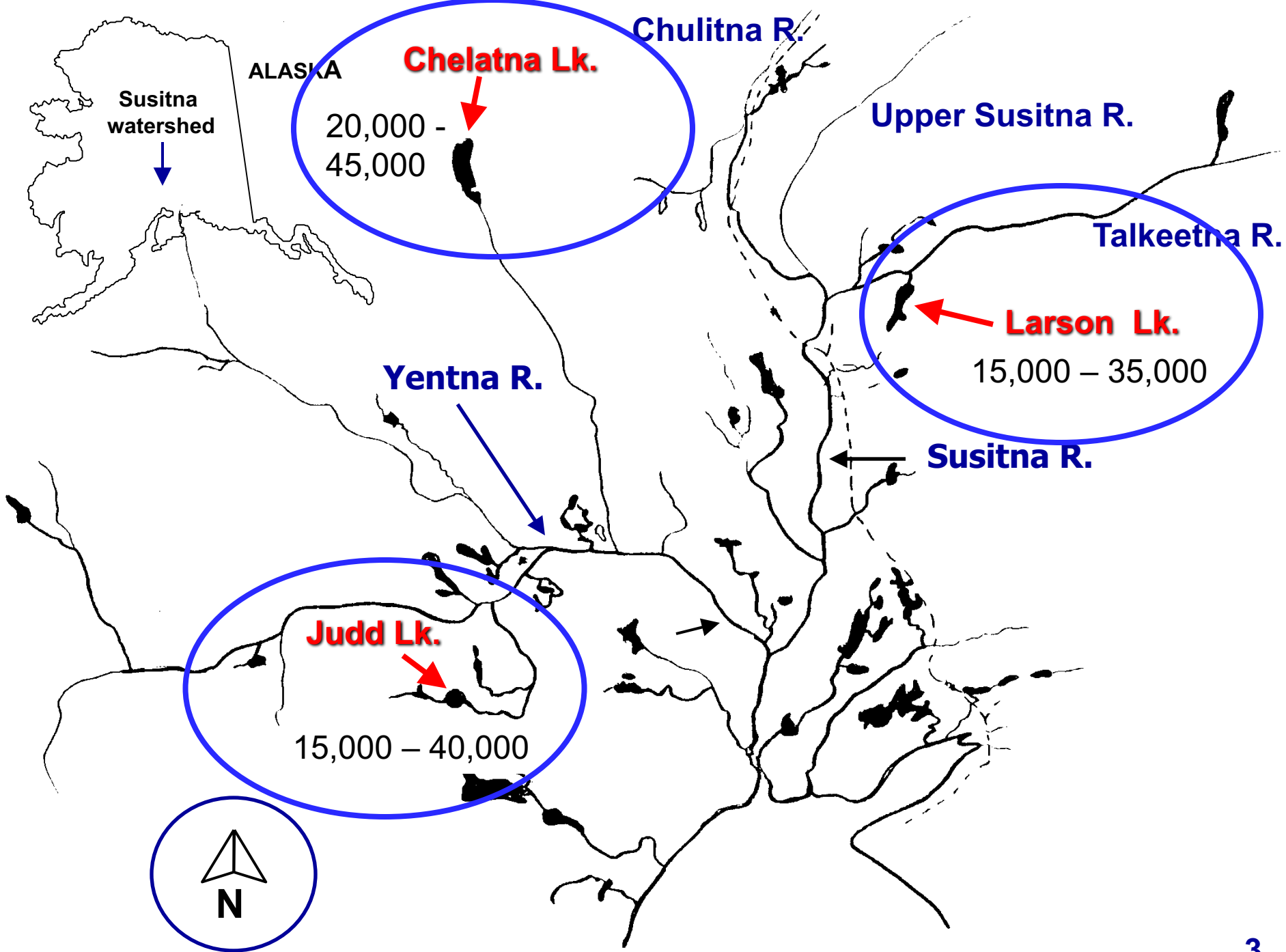
# Chelatna Lake Northern Pike Suppression Project - 2017

By

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# Objectives

- **Remove northern pike from Chelatna Lake during the spring salmon smolt migration using variable-mesh gillnets and hoop traps.**
- **Compare northern pike catch per effort in variable-mesh gillnets with data collected in 2010-2012.**
- **Estimate the increase in adult sockeye salmon returns resulting from the removal of pike predators during this project.**
- **Compare average sockeye salmon adult returns per spawner during the 5 years preceding the project and the 5 years after project completion.**

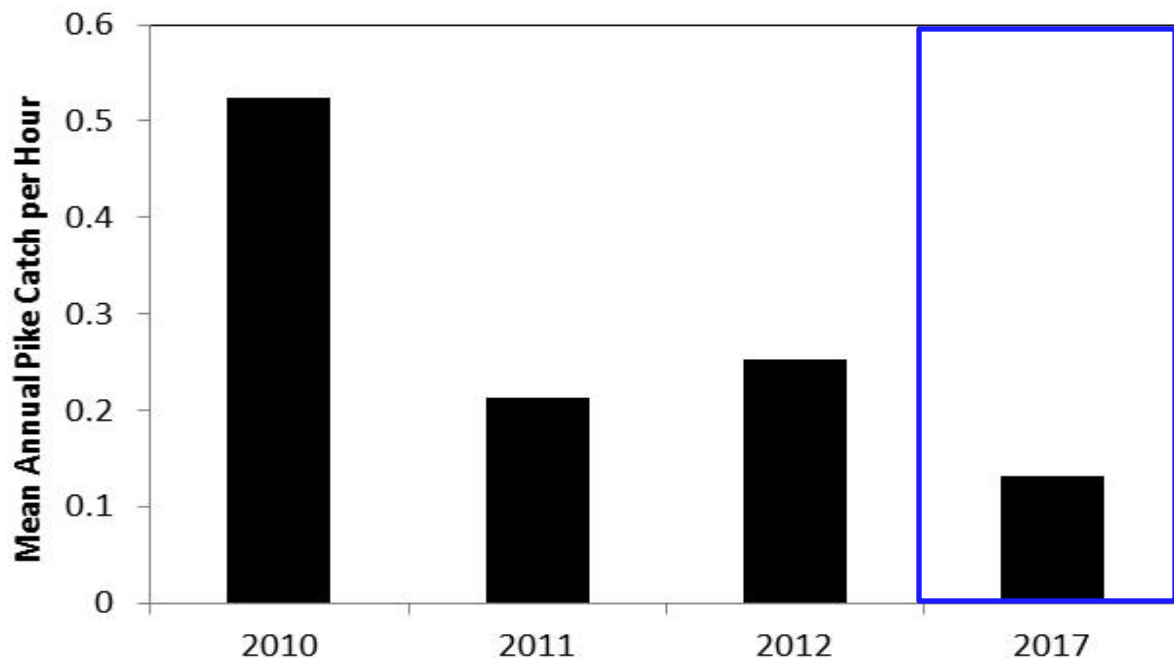
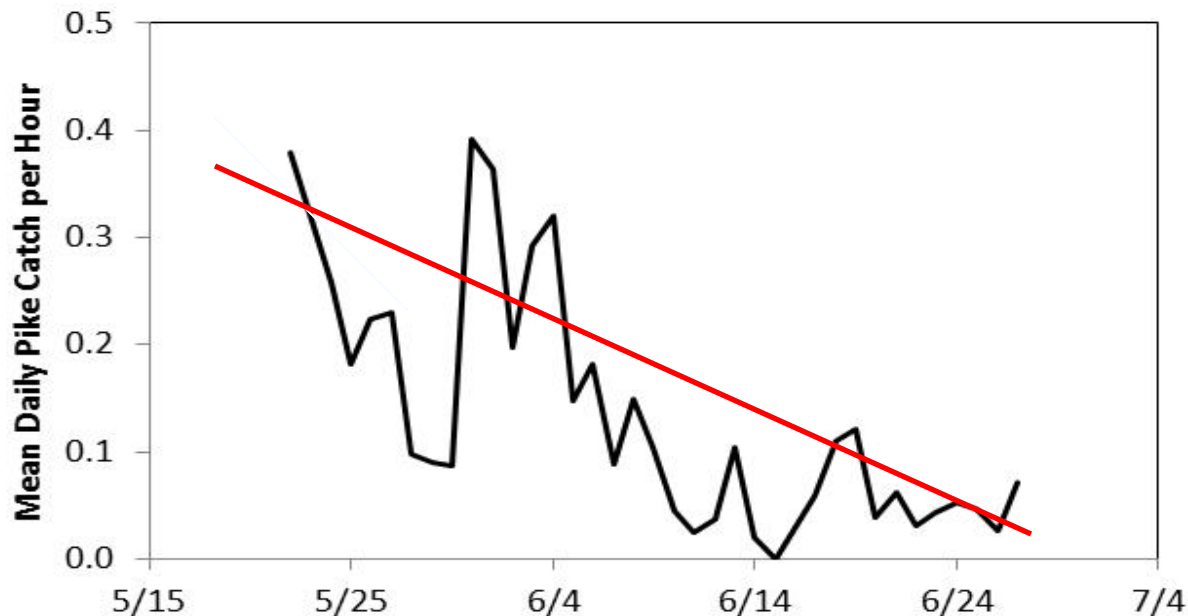


# Euphotic Volume Model Estimates of Sockeye Salmon Production

Drainage	Lake	Lake Area (acres)	Adult Production	Percent
Chulitna	Byers	368	37,200	3.80%
	Swan	385	11,000	1.10%
	Spink	252	23,500	2.40%
	Bunco	106	1,600	0.20%
	<b>Total</b>	<b>1,111</b>	<b>73,300</b>	<b>7.60%</b>
Mainstem	<b>Caswell</b>	<b>159</b>	<b>13,700</b>	<b>1.40%</b>
	<b>Trapper</b>	<b>1,188</b>	<b>16,800</b>	<b>1.70%</b>
	<b>Fish</b>	<b>132</b>	<b>10,600</b>	<b>1.10%</b>
	<b>Sucker</b>	<b>273</b>	<b>8,300</b>	<b>0.90%</b>
	<b>Red Shirt</b>	<b>1,272</b>	<b>69,500</b>	<b>7.20%</b>
	<b>Neil</b>	<b>115</b>	<b>7,600</b>	<b>0.80%</b>
	<b>Total</b>	<b>3,139</b>	<b>126,500</b>	<b>13.00%</b>
Talkeetna	<b>Larson</b>	<b>437</b>	<b>45,100</b>	<b>4.60%</b>
	Stephan	899	63,700	6.60%
	<b>Total</b>	<b>1,336</b>	<b>108,800</b>	<b>11.20%</b>
Yentna	<b>Chelatna</b>	<b>3,906</b>	<b>363,574</b>	<b>37.50%</b>
	Trinity	308	19,300	2.00%
	<b>Whiskey</b>	<b>271</b>	<b>23,600</b>	<b>2.40%</b>
	<b>Fish Creek</b>	<b>111</b>	<b>9,000</b>	<b>0.90%</b>
	<b>Shell</b>	<b>1,293</b>	<b>90,265</b>	<b>9.30%</b>
	Puntilla	90	8,800	0.90%
	<b>Eightmile</b>	<b>115</b>	<b>5,600</b>	<b>0.60%</b>
	Movie	110	6,700	0.70%
	<b>Lockwood</b>	<b>233</b>	<b>11,000</b>	<b>1.10%</b>
	<b>Judd</b>	<b>316</b>	<b>59,500</b>	<b>6.10%</b>
	<b>Hewitt</b>	<b>697</b>	<b>60,600</b>	<b>6.20%</b>
	Red Salmon	113	3,400	0.40%
<b>Total</b>	<b>7,563</b>	<b>661,339</b>	<b>68.20%</b>	
<b>Grand Total</b>		<b>13,149</b>	<b>969,939</b>	<b>100%</b>

- **Number of Net Sets with Variable-mesh Gillnets** **357**
- **Number of Net Sets with Hoop Traps** **184**
- **Number of Pike Removed** **958**
- **Number of Pike Stomachs Examined** **642**

# Pike Catch per Hour in Variable-Mesh Gillnets



**Pike Catch per Hour Declined In 2017**

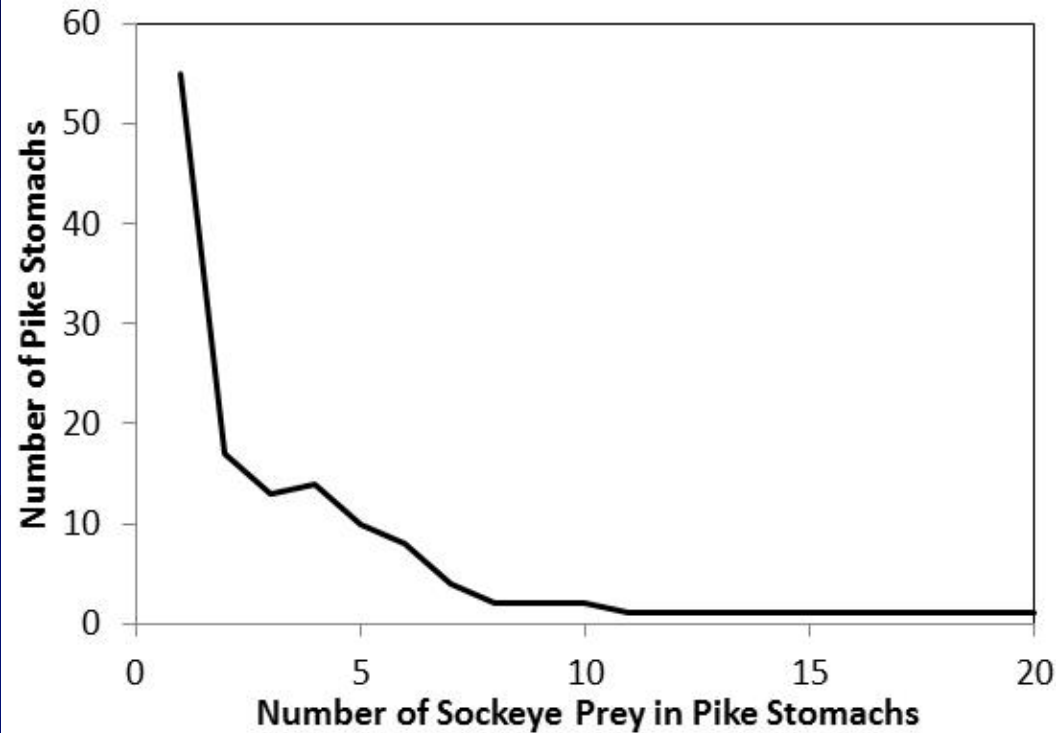
**Pike Catch per Hour was Lower in 2017 Compared with 2010-2012**

# Pike Age Composition and Salmon Consumption by Pike Age Class

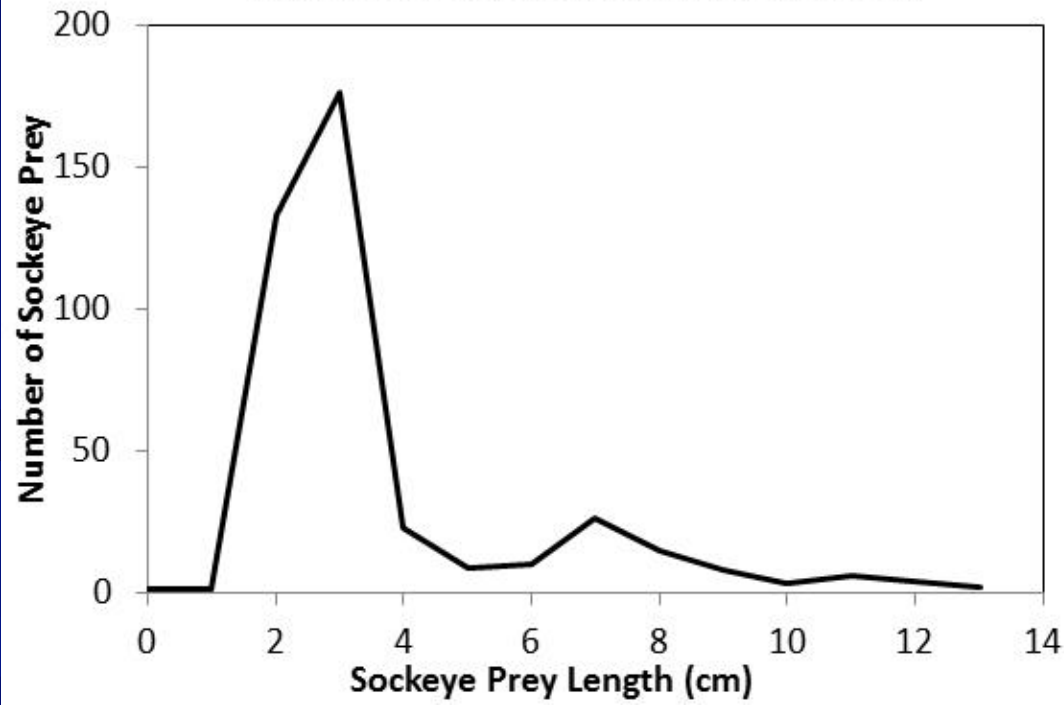
Pike Age Class	Pike Removed by Age		Salmon in Stomachs by Age	
	Number	Proportion	Number	Proportion
1	127	0.13	139	0.33
2	146	0.15	155	0.37
3	410	0.43	83	0.20
4	149	0.16	24	0.06
5	23	0.02	0	0.00
6	35	0.04	2	0.00
7	35	0.04	13	0.03
8	18	0.02	0	0.00
9	6	0.01	0	0.00
<b>Total</b>	<b>952</b>	<b>1.00</b>	<b>417</b>	<b>1.00</b>



# Frequency of Occurrence of Juvenile Sockeye Salmon in Pike Stomachs and their Size Distribution



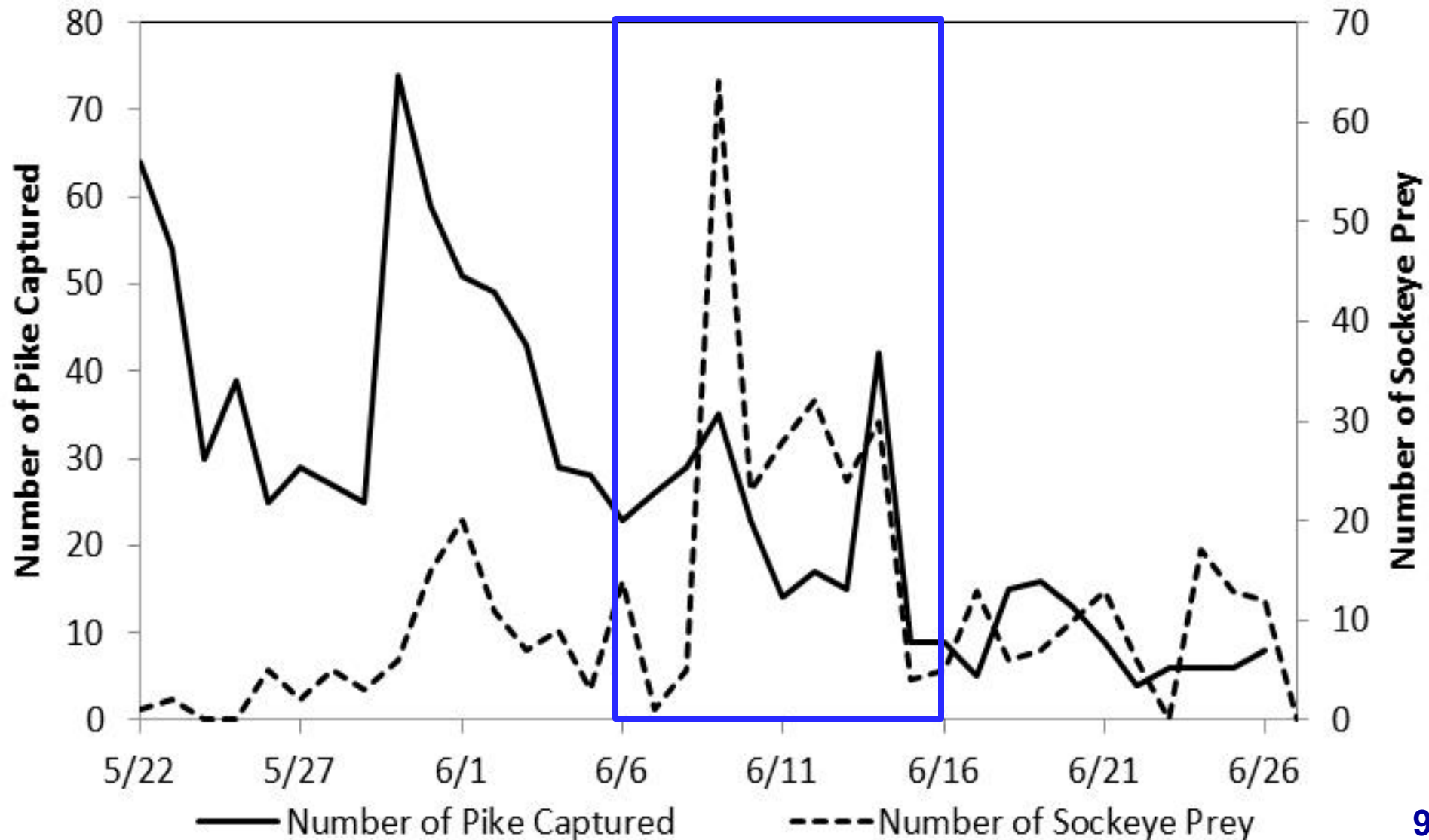
**84% of Pike Stomachs Contained <5 Salmon**



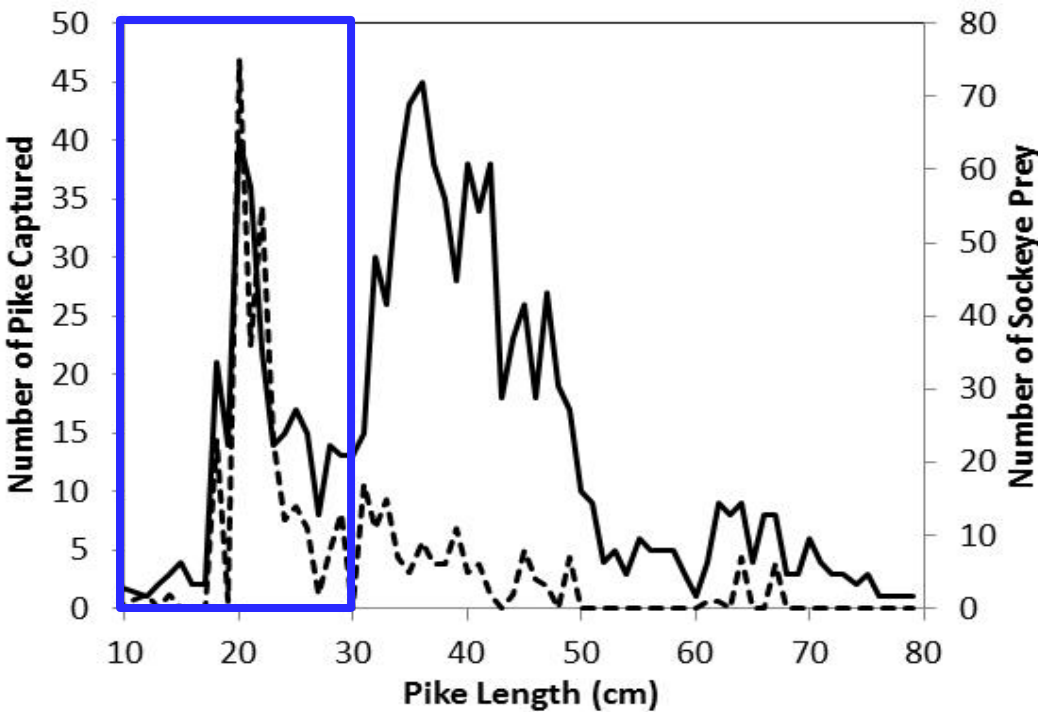
**80% of Sockeye Salmon Prey were Age-0 Fish <5 cm in Length**



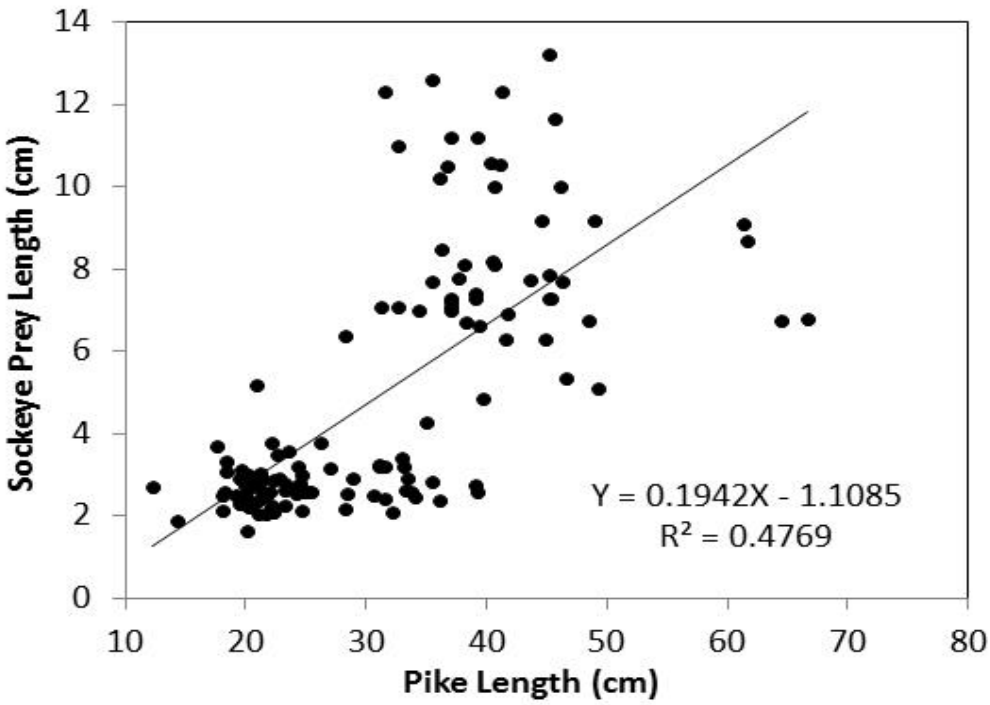
# Number of Pike Captured and Number of Sockeye Salmon Prey by Date



# Pike and Juvenile Sockeye Salmon Prey Length Distributions and Prey-Predator Length Relationship



**Pike <30 cm in Length Consumed 67% of the Sockeye**



**Sockeye Salmon Prey Length was Correlated with Predator Length**

# Assumptions of Adult Salmon Return Estimate

- ❑ feeding on age-0 sockeye salmon occurs over 150 days each year,
- ❑ feeding on sockeye salmon smolts occurs over 90 days each year,
- ❑ the average lifespan of northern pike is 7 years,
- ❑ average fry-to-adult survival is 3.5% and
- ❑ smolt-to-adult survival is size-dependent ranging from 13–46%

# Estimated Increase in Adult Sockeye Salmon Returns Resulting from Removal of Pike Predators

Pike Age Class	Adult Salmon Saved by Removing Pike Predators (By Year of Predators Life)							
	1	2	3	4	5	6	7	Total
1	1,079	1,203	1,425	751	0	87	658	5,204
2	0	1,203	1,425	751	0	87	658	4,125
3	0	0	955	503	0	58	441	1,958
4	0	0	0	503	0	58	441	1,003
5	0	0	0	0	0	58	441	499
6	0	0	0	0	0	0	441	441
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
<b>Total</b>	<b>1,079</b>	<b>2,407</b>	<b>3,805</b>	<b>2,510</b>	<b>0</b>	<b>347</b>	<b>3,081</b>	<b>13,229</b>

# Summary

- ❑ **958 northern pike were removed from Chelatna Lake from late May through June using variable-mesh gillnets and hoop traps.**
- ❑ **Pike catch per hour in variable-mesh gillnets declined during the season and was lower on 2017 than in 2010-2012.**
- ❑ **71% of the pike removed from Chelatna Lake were ages 1-3.**
- ❑ **Stomach contents of 642 pike were examined and 417 juvenile sockeye salmon were found in them.**

# Summary

- ❑ **80% of sockeye salmon preys were age-0 fish <5 cm in length and the highest numbers of sockeye salmon prey were found in early June.**
- ❑ **Sockeye salmon prey length was positively correlated the length of pike predators.**
- ❑ **We estimated that removal of pike predators by this project will result in an additional 13,229 adult sockeye salmon returning to Chelatna Lake in future years.**



# Questions ?

