Adult Steelhead Assessment 2014

By: JG.

Co-op Angler 2014

(A partnership in science between the Ontario Ministry of Natural Resources and the North Shore Steelhead Association)

Introduction

- Five steelhead assessment projects were conducted during the spring of 2014.
- They are:

  A) McIntyre River Steelhead Population Assessment

  B) Portage Creek Steelhead Population Assessment

  C) Cypress River Steelhead Population Assessment

  D) McVicar Creek Steelhead Population Assessment

  E) Co-op Angler Study
- All studies were conducted in partnership with the North Shore Steelhead Association (NSSA) and the Ontario Ministry of Natural Resources (OMNR).

Steelhead Assessment 2014 (A partnership between MNR and the NSSA)

Methods

A) McIntyre River Steelhead Population Assessment

Four experienced anglers biologically sampled, fin clipped and tagged adult steelhead they captured while angling during the spring spawning migration (May and June). (Figures 1 and 2)

B) Portage Creek Steelhead Population Assessment

Anglers from the NSSA angled, biologically sampled, fin clipped and tagged adult steelhead during the spring spawning migration (May and June) (Figures 1 and 2)

C) Cypress River Steelhead Population Assessment

Three experienced anglers biologically sampled and fin clipped and tagged adult steelhead they captured while angling during the spring spawning migration (May and June)). (Figure 1)

D) McVicar Creek Steelhead Population Assessment

Two experienced anglers biologically sampled and fin clipped and tagged adult steelhead they captured while angling during the spring spawning migration (May and June). (Figure 1)

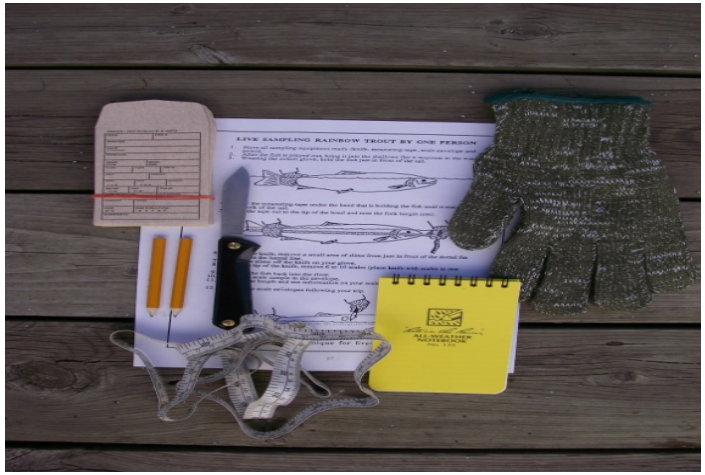
E) Co-op Angler

Anglers from the North Shore Steelhead Association received sampling kits (tape, glove, knife, envelopes and instructions) and biologically sampled their steelhead catches (fork length, sex, and scale samples) from north shore tributaries during the spring (Figures 1 and 3). Scientific permits were issued by MNR.

The population estimates were based on a 'Petersen Population Estimate'. Adult steelhead are fin clipped in year one and recaptured in year two. The repeat spawners with fin clips in year two complete the formula. (Figure 4)

Life history data is extracted from the scale sample (Figure 5) and summarized on an Excel spread sheet (Figure 6)

Collecting the data



Sample Kit

Measuring length

Gender (male or female ?)

Scale Sample

Figure: 1

Adult Steelhead Sampling

Portage Creek Clipping, tagging and Sampling

2010 289 sampled and tagged (white Floy MNR 44000, Adipose clipped)
2011 211 sampled and tagged (copper Floy MNR 43000, Left Ventral clipped)
2012 150 sampled and tagged (yellow Floy MNR 49000, Right Pectoral clipped)
2013 96 sampled and tagged (purple Floy MNR 31000, Front Dorsal clipped)
2014 31 sampled and tagged (white Floy MNR 44000, Right Ventral clipped)

McIntyre River Clipping and Sampling

2011 410 sampled, Front Dorsal clip, Sampling: Fork length, sex and scale sample, tag
2012 341 sampled, Front Anal clip, Sampling: Fork length, sex and scale sample, tag
2013 242 sampled, Adipose clip, Sampling: Fork Length, sex and scale sample, tag
2014 101 sampled, Front Dorsal clip, Sampling: Fork Length, sex and scale sample

Figure: 2

Co-op Angler Sampling by Tributary 2014

	Basin	Tributary	Sample Size
A	Thunder Bay	Whitefish River	78
		Neebing River	115
		McIntyre River	101
		McVicar Creek	144
		Wild Goose Creek	17
		Blind Creek	26
		others	8
B	Black Bay	Portage Creek	31
		Coldwater Creek	26
		Wolf River/ B. sturgeon	7
C	Nipigon to Marathon	Jackpine River	103
		Cypress River	184
		Steel River	12
		Others Nipigon to Marathon	10
		Book trout samples	15

Figure: 3

Petersen Population Estimate

Number of Fish Clipped in Year #1 X Repeat Spawners in Year # 2 / by Clips from Year # 1 Captured in Year # 2

Example :

250 marked in Year #1
150 Repeat Spawners Year # 2
30 Marked fish from Year # 1 Captured in Year #2

$$\frac{250 \times 150}{30} = 1259 \pm 95\ \%\ \text{Confidence}$$

Figure: 4

Life History Extrapolation

Steelhead Scale:
Age 5 years
(2 stream, 3 lake, 3rd spawn)

Third Lake Year, Third Spawn

Second Lake Year, Second Spawn

First Lake Year, First Spawn

Second Stream Year

First Stream Year

Figure: 5

Steelhead life history information from scale samples (Recorded on Excel Database)

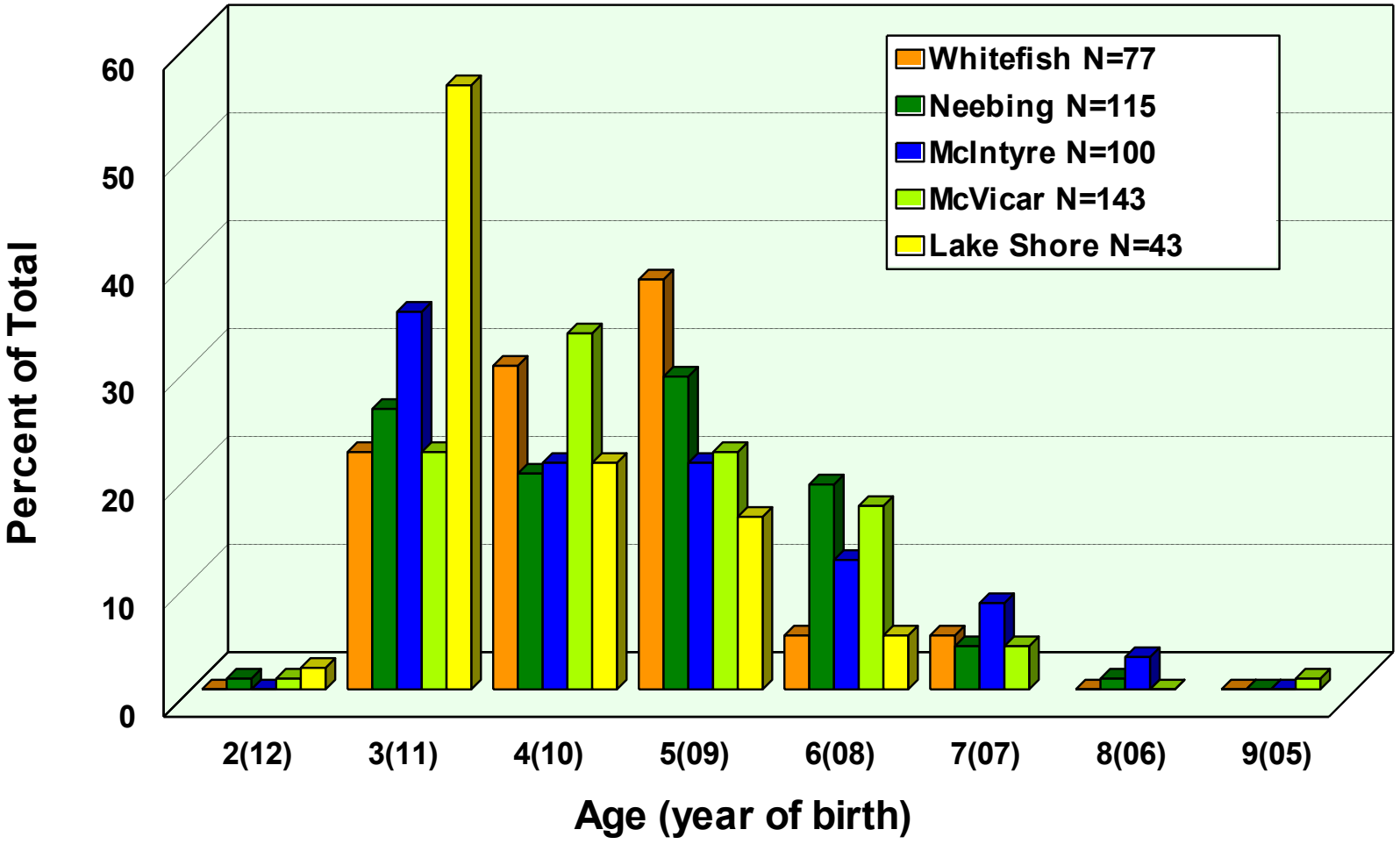
Flen	Sex	Spw	Lk/Sp	St.	Lk.	Age	Mat.
450	2	1	2	1	2	3	3
380	1	1	1	2	1	3	3
470	1	2	1	2	2	4	3
510	1	2	1	2	2	4	3
580	2	1	2	2	2	4	4
600	2	2	3	2	4	6	5
540	1	2	1	2	2	4	3
340	1	1	1	2	1	3	3
680	2	5	2	2	6	8	4
470	2	1	2	2	2	4	4
510	1	2	1	2	2	4	3
610	2	6	2	1	7	8	3
690	9	4	3	2	6	8	5
640	2	3	2	2	4	6	4
490	1	2	2	1	3	4	3
580	2	1	3	1	3	4	4

Legend: Flen. (fork length), Spw. (# of spawns), Lk/Sp (# lake years @ first spawn), St. (# stream years), Lk. (# lake years), Age (total age), Mat. (age at maturity)

Figure: 6

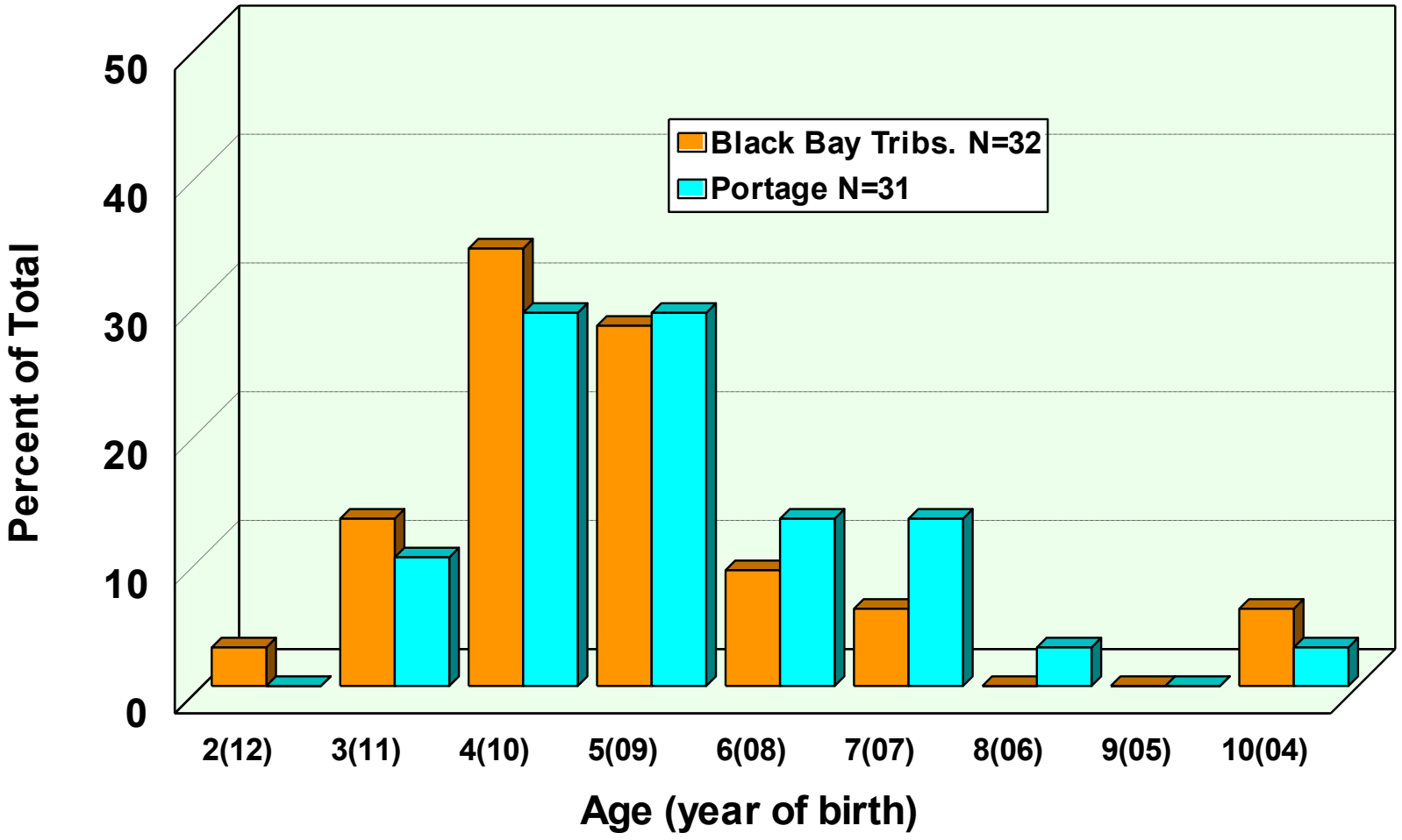
Steelhead, Thunder Bay Tributaries

Age Structure 2014



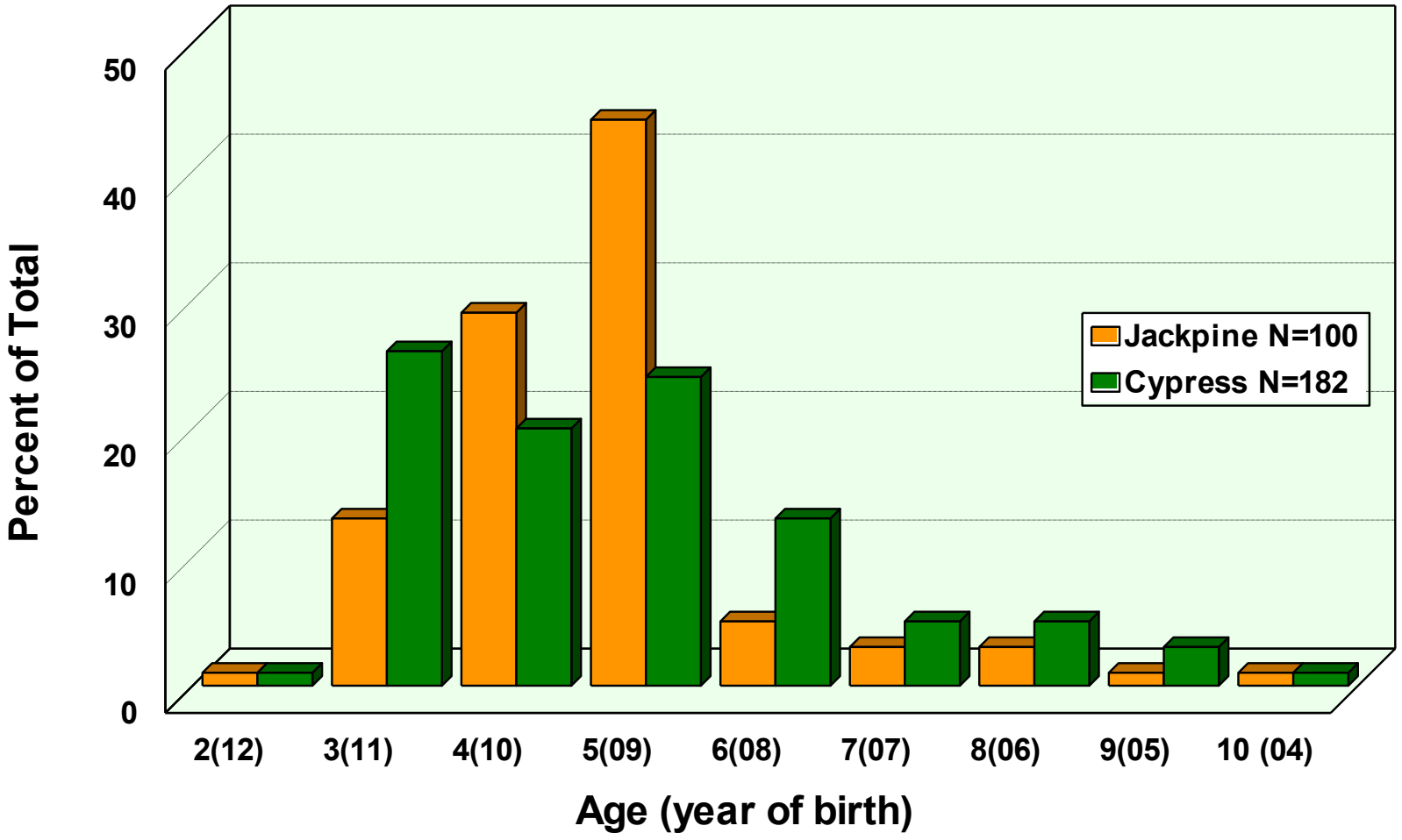
Steelhead, Black Bay Tributaries

Age Structure 2014

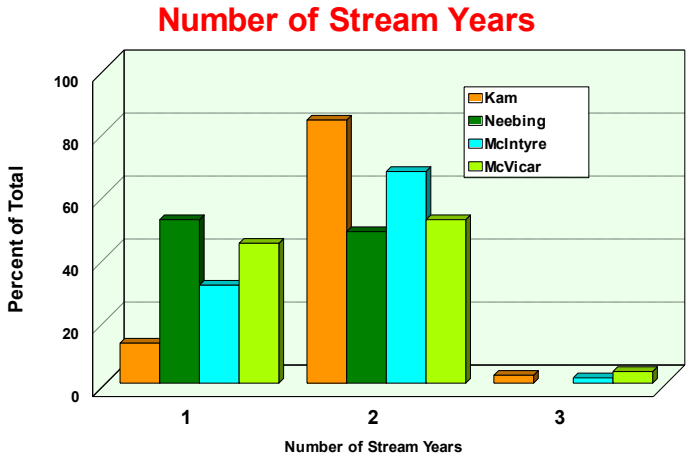


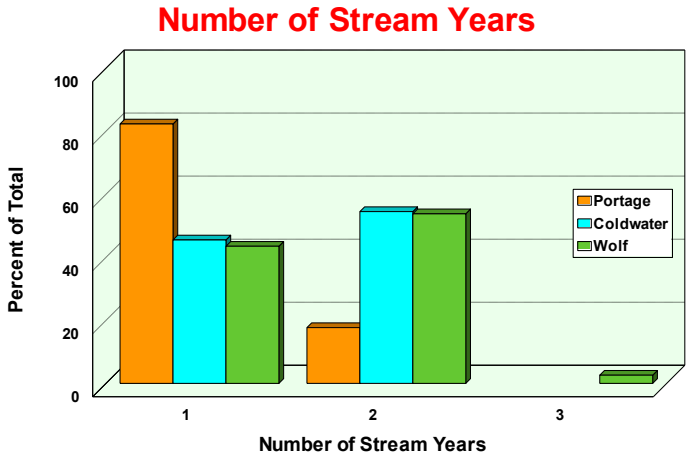
Steelhead, Nipigon Bay Tributaries

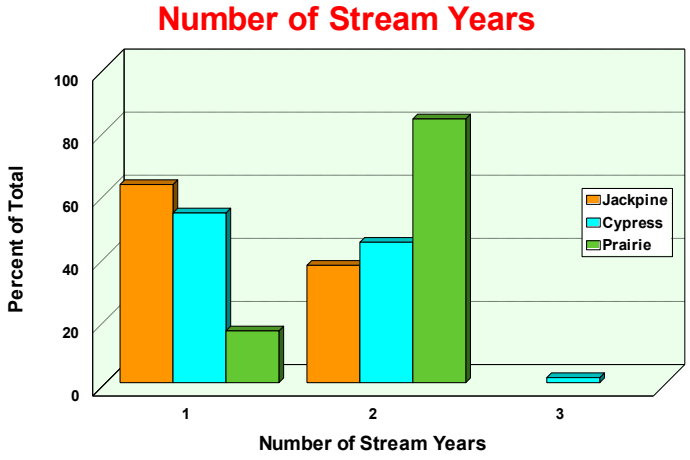
Age Structure 2014



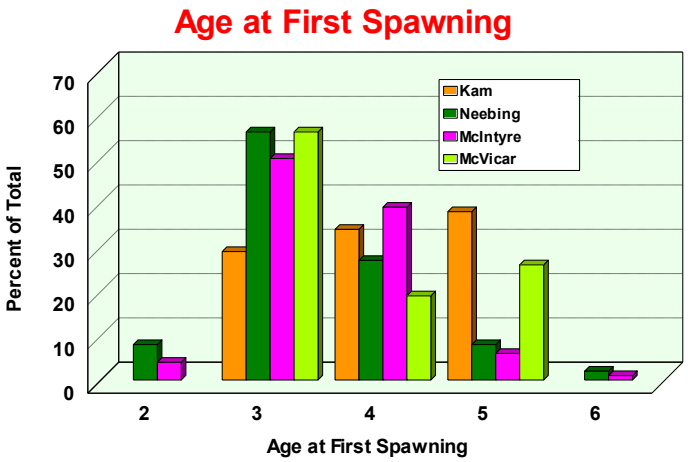
Smolting History

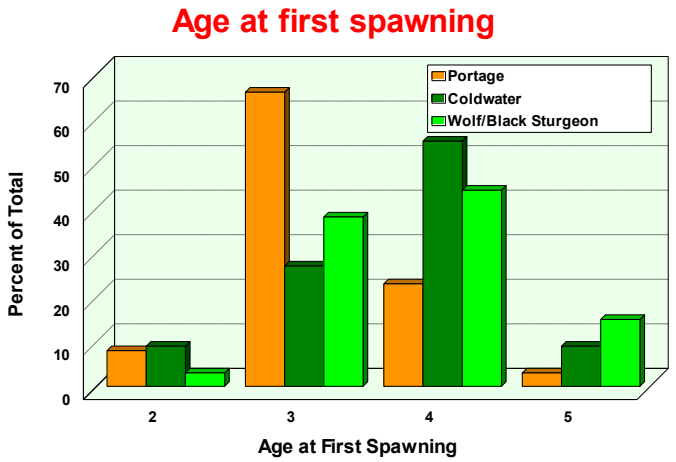


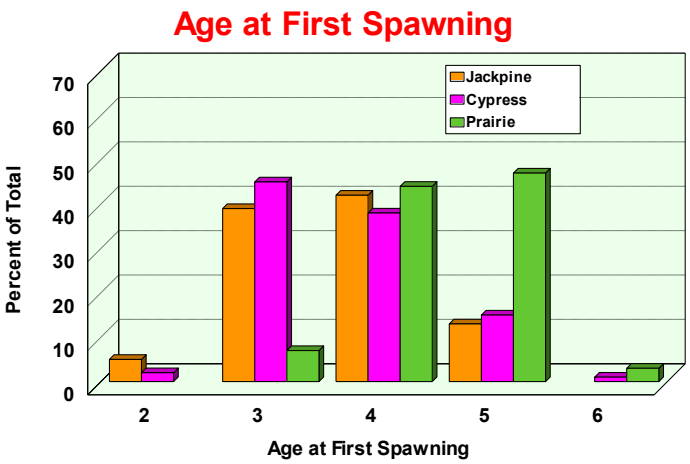




Steelhead Maturity



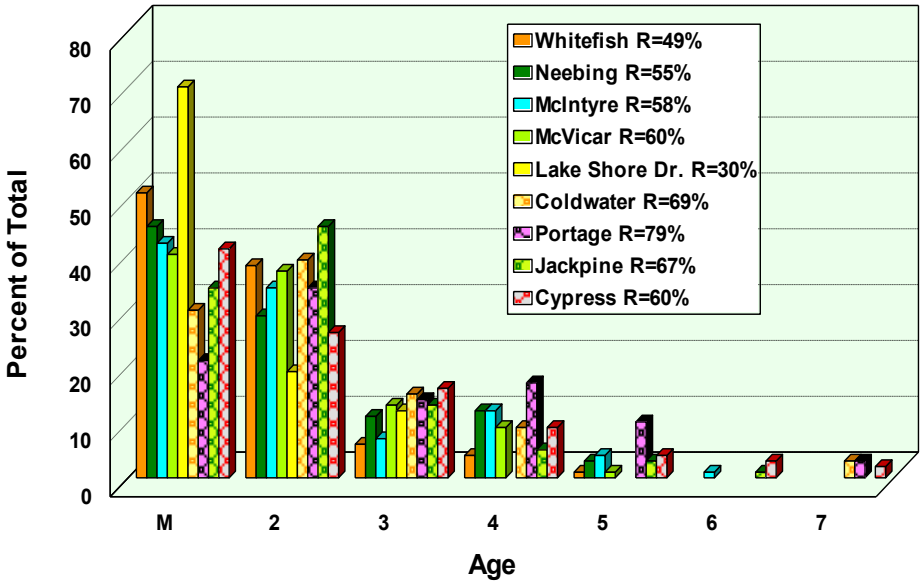




Repeat Spawners

Lake Superior Steelhead

Number of Spawning Events 2014



Legend note: Whitefish R= 49% (total percent of repeat spawners for each river)

Weight and Age of your Steelhead

Figure A

Length to Weight

- A 60 cm. (24”) steelhead weighs 2.5 kg. or 5.5 Lbs.
- A 75 cm. (30”) steelhead weighs 3.8 kg or 8.5 Lbs.

Lake Superior Steelhead

Weight for Length Categories

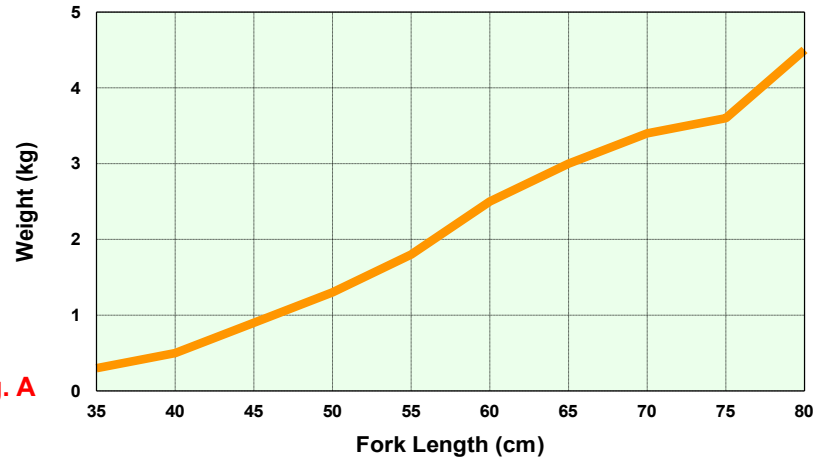


Fig. A

Note: 2.54 cm = 1 in ; 1 kg = 2.2 lb

Figure B

Fork Length to Age

- A 50 cm. (20”) steelhead is 3 years old
- A 70 cm. (28”) steelhead is 7 years old

Lake Superior Steelhead

Fork Length at Age

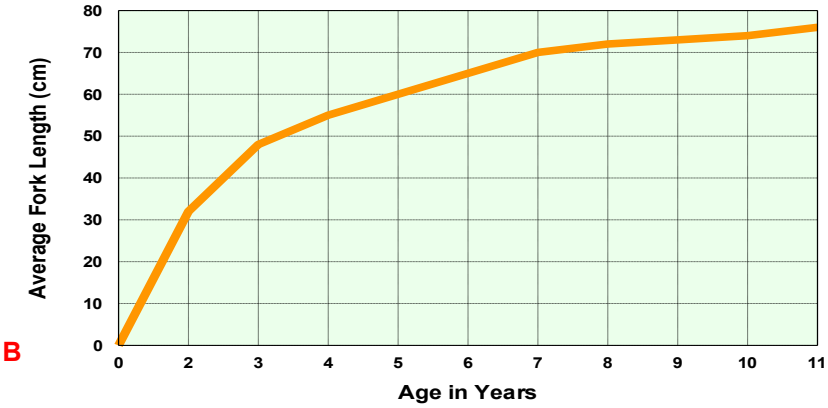


Fig. B

Note: This is s general guide. Growth will vary considerably with maturity, stream life and feeding behavior.

McIntyre, Portage Creek Population Trends

These two graphs indicate the trends in adult steelhead population size up to the present time. **Figure A** is the McIntyre River, Thunder Bay, **Figure B** is Portage Creek, Black Bay.

Figure A

- McIntyre River adult steelhead population maintained it's size at over 2000 from 2010 to 2012 decreasing to 1400 in 2013
- A minimal size limit of 1 over 69 cm was enacted for the spring 1999. This regulation has shown positive results with an increase in population size, and recruitment of juveniles

Figure B

- Portage Creek were closed to angling in 1994.
- From 1994 to to 2004 adult population increased from 800 to over 2000
- From 2007 to 2013 the adult population decreased to an estimate of 500 individuals
- the lower numbers of adult steelhead in Black Bay tributaries can be contributed to the increase in yellow perch and Walleye.
- Figure 7 illustrates the decrease in steelhead survival following the perch and walleye increases from 2005 to the present

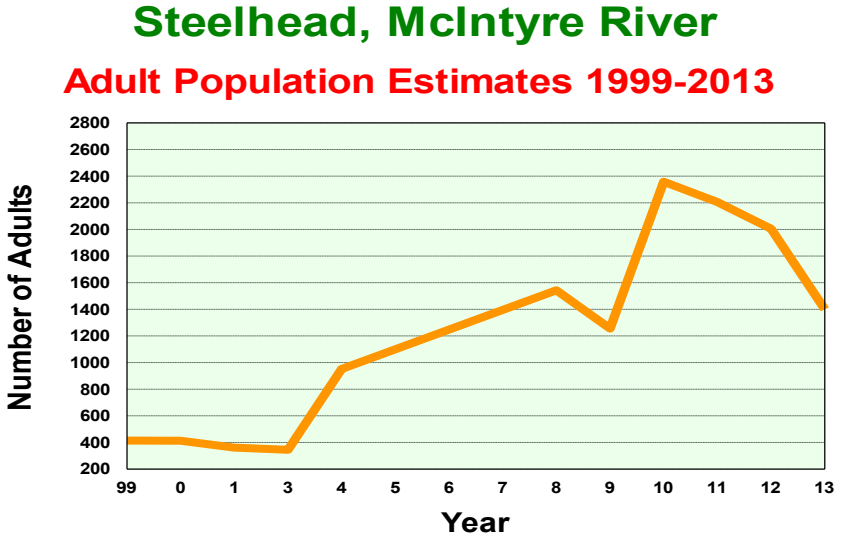


Fig. A

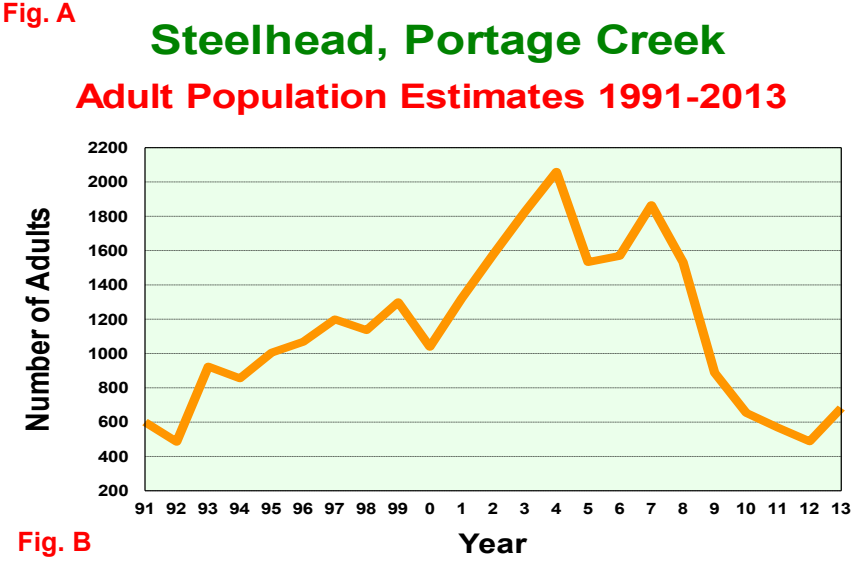


Fig. B

Steelhead, Portage Creek

Number of Age Three Adults 1991-2014

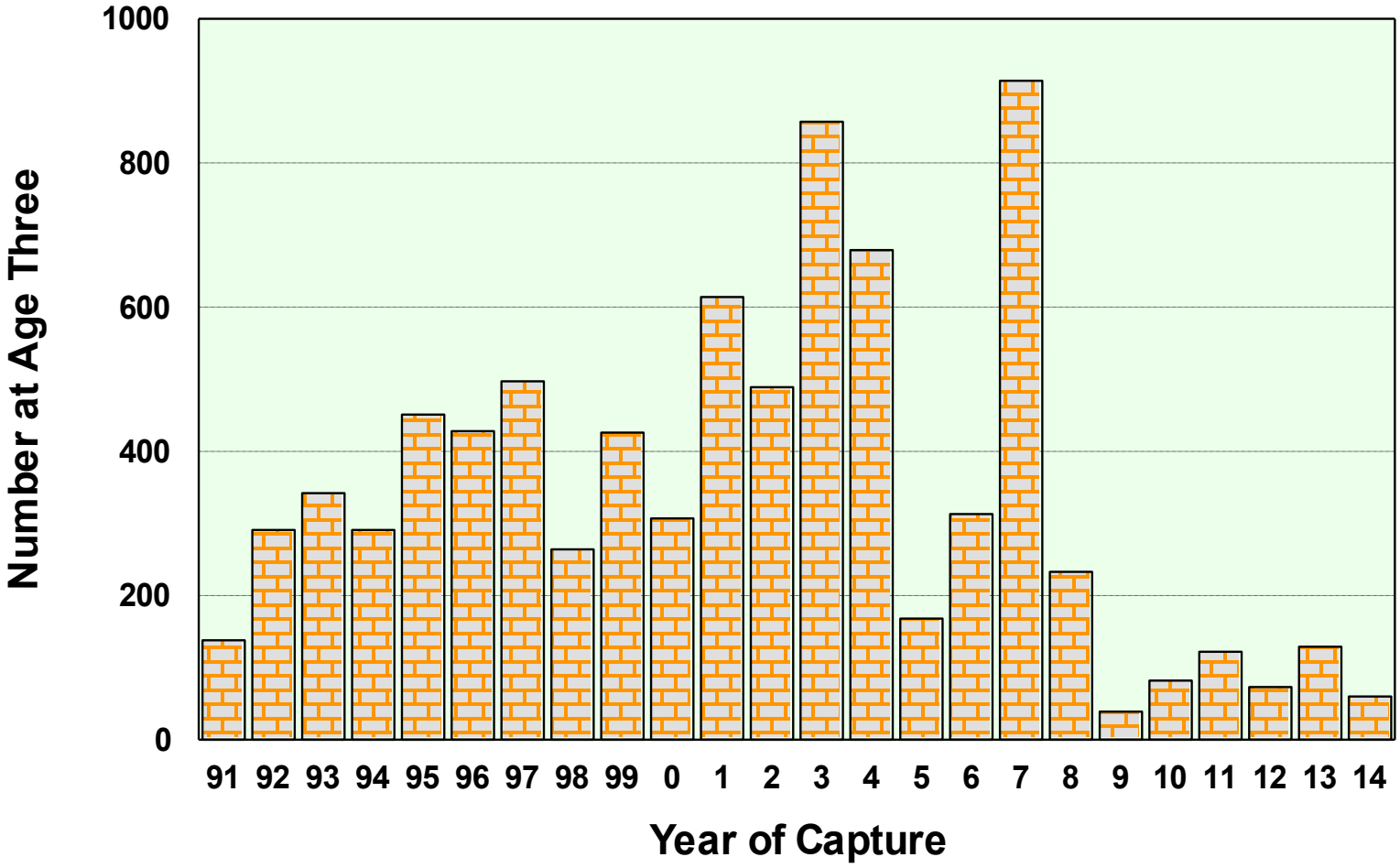


Figure 7

Summary

Thunder Bay

- In both 2013 and 2014 we had late springs that delayed the steelhead spawning migration well into May
- High flows decreased angler success.
- The McIntyre River steelhead population characteristics can be used to index the health of other Thunder bay tributaries
- In the McIntyre River the strong year classes of 2007 to 2009 are declining (natural mortality) resulting in a decreased population size in 2013 from what we estimated in 2010 to 2012.
- The 2011 year class (age three years….30 to 45 cm) appears to be strong in Thunder Bay tributaries and should increase the population size over the next few years as it fully recruits into the spawning population.

Black Bay

- Portage Creek's adult steelhead population can be used to to index the health of Black Bay tributaries.
- Since 2004 survival of juvenile steelhead to maturity has declined in Portage Creek as illustrated in Figure 7
- The decline has been observed by anglers in all Black Bay tributaries ie. Wolf, Coldwater and Black Sturgeon Rivers
- The decline in steelhead numbers coincided with a dramatic increase in yellow perch and walleye in Black Bay

Nipigon East

- Tributaries from Nipigon to Marathon had a late spawning migrations that began in mid May and continued into into early June
- High flows decreased angling success
- 2009, 2010 and 2011 year classes in the Jackpine R. and Cypress R. appear strong and both river appear to have healthy adult populations
- The adult population for the Cypress River was estimated to be 1500 to 2000 individuals

Acknowledgements

The author of this report would like to thank the following persons and groups for all their hard work in making these projects successful.

McIntyre River Population Study
Randy Beamish, Wes Bender, Keith Ailey and Terry Kosolowski

Portage Creek Population Study
Tom Kleinboeck (DFO). Mike Deschamps and Davis Viehbeck (OMNR) and NSSA membership

Cypress River Population Study
Wes Bender. Keith Ailey, Terry Kosolowski

McVicar Creek
Norm Stieh and Kyle Stratton

Co-op Angler Steelhead Data Collection
Thanks to all the steelheaders that collected the data.

Aging and Data Management:
Jon Tost, NSES

Funding:
NSSA., Lake Superior Upper Great lakes Management Unit (OMNR)

Corporate Sponsorship:
Enterprise Rent-A-Car and Normark Inc., Canada

Web Site:
Frank Edgson

A Partnership in Science