

Informing stakeholders on the status of an Adirondack cold-water fishery J. Benjamin Casscles and Daniel Stich



- Lake 2,842- acres
- Watershed 38,023-acres
- Shoreline 21.3 miles
- Elevation 1,661 ft.
- Maximum depth 125 ft. and mean depth 58 ft.



Figure 1. Piseco Lake watershed, elevation contours, tributaries and connected waterbodies

OBJECTIVE AND BACKGROUND

• Inform stakeholders on the status of the cold-water fishery

 Asses changes in size structure and condition of the lake trout population between years

• NYSDEC gillnet survey performed in 2002 and 2014

Lake trout supplemented annually by the NYSDEC with stocking of 1,600 – 3,500 individuals

WHAT IS A COLD WATER FISHERY ?

• Lakes with low productivity usually mesotrophic or oligotrophic

• Can be either naturally reproducing or hatchery supplemented

 Generally talking about salmonids (brown trout, brook trout, rainbow trout and lake trout)

• 15 °C (60 °F) for salmonid growth

• Sufficient forage base

STOCKING HISTORY

• 2002 minimum size 194 mm = 7.6 inches

• 2014 minimum size detected 163 mm = 6.4 inches

Year	County	Waterbody	Town	Month	Number	Species	Size (Inches)
2011	Hamilton	Piseco Lake	Arietta	May	1,660	Lake Trout	6.1
2013	Hamilton	Piseco Lake	Arietta	May	2,530	Lake Trout	7.4
2014	Hamilton	Piseco lake	Arietta	June	1,600	Lake Trout	6.7
2014	Hamilton	Piseco Lake	Arietta	June	3,500	Lake Trout	6.7
2015	Hamilton	Piseco Lake	Arietta	Мау	3.500	Lake Trout	6.3
2016	Hamilton	Piseco Lake	Arietta	April	1,970	Lake Trout	6.9

WHAT ARE WE LOOKING FOR ?

• Growth: rate of length and weight progression

• Recruitment: advancement to the next size class

• Mortality: death attributed to natural and unnatural causes

• Balance: indicator of stability proportion of large and small fish

LENGTH FREQUENCY HISTOGRAMS

• Use of breaks depending on sample size and fish size

• Breaks are usually in 1, 2, or 10 mm bins

 Helps detect gaps which are rough indicators of size class and age class groupings

• Shows deficiencies in stock distribution





Proportional Size Distribution

- Stock length 20 % WRA catchable size minimum length available to anglers
- Quality length 36 % WRA harvestable size minimum size anglers like to harvest
- Gives an idea of balance
- Preferred length
- Memorable length
- Trophy length

 $number \ge quality$ $number \ge stock$ PSD

 $PSD = \frac{number \ge specified}{number \ge stock}$



Figure 4. Lake Trout proportional size distribution estimates and upper & lower credible intervals in Piseco Lake, 2002.



Figure 5. Lake Trout proportional size distribution estimates and upper & lower credible intervals in Piseco Lake, 2014.

• PSD - Q increased from 3 – 13, between 2002 and 2014





RELATIVE AND STANDARD WEIGHTS

Standard Weight (W_s)

 $W_s = 10^{-5.681 + 3.246 \times \log(length)]$

 Assigns a weight based on roughly 60 other population y-intercept and slope

• Relative Weight (W_r)

• Scale of fitness

• Values above 75 are fit

 $W_r = \frac{observed weight}{standard weight} \times 100$



LENGTH WEIGTH REGRESSION

- y = mx + b
- 2002: y = 2.946x + -4.9677

• 2014: y = 3.392x + -6.0747

• Provides a comparable equation

• Slopes above 3 indicate gaining mass with length

RECAP 2002 - 2014

• Length frequency gap from 450 – 620 mm

• PSD increased from 3 - 13

• Relative weight increased from 88 – 100

• Length weight regression slope increased from 2.946 – 3.392

CONCLUSION

- The absence of Rainbow Smelt in 2002 suggests a mechanism for change in size and condition due to a shift in forage availability
- Spiny water flea may be impacting trophic exchange up the food chain through alteration of the zooplankton community
- Forage competition may also currently be reduced by conclusion of Landlocked Atlantic Salmon stocking programs
- Conducting cold-water fishery surveys in 2018 will facilitate monitoring of size and condition as related to recent changes in lake ecology

